Faculty of Design

2017

Conference proceedings of the Design Management Academy: Research perspectives on creative intersections

Bohemia, Erik, de Bont, Cees and Holm, Lisbeth Svengren

DESIGN MANAGEMENT ACADEMY CONFERENCE 2017
HONG KONG

ISSN 2514-8419

volume 3

Conference proceedings of the Design Management Academy

Research Perspectives on Creative Intersections

edited by
Erik Bohemia
Cees de Bont
Lisbeth Svengren Holm

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Conference Proceedings of the Design Management Academy

2017

Research Perspectives on Creative Intersections

Hong Kong

7–9 June 2017

Volume 3

Editors

Erik Bohemia, Cees de Bont and Lisbeth Svengren Holm

Conference Proceedings of the Design Management Academy
2017 International Conference
7–9 June 2017, Hong Kong,
designmanagementacademy.com
Volumes 1, 2, 3, 4, 5

Cover and conference identity design by Jason Liu
Proceedings compiled by Ekaterina Kotina, Federico Vaz and Yasemin Canik

Editors: Erik Bohemia, Cees de Bont and Lisbeth Svengren Holm

Conference Proceedings of the Design Management Academy

ISSN 2514-8419 (Online)
Design Management Academy

ISBN 978-1-912294-11-4 (Volume 1)
ISBN 978-1-912294-12-1 (Volume 2)
ISBN 978-1-912294-13-8 (Volume 3)
ISBN 978-1-912294-14-5 (Volume 4)
ISBN 978-1-912294-15-2 (Volume 5)

Published as an imprint of the Design Research Society
Loughborough University, London
3 Lesney Avenue, The Broadcast Centre, Here East
London, E15 2GZ
United Kingdom

The Design Society
DMEM
University of Strathclyde
75 Montrose Street
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DS 90

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HONG KONG DESIGN MANAGEMENT ACADEMY CONFERENCE 2017

RESEARCH PERSPECTIVES ON CREATIVE INTERSECTIONS

Editorial: Research Perspectives on Creative Intersections

DE BONT Cees[a]; HOLM Lisbeth Svengren[b] and BOHEMIA Erik[c]

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doi: 10.21606/dma.2017.244

The conference general theme *Research Perspectives on Creative Intersections* captured the overall conference spirit. It also reflects the conference planning and organisational processes which involved the community of international scholars located in different institutions, faculties, schools and departments.

The interdisciplinary nature of the conference enabled active intersections of scholars from the fields of design, social sciences and business studies. The mingling of researchers from diverse disciplines reflects the need for interdisciplinary approaches to research complex issues related to innovation.

The intersection between emerging and established researchers was an intended aspect of the conference. The reason was that today's PhD candidates will drive the future research. The conference succeeded by attracting significant number of PhD candidates who represented a third of the conference delegates. This provides a good indication for the future growth research related to design innovation.

Altogether, 295 authors have submitted: 140 full papers and 31 workshop proposals. These numbers indicate that a single authored research is no longer the norm. The intersection which stems from collaboration amongst researchers to undertake and disseminate research is now becoming the established practice within the design innovation research.

The 19 conference tracks, for which the papers were submitted, were organised within 7 overarching themes (see Table 1). The track facilitators ultimately shaped the overall conference scope and direction. The tracks' topics acted as the focal points for the overall Call for Papers. Thus, our thanks you go to all the 69 tracks' facilitators. It was them who collectively were responsible for the conference programme and we would like to thank them for their valuable services on the International Scientific Programme Committee.

Table 1 Conference Tracks

Theme 1) New Models of Innovation
Track 1a. The Interplay between Science, Technology and Design
Track 1b. Interdisciplinary Perspectives and Trends in Open Innovation
Track 1c. FROM R&D TO D&R: Challenging the Design Innovation Landscape
Track 1d. Design creating value at intersections
Track 1e. Design management transforming innovation strategy
Theme 2) Product-Service Systems
Track 2a. Capturing Value and Scalability in Product-Service System Design
Track 2b. Service Design for Business Innovation for Industry 4.0
Theme 3) Policy Making
Track 3a. Creative Intersection of Policies and Design Management
Theme 4) Intersecting Perspective
Track 4a. Changing Design Practices: How We Design, What We Design, and Who Designs?
Track 4b. Challenges and Obstacles to the Enactment of an Outside-In Perspective: The Case of Design
Track 4c. At the Intersection Social Innovation and Philosophy
Theme 5) Methods
Track 5a. Design practices of effective strategic design
Track 5b. Markets and Design: Vertical and Horizontal Product Differentiation
Track 5c. Foresight by Design: Dealing with uncertainty in Design Innovation
Track 5d. Contemporary Brand Design
Theme 6) Capabilities
Track 6a. Building New Capabilities in an Organization: A research methodology perspective
Track 6b. Exploring Design Management Learning: Innovate with 'user' oriented design and KM perspectives
Track 6c. Design teams in the pursuit of innovation
Track 6d. Designing the Designers: Future of Design Education
Theme 7) Foundations
Track 7a. Pioneering Design Thinkers

We would like to also thank the over 150 expert reviewers who provided their valuable time to provide critical peer feedback. Their service on the International Board of Reviewers was invaluable as the good quality peer reviews provided a vital contribution to this international conference. Each reviewer scored papers on a scale of 0 to 10 and provided critical review comments.

Most papers were reviewed by two people, though some had three or even four reviewers, and in a very small number of cases only one review was submitted. Total number of submitted full papers was 140. After the blind peer review process 66 papers (47%) were accepted and 49 (35%) papers were provisionally accepted as these needed major revisions, and 25 (19%) papers were rejected.

In making the final decisions about papers, the Review Committee first looked at all papers where the difference of opinion between reviewers was 4 points or greater and moderated the scores if necessary. The Review Committee then discussed all papers that were just under the general level of acceptance to determine outcomes, before finally looking at any exceptions.

At the end of the review process 103 (73%) paper submissions were accepted for presentations of which 95 (68%) were included in the proceedings and 38 (27%) papers were rejected. Seven accepted papers were presented at the conference as research in progress and they were not included in the proceedings.

The workshops provided another intersection on how delegates and workshop facilitators interacted. Altogether, 31 workshop proposals were submitted and 17 (54%) workshops were accepted by the International Workshop Organising Committee. We would like to thank the International Workshop Organising Committee members: Katinka Bergema, Nuša Fain, Oriana Haselwanter, Sylvia Xihui Liu, Ida Telalbasic and Sharon Prendeville for providing their expertise.

We would like to thank both keynote speakers, Professor Jeanne Liedtka and Mr Richard Kelly, who generously gave their time to share their insights with the conference delegates. Their generosity allowed us to offer bursaries to five emerging researchers to attend the conference. The bursar recipients were selected from close to 40 applicants. The number of applicants indicates the need to setup funding schemes to allow emerging researchers to attend international events such as this conference.

The PhD Seminar event which took place a day prior to the conference was attended by over 100 delegates. The PhD Seminar was chaired by
Dr Sylvia Xihui Liu and Professor Jun Cai. Initially 40 submissions were received of which 36 were presented at the event. The event culminated with a debate organised by the PhD students who were inspired by the "Open Letter to the Design Community: Stand Up for Democracy" by Manzini and Margolin (2017). We are grateful to the debate organisers.

The location of the conference in the Jockey Club Innovation Tower designed by Zaha Hadid at the Hong Kong Polytechnic University has also provided delegates with visible cultural intersections of a rapidly transitioning major interconnected global city from one political sphere of influence into another. The conference would not have happened without the solid work provided by the local organising team which was led by Professor Cees de Bont and consisted of: Ms Rennie Kan who took up the role of the fixer; Mr Pierre Tam who in his role as the Conference Secretary tirelessly worked on satisfying at many times conflicting requirement; Ms Flora Chang who checked and checked again all delegates registrations; Mr Rio Chan wizard of IT and Mr Jason Liu who provided the visual direction for the conference.

The Design Management Academy's international research conference was organised under the auspices of the Design Society's Design Management Special Interest Group (DeMSIG) and Design Research Society's Design Innovation Management Special Interest Group (DIMSIG) in collaboration with: The Hong Kong Polytechnic University, Loughborough University, Tsinghua University, University of Strathclyde, Politecnico di Milano and Delft University of Technology. The conference was a culmination of two years of planning and the 2019 conference planning commenced well before the 2017 conference programme schedule was finalised. It is a hope that the conference will act as a platform to build a diverse community of scholars who are interested to explore and discuss design innovation practices.

Reference

Manzini, E., & Margolin, V. (2017). Open Letter to the Design Community: Stand Up for Democracy. 5 March 2017. Retrieved from http://www.democracy-design.org/open-letter-stand-up-democracy/

About the Editors

Cees de Bont is dean of School of Design, Hong Kong Polytechnic University. His research interests are in the areas of early concept testing of consumer acceptance, branding, networked innovation and design education.

Lisbeth Svengren Holm is professor in Design Management at University of Gothenburg, Director of Business & Design Lab. Her research interests include design management, design & strategy, design & innovation, and the interaction between design and other functions.

Erik Bohemia is the Programme Director in the Institute for Design Innovation at Loughborough University London. He is interested in Design as a cultural practice and the material effects of design.

Theme 4: Intersecting Perspective

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Section 4.a

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HONG KONG DESIGN MANAGEMENT ACADEMY CONFERENCE 2017

RESEARCH PERSPECTIVES ON CREATIVE INTERSECTIONS

Introduction: Changing Design Practices: How We Design, What We Design, and Who Designs?

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doi: 10.21606/dma.2017.239

Co-design is a process in which designers and users collaborate as 'equals' to develop innovative solutions (Bertini & Plumley, 2014). Co-design methods are increasingly used by professional designers to facilitate and enable users to co-develop innovative solutions for 'themselves' (Mitchell, Ross, May, Sims & Parker, 2015; Steen, Manschot & De Koning, 2011). For example, the Design Council is advocating the use of co-design methods to support the development of practical innovative solutions to social problems such as increased cost of elderly care and tackling child poverty (Design Council, n.d.). The involvement of users in developing solutions acknowledges that their take up is dependent on the ways users create and negotiate meanings of objects and services (Vossoughi, 2013).

The aim of this track is to shed light on existing co-design practices within the context of social change and transformation that they enable. The track is particularly interested in, first, suggesting theoretical and methodological tools that are useful for exploring collaborative practices, and second, identifying motivations for and conditions of changing design practices. The 11 articles from 21 authors approach the theme of this track from various perspectives, highlighting different aspects of change and transformation in design.

In *Design for Circular Futures through Distributed Repair*, Giuseppea Salvia and Sharon Prendeville explore repair activities as a co-design practice, by highlighting the potential of the distributed knowledge and production systems for repair. Beginning their article with a discussion on the reasons behind the decline in the repair market, they offer four scenarios (self-repair, bespoke repair, mass customised repair, mass fabrication repair) in

which design can serve as a strategic tool to foster repair, at different scales and levels of collaboration (between individuals and organisations), using the power of networks.

Tsai-Ping Chang and Pei-Jung Cheng, in *Exploring Consumers' Trust Difference between Shopping on Website and Mobile App Service Process*, focus on the experience of mobile shopping platforms, which is a common form of shopping today due to the development of mobile services and mobile internet. In their comparison between shopping via websites and apps, they particularly address the issue of trust, and based on the findings collected through questionnaires, they conclude the article with suggestions for future service providers.

Another article that is interested in the consumers' emotions belongs to Yuuki Shigemoto. In the article titled *Managing Emotion for a Sustainable Future*, the author explores the possible patterns of consumers' purchase and ownership. After reviewing various factors that affect the decision-making process, the article discusses how designing emotional attachment could encourage sustainable consumption. It derives future implications by considering sustainable consumption together with technological innovation and advantage.

In *Tracing the Tensions Surrounding Understandings of Agency and Knowledge in Technology Design*, Ruth Neubauer, Erik Bohemia and Kerry Harman examine the dualism of structure and agency, and identify four paradigmatic forces in production of design knowledge, which are objective versus subjective and individualist versus participative. Utilising these forces as an analytical framework and drawing on a comprehensive review of various conflicting and concepts within technology design processes from the literature of HCI, sociology and sustainable design, the authors highlight the tensions that occur in design practice.

In another article that presents a theoretical discussion, *FREE Architecture: An Ethnographic Approach to Architecture Practice*, Claudia Sánchez and Victór Coreno propose digital ethnography as an architectural design model that facilitates collaborative experimentation, replication and feedback in architectural design processes. They suggest that this model can serve as a general guide that enables a freer architecture in theory and practice with adequately realistic, sustainable and deeper connections between the architectural artefacts, users and the architect whose decisions create the space.

Likewise, in their article *Design Practices: Where is the Sense in That?*, Felipe Domingues, Salvatore Zingale and Dijon De Moraes address a theoretical debate on the relationship between design theory and practice. Posing their questions from the perspective of design semiotics, they interrogate how to cope with evidence in field research within design semiotics.

In the article titled *Exploring Articulations of Design Activism*, Noémi Zajzon, Erik Bohemia and Sharon Prendeville review emerging issues related to design activism. The article begins by reviewing the key concepts related to design activism, and presents three case studies to highlight the need for a dialogue between design activism and its communities.

Tackling *The What, How and Who of Social Service Design,* Mieke van der Bijl-Brouwer presents three case studies with the aim of providing insight into design practices for social services. Making a comparison of these cases the article reveals the complex nature of social services, highlighting the significance of developing bottom-up, rather than top-

down, structures within social service organisations, and the need to bridge design and implementation in social service design. In the final part, in light of these findings, it delineates some opportunities for improvement of social service design practices.

In *Together We do not Forget: Co-designing with People Living with Dementia towards a Design for Social Inclusion*, Marjolein Wintermans, Rens Brankaert and Yuan Lu present a design process in which cognitively impaired participants are involved in the design of products and services for themselves. Demonstrating each phase of the co-design process in detail along with their personal reflections, the authors share their observations regarding the role of designer in co-design activities as well as the methods and tools used within the process.

Another article that is empirically based on a collaborative activity is *Using Collaborative Reflection in Service Design Research*. In this article Merlijn Kouprie and Soumava Mandal aim to show how applying a methodology based on collaborative reflection in the research phase of a service design project enables employees of an organisation to reflect together and build a common understanding. In a similar way to the previous article, the authors discuss and evaluate the research tools they have designed for the workshop, and place much emphasis on their observations as design researchers.

In *The Role of Inner Values to Teamwork during Design for Social Innovation*, Pratik Vyas and Robert Young's goal is to identify and verify the inner values that are considered to play an important role in teamwork during design for social innovation. The paper draws on a survey (that generates both qualitative and quantitative) with design professionals. In the conclusions, the authors highlight the context-dependency of inner values, arguing that the trade-off between inner values is essential, yet requires wisdom and balance by the designer.

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About the Track Facilitators

Dr Pınar Kaygan is Assistant Professor in Industrial Design, Middle East Technical University. Her research interests are creative work and workplace; interdisciplinary relations, collaboration and teamwork in design education and practice; critical aspects of design management, including gender, hierarchy, power relations.

Dr Silvia Pizzocaro is a full professor of Industrial Design at Scuola del Design of Politecnico di Milano. Master Degree cum laude in Architecture. PhD in Industrial design. Former Chair of the degree programme in Product design and of the Master of science programme in Product design for innovation for the years 2012–15. A current member of the Board of Professors of the PhD programme in Design at Politecnico di Milano. Over the years, she has worked at the intersection of product design theory, design research culture and education in design.

Dr. Kerry Harman's main research interests are concerned with the politics of learning at work. Her work explores the interrelationships between workplace practices, knowledges, power and subjectivity. She uses the notions of embodiment and performativity to help in these explorations.

Dr Erik Bohemia is the Programme Director in the Institute for Design Innovation at Loughborough University London and a visiting professor Politecnico di Milano. He is interested in Design as a cultural practice and the material effects of design.

HONG KONG DESIGN MANAGEMENT ACADEMY CONFERENCE 2017

RESEARCH PERSPECTIVES ON CREATIVE INTERSECTIONS

Design for circular futures through distributed repair

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The Circular Economy (CE) is attracting business, policy and academic interest through potential monetary and environmental savings, by material and product lifetime extension. However, it overlooks the role of consumption in achieving its goals, posing less emphasis on reuse and repair for instance. Focusing on the 'inner' CE loop of repair could unlock underaddressed potential, especially if developed in conjunction with emerging sociotechnical changes of distributed production. These are considered adaptable, flexible and resilient which exploit the power of networks.
In this paper, we propose that distributed production (through open design) can be leveraged to foster the wider uptake of repair practice and business. To this end, four scenarios are represented in which design is a strategic tool to foster repair, at different scales and level of peoples' engagement.

keywords: repair; circular economy; distributed production; open source hardware

Introduction

The Circular Economy (CE) is "an economic model based inter alia on leasing, reuse, repair, refurbishment and recycling, in an (almost) closed loop, which aims to retain the highest utility and value of products, components and materials at all times" (EPRS, 2016:2). With a need for economic reformation, the CE sets out a vision for a system of intensified 'closed loop' production to extend resource value (EMF, 2013a; 2013b). The CE is an umbrella concept that seeks a new economy, drawing on theories of the ecological economics; bioeconomy; industrial ecology; the blue economy; and cradle-to-cradle. Its success is its alluring premise of 'win-win' ideas for a sustainable future, ecological

modernization theory (Buttel, 2000) that captures the interests of businesses and policy-makers. For instance, the Ellen MacArthur Foundation – a vociferous promoter of this model – suggest that by 2030 'going circular' can contribute up to 7% increase in Gross Domestic Product in Europe and the European Commission forecasts the creation of circa 2 million jobs through CE activities (EMF, 2015).

The CE requires a considerable change in how businesses operate as well as how citizens buy and use products. It is perhaps surprising that such a challenge to the very core of how the economy works has gained prominence in national policies globally. The CE has been prominent in China for many years, most recently through its 11th and 12th 'Five Year Plans' (Su, Heshmati, Geng & Yu, 2013) and Europe has adopted a CE Roadmap (European Commission, 2015). Yet, concerns about the CE have been put forward from stakeholders in the environmental community. The European Union's CE package is perceived to overemphasise materials (e.g. recycling or upcycling) rather than products (e.g. through repair). Anderson (2007) has lamented the limitations of closed energy systems and Reijnders (2008) those of cradle-to-cradle approaches, which they say are not unequivocally good for the environment. Despite aiming to re-imagine the economy, the CE is blinkered to the complex role citizens play in driving economic growth through consumption, which is paramount to whether or not a new economy through a future CE can be realistically achieved (Murray, Skene & Haynes, 2015; Edbring, Lehner & Mont, 2016).

Activities such as repair, conveyed as the 'inner loops' of the CE model, serving products and parts rather than materials, have the potential to extend the lifetimes of products while boosting labour (Stahel, 1984). Although systematically addressed in areas like public infrastructure (e.g. water and energy), for many decades repair activities in Western societies have been in decline for many years and the system of repair actors is fragmented. Yet, anecdotal reports tell stories of an upsurge in repair communities, projects, and interest. Notwithstanding this, these inner loops are neglected in CE debates (Ghisellini, Cialani & Ulgiati, 2016; Riisgard, Mosgaard & Zacho, 2016) despite an acknowledged need to support longer product lifetimes.

Here, we describe repair as "a process whereby a faulty, damaged or worn product is restored to an acceptable or usable condition and encompasses a complex and fragmented set of activities involving a wide range of organizations and individuals" (Cooper & Salvia, forthcoming). In this article, we explore how repair activities might be fostered by leveraging distributed systems, through four future design-driven scenarios. We place repair at the heart of the CE and explore how new contexts for collaborative design through distributed production can be a means to enhance repair practices.

The paper first introduces the value and challenges to repair. This is followed by a discussion on the potential for distributed production (through open design) to contribute to a repair resurgence. Finally, we speculate on the role of design as an enabler of distributed repair.

The benefits and limits of pursuing repair

Repair has potential environmental benefits through lower material throughput and waste (European Commission, 2012, 2015) and as such plays an important role for achieving

resource efficiency. From a policy viewpoint, repair is a waste management strategy prioritised over recycling, energy recovery and disposal (European Commission, 2008), which unlocks a higher (monetary) value (Geyer & Blass, 2010; Mars, Nafe & Linnell, 2016).

Increasing repair activities is expected to foster skills development and increase job opportunities in many countries (Benton, Coats & Hazell, 2015; Bureau of Labor Statistics, 2016; European Commission, 2015).[1] Some companies offer repair and refurbishing services to their clients and several business models that could increase repair opportunities have been proposed for different products, including electronic equipment and furniture (WRAP, 2016; FRN, 2015). For instance, the US-based clothing firm Patagonia is a well-known industrial case pursuing product longevity as a company value, offering repair support for their products, by either mailing the item back to the company or through online step-by-step guides for their customers.[2]

Repair may generate less tangible – yet valuable – benefits such as product variation, personalization and innovation (Graham & Thrift, 2007), individual wellbeing (Mugge, Schoormans & Schifferstein, 2005), learning experience (Houston et al., 2016), personal and community empowerment (Rosner & Ames, 2014), and social cohesion (FRN, 2015).

Today, the "fragmented and complex" nature of repair means fully releasing such benefits is challenging, because repair involves a wide range of activities and actors, with a plethora of interconnected elements. Therefore, the successful release of the potential for repair in a future CE needs to overcome barriers, on multiple levels, such as individual perceptions and attitudes (McCollough, 2007; Scott & Weaver, 2014), adverse technological, business and marketing strategies (Cooper, 2010; Riisgaard et al, 2016; Slade, 2006), local and culturally situated challenges (Rosner & Ames, 2014; Houston et al., 2016).

Such difficulties contributed to the decline in the repair market over the last decades (especially for footwear and electronic equipment in Western society), which is associated by many with a throwaway culture (McCollough, 2009). Encouraged by researchers and experts for many years, recent policies and governmental initiatives have been attempting to overcome some of these barriers, namely by regulating the minimum time availability of spare parts, reducing taxes on repair jobs,[3] or banning planned obsolescence.[4]

Top-down initiatives are bound in lengthy processes, which may struggle to be both sufficiently effective and productive with regards to local diversities and needs. A situated, adaptable approach to repair has potential to overcome many of these proposed issues; "the inner circle of the circular economy [i.e. repair] is a local circle, it is for citizens, small

[1] http://ifixit.org/blog/3654/one-way-to-create-american-jobs-fix-our-5-million-tons-of-out-of-use-electronics/

[2] http://www.patagonia.com/worn-wear-repairs/

[3] https://www.theguardian.com/world/2016/sep/19/waste-not-want-not-sweden-tax-breaks-repairs

[4] http://www.eesc.europa.eu/?i=portal.en.ccmi-opinions.26788;
http://www.dailymail.co.uk/news/article-2976012/France-wants-companies-make-appliances-longer.html

companies, community initiatives to reinvent."[5] We propose to use a bottom-up approach, which gives value to – rather than resist or override – local diversity, granularity and complexity as a lever for diffusing repair. The strategy described in this paper intend to engage people and their local material and cultural capital more deeply in the repair journey; co-design approaches and methods appears beneficial for the achievement of this goal.

Such an approach may appear challenging for both manufacturers and people. On the one hand, the former have likely benefited from rapid (if not planned) product obsolescence (Packard, 1961; Slade, 2006). Thus the extension of product lifespans, through repairability, may sound counterproductive. However, this may also represent a business opportunity, especially for certain product categories such as electronic devices (Benton, Coats & Hazell, 2015). Indeed, successful Do-It-Yourself (DIY) repair can build brand trust and promote brand loyalty (Scott & Weaver, 2014; Sabbaghi, Esmaeilian, Cade, Wiens & Behdad, 2016).[6]

On the other hand, laypeople may be uncomfortable with a DIY repair approach, for lack of skills, time or other resources (e.g. manuals, tools, spare parts). A major attempt to overcome such difficulties and thereby empower people to repair, has been pursued by iFixit[7] – an online platform and community that supports DIY repair of electrical and electronic devices by providing guides and selling spare parts. Alternatively, designers and entrepreneurs have been developing devices for accessible, adaptable and appealing DIY repair that requires low-level skills and emphasises aesthetics. Sugru, Kintsugi or Woolfiller[8] represent this new repair practice, which moves beyond the conventional paths of DIY tools towards making mending a visible aesthetic attribute of a product (Figure 1).

[5] https://therestartproject.org/consumption/we-are-the-circular-economy/
[6] http://ifixit.org/blog/4631/ifixit-community-survey-the-results-are-in/
[7] https://www.ifixit.com/
[8] https://sugru.com; http://www.woolfiller.com; http://humade.nl/products/new-kintsugi-1

Figure 1 Examples of design-driven DIY repair devices, such as Sugru (top-left, source: https://sugru.com), Kintsugi (top-right, source: http://humade.nl) and Woolfiller (bottom, source http://www.woolfiller.com).

These explorations, however, frame the repair practice as an individualistic one. Individuals are enabled to mend and repair their belongings in a reshaped way, but with limited interaction with others. This may inhibit certain people due to skepticism of the quality of the repair, perceptions of safety risk, low confidence in ability to repair, as well as the likelihood of abandoning the activity in the face of any hurdles. Expert peer or professional support may be reassuring, giving confidence to self-repairers (Salvia, 2016). Therefore, the emerging trend of distributed production and distributed knowledge is envisaged as an opportunity to support people and overcome resistance towards repairing, by building collaborations with peers and through interaction with experts. Codesign methods may help these forms of collaborative repair.

The potential of distributed systems for repair

A new generation of sociotechnical systems has been emerging over recent decades, called 'distributed systems'; these are constituted by relatively autonomous parts, scattered yet connected between themselves and in wider networks (Manzini, 2015). The concept is closely linked to that of 'Distributed Economies', which is a direct response to extreme environmental degradation created by centralised economic systems (Johansson, Kisch & Mirata, 2005). Such decentralization through,

> *(t)he distributed model sees infrastructure and critical service systems positioned close to resources and points of demand. Individual systems may operate as separate, adaptive units but are also linked within ever-wider networks of exchange at the local, regional or global level. Each is tailored to the needs and opportunities of unique locations but has the*

capacity to transfer resources across a wider area (Ryan, quoted in Manzini, 2015).

These characteristics enable the creation of an adaptable, flexible and resilient system, which builds on the power of networks to make an optimal use of distributed – although small – resources.

Distributed systems fostering repair are few, but significant cases exist. Grassroots initiatives oriented to repair include Fixit Clinic or Repair Café[9], which are local, community-led initiatives of amateurs supporting citizens wishing to repair their items. These bottom-up initiatives are global, though prominent in industrialised countries, and capitalize on goodwill to provide valuable services to communities by helping improve product reparability and longevity (Keiller & Charter, 2014). Through a more collaborative practice of repair, people are engaged in learning processes and social interaction, which may enable material resource savings through the extension of product lifespans (Houston et al., 2016), thus contributing to the CE goals and overcoming barriers to repair faced by individuals at the same time.

More effort is needed to escalate and act on the potential of repair. Engaging a wider network – or better 'distributed system' – of competences and resources could be a strategy to foster such escalation. Manzini (2015) identifies five main waves of innovation, which led to the emerging, establishment and convergence of different distributed systems, up to the wider level of distributed economy. These waves of innovation include distributed intelligence (or knowledge) and distributed fabrication, which here we speculate may be valuable for diffusing repair for a future CE.

Emergence of distributed production and consumption

Distributed production includes a range of practices. This can include citizens having the opportunity to be involved at varying levels and at different stages in the definition of products, as well as companies restructuring their production systems to decentralized networks. Distributed production is supported by innovative technologies (e.g. Atkinson, Unver, Marshall & Dean, 2008), networks of people (e.g. Leadbeater, 2008) and new business models (e.g. Franke, von Hippel & Schreier, 2006). The shift to distributed systems was anticipated over thirty years ago (Toffler, 1980), and in essence blurs the boundaries between producers and consumers (von Hippel, 2005; Leadbeater & Miller, 2004) to reshape conventional approaches of centralised production and innovation generation (Dickel, Ferdinand & Petschow, 2014; Fox, 2013; Hoftijzer 2009; Srai et al 2016).

Today, we see amateur and expert makers, fabbers, prosumers, DIY-ers gathering in physical workshops and virtual places to create products, enabled with user-friendly machines for digital production. The types of activities these workshops (also called 'makerspaces'[10]) are used for vary according to context and preferred interests, but can be

[9] http://repaircafe.org/about-repair-cafe/

[10] According to Hyysalo et al. (2014) makerspace include "fab labs, which are workshops in the MIT Center for Bits and Atoms' network; hacklabs or hackerspaces for exploring electronics and physical computing; commercial machine shops offering paid access to members; and a variety of other

variously described as ‘personal fabrication’, ‘fabbing’, ‘commons-based peer production’ or simply ‘making’ (Kohtala, 2015). In turn, all of which can be positioned within a frame of distributed production.

The seed of this, now global, social movement for self-production may be traced back to 2003, when the US-based professor Neil Gershenfeld set up the first fabrication laboratory (aka FabLab) intended to transform data into things and vice versa through a set of digital manufacturing technologies endowed with the capabilities ‘to make (almost) anything’ (Gershenfeld, 2012).

Some see makerspaces contributing to distributed forms of production (Troxler, 2013), whereas others see them as “promising spaces for incubation and experimentation of new potential circular solutions and ideas” (Prendeville, Hartung, Purvis, Brass & Hall, 2016: pp 577-588), namely by instating shorter production loops, supplying spare parts through rapid manufacturing technologies and through wider social engagement (Prendeville et al., 2016).[11] Repair skills and knowledge are enacted and may further thrive in such contexts (Maldini, 2016; Salvia, 2016),[12] by teaching communities to repair (Dellot, 2015), or developing repair-oriented and service-based business models, that avail of additive manufacturing devices available in makerspaces (typically 3D printers) (Ford, Despeisse & Viljakainen, 2015).

However, up to now, the benefits of giving value to repair in makerspaces were verified for a FabLab in London through its recent collaboration with The Great Recovery project, which is a network of professionals – especially designers – engaged in rethinking the design of products from a circular perspective, such as designing for longevity through user action by upgrading, fixing and repairing (Royal Society of Arts, 2013). This collaboration encouraged monitoring, re-using and re-purposing products by fixing, hacking or customizing them, while availing of rapid manufacturing and open source technologies (The Great Recovery Project, 2016). Therefore, making in FabLabs provides the opportunity to understand how to fix or repurpose objects, with potential for empowerment enabled by balanced ways to engage with technology (Nascimento & Pòlvora, 2016). These benefits are evident also in occasional repair activities (such as at Repair Cafés) often hosted at makerspaces, but which risk being individualistic, dividing experts from citizens (Rosner & Ames 2014; Hielscher & Smith, 2014; Houston et al., 2016). This suggests that there are wide margins to bridge to guide repair towards patterns of active, engaging, collaborative practices, rather than isolated item-fixing-activities.

spaces that may be independent or associated with a library or museum.” Other spaces include TechShop, Mens’ Shed and Community Garages, spread globally.

[11] Prendeville et al. 2016 is suggested also for a summary of opportunities to be implemented in CE and distributed manufacturing through makerspace, including social and environmental sustainability, specialist expertise and capacity building, innovation and incubation.

[12] Similar goals are pursued by organizations such as The Restart Project and ReFab Space, i.e. social enterprises that promote the extension of electric and electronic equipment lifespans by teaching and sharing repair and maintenance skills, either in their premises or during workplace events, as an empowering practice.

Importantly, despite speculation that distributed production (including makerspace networks) can lead to a future CE, through more localized and granular (therefore needs-driven) production, this is so far difficult to identify and foresee within many makerspace contexts (Prendeville et al., 2016; Prendeville et al., forthcoming). Local makerspace resources, including machines and competences, are at present insufficient to address the range of repair journeys that can be envisioned, a limit that can be overcome by connecting with a wider network of partners, through their information, data and knowledge. Therein, we envisage potential in "the connection of decentralized collaboration in digital networks with material forms of production" (Dickel et al., 2014).

The potential of open source hardware and open design

The diffusion of open source hardware (such as digital 3D printer technologies), widespread access to the Internet and inexpensive computing (Pearce et al., 2010) has given rise to a new phenomenon called 'Open Design'. In tandem with and linked to the emergence of makerspaces, open design activity and interest has risen steadily over recent years. Open design, or open source hardware design, adopts the Open Source Hardware Association's definition, derived from the principles of open source software; design that is "made publicly available so that anyone can study, modify, distribute, make, and sell the design or hardware based on that design" (OSHWA, 2016).

Open design activity is enabled by the accessibility of open hardware designs through online platforms, which foster sharing by and through communities. Therefore, what is particularly disruptive is that open design upends and diminishes the traditional forward supply chain approach to markets, replacing it with a network of 'prosumers'. For this reason open design is closely linked to distributed production, by making such production technically feasible and enabling a larger group of society to access the means for production (Wittbrodt, 2013).

Open design is common practice in makerspaces (see also Smith & Light, 2016) and this can be a driver to foster increased repair. Planned obsolescence and irreparability of products today are nurtured by existing support structures for innovation (such as patents). Irreparable products are black boxes, where reverse engineering is proactively hindered by firms through a multitude of approaches and for a multitude of reasons (vested interests, standards, safety). In contrast, open designs are inherently repairable (though not necessarily designed for repair), due to the transparent nature of the objects and the information inherently accessible through an open design approach. Bonvoison (2016) describes two ways in which open source hardware designs can be relevant for sustainability: through the modularity of the hardware design and the potential for local production. This modularity renders the product separable while preserving a given product's 'integrity' (Bakker, Den Hollander, Van Hinte & Zijlstra, 2014), to allow for reversibility, reconfigurability, and repair. The act of making itself fosters implicit knowledge of the object's design that builds skills and capabilities. The open source principles of collaboration and documentation and practices of sharing (typically online) provide practical support and explicit information for repair activities.

Amongst the wave of open source hardware initiatives, we see pioneers such as RepRap[13], Wikihouse[14] and Open Structures[15] who use these now widely accessible technologies for local production. Project documentation and instruction manuals are shared through platforms such as Wevolver[16] and parts can be 3D-printed for suppliers through on-demand services, relieving the need to pay for and keep large stocks of spare parts in stores. Open Structures is an open modular construction kit, which provides reconfigurable parts for designing bikes, tools, furniture and more. Open designs have been conceived for demining technologies (Cepolina, 2015), agricultural applications (Rankin, 2015), and solar photovoltaics (Buitenhuis & Pearce, 2012) inter alia. Nevertheless, from an academic viewpoint, we have still to unravel what it means to design for open hardware in-and-of-itself, with even fewer insights on the potential of these new design contexts for a CE.

Economic estimates of open design vary. Wittbordt (2013) summarizes that it can perhaps offer more (financial) value than those of closed innovation approaches (Pearce, 2015) whereas, Rankin (2015) estimated that agricultural applications required less money to develop, but required more labour and time.

In 2014, a global collective of activists from design, policy, open source and business backgrounds established the grassroots Open Source Circular Economy (OSCE) Days[17] community. This was founded on the premise that open source is a promising methodology that can overcome known barriers to a future CE. The initial mission[18] of the collective was to plant the seed that the open source methodology, through collaboration, clear and open documentation of processes and methods, materials, data and tools, and sharing of this information can lead us to a more holistic manifestation of a CE. Since its conception, it has sought to question the mainstream CE trajectory, offering locally-conceived solutions such as a biodigester for a school, redesigns for wood pallets, a prototype recycling application to boost citizen engagement, as well as a manifesto and roadmap for an (open source) circular textiles industry. Nevertheless, the practicalities of building an OSCE remain distant.

Future repair scenarios enabled by distributed production and design

Given the potential of the approaches presented, i.e. Distributed Production and Open Design, next we speculate on their potential for embedding repair in a future CE. In this section, we propose four scenarios where repair is enabled by such approaches and catalysed by design. The scenarios build upon the analytical work carried out by Kohtala (2015) on the current trend of distributed production. Drawing from an integrated literature review, Kohtala maps the landscape of distributed production according to the scale of action (from small to large) and to the level of control over the user (from digital manufacturing to the peer-to-peer production). The resulting quadrants show types of

[13] http://reprap.org/wiki/Main_Page
[14] http://www.wikihouse.cc
[15] http://openstructures.net
[16] https://www.wevolver.com/home/
[17] https://oscedays.org
[18] https://oscedays.org/open-source-circular-economy-mission-statement/

distributed production, with specific design, product and user characteristics (Figure 2). Though segmented in quadrants, Kohtala emphasises that the analysis represents a continuum and this is also true for the following analysis on repair.

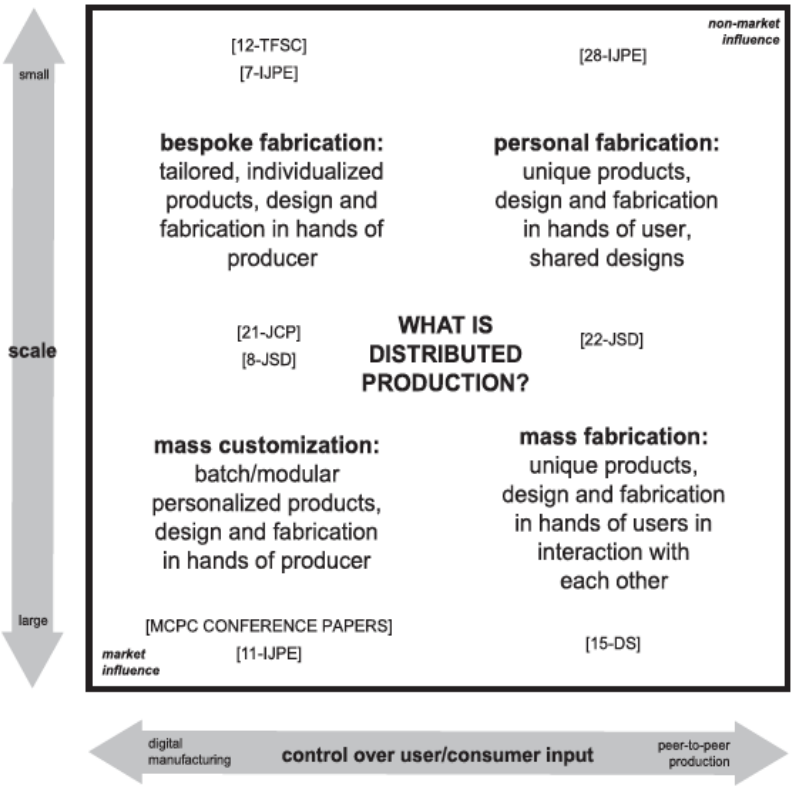

Figure 2 Concept of distributed production landscape. Source: Kohtala, 2015

Building on this map, we speculate on opportunities for fostering repair in each of the four quadrants to explore how a distributed production system could support more systematic repair activities (Figure 3). We pay particular attention to: how people are engaged, how the strategies can entice companies or fit with CE, the potential role of design, and if any negative environmental effect may arise.

It should be noted that while much activity happens in some industries through company-led repair (e.g. outside warranty repairs of mobile phones), typically this does not happen through open source collaboration between producers and repair entities. Therefore the opportunities to offer 'bespoke repair' and 'mass-customised repair' through open source collaborations is limited at present, whereas open source collaborations are much more likely to support scenarios in quadrants one and four.

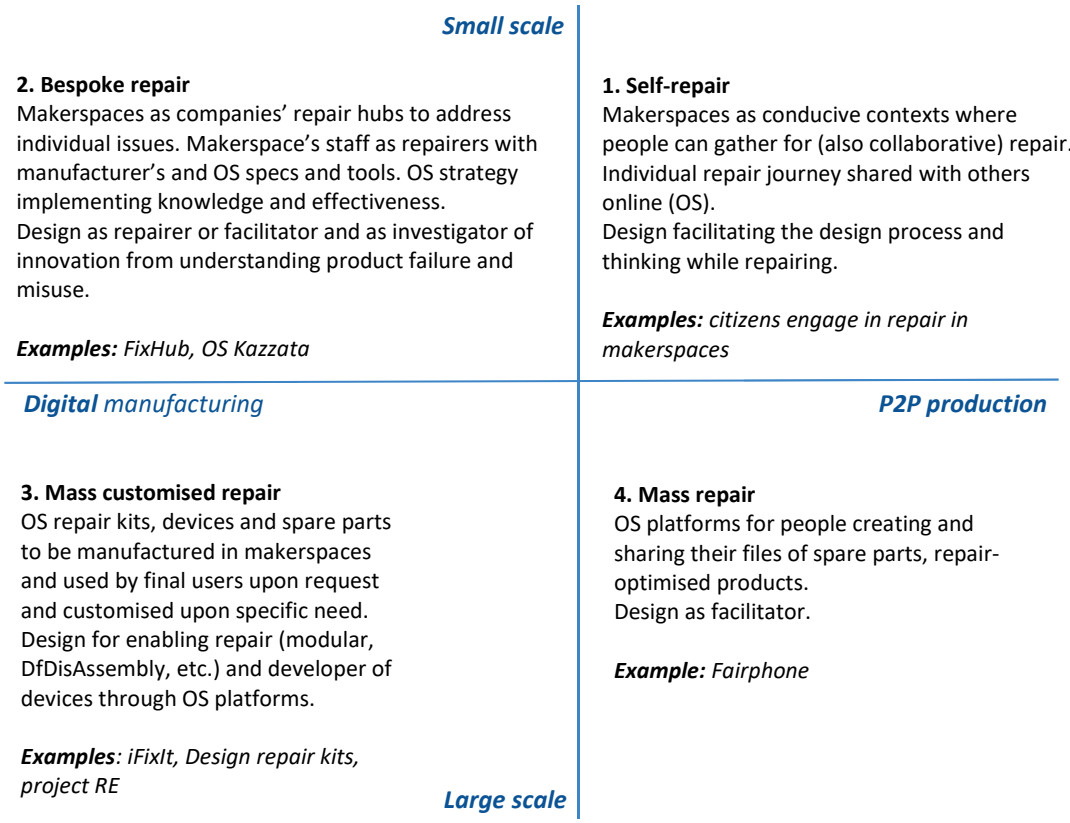

Figure 3 Concept of landscape for design-driven repair strategies in CE through distributed production and open design

In the scenarios we portray, design plays a central role in multiple ways through its 'specialities', ranging from product (e.g. design for sustainability and DfX), product-service system, people engagement (participatory-, co-design, social innovation), to companies (design for innovation). In this case, designers can facilitate the entire making and repairing process, bringing knowledge (e.g. about materials and technology) and competences (e.g. design thinking) to address the problem of minimizing resource consumption as well as empowering and educating individuals. The examples proposed in each quadrant are intended as speculations on future potential scenarios, rather than a prescriptive mapping exercise of the current landscape. Furthermore, the boundaries between quadrants are necessarily artificial and are not intended to reflect the spectrum of possibilities, alongside this examples are sometimes ambiguous and could be allocated in more that one quadrant.

1. Self-repair

In the first quadrant, personal fabrication conveys how individuals drive repair practices and this frames the scenario for 'self-repair'. Here, people are envisioned to gather in physical spaces within a distribution of networked makerspaces to self-repair items.

People willing or incentivised to repair can be supported by peers within the community (online or offline) be these citizens, professional makers or workshop managers. Makerspaces are typically equipped with tools and sometimes materials useful to fix items and produce spare parts. As such, promoting self-repair activities through makerspaces is a practical way to facilitate and boost engagement and awareness (and perhaps trigger new innovative and creative practices) of self-repair locally. Occasionally, makerspaces host events intended to promote repair or teach specific skills, similar to Repair Cafés.

Sustainability is mostly not a concern for many of these places, which is observed to require leadership from the makerspace founder or manager (Hielscher & Smith, 2014; Kohtala, 2015; Prendeville et al., 2016). This means that while systematically introducing repair in makerspaces could extend the range of activities carried out, the promotion of self-repair today hinges on a number of aspects, including promotion of this facility by the makerspace itself. Because makerspaces have diverse orientations in terms of environmental sustainability commitments (Hielscher & Smith, 2014; Prendeville, 2014; Dickel et al., 2014), over the coming years, some makerspaces may opt to pursue more-or-less environmental and social sustainability, which could influence its decisions towards supporting more systematic repair activities. Importantly, today self-repair is not systematic, universally understood nor strategically endorsed (for instance through government financial support and policies).

Design could catalyse this scenario by fostering citizen participation and engagement as-well-as supporting self-repairers locally, advising on optimal and safe ways to fix, upgrade or upcycle the artefact.

2. Bespoke repair

The second quadrant shifts the lead of the repair action from people to organisations interested in offering services for repair of products feasibly and economically at a small scale. Companies may struggle to sustain proprietary support and repair centres: when otherwise possible, these repair services tend to be localised in a limited number of cities and are difficult reach by many customers. Distributed production offers companies access to local networks and organizations (such as makerspaces) addressing repair for customers. For instance, similar to repair in the automotive sector, broken small appliances could be brought into a local makerspace, where it is repaired using the company's instructions and available spare parts. Alternatively, open source hardware parts could be produced locally, to favour collaboration amongst companies and makerspaces. Bespoke repairers could avail of platforms that offer spare parts on demand through collaborations with online file databases, such as Kazzata.[19] People may benefit from having their items customized or repaired for their own specific needs in this scenario. If speculation about the increased product attachment through personalisation is valid, then this scenario could offer repaired products of high emotional value to citizens. On the other hand, highly personalised products, of limited range, are difficult to recoup value from after first use-life.

[19] http://kazzata.com

This scenario has the potential benefit of income generation for the (commercially-orientated) makerspaces, who are known to struggle, due to an inability to monetize their activities.

This strategy fits ideally with:

- people who may not feel confident or willing to attempt self repair (as per first quadrant)
- products which are considered worthy of repair in monetary terms but with limitations for shipping (e.g. expensive, bulky or fragile items), such as small appliances, clothing or furniture
- issues of up to medium complexity, that makerspace staff members with sufficient knowledge about mechanics and electronics may approach
- companies interested to provide after-sale service (namely to maintain brand loyalty) and repair support at limited costs.

This scenario risks competing with any existing local repair economy. However, synergistic collaborations are imaginable, multi-purpose repair centres may provide the service and avail of the makerspace's network as a platform for its repair services. Other benefits of such partnerships include increasing the touchpoints for people to access repair services, bolstering the connections between repair actors, scaling repair activities by leveraging makerspace networks in collaboration with multi-purpose repair centres and producers. In addition, partnerships between existing repair service-providers and the maker community could help raise awareness of issues and foster better practices amongst the maker community.

In this scenario designers may intervene in the mechanical or use factors leading to product failures, to optimise designs and to understand more about actual use that leads to failures. Also, this scenario requires that products and parts are designed, produced and distributed taking into account the possibility to be repaired in makerspaces, supported by open source hardware designs. In addition, designers could support personalization of repair, but also conceive solutions that ensure this personalization does not contaminate material streams in future.

A relevant example is that of FixHub, a hub for repair located in makerspaces, proposed by the London based consultant 'From Now On' (first appearing in 2014 at the exhibition 'Brave Fixed World'). "The aim is to offer access, experience, engagement and confidence in making, and in this case with a focus to inspire fixing and repair."[20] Still in its embryonic stage, the initiative (now renamed 'Future of Fixing') intends to share material openly and its activities can be hosted through customisable versions[21] by makerspaces or libraries around the globe.

[20] http://2014.lodzdesign.com/en/event/brave-fixed-world-2/

[21] The first exhibition had a live makerspace, a library and a small cinema, as well as an exhibition which showcased projects by designers and makers trying to fix their world. Such elements can be customised by the host. (http://fixers.wikispaces.com)

3. Mass customised repair

In the third scenario, 'mass-customised repair', systems enabling repair are developed, by companies or makerspace, to meet a broader set of product faults and user needs than in the previous scenarios. Namely repair services, repair kits, devices, step-by-step guides and spare parts are made available (potentially through open source) and manufactured on need through a distributed network. In this scenario, companies, or makerspaces themselves, could develop customisable repair solutions, as well as coordinating logistics for collecting items for repair and returning the customised repaired items to users. Spare parts for typical faults could be provided to makerspaces, (again potentially through open design files). This scenario could offer solutions for users seeking a convenient solution or, the final user may also participate in customization, to align a designed generic solution to specific circumstances or needs.

A similar case is provided by the iFixit online marketplace, where tools and parts for repairing or upgrading electric and electronic devices are available and these are often developed for specific items (e.g. a specific mobile or laptop model).

Here, repair can engage makerspaces when parts have to be produced by final users. In a related activity, the design student Bernier developed the concept 'Project Re' which explores 3D printing as a DIY tool for upcycling. Customized lids may be 3D printed – also in a makerspace – and clipped or screwed onto standard jars, tin cans and bottles to create new and personal objects (Figure 4).

Figure 4 Project RE by the designer Samuel Bernier (Available from: https://www.shapeways.com/wordpress/wp-content/uploads/2012/04/Project-RE-by-Samuel-Bernier.jpg)

Overall, this scenario appears close to current market-driven businesses, where products and devices are designed and produced for a wider public. The possibility to customise the design solution increases the adaptability of the system, as explored in mass customization business models. However, kits, devices or tools developed in this way are not widely used yet and a distributed production network could be more easily harnessed to accelerate this type of repair, by overcoming issues relating to retrieving products from consumers in business-to-consumer markets.

This scenario offers new market opportunities in repair, sustained by the availability of open design files for hardware produced by the user, locally and collaboratively. Here, design would play a major role in the initial stage of designing the devices, to make products or platforms which enable repair (e.g. modular design and design for disassembly) as well as designing the associated product-service-system.

Kohtala's environmental concern in this scenario is the risk of the escalation of production, rather than users repairing existing goods; this may happen in the case of repairing and upcycling also, as the amount of raw materials consumed or devices produced to repair something may offset the resources saved from disposal.

4. Mass fabrication repair

The fourth quadrant shifts the lead of repair from the producer back to the user. People can be engaged in the repair of mass produced products through optimal design, through easily replaceable parts if faulty, with common tools and low levels of skills.

Originated in 2013 with the intent of making the supply chain of smartphones more socially and environmentally sustainable, the Dutch smartphone company 'FairPhone' released its second model in 2015 which promises a long lifespan through facilitated maintenance and repair. The design of this telephone has been assessed by iFixIt,[22] which ranked its repairability at the top in the smartphones category. In fact, the software is open, the design is modular, spare parts for six main modules are easily available, disassembly requires standard tools and instructions are printed on the phone. FairPhone illustrates a valuable business case for monetary opportunities deriving from pursuing sustainable goals, including repair.

In this scenario, collaboration plays a key role. People (often as members of communities) could be actively engaged in the design or production of parts, tools, products and knowledge together with peers or experts. Some platforms provide such feature (e.g. Thingiverse).

It could be argued that in this scenario repair activities are functional and collaborative, as compared with self-repair which is individual and in many ways experiential, due o the high levels of intrinsic motivation that lead individuals to self-repair. This scenario fits ideally with:

- People interested and committed to take part in the design process of parts and products

[22] https://www.ifixit.com/smartphone_repairability

- Products with limited health and safety risks for the user (as the process may not be overseen by experts) and those that may benefit from future adaptations and upgrades
- Companies and stakeholders with an interest in user-led innovation.

In this scenario, design would play a valuable role in the management of the platform and the facilitation of the design process.

The economic sustainability requires some consideration, as it may need to rely on third party donations and sponsorships (e.g. crowdfunding), or perhaps projects can be commissioned by companies (e.g. contests, see OpenIDEO).

Conclusion

The purpose of this paper was not to provide a prescriptive model for distributed repair, but rather to begin to explore possibilities of repair in new design contexts. On the premise that we need to escalate repair practices, we drew on an existing distributed production framework to create scenarios for scalable future repair activities, catalyzed by design and participatory approaches.

Rooted in localities, makerspaces and their communities could bridge between citizens and the wider economy and societal system to address what is a currently fragmented network of repair actors. Open design enables the circulation of knowledge and innovation through collaboration, while distributed production provides the infrastructure. It is possible to imagine how these concepts can meet to create a more resilient and regenerative system, by reducing the dependence on centralised systems of production and by nourishing local value and even participation. Exploiting networks of makerspaces and using open design for local problems overcomes the challenges of context and time-specific conditions when repairing (Rosner & Ames 2014). This could make repairing more convenient, as it is not at the moment for most companies or most people.

This change faces some threats and here we raise three. First, over-consumption is still widespread in Western societies and risks of converting the strategies presented above into an additional occasion for shortlived artefacts are clear, thus increasing waste and resource consumption. Although there is the potential for open design to support sustainability, particularly in the context of development issues (McKnight & Herrera, 2010), scholars tend to agree that activities in makerspaces are not sustainability-driven unless explicit strategies are in place (Smith & Light, 2016), thus needing guidance (Kohtala & Hyysalo, 2015). Arguably, the threats of ever-escalating consumption may be lessened if human-centric, rather than techno-centric approaches, interventions that promote skills and empowerment through collaborative activities are valued.

Second, a close collaboration with corporations – as emerged in some scenarios – may not be welcomed by many makerspaces, such as Hackerspaces, which promote a critical vision of our current capitalist economic system. However, many makerspaces are commercially-oriented in a traditional sense. This proposal does not intend to be a one size fits all solution and diverse strategies may be developed according to the types of actors involved. Alternatively, the proposed types of collaborations, based on common interest in promoting (possibly) more sustainable consumption and production, may reshape the

relationships between these two worlds. A more granular manufacturing system that caters for the multitude of 'repair journeys' is speculated on here. This may also overcome the issue of conflicting ideologies. The more radical makerspaces can continue on one path, with more commercially-minded availing of potential collaborations.

Third, as emerged in some scenarios, companies are expected to share their designs and codes openly, namely with makerspace communities or clients. This may be a barrier for some firms. However, parts, 3D files, codes and product teardown tutorials circulate widely on the web, especially for electric and electronic equipment (EEE). It could also be argued that open source hardware is on an upward trajectory. Therefore, some companies could embrace the open design approach as an opportunity to expand their market, increase their clients' loyalty, facilitate repair and maybe reduce their costs. This would also present ways to recover materials (especially rare ones from wasted EEE), which risk inappropriate disposal (cellphones in drawers or in landfill). EEE may be the product category with the highest potential for this collaboration, to facilitate material recovery and for the expected implementation with IoT. In fact, the development of smart devices and systems often enabled by IoT could also increase the amount of products that fail and be repaired.

In this article we have endeavoured to explore future scenarios for repair journeys through the lens of open source distributed production. While distributed production could open up the potential for systematic and scaled repair activities for products that are not typically repaired today, it is not possible to say if the combination of distributed production and open source can overcome the complex barriers to repair that we have discussed earlier in this article. Rather, this work acts as a starting point for a conversation on how distributed production can support local circular economies centred on repair. Future work aims at further unpacking the proposition set out in this paper, including the multitude of factors affecting the resurgence of repair as an economic, environmental and social sustainable practice and the design contribution to this agenda.

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HONG KONG DESIGN MANAGEMENT ACADEMY CONFERENCE 2017

RESEARCH PERSPECTIVES ON CREATIVE INTERSECTIONS

Exploring Consumers' Trust Difference between Shopping on Website and Mobile App Service Process

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doi: 10.21606/dma.2017.21

In a time of developed mobile services and mobile internet, consumers now can shop online easily via mobile phone in replacement of physical stores and desktop computers. Hsu, Xiao Yu (2015), mentioned in “Mobile commerce dominates purchase; three things the marketers must remember,” 56% of consumers consider mobile shopping as very convenient. However, the size of mobile phone screen hinders consumers who are used to shopping via desktop computers of laptop computers since the consumers receive more complete information from bigger screens and better shopping security. Therefore, the subjects of the study shopped online via web and App before completing the questionnaire. Research result reveals that the journey map of the web is the same as Apps, however with some trust difference between shopping on web and APPs.

keywords: journey map; mobile shopping app; online shopping sites; trust

Introduction

Institute for Information Industry IDEAS-Team FIND collaborated with Mobile First in a research investigation and discovered that 8.9 % of the people aged over 12 years (inclusive) in Taiwan use 4G mobile internet services. Most frequent applications used by 4G users include “Map Location and Navigation,” “e-mail,” and “mobile shopping” (Institute for Information Industry FIND, 2014; 2015). The result suggests a great potential of mobile shopping in the consumer market under the availability of mobile devices and mobile internet.

Moreover, the investigation conducted by Institute for Information Industry FIND (2015) shows that 53.9 % of consumers have an experience of shopping online via mobile devices between January and July in 2015. Findings suggest that consumers are changing their habits as consumers are now more willing to shop online via mobile devices.

Nonetheless, Nielsen NetWatch (2014) suggests that the majority of users still prefer to use desktop computers and place order via web interface; only a small number of users use shopping related APPs. Users find APP interface inconvenient to use, which could be related to the higher user familiarity with web process (Nielsen NetWatch, 2014). The investigation conducted by Market Intelligence & Consulting Institute of Institute for Information Industry Market Intelligence & Consulting Institute (2013) reveals the factors affecting some consumers who own mobile devices but never shop via mobile devices, including “inconvenience with web browsing, concerns for transaction security, unstable quality in internet speed, reluctance to reveal personal information.” The results also suggest some concern and insecurity in shopping via mobile devices. Hence, increasing consumers’ purchase intent via APPs will likely provide more convenience for consumers to shop online.

Moreover, Song, Tong Zheng (2014) though that people now expect or pursue more fun, perception or taste in product use or service experience as the economy and technology become more developed. For this reason, service providers will outperform in the mobile market if they can improve consumers’ trust in APP shopping and consequently consumers will constantly such shopping APP. Furthermore, service design is a people-oriented design idea developed from tangible targets to the intangible world in this information society. Service design also shifts towards emphasis on interactive design, experience design and service design (Mager & Sung, 2011). Service providers will need to emphasize more on the service experience of customers according to the study motive. The study will investigate on the trust difference and active conditions for online shoppers between different platforms and then apply the viewpoint on service design for trust difference between touchpoint and e-commerce.

Literature Review

In the past, consumers always went to brick-and-mortar stores to purchase commodities. However, consumers can online shopping now. As mentioned above that everyone shopping on online, but customers usually order the product on the website not APP. Therefore, the study talks about three topics of literature, including mobile commerce, service design and trust.

Mobile Commerce

According to " Mobile Commerce Research Status and Trends of Doctoral Dissertations and Master Theses in Taiwan" written by Ying Feng Kuo and Ching Wen Yu (2008) , it is mentioned that due to the intensely speedy development of wireless network and mobile phone mobile communication technology nowadays, the use of both the characteristics on electronic commerce, innovative thoughts of mobile commerce(MC, Mobile Commerce) is generated. In the meanwhile, mobile commerce brings a huge business with more focus on electronic commerce and thus turns into the target of competition. In addition, the study related to electronic commerce was increasingly gradual. Academic

journals and conferences worldwide pay more attention on related topics. Moreover, there are also journals mainly talking about electronic commerce. For example, the International Journal of Mobile Communications talks about electronic commerce. In conclusion, it is foremost important to focus on development of mobile commerce in the future.

Definition

In the article of "Mobile Commerce Research Status and Trends of Doctoral Dissertations and Master Theses in Taiwan", Ying Feng Kuo and Ching Wen Yu (2008) mentioned that now is just the beginning of development of mobile commerce but the definition of mobile commerce is not consistent. There are different views of points in the different area, and the range of definition is different as well.

Forlik and Chen (2004) propose mobile commerce as " wireless of electronic commerce ". Companies apply the latest information technology and infrastructure to achieve business activities. Mennecke and Strader (2002) define the use of mobile devices (for example: cell phone, PADs) for electronic commerce activities as a mobile commerce. In other words, mobile commerce (Mobile Commerce, M-Commerce) suggests that receive resources on the internet from wireless network via mobile device at anytime and anywhere for commercial transactions.

Application

Comparing with personal computer, mobile device is different from it in essence. Therefore, it is difficult to simply compare the difference between mobile device and personal computer, which leads to various applications. There are many kinds of electronic commerce, the transaction partner can be divided into three different kinds of types: the first type is Business to Consumer (B2C), the second one is Business to Business (B2B), and the last one is Consumer to Consumer (C2C) (Tang Zhen, 2007).

Service Design

Industrial structure gradually changed in Taiwan. Today it becomes a service-oriented society, and the industry is changing from "manufacturing-oriented" to "service orientation" (Lin, Zhang Qing, 2010). Therefore, from a design viewpoint, it becomes increasingly important to focus on service-oriented design thinking. Taiwan should begin to understand the importance of service design as well.

Definition

Service design is a multidisciplinary subject which not only engages in a wide range of different methods and tools but also applies to the design processes. It is a new way of design thinking but not a new and independent academic field. (Marc Stickdorn, 2011) In addition, Birgit Mager (2009) states that services design aims to ensure that the content of the services used by consumers with feasibility and needed by the customer. At the same time, the service providers take consideration of the efficiency, effective and feature of the service in the book that called This is service design thinking (2011).

There are various options in defining service design. Although it is hard to talk about service design briefly, service design can be divided into five important principles, including user-oriented, co-creative, sequencing, evidencing, and holistic. User-oriented

means that service must be based on customers' experiences. Co-creative refers to all positions are related in service provided and require the users to join the service design process. Sequencing is a series of interrelated actions, and evidencing turns intangible services into physical entity. Holistic refers to the consideration of overall environment.

Although there is no one single definition of service design, Marc Stickdorn (2011) thinks service design is a constantly repeated process, which consists of four important steps that need to be constantly repeated. These steps are exploration, creation, reflection and implementation. The four steps will lead to a service-oriented result. This study will use a services design tool to implement the step in "exploration" in addition to compare the journey map and trust.

Customer service Journey map

Grocki (2014) believed that a customer service Journey map is the overall visual or graphic interpretation of the story from an individual's point of view. The relationship between organizations, services, products and brands may change due to time and different field. Sometimes it is necessary to have more descriptions based on text to describe and customer experience related nuances and details. The concept could be told from a customer perspective it emphasizes on the importance of user expectations and the key business crossroads. This is service design thinking: Basics - tools - cases (2011) suggests that customer journey map is like a the personal of story book and its function is to construct realistic and construct user experience data. Consequently, consumers can interact with the touch point of service. As seen from the "journey" of schemes, the details of the service interaction become clear and are accompanied by emotional link.

Touchpoint

A touchpoint is defined as a kind of contact or interaction, in particular appended between business and its customers or consumers, and also mention that each touchpoint must reflect, stress, and repeat company`s core brand strategy' in the Oxford Living dictionaries (2016). Wiki (2016) suggests that in marketing communications, touchpoints are different ways to interact and display information between a company, prospective customers and current customers. Touchpoints allow consumers to have experiences at any time when they contact with any part of the product, service, brand or organization, and through multiple channels and several points in time, in brief, touchpoint is that points of customer or consumer is contacted in the company's whole service process.

Trust

Allen C. J and Merrill. W (2004) suggested that companies that couldn't develop successful customers' trust would face with great impediment in maintaining long-term electronic commerce success. Sebastian Shepard (2015) showed that 94% of online customers worry about their security online, according to a survey conducted by Harris Interactive.

Definition

Trust means the belief in the reliability, truth, or ability between someone or something (Oxford Living Dictionary , 2016). Trust is defined differently in each area and in various academic viewpoints because of its own particular perspective (D. Harrison McKnight & Norman L. Chervany, 2002). McKnight and Chervany (1996) believed that trust is needed for conception, and conception of trust could be interdisciplinary in nature. McKnight and

Chervany (2002) also stated that trust is a important relationship concept between someone or something and trust requires explanation because interdisciplinary researchers have specified trust in many different ways. McKnight and Chervany (2002) claimed that trust belief means that one believes in the other group has one or more special benefits for oneself. Under the premise that has special benefit for customer, the customers would like the e-vendor to be willing and able to act on the customer's interest, honesty in transactions. In business, customers are expected to predict and transfer as promised to e-vendor. Therefore, customer will trust e-vendor when e-vendor was give customers what they prefer. In addition, Jui Yen Yen , Mei Liang Chen and Chia Chun Chou (2007) also indicate that purchasing online is a risky business for consumer and it is also related to trust. Hence, they use the structural equation modeling (SEM) to test and verify the relationship among the service quality and trust in the online store. In electric commerce, Jui Yen Yen , Mei Liang Chen and Chia Chun Chou (2007) state from their study that there is a positive relation between service quality and trust. Jui Yen Yen et al. (2007) who adopted also cite the study questionnaire consisting of four constructs, including e-service quality, store image, trust and customer loyalty. According to Yen's et al. (2007) study, this study modifies the questionnaire content for subjects to answer the question.

Trust and Business

McAllister (1995) mentions two forms of trust, namely cognitive-based trust and affective-based trust. Devon J. and Kent G. (2005) collected survey data from firms of financial advisers in the United Kingdom with the use of cognitive and affective dimensions of trust in distinguishing both common and unique precursors.

In McKnight and Chervany (2002) opinion, the categorization of trust should be interdisciplinary as mentioned in many pre-academic research papers in the aspect of electronic commerce. In traditional business, trust appeared relationship between two different people and the people in contact with consumers and vendors as well in the electronic commerce (D. Harrison McKnight & Norman L. Chervany, 2002). In The Online Consumer Trust Construct: A Web Merchant Practitioner Perspective of article, Allen C. and Merrill W. (2004) mentioned the kind of modules that have influence on eMerchants' trust: eMerchants' website design and management principles, Trade journals and magazines, peer website elements, hardware and software vendors, self-training, practical books, e-store host guidelines, previous experiences. Above all, eMerchants' website design and management principles become the templates for website development. These principles were based on the culture and philosophies of the business and also ruled some parts of special web design elements. For instance, eMerchants will use their own store colors, logos and slogans on their user interfaces.

Summary

This study mainly aims at the mobile commerce's shopping of website and APP and service design, followed by analysis and discussion on two directions. Universal Mobile Device and changes in the industrial structure, social and other brands the consumers wish to make a distinction between the commercial or retain customers. The study will develop different shopping channels, as referred to in the literature in the high-tech era, and the community owning smartphone accounting for the majority. Therefore mobile commerce - Shopping related APP will have a potential in consumer market while a predecessor of the mobile

commerce, shopping, both of difference is the use of the different platforms. Consequently the consumer shopping APP coverage will be improved. Moreover, more information on the network shopping operating processes will be revealed so that the experiment object will purchase through the research experience.

In the service design literature that is referred to service design is a new mode of thinking, and it is also mainly based on customer experience. A service provider is a company that wishes to sell products or services to consumers in the past, and easily ignores the real needs of consumers. The study will investigate on the service design between different platforms, differences between operating processes for customers in experience-based and consumers using the web, thereby to comprehend the real needs of consumers.

Method

Literature review suggests that as channels for consumers to acquire information become increasingly diverse and technology advances, consumers no longer focus on the quality of products purchased but also the process of shopping experience. Hence, the study investigates on the shopping experience via different platforms and applies five-point Likert scale questionnaire to understand the trust difference in respondents via different platforms. In addition, the study compares the difference of service journey map. Samples of brand e-commerce investigation include three brand companies in electronics products with online shopping and shopping APP functions, namely Apple Store, ASUS Store and etungo.

Experimental Design

The experiment was implemented in 31 study subjects (10 males and 21 females), aged 24 years old in average with online shopping experience. The three brands of electronic commerce are required to own both online shopping site and mobile shopping App. The experiment was divided into two sections, using computer for online shopping (Figure 1) and using mobile phones for APP shopping (Figure 2). The subjects completed the questionnaire developed were based on open questions and dimension questions related to trust, proposed by Yen et al. (2007). Prior to the experiment, the respondents with shopping experience were given introduction and instruction on the content of experiments, in order to help the respondents understand the content and process of experiment. Respondents operated different online shopping platforms in random order (Figure 3) and completed the relevant questions on questionnaire each time they have shopped online via web and APP of a brand. Actual tests show that the subjects will forget some content of previous experiment three days after the tests. To prevent influence from previous experiment, the respondents would use different shopping platforms in an interval of three days before taking the experiment and will need to complete the questionnaire of another platform. The experiment process (Figure 4) shows that one task product that needs to be purchased for each brand, which will be returned after purchase. The study records the operation process of each respondent in the experiment with screen shots recording throughout the process.

Figure 1 The prototypes of shopping sites for the experiment include Apple Store (a), ASUS Store (b) and etungo (c).

Figure 2 Shopping APP prototypes for the experiment (from left to right, Apple Store, ASUS Store and etungo)

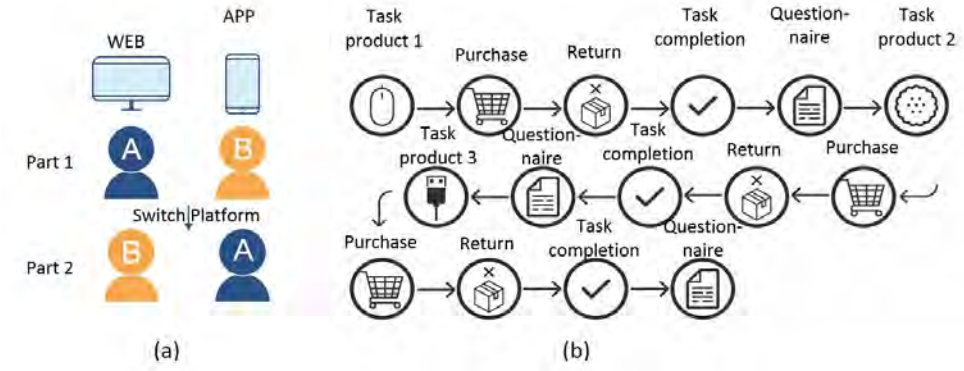

Figure 3 experiment process (a); Shopping websites and shopping Apps operation process (b) (sketched by the Study)

Results and Discussion

Difference of Customer Service Journey Maps on Different Platforms

The subjects must use two different platforms to implement shopping experience in the experiment. The following three online shopping stores on web and APP, including Apple Store, ASUS Store and etungo, have been selected randomly to sketch each customer journey map (Figure 5 and Figure 6) respectively.

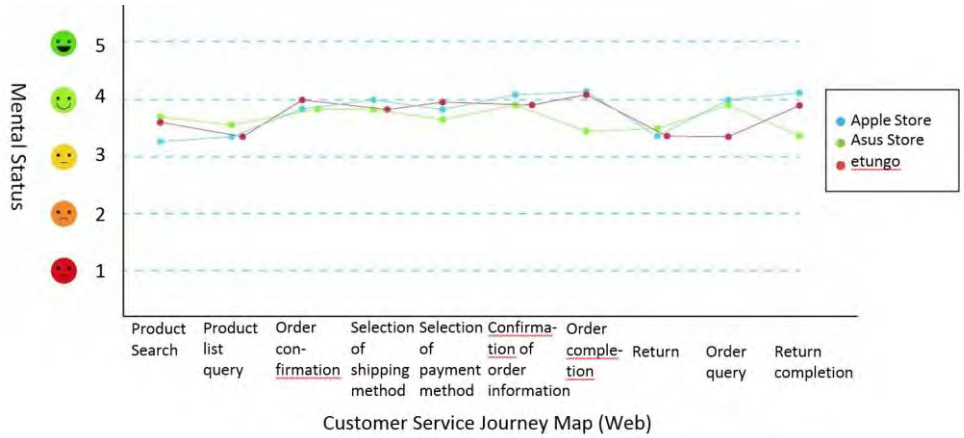

Figure 5 Customer Journey Map for Shopping Sites (Sketched by the Study)

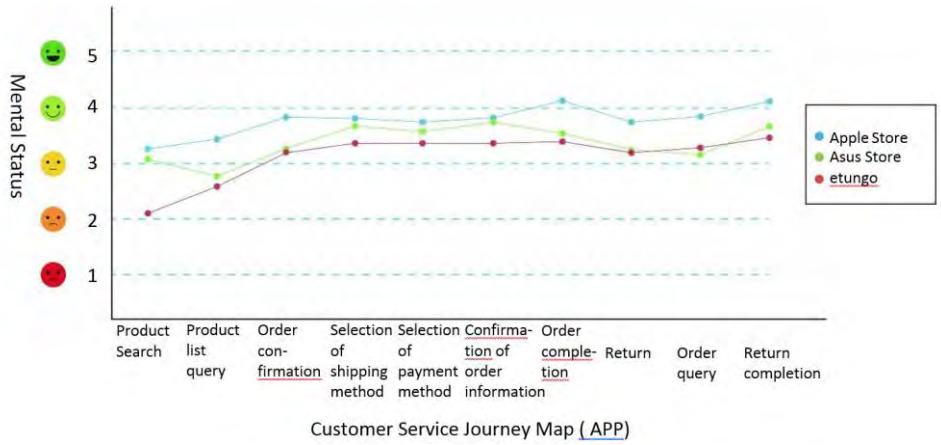

Figure 6 Customer Journey Map for Shopping APP (Sketched by the Study)

The comparison of Figure 5 and Figure 6 does not show difference between the touchpoints of APP and the websites as the shopping process between the two consists of product search, product list query, order confirmation, selection of shipping method, selection of payment method, confirmation of order information, order completion, return, order query, and return completion.

The lowest touchpoint of the mental status for Apple Store websites and APP are both the section on product search. The lowest touchpoints of ASUS website and APP are also different, where the touchpoint of product search in APP operation shows the lowest mental status while the touchpoint of return completion for websites is the lowest. The lowest mental status for etungo website and APP differs, in which the lowest mental status for APP is product search while the lowest touchpoint of website are product search and order query.

The highest mental status of Apple Store website and APP is both order completion. The highest mental status of ASUS website is order query while the highest mental status of APP is confirmation of order information. The highest mental status of etungo website is at order completion while the highest mental status of APP is at return completion.

Regardless of websites or APP, the touchpoint of the lowest mental status includes involves the display of much information and requires selection while the highest touchpoint of mental status involves the display of simple information and pressing the confirm button. Hence, the sections of the interface displaying key information still require improvement.

Comparison of unfriendly touchpoints for different platforms of online shopping

The content of questionnaire completed by respondents not only undergo trust completion but also are responded for the unfriendly sections of each brand, as shown in the following summary:

Table 1 Unfriendly sections of all brand websites

Touchpoints	Apple Store	ASUS Store	etungo
Product Search	Could not find the items for purchase (S.2) Peripheral products require search and are unintuitive (S.16) Product category from the beginning is difficult to find (S.17) Search columns are too small (S.24) A little difficult to find the product (S.25)	Search column is difficult to find (S.11) There are too many photos on homepage and it is difficult to find the category menu at the beginning (S.19) The menu on top is over neglected and could not be found (S.22) "Search" is too small and should be "fixed type" that should not be affected by scrolling (S.24)	
Product list query	Excessively white background and the fonts too small make reading difficult (S.1) Product name and images quite identical and confusing (S.8) Accessories should be placed under one category (S.18)	Few photos of viewing angles (S.10) It is easy to choose the button above the price using the mouse (S.11) Interface buttons are unclear (S.27)	Small fonts (S.8,S.10) Images too small without detailed introduction but only the instruction of different dimensions (S.9) The interface for finding extension cords are confusing and arranged intensely, making it difficult to find the product immediately (S.21) Too much text for product list, making viewing difficult (S.24) Webpage viewing requires improvement (S.31)
Order confirmation		The section of order confirmation is unclear (S.16) Dislike the page scrolling up after selecting the products. Order information is a little messy (S.28)	

Selection of shipping method			No selection of shipping method (S.28)
Selection of payment method		Few payment methods (S.2)	
Confirmation of order information		The website does not display all order information at the final step and pressing the confirmation button is the actual order confirmation (S.21)	
Order completion			Refund and bills immediately appear after settling the account, so I think it is fast but I may not find it if I were to research later (S.7)
Return	To return, the information provided is sometimes incomprehensible (S.6) There is not button for return (S.19) Return needs more visible buttons (S.21)	Return button is too small and difficult to find (S.1)	Dislike the method of return (S.20)
Order query			
Return completion	Order can still be seen after return; return request could not be confirmed before receiving the email (S.7)		

* S = Subject, number = numbers of subjects

Table 2 Unfriendly Sections of all brand APPs

Touchpoints	Apple Store	ASUS Store	etungo
Product Search	The location of search column not visible (S.15) Accessory items are difficult to be searched (S.24)	The first page is unrelated to products and it feels strange (S.16) Search is difficult (in terms of search by category) and does not	Could not find product search and accesses the site via strange means (S.4) Absurd shopping site portal (S.14)

	conform to user habits. Buttons are difficult to click (S.15)	Not sure where to click to enter the menu search (S.15) Could not find out how to enter the page for products immediately (S.16) Homepage does not offer product search and query links are not visible (S.19) Confusing as where to start shopping (S.20) Direct access to product search page is preferred (S.21) Not sure where to begin product search (S.23) The method of accessing etungo shopping site is confusing (S.28) Product search is difficulty (S.30) Could not find product search (S.31) Shopping APP surprisingly leads to web interface (S.7) The site is perceived as additional shopping APP rather than web interface (S.18) Could not search via product name directly with inconvenience in use (S.15)
Product list query	Difficult to find the product while price and products are unclearly labelled (S.11) Frequently selecting the wrong choice (S.20) I thought the clicking the button on the	Could not find product (S5) Product search is difficult (S.11) Product search requires many procedures (S.10) Poor presentation of product list and small

	image could add product to shopping cart but it turns out to be the bottom button (S.21) Selection unclean (S.26) Product search is difficult (S.29) Product search is time consuming (S.5) Unclean selection of product color and could cause wrong selection made by consumers (S.1) Scrolling item one by one for shopping is required to find the target product (S.2) The separation line for product photos and quantity and order button confuses consumers with the top or bottom products (S.7) Product price on the page is confusing (S.8) Could not view all items and price but needs to scroll down all the way; one 3 items can be displayed each time (S.9) It is difficult to click on the black mouse (S.14) Product viewing could not be corresponded to the product and placement into the shopping cart (S.18) The distinction between price and product photos are not visible enough (S.19) Poor presentation of product list (S.24)	images make it unsuitable for operation via mobile phones (S.24) Small fonts (S.7) Small fonts (S.8) The content should cooperate with the screen size rather than asking users to constantly enlarge or reduce the screen (S.18) The description of item specification is too identical and makes it difficult to click an item and purchase (S.9)

Order confirmation	Button on the upper right-hand corner is easily neglected (S.11)	The location of button for adding to shopping cart could misguide users (S.4)
Selection of shipping method	Address input uses additional link input and some could be easily neglected (S.4)	
Selection of payment method		
Confirmation of order information	The confirmation button is similar to the one on websites that requires enlarge and reduction (S.18)	
Order completion		
Return	Too many words that are invisible on the return page (S.28)	
Order query		
Return completion		Could not find the return (S.10) Return is too difficult process (S.12)

* S = Subject, number = numbers of subjects

Table 1 and Table 2 show that most people find the touchpoint of product search most unfriendly on the Apple Store site (Figure 7-(a)) and most respondents find it difficult to locate product search. More respondents find problems with product search on App as respondents believe the location of search and button of order are not visible. The respondents on ASUS Store website (Figure 7-(b)) proposed the most unfriendly sections in product search, such as the difficulty in finding the product searched, excess information on homepage and difficulty in finding the category button as well other similar problems. For the App, most problems occur in the query of product list, where most respondents suggest the poor presentation of product list that leads to wrong selection of products. Most respondents find problems with product list query on etungo website (Figure 7-(c)), where the respondents believe that the text and images are too small while identical products are displayed too close that could lead to wrong selection of products. With regards to App, some respondents propose the most problems for product search. The respondents often could not locate the product desired while messy screen of search makes it difficult for the respondents to use.

The comparison of customer journey map (Figure 4 and Figure 5) in Table 1 and Table 2 reveals that the touchpoint of product search for Apple Store website also has the lowest

mental status among all journeys due to the most unfriendly sections. The App also shows the most unfriendly sections are product search while mental status also has the worse touchpoint. ASUS website shows the most unfriendly problems but the worse mental status is after returning the goods. The App shows the most unfriendly sections in product list query and the worse mental status for query list in the service journey. The product list query for etungo has the most unfriendly sections and also the worst mental status for product list query. The product search on the App shows the most unfriendly problems with the worst mental status at the same touchpoint.

The comparison with customer journey map suggests that the respondents tend to have worse mental status if they perceive more unfriendly sections. In spite of the different results yielded from ASUS website, the respondents show the worse mental status for unfriendly problems in the return process due to the failure to return and the unclear return button. Such mental status could possibly be the dissatisfaction against the products but could not quickly find the return service in need of returning the products, causing poor mental status to increase. In general, respondents tend to move toward low mental status when they encounter more unfriendly problems.

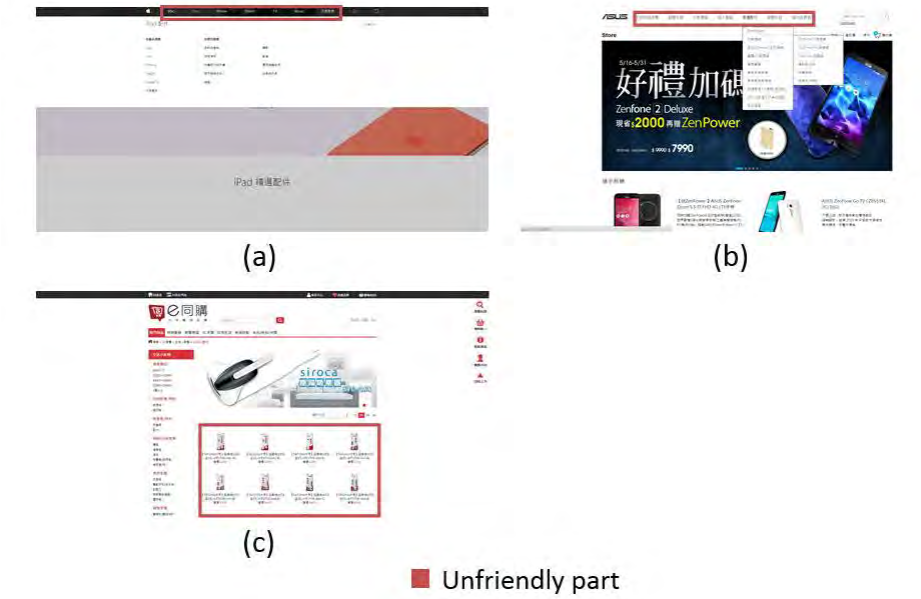

Figure 7 Unfriendly sections of all brand websites include Apple Store (a), ASUS Store (b) and etungo (c)

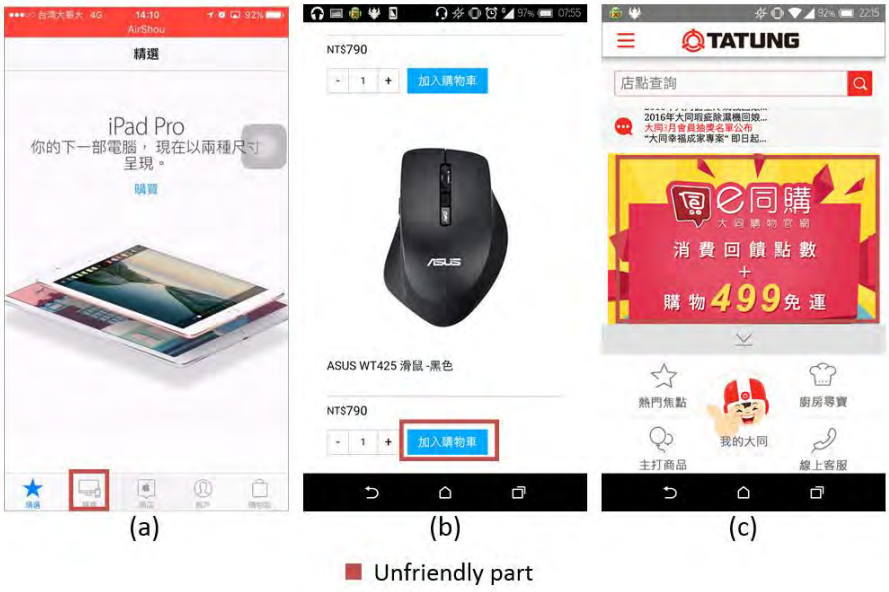

Figure 8 Unfriendly sections of all brand Apps include Apple Store (a), ASUS Store (b) and etungo (c)

Trust for Different Online Shopping Platforms

Table 3 shows that the reliability of questionnaire has an Alpha value = 0.847 after completing the task. However according to the viewpoint of DeVellis (1991) against Cronbach's Alpha value: Reliability is the best when Alpha is greater than 0.80. Hence, the results of trust in respondents for this questionnaire are reliable.

Judging from the average of the numbers, the top three average values include the shopping web and shopping APP. It is known that the consumers' trust for shopping websites is higher in comparison. On contrary, the last two rankings are shopping APP and hence suggesting lower trust in consumers for APP. According to the study by Yen et al. , service quality and trust have positive relationship, so a web mode of online shopping more trustworthy than app mode for consumers. Therefore, if App`s service quality can promote, trust will be increased.

Table 3 Trust of Brand Consumers for web and APP

	M	SD	Alpha value
Apple Store-Web	3.91	1.031	0.847
Apple Store-App	3.74	0.872	
My ASUS-Web	3.66	1.032	
etungo-Web	3.58	0.995	
My ASUS-App	3.21	0.933	
etungo-App	3.04	1.053	

Conclusions and suggestions

The abovementioned research results show that in spite of the identical touchpoints between the website and APP, the mental status in customer journey map is not completely identical. Hence, similar to the findings from Nielsen NetWatch, consumers tend to purchase via the web interface on mobile devices rather than APP shopping. The study findings also suggest that more unfriendly problems on the touchpoints will lead to lower mental status while consumers perceive more insecurity. As suggested in the same findings conducted by Institute for Information Industry Market Intelligence & Consulting Institute, mobile shopping is convenient in terms of web browsing and research results show that the unfriendly problems with APP occur at the two touchpoints, namely in product search and product list query. Unfriendly problems are all related to page display. With regards to trust, the comparison between web and APP suggests higher trust in web than the APP. Hence, the factor affecting APP operation mainly lies on the key information displayed on the interface. The study suggests that the future service providers will need to improve APP interface and increase fluency in order to improve the probability of APP online purchase, so that consumers will gain better experience in mobile shopping. For future research, the analysis of relation between APP trust and service experience will produce more factors for APP improvement.

Acknowledgements

The author gratefully acknowledges the support for this research provided by the Ministry of Science and Technology under Grants No. MOST-105-2410-H-036 -009. The author also thanks all the subjects who participated in the study.

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HONG KONG DESIGN MANAGEMENT ACADEMY CONFERENCE 2017

RESEARCH PERSPECTIVES ON CREATIVE INTERSECTIONS

Tracing the tensions surrounding understandings of agency and knowledge in technology design

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doi: 10.21606/dma.2017.70

The literature suggests that prevailing understandings of the makeup of design knowledge and agency in producing design knowledge in technology is not helpful for design processes and its practitioners.
Tensions arise within processes of designing, when design knowledge is understood as objective, whilst subjectivity is experienced in the research methods employed. In the same time, knowledge production is pursued in an individualist manner, where the situated nature of knowing as an interplay of factors, likely reaching beyond personal traits and human intention, is not acknowledged. In this way, design processes are currently working against their inherent potential with likely effects on designers and subsequently design outcomes. The arising tensions cause issues for practitioners, who are stuck in between an objectivity demand and experienced subjectivity, without an alternative conception of their work. Practice-oriented conceptualisations of social dynamics, how things are, and come to be, as well as existing research in consumption practices and sustainable design, have shown that agency and knowing conceptualised as emerging from practice might reconcile this tension. It is therefore that we argue for a reconceptualization of the makeup of knowledge and agency in knowledge production, so that these advancements in conceptualising practices can be of service to the technology design discipline.

keywords: human-computer interaction; user experience design; practice theory; materiality

Review of paradigms

Agency and structure are fundamental subjects in the study of the make up of social life. They are about the relationship between individuals and the 'social' in which they participate. To what extent individuals have capacity to act amid the constraints in this social process, is the subject of much debate between various strands of thinking (Johnson, 2000).

Four paradigmatic forces can be identified within existing efforts of describing design. On the one hand, there are two opposing ends of understanding design knowledge as objective (the results of rational thinking) and understanding design knowledge as subjective (the result of practical doing). On the other hand, there are two competing views of the production of design knowledge via individual skill versus design knowledge emerging from social participation. The paradigmatic force field could be visualised as four arrows pointing in four different directions: objectivist versus subjectivist, and individualist versus participative. Neither of the following accounts speak explicitly about these opposing forces or categorise accordingly; the visualisation of the four pulling forces is a mere support structure for making sense of the various accounts and categorisations within this space (see Figure 1).

Fallman (2003) speaks of three distinctions of how design is understood today: 1) The conservative, 2) the romantic, and 3) the pragmatic approach. He sees the *conservative* approach to design as a scientific and logic-oriented process of problem solving (see Simon, 1996). In this "process-oriented" account, methods and structure build the core, and the designer takes the position of a natural scientist. Fallman describes the designer here as someone who is able to follow plans and prescribed steps; this understanding of design "disembodies" the designer in the process. It could be interpreted that the designer's cognitive skills are a scientific instrument here.

Fallman places the conservative approach in juxtaposition to the *romantic* approach, which places the designer in the centre of the design process, whereby the designer possesses "almost magical abilities of creation" (p. 226). Here, the designer utilises gifts such as intuition, imagination and creativity, and is not able to express in words the process of design. Fallman assigns the origins of this type of understanding design to art, and the individualist thinking inherent to romanticism. Fisher (1997) describes this "romantic" stereotype similarly. He even sees it as the prevailing understanding of design, and describes the conflicts that arise for designers in the light of this understanding, which starkly contrasts with every day work practices. Fisher juxtaposed the romantic approach with logical thinking, like Fallman does, but contrasts both categories mainly with the idea that design skills are a situated way of understanding, rather than a given talent. Fallman (2003) goes on to describe a third, the pragmatic, approach.

The *pragmatic* approach makes use of what materials and resources are available. In the description, Fallman references Schön (1983), with his account of a tacit, intuitive, and reflective knowing-in-action. Also, Fisher (1997) speaks of a pragmatic approach, whereby he means a dissolution of the Cartesian subject - object dichotomy. Both mean to describe that in this understanding, designing is not an individual skill but a way of situated and participative knowledge production. Similarly, Wright, Blythe, and McCarthy (2006), call for the pragmatist approach as an alternative to the prevalent "design-as-engineering"

and “design-as-craft” approaches. They follow the philosophy of Dewey in proposing that knowledge is dependent on the “technology, circumstances, situations, and actions from which it was constructed” (McCarthy & Wright, 2004, p. 17). A pragmatist understanding of design relies on the participative notion of situated knowledge production, and a resolving of subject-object dichotomies. Caroll (1997) sees an actual transition happening from a “cognitive” approach towards a more “social and contextual” approach. Accordingly, such developments can be observed in management-oriented literature of product design. In, what could be described as a lose group of methodologies around, Lean and Agile[1], design processes are appropriated and used by multi-disciplinary teams. These industry-led methodologies do neither relate to the ‘romantic’ approach, as designers often do not even exist in these teams, nor do they fit with the ‘conservative / scientific’ approach which takes an abstract stance to design. They fit in their emphasis of situated knowledge production in self-organised teams well with both Fallman’s and Fisher’s description of the ‘pragmatic’ approach. They, however, do not explicitly cross-reference anti-Cartesian or pragmatic ideas, or indeed reference each other very much (Mueller & Thoring, 2012).

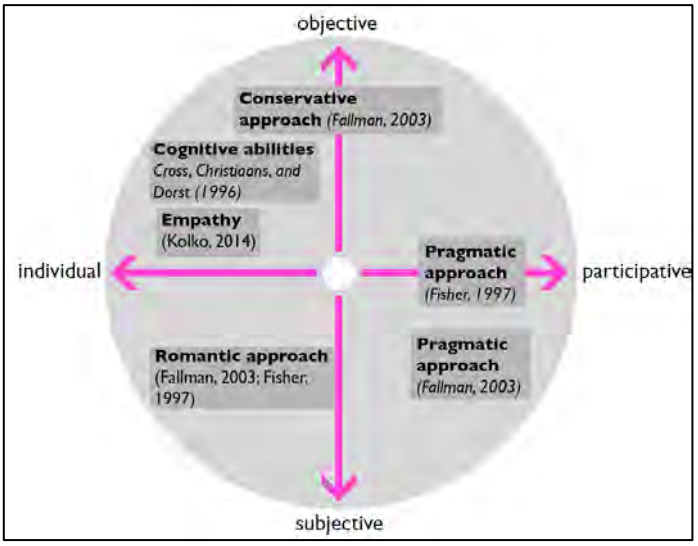

Figure 1 Paradigmatic forces in design theories

Questions of skills and mastery, hinting on specialist individual abilities outside of the rational, have accompanied design literature for a long time. They might be counter-intuitive to perceptions of the design process as a scientific instrument (and designers as its extensions), they nevertheless appear in various accounts. Dreyfuss (1955) speaks of the designer as “qualified by experience, observation and research to suggest in advance what a product should look like. As nearly as anyone can, he has mastered what might be called the science of appearance” (p. 65). Cross, Christiaans, and Dorst (1996) celebrate

[1] namely Agile software development (Beck et al., 2001), Lean Startup (Ries, 2011), Lean UX (Gothelf & Seiden, 2013), and Design Sprint (Knapp, Zeratsky, & Kowitz, 2016)

design skills as the “highest cognitive abilities of human beings, including creativity, synthesis and problem solving [where] the most able designers clearly exercise exceptional levels of ability” (p. 1). Elsewhere Cross (1982) ascribes “self-confidence” to designers, as a required personal attribute in the face of dealing with wicked problems (p. 224). And in a more recent publishing, Kolko (2014) speaks of empathy as an important trait of design leaders, and quotes Roger Martin: "[design leaders] have the predisposition and the capacity to hold in their heads two opposing ideas at once. [They] creatively solve the tension between those two ideas by generating a new one that contains elements of the others but is superior to both" (Kolko, 2014, p. 22). There is clearly an attributing of exceptional personal traits going on, where designers’ abilities are spoken about in individualised ways, even outside the “romantic” approach to design (as categorised by Fallman, 2003; Fisher, 1997). We can observe an ongoing story, where designers’ special traits and abilities thread through various accounts of older and newer, more rational and less rational accounts of design. However, we will argue that this conception yields challenges to the design process and its participants.

The above reviewed summaries of understandings of design skills ranged, firstly, from a conservative, scientific, logic-oriented and process-oriented *objectivist paradigm*, to a romantic, intuitive, magical *subjectivist paradigm*. Secondly, from a skill and talent-oriented *individualist paradigm*, to a situated, social and reflective *participative paradigm*. The existing paradigmatic space is seen as problematic in theorising design (Fallman, 2003; Fisher, 1997; Kimbell, 2011; Suchman, 1994; Wright et al., 2006) for a number of different reasons which we are going to cover in the following section.

The issues in design hinted at here are on two levels: 1) **Agency** (is it individual or participative?); 2) **Knowledge** (is it objective or subjective?).

How agency and knowledge are understood in technology design

Human Computer Interaction (HCI), which Caroll (1997) describes as a “science of design”, and Wright et al. (2006) as the “design-as-engineering approach”, is a domain that celebrates scientific knowing, whereby the process is defined by empirical data gathering. Assuming a “fixed problem statement”, designers work methodologically though “proceduralised” steps of research and design, to arrive at an “abstract specification of the solution” (p. 3). These engineering-oriented, technical ways of designing are defined by a systematic process of analysis, synthesis and evaluation (see Jones, 1963) leading into abstract diagram representations. The “boxes-and-arrows” approach to design leads to an externalisation of the “rationality of design work into guidelines” (p. 226), says Fallman (2003), and the role of the designer being deemphasized in this “disembodied design process” (p. 3). The driving force of design, in the engineering approach of designing technology, is ascribed to the rational process, rather than the designer. In the meantime, the designer is conceptualized as a scientific instrument in this process.

However, the role of the designer has changed alongside the developments of HCI. In its beginnings, HCI practitioners were research-oriented, and informed interaction designers and engineers of their findings which would in turn inform the designs. Zimmerman, Forlizzi, and Evenson (2007) report the frustration of designers who would only be included at the end of a project to make the user interface “pretty”. The role of the HCI researcher and the interaction designer later moved closer together, and HCI practitioners

would often cover both, research and design. In user-centred design (UCD) and user experience design (UX) the research around user needs and the experience of the user is central in this design process. There is, however, a clear distinction between the activities of research and the activities of design (Fallman, 2007), and even a "social-technical" gap, implicated by power relations where (social) research is of service to (technical) design (Dourish, 2006).

User-centred design (UCD)

Even though the integration of the user in the design process has been gradual over the past decades, the user is now understood to be the central point in design. In UCD (see Nielsen, 2000; Norman, 1988) this integration of the user into process-oriented product design brings with it the addition of user requirements, iterative cycles and multi-disciplinary teams (Maguire, 2001). Within this process, the designer is responsible for researching user requirements, planning and designing product features accordingly, and iterating designs according to evaluation activities. The designer is supported in making design decisions through research methods such as surveys, interviews, focus groups, personas (see Cooper, 2004), task analysis, heuristic evaluations, and competitor analysis (Maguire, 2001). In older accounts of UCD the user is generally seen as a set of well defined tasks, of which relatively abstract representations suffice (Wright et al., 2006, p. 4). For example, Nielsen (1994) postulates that usability tests need only be conducted with 5 participants in order to find 75% of usability problems. Here, the user's interactions are treated predictable and controllable "through properties and features of the design" (for a critique of this approach see Wright et al., 2006, p. 6). But with the more recent acknowledgement of use being embedded in a social context, UCD has embraced the use of ethnographic research methods, or specifically, ethnomethodology, as Button (2000) explains the type of research methods typically used in design. Education and industry-related literature (Garrett, 2011; Kuniavsky, 2003) call it simply "user research". General emphasis is placed on empathy in user research (see for example Young, 2015). The move from HCI to UX was also a move from lab-based research towards fieldwork (Button, 2000). Discipline-wise this meant a shift from psychology-supported research towards anthropology and sociology-supported research. But with the coming together of anthropological research methods and design, designers are faced with the "distinct style of knowing" that anthropology brings with it (Otto & Smith, 2013).

The divide between design and use

This 'supportive function' of social research to design has not gone unchallenged. Suchman (1994) proclaimed that knowledge is not something that can be wrapped up in an object and passed on for use in design and production – that practitioners in the design process are just as entangled in the social activity of producing knowledge. Similarly, Dourish (2006) raises concerns about designers' task of producing ethnographic knowledge and packing it up in the form of a report, as the well known "implications for design" which usually conclude research and pass over to design a catalogue of recommendations and guidelines. Ethnographically acquired knowledge is of limited use as a general representation of users' experience, as it is generated in the situated interplay between researchers and participants. And, he adds, classical ethnography requires the researcher to reflect on their own role in generating this knowledge, which is

not taken into consideration in ethnography for design. A second concern raised by Dourish (2006) is around power relations. He says, not only elevates the "implication for design" model designers into the special position of "gatekeepers" for research, it also places both, ethnography, and those who take part in ethnography studies, outside the design process. Woolgar (1991) goes so far to suggest, that ethnographic study may be a device, employed by producers to configure users, and exert control to "define, enable and constrain" the user. Mackay, Carne, Beynon-Davies, and Tudhope (2000) respond to that that this goes in a two-way fashion, that designers do certainly configure users, but that designers are also configured through users and through their organisations. Questions have been raised as to why design and production practice make this distinction between themselves and "the user" (Kuutti, 2001). Hysaalo (2009) explains the separation historically, with the long chain of design, manufacturing, and retail that used to separate design and use in mass production, as well as the distinct "activities" applied in design and use, and a general distribution of expertise and power, and issues of trade secrecy. But Suchman (2002) points out how such separations mask the actual dynamics of designers negotiating a social process, and, for example, are "themselves among the most intensive of technology users" (Suchman, 2002, p. 142).

The divide between 'analysis' and 'synthesis' or 'thinking' and 'doing'

Gedenryd (1998), in his investigation on designers' ways of working, found out how the supposedly exemplary process of 'problem setting' and 'problem solving' in design – 'analysis' of the user and 'synthesis' of findings into designs – which goes back to ancient Greek theories, is not working as expected. He demonstrated how designers' activities were simply not separable into 'analysis' and 'synthesis', but that a "very tight coupling between test and use" within designers' activities made impossible a separation of "problem setting" and "problem solving" (Gedenryd, 1998, p. 86). Fallman (2003) summarises that *iterations* in UCD, which were meant to overcome the problem of the linearly structured design process, as a way to allow the designer to move 'freely' between the various stages of the process, demonstrate that a distinction between activities cannot be made. He draws on Gedenryd to conclude that the "add-on" of iterations to the structured process is in itself contradictory since it means an active abandonment of the linear process, and instead the embracing of the fact that design activities are "inseparable and intertwined" (Fallman, 2003, p. 229; Gedenryd, 1998). With this, both, Gedenryd and Fallman, make a major statement about the state of HCI. The supposedly objective knowledge production in HCI is suddenly faced with the subjectivity and "direct involvement" that designing brings with it (Fallman, 2007).

HCI's conquering of the social context

The "turn to experience" (Wright et al., 2006) denotes the change that happened when HCI's focus shifted from the *user interface* (UI) and its *usability* to *user experience* (UX). It marks the increased interest in the social context of use. The experience users have with products and services has become a perceived competitive advantage for businesses. Reasons for the advent of UX are explained, for example, with the more intertwined relationship between "end user and the organisation creating the experience" (Kuniavsky, 2007, p. 898). User experience design has a largely increased scope, in comparison to traditional usability which concerns largely the ease of use of the user interface. "UX is

about everything" (NN group, 2016). Hassenzahl and Tractinsky (2006) define UX as "*more than* just instrumental needs in a way that acknowledges [the use of technology] as a subjective, situated, complex and dynamic encounter" (p. 95, our emphasis). This definition reflects the view of a majority of survey respondents from the UX community (Law, Roto, Hassenzahl, Vermeeren, & Kort, 2009).

Control over what?

However, Wright, McCarthy, and Meekison (2003, p. 43) detect an "uneasy silence as to what actually constitutes experience […] how to account for subjectivity, and whether it is possible to design experience" (p. 43). The all-encompassing and in the same time vague definitions of what user experience comprises, sit uncomfortably with the implied power and control of the design process over the user's experience.

> *"The user experience design process is all about ensuring that no aspect of the user's experience with your product happens without your conscious, explicit intent. This means taking into account every possibility of every action the user is likely to take and under- standing the user's expectations at every step of the way through that process." (Garrett, 2011, p. 19)*

It appears that in the era of UX design, some things have changed, and some have remained true to traditional HCI principles. Design knowledge (experience) is now understood to be subjective of nature. It concerns the encounter of a person with a product in the entirety of its social context, as we can see in the various definitions of UX. However, the process of producing and applying this knowledge is still postulated as an objective process, owned by the individual designer, as we can see for example in the quote from Garrett.

If the too abstract user has caused issues in the past, in terms of absent user subjectivity, in the era of experience new challenges arise with user subjectivity being the *object* of design.

The object of design and experienced subjectivity

On the one hand, users' subjectivity has finally found access to design and production in user experience design, in the form of ethnographic and socially oriented research. On the other hand, the designer now scrambles to manage this user involvement – this *object* of design. Sociological questions are being raised as to why the distinction between designer and user is upheld, how subjectivity and objectivity are perceived in this social knowledge production, and about the designer's own involvement in it. The designer ends up in a situation where he or she is required to create objective knowledge, but through highly subjective means of investigation, and of a highly subjective and situated matter. The demand of rational agency from the designer here, with subjectivity (both their own and others') not accounted for, compounds the knowledge and agency issue in design to a direct contradiction in itself.

It is a tension which one could expect to be felt by practitioners engaged in product design. We are inserting here an extract from Lucy Suchman's paper on the artificiality of the divide of design and use, and her personal experience with expectations around producing these design requirements (or "design implications" as she terms it), and the resulting conflict that arises for her as a practitioner.

> *A longstanding mutual dissatisfaction between research and product development arises from the failure of technologies and ideas to 'transfer' from one to the other, understood by one side as a failure of development to take advantage of the results of research, by the other as a failure of research to address the needs of development.*
>
> *My own experience of this gap began in the early 1980's in grappling with the question of how an anthropology of technology might be made relevant to the design of machine interfaces. The first proposal was that, as ethnographers, we might mediate relations between designers and users. Increasingly, however, our reluctance to translate our practice directly into design terms was met with frustrations from the design community. […] Our hesitation to produce such translations led to our characterization as recalcitrant social scientists, unwilling to roll up our sleeves and engage in the real work of design. For a time I at least was confused by this, feeling that to deliver design implications was indeed my responsibility but that I was unable to do so. I dwelled uncomfortably for several years within this gap between my practice and that of my design co-workers, seeing it not as a systemic discontinuity but as a personal shortcoming. (Suchman, 1994, pp. 30–31)*

This account of felt experience, in an academic paper, is revealing as to the extent how personally this epistemological problem of objectivity can be felt by practitioners. And it may be not far fetched to assume that the practitioner's experience manifests itself within, and influences in certain ways, the design process and its outcomes.

HCI, UX and the problem of objective knowledge and individual agency

To some extent, it can be derived from the literature that the latest movement in HCI, with increased focus on experience and social context, is exacerbating the existing problem in HCI – the understanding of knowledge as objective and the understanding of agency as individual. The object of design – experience – is a design object as big and intangible as never before. The unease which practitioners felt before with attempting to create objective knowledge out of situated social interaction between user and machine (Suchman, 1994, pp. 30–31) must be compounded here, where an entire social setting surrounding user and product must fit into this *object* of design – and be moulded by the designer afterwards. One of the authors of this paper has got many years of experience in HCI. What we can report from these years of working in the field is that there are indeed ongoing debates amongst practitioners reflecting some of these issues which we have derived from the literature. For example, there are numerous blog posts and magazine articles around the question of *what* UX is (Norman & Nielsen, 2016; UX Mastery, 2012), and for example around the question whether UX is a process or a verb, to much exasperation of the author – "*Okay, so how long to UX it?*" (Todish, 2013). There is also a debate whether UX designers design *the* or *for* experience (Fredheim, 2016; Olyslager, 2012), indicating a discomfort with the idea that an individual designer would have the power or responsibility to determine the experience a user has with a certain product in their lives. Some publications attempt to tackle the question of the user-designer divide, and indirectly the thinking-doing divide, by bringing users directly into the product

development process and by abandoning user research and user representations all together (Gothelf & Seiden, 2013; Patton, 2014). But perhaps frightening and comforting in the same time is the ongoing suspicion that 'user experience' is only a new buzzword for (the same old) 'usability'. As Scapin, Senach, Trousse, and Pallot (2012) note that "user experience" is often used synonymously with "usability". They also note that there is a mix between absolute vagueness what 'experience' means on the one hand, and great efforts to emphasise the difference between 'usability' and 'UX' on the other. This widely practiced public negotiation of what a UX designer's job is (Fredheim, 2016; Norman & Nielsen, 2016; Olyslager, 2012; Todish, 2013; UX Mastery, 2012), and what it is not – "UX is not UI" (Flowers, 2012), indicates the passion which is behind this topic, and that it could really be interpreted as a search for guidance, which is not provided by the existing academic discourse in the field.

Possible resolution of the knowledge and agency problem

Despite the growing interest from the HCI community in user experience (Hassenzahl, 2004), Kuutti and Bannon (2014) have called this quest of focusing on experience in technology design a "tacit, spontaneous, and unsystematic" reaction to what had been going on in the social sciences, in particular related to the "turn to practice". That HCI was closely wedded to cognitive psychology and scientific ideas of product design and use for such a long time has left deep imprints on today's practices of designing. Fallman (2007) calls HCI an "implicit design discipline", a discipline that works under the models of scientific research-based understandings of design, but under covers conducts design-oriented work, which creates a conflict within the discipline. McCarthy and Wright (2004) go so far to say that HCI is not ready to deal with 'experience'.

Psychology attempts to explain user experience as a set of pragmatic ("do-goals" such as practical tasks) and hedonic needs ("be-goals", for example, the desire to be admired) in order to arrive at a tangible understanding of what to design for (Hassenzahl, 2004). Yet, critics have said that psychological accounts are reductionist (Wright et al., 2003), "that human experience is also constituted by continuous engagement with the world through acts of sense making at many levels" (p. 5) and that experience cannot be reduced to the user – object interaction alone. Hassenzahl, Diefenbach, and Göritz (2010), respond that it is however possible to categorise experiences according to sets of psychological needs such as autonomy, competence, relatedness, or influence – needs whose fulfilment, they say, triggers positive emotions (p. 361). This model, though, does not take into account the "situated, complex and dynamic" and "context" factors of experience, that some of the very same authors established as fundamental in an article four years earlier (see Hassenzahl & Tractinsky, 2006).

Kuutti and Bannon (2014) speak of competing paradigms in HCI – the "interaction paradigm" and the "practice paradigm". The interaction paradigm, traditionally supported by cognitive psychology, honours the relationship between human and object, in context-removed lab-settings. The practice paradigm is a new form of honouring the wider connections that make up social phenomena, and requires it to work with 'context', they say. Kuutti and Bannon (2014) identify an emerging interest in practice in HCI, which they pin onto existing academic interests such as appropriation, research 'in the wild', materiality, and explicit mention of practice in sustainable HCI. They say that this presents

an opportunity for a new research agenda in HCI. Opportunities for HCI are seen in pragmatic models of understanding technology design (Fisher, 1997; Wright et al., 2003). And amendments to existing methodological models are called for in the way of how ethnography is used in design (Button, 2000; Dourish, 2006). There is a sense of a new era in designing for technology.

Sustainable technology design has already established ties with practice-oriented inquiry (Kuutti & Bannon, 2014). An example of this is the work of Lenneke Kuijer, who has developed a framework for design, to take practices from the "unit of analysis" to the "unit of design" (Kuijer, 2014; Kuijer, De Jong, & Van Eijk, 2013). She mostly draws on the sociological work done by a researcher team around Elizabeth Shove, who reason that social change needs to be conceptualised beyond conventional models of "attitude, behaviour, and choice" (Shove, 2010; Shove, Hand, & Watson, 2012). In consumption studies of sociology, theories of practice build the conceptual basis for alternative understandings of use, where consumers engage in practices of "appropriation and appreciation" in a highly creative manner (Warde, 2005). Innovation is here seen as the active participation of consumers in everyday life (Shove et al., 2012; Shove, Watson, Hand, & Ingram, 2007), in the form of an "active and ongoing integration of images, artefacts and forms of competence" (Shove & Pantzar, 2005, p. 43). However, as Kuijer points out, this practice-oriented conceptualisation of how people participate through use and consumption is helpful for design analysis, but does leave designers' work in this process open for further investigation. Shove et al. (2007) themselves posed this challenge to designers when they remarked, "If everyone is a designer, to what special expertise does the profession lay claim?" (pp. 136–138).

What the practice paradigm means for those who are in the position of wanting change, and the designers who operate within this organisational premise, is left open for investigation. There is a large work force of professional designers, who are implicated in the social process of how things end up being. The need of reconceptualising change and innovation affects designers directly. "Product designers rarely determine what gets made, but their working methods embody and reproduce ideas and concepts that matter for the detail of material culture and for the practices of which it is part" (Shove et al., 2007, pp. 136–138). Not only are designers impacted as the supposed agents, subject to arising tensions between understandings of objectivist design knowledge production and experienced subjectivity, but they are also implicated in outcomes of change processes. In practice-oriented theories practitioners are part of sociomaterial configurations which organise activity (Gherardi, 2010, 2012; Orlikowski, 2007). The material is here as implicated in outcomes as human intention. It is hence not the individual intention of the designer which determines design outcomes. It does matter, for example, whether pen and paper are used for conveying ideas, or a prototyping software. It can be derived, however, that designers contribute in significant ways. Even the various understandings of design, which we have looked at critically in the review of paradigms, are "normative infrastructures" (Gherardi, 2012, p. 150) which are co-produced by the practitioners of the practice as a form of "practical accomplishment" (p. 135). Practitioners' doings and sayings help constitute practices, in the same time as they are constituted by the practices of which they are part (Schatzki, 1996, 2002). Designers engage in activities which are established within the processes of their professional work (Shove et al., 2007, pp. 136–

138). These activities may be very different to the activities of people who use the objects they help create, and yet, these activities affect wider outcomes. Designers engage with practices around users – they for example invite users for user testing, or draw up confidential spreadsheets of user research participants. They engage in practices of use representation – they for example employ drawing materials and software to create representations. They are entangled within sociomaterial environments made up of computers, managers, whiteboards, engineers, bean bags and foosball tables, or whatever. Designers participate in significant ways in the practices of product designing. Just in what ways is not clear.

This paper identifies a need to consider deeper the angle of design in practice-theoretical analysis, and in particular that of the designer, the putative agent in design. This leads directly to the work of Lucy Kimbell. She has suggested to view "design as a situated, local accomplishment" (Kimbell, 2012), through a framework of design-as-practice and designs-in-practice, to acknowledge how design practitioners and design artefacts constitute practices. She criticises the ways how design thinking centres the designer, and the supposedly particular ways of doing, knowing and being as a professional designer, within the design process. "But perhaps more interestingly, we might attend to the material and discursive practices in which designers of particular kinds do, know, and say particular things and how they come to do, know, and say these things but not others. In so doing we might develop a richer understanding of professional design and its effects" (Kimbell, 2012, p. 130). In Kimbell's view, practice theory accounts for, first, distributed activity across people and artefacts, second, the constitution of structures in practice, third, the role of objects, and fourth, knowledge. She sees practice theory as an alternative which solves a number of current issues in the concept of design: Firstly, the dualism between thinking and knowing and acting, secondly, designer's diverse ways of doing, knowing and saying which are unaccounted for in prevailing design process models, and thirdly, that the designer is seen as a main agent (Kimbell, 2012, p. 141). Kimbell's work, the reconceptualization of design thinking, knowing and acting, as a social practice, is the beginning of creating this missing link in the emergent coalition between design and practice theory – and it is this particular crossover we suggest to further, from the particular angle of HCI and technology design. The focal point should be how designers in technology design participate in the practice of producing design knowledge – and how they are constituted in, and constitute, this process.

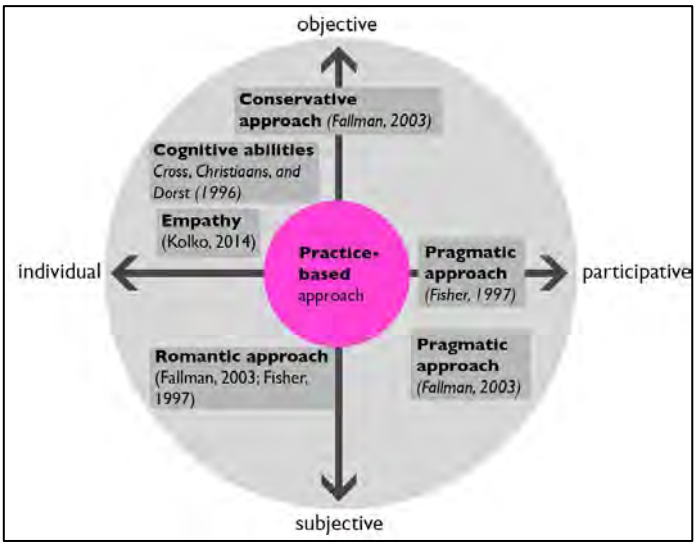

Figure 2 Practice-based paradigm

Conclusion

We have tried to pull together conflicting ideas and concepts within design processes around technology, to highlight some of the tensions which do exist. In HCI, objectivist understandings of knowledge have shown to bring tensions for both the design process as well as its practitioners (Button, 2000; Dourish, 2006; Suchman, 2002) as they are faced with their own subjectivity within the process (Fallman, 2003). In the same time, individualist concepts of agency do run counter to a pragmatist and practice-oriented appetite within design practices (Fisher, 1997; Kuutti & Bannon, 2014; McCarthy & Wright, 2004). The arising tensions are likely to affect, both, design processes as well as designers.

In consumption studies of sociology, some of these issues have already been reconciled, through a conceptualisation of users as creative participants in innovation (Shove et al., 2012; Shove & Pantzar, 2005; Shove et al., 2007; Warde, 2005). This may aid organisations and designers to have a more helpful view on how their products and services fit into people's everyday lives. But while sustainable design research has begun to incorporate practice-oriented design frameworks (Kuijer, 2014; Schatzki, 2011; Shove, 2008), research on how professional designers are implicated in this social process of how products come to be, has been covered relatively little. Tentative conceptualisations of design-as-practice and designs-in-practice (Kimbell, 2011, 2012) have made some advance in this field. However, we propose to further the crossover of practice-oriented research and professional designing in the more technically oriented fields such as HCI.

For designers, new conceptualizations of their work arise with practice theoretical ideas. Practice theoretical ideas of the social create the need of rethinking designers' own work practices, and the ways how designers constitute, and are constituted, within this social dynamic. Problematic expectations and tensions arise in designers' work, as we have seen in the review of the understandings of agency and knowledge in design. And it appears that designers *are* significantly affecting professional designing of consumer products. But

it has also become clear that they are significantly affected within this practice, and that the material plays a role in this sociomaterial configuration of which designers are part. Following Gherardi (2006, 2012), new understandings of the social dynamic in which designers engage, may pose opportunities for designers to make individual choices about their engagement. In particular, if normative understandings form part of the practical accomplishments in which practitioners take part (Gherardi, 2012), this may allow a resolving of some of the issues and debates which designers in HCI currently face. Designers may be best supported by new conceptualisations of their work practices - conceptualisations which help illustrate in what ways designers are affected, and in what ways they affect outcomes of design.

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HONG KONG DESIGN MANAGEMENT ACADEMY CONFERENCE 2017

RESEARCH PERSPECTIVES ON CREATIVE INTERSECTIONS

FREE Architecture: An ethnographic approach to architecture practice

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doi: 10.21606/dma.2017.78

As architects, we study the behavior of the inhabitant, taking into account collective and individual subjectivity. However, it becomes difficult to generate transformative architecture when the user is seen as a bank of ergonomic data and space is understood as mere geographical coordinates. This results in the construction of spaces that are separate from existential depth, where the user is not actively involved in any of the design process, which affects his will, interests, and values. This also prevents interaction between different types of knowledge that arises from these spaces. Through this horizontal interaction, it is possible to obtain architectural design that transforms its context. Digital ethnography is a methodology that raises questions related to the practices of *everyday life* through a *flexible and multilevel scheme where the virtual space reveals the social practices of a community, freeing* up the *space and scope of architecture and connecting lay with expert knowledge.*

keywords: ethnography; transformative design; transdiciplinary; sustainability

Introduction

The principle of post-structuralism brought intellectual concepts proper to the Frankfurt School and French philosophers, mixing semiotic, structuralist, and phenomenological paradigms into the field of architecture (Sykes, 2010, p. 14). These ideas were implemented in different architecture theories as a counter to the positivist and structured models of modernism (Eisenman & Johnson, 2013, p. 4). They were critical, speculative, and somewhat utopian (Sykes, op.cit, p. 15), along with many tasks and responsibilities that the architectural discipline has not been able to cope with thus far. Currently we must add the technologic paradigm, thanks to digital tools created during

the early 1990s and perfected in the 2000s. Which introduced new concepts of what "reality" means in terms of "media and simulation" (Eisenman, 1995, p. 144) creating an imposition for the "visual" and "new forms" within contemporary architecture. There is no respect for “the street” architecture, with its roots and cultural memories.

Is into phenomenology paradigm that we find architectural theory that counteract capricious forms. Husserl and his followers[1] rose in prominence based upon the subject (person) – object (place) relationship and the sensorial qualities that a space emits. Even when they write about existentialist space, this relationship is still an "individualistic view of phenomenology ", who perceives an object, leaving aside the perception of the "social and political experience " (Montaner, 2014, p. 130). In this sense, as architects we must think about how the community (the social dimension) interacts with the environment. And why architects and habitants currently appear to work separately, resulting in a city of makeshift construction and buildings without a sense of belonging. This creates a city in which economic interests often create architecture based on innovation, image, and repetitive and unilateral schemes, where active participation is excluded from all parts of the architectural process

Architecture is still struggling to overcome this complexity.

Henceforth, the goal of freeing contemporary architecture is based upon the construction of new connections and experiencing different ways to approach space problems.

The question is: How can a new understanding of space and its interactions generate an architecture that meets the needs of today's society?

What type of disciplines must architecture connect to in order to avoid its extinction?

While many concepts have changed over time, it is vital to raise the issue of the renewal of architectural thinking from a pragmatic point of view. The post-architectural context will become reality if architects continue to be disconnected from the people, other discipline theories, and new technological affordances. In order to achieve a free modern architectural structure, free of typologies, ideologies, aspirations, heroism and utopias (Rajchman, 1998, p. 111), architects must expand their self-imposed limits and appropriate new methods and tools, especially those that are used in the social sciences. There is a need to rethink concepts and categories based on the "new facts of reality" (Montaner, 2014, p. 36), and what better than social methodologies to illustrate this process?

"The inhabitant" from the "social"

The word “social” is often an abstract explanation that other disciplines use to avoid doing their own experiments by placing all the responsibility on the social disciplines. However, the theory assembly must be done through all disciplines so that, through the social sciences, the word "social" can be truly understood (Latour, 2008, p. 14). In this way, architects can avoid the inevitable accusation that "social architecture" has become the new “green wall of sustainable architecture," meaning that it becomes the latest overused

[1] One of his followers was Juhanni Pallasma, finnish architect, his book The Eyes of the Skin – Architecture and the Senses, review the bias toward vision, and the suppression of the senses in architecture process.

trend in the industry. Current society must be reviewed in depth in order to include it, not only as an adjective, but also as a complex phenomenon that influences architecture and vice versa.

The traditional sociological model aimed to explain "social reality" by reinterpreting the data that informants may provide by attempting to remove unconscious factors of their everyday life (opt Ibid, p. 59). The work of the architect is also to reinterpret shapes, symbols, and social dynamics. If the figure of the sociologist is replaced with the architect, and the informant is replaced with the inhabitant, an empathic and horizontal relationship would be created instead of a relationship based on superiority (vertical layout), which brings about simple architectural aesthetic whims in cities without nurturing the real needs of humankind.

Based upon the premise that societies are defined by their historical contexts, which are susceptible to change (time), contemporary society, according to Castell, "is defined by contemporary processes of globalization and the emergence of the net-society." This net-society is directly dependent upon existing communication networks and their actions (Castells, 2009, p. 41). These networks are the results of a new technological paradigm, which could be defined as "networks of social interactions, which are open, flexible, adaptable and able to survive, transcending the barriers of space and time" (opt Ibid:, p. 44)

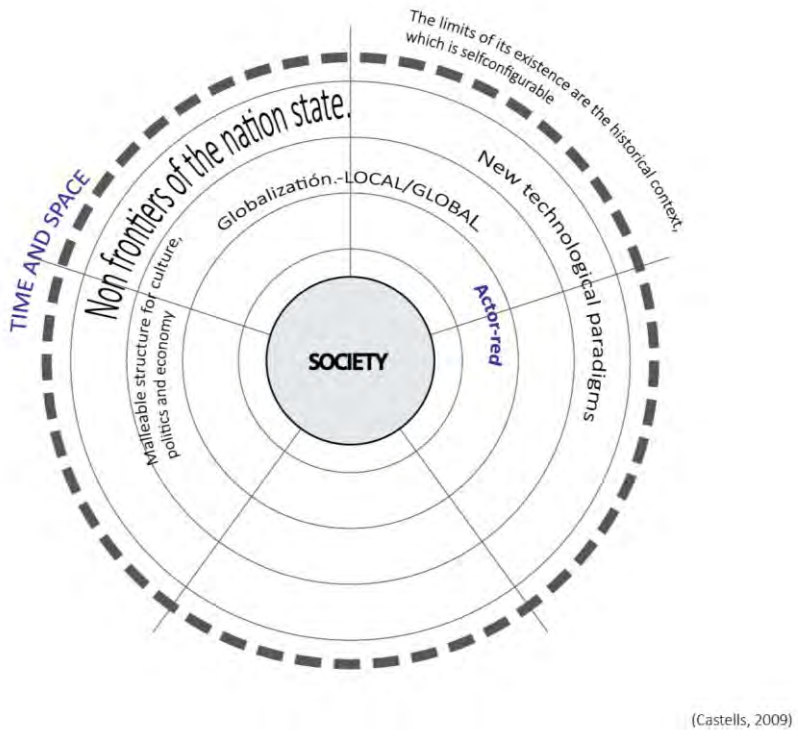

Figure 1. A diagram of society, according to Castell's Communication and Power (2009)

In this network, the local is mixed with the global in the historical context, transforming themselves into an object-network within a global network. As a result, new forms of *online* influence emerge from these global networks in urban environments (Ignacio & Bender, 2010, p. 254). Therefore, contemporary society can be analyzed through the interactions between actors and objects that create networks. A phenomenon that has yet to be contemplated in detail in architecture, but widely developed by social science through digital ethnographic methodology.

This methodology is used in qualitative research, wherein the researcher observes behaviors and significant rituals among online and offline communities. Among the most recognized authors are Sarah Pink, a visual ethnographer, and Edgar Gómez Cruz, a virtual Ethnographer, both of who work at the Institute for Research Design and RMIT School of Media and Communications, in Australia.

Flexible and open digital ethnography "method"

While ethnography was developed in the 20th century by sociologists and anthropologists, such as Malinowski, Boas, and Mead Brown, it has exceeded the limits of such disciplines and is currently being used in the field of education, business, and design. Thus, it is common for various disciplines to use digital media to collect data. Architects use it to collect quantitative information that provides input for the design process, including square meters, laws, regulations, similar projects, and, in some cases, social aspects. However, this process lacks reciprocal influence as it generates data, but does not provide any flow-back or empathy between them, thus making it impossible to create a design that can transform real space.

It is necessary to understand that social worlds exist inside this "virtual reality," which is loaded with "aspects of human action and experience" (Garcia, Standlee, Bechkoff, & Yan Cui, 2009, p. 54) which cannot be understood separately from the offline world (Pink, 2014, p. 174). These worlds become indivisible and complex, where the flow of power in the online-offline world has changed from user to pro-consumers who, through their own actions, produce content and services that they consume themselves (Jenkins in Scolari, 2013, p. 84). It is in this construction of the world that we can take advantage of the benefits of the Internet and computer-mediated communication (CMC; Garcia et al., 2009,p. 53). It also allows us to create a "cultural profile of who we are" (Curran, 2013, p. 64), one that is limited by digital techniques and the availability of technological advances (time temporality). In fact, it is necessary to mix online interactions with offline, face-to-face discussions, especially for architects, who will need a more spatial interaction.

Therefore, it is necessary to ask, how can one avoid getting lost in the immensity of information in the "adjacent world" as an architect? When an ethnographer examines a particular topic, the principal objective is to define the field site and analyze the social dynamics that happen through a screen "with textual, visual, aural and kinesthetic components; complicating its analysis" (García et al., 2009, p. 64). Is necessary to develop abilities in the analysis of textual and visual data; such as interpreting texts in e-mail, chat and instant messaging, using images, colors, page layout and website graphic design Recurrent use of digital online interviews, emails, chat rooms, videoconferences, and webcams are intended to create empathy and participation. But there still some issues that concern both traditional and online ethnography like getting access to research,

establishing a relationship with research subjects, and obtaining volunteers for interviews (opt Ibid, p. 68).

Within these restrictions lies the ability of participants to verbalize their emotions, the characteristics of automated tools, and the authenticity and veracity of the profiles of the people you interact online (Cherny, 1999; Mann and Stewart, 2000; 2002 in Garcia et al., 2009, p. 68). An example of taking advantage of social media tools, Javier Toret used Twitter, to analyze a series of protests that were happening in the social movement 15M in Spain. This showed how the generation of emotions and network analyses, as well as personally analysing big data, could generate a degree of understanding about a complex phenomenon:

> *"In the network (and more specifically, Twitter) the whole phenomenon is not reflected, but part of it. However, it can be used for a comparative study of influences, and even as a first intuition to reinforce (or modify) raised hypotheses" (Toret et al., 2013, p. 151).*

While analyses can be done through different software, with the ability to transform texts into emotions, humans should always interpret the results and keep track toward the main objectives and selected categories of the phenomena to be studied. Each new discovery sets the tone for "reviewing categories that do not work, and redefining frameworks for analysis, through "reflection both in the field and outside of it. Therefore, it is important to compare different levels of knowledge between experts (academics and professionals) and non professionals (society). As it can lead to multi-level and multi-platform research that uses a wide range of data collection methods.

This non linear methodology make it possible to review theories and have a clearer understanding of the "setting" without the need to "live for a long period of time" (Hine, 2015,p. 56) in situm. But in order to use ethnographic methods in architectural design, it is first necessary to identify a common purpose among ethnographers and designers. In their book Un/Certainty, Drs. Sarah Pink and Yoko Akama explain it in this manner:

> *We understand our work as being substantively engaged in processual worlds where ethnographers/designers are always working with emergent qualities and with people who share their journey into the immediate future (Pink & Akama, 2014, p. 4)*

Therefore, the limits of society discussed above are transformed when observed through the digital ethnographic lens. This transforms the space from a specific place with existing geographical coordinates into a field site. This provides the ability to expand networks based on their different layers of information. The user ceases to be a simple entity and becomes a social actor with the ability to influence the networks that are configured through their practice. Time also becomes a constant variable called uncertainty, thus nullifying the possibility that any result obtained is categorized and permanent.

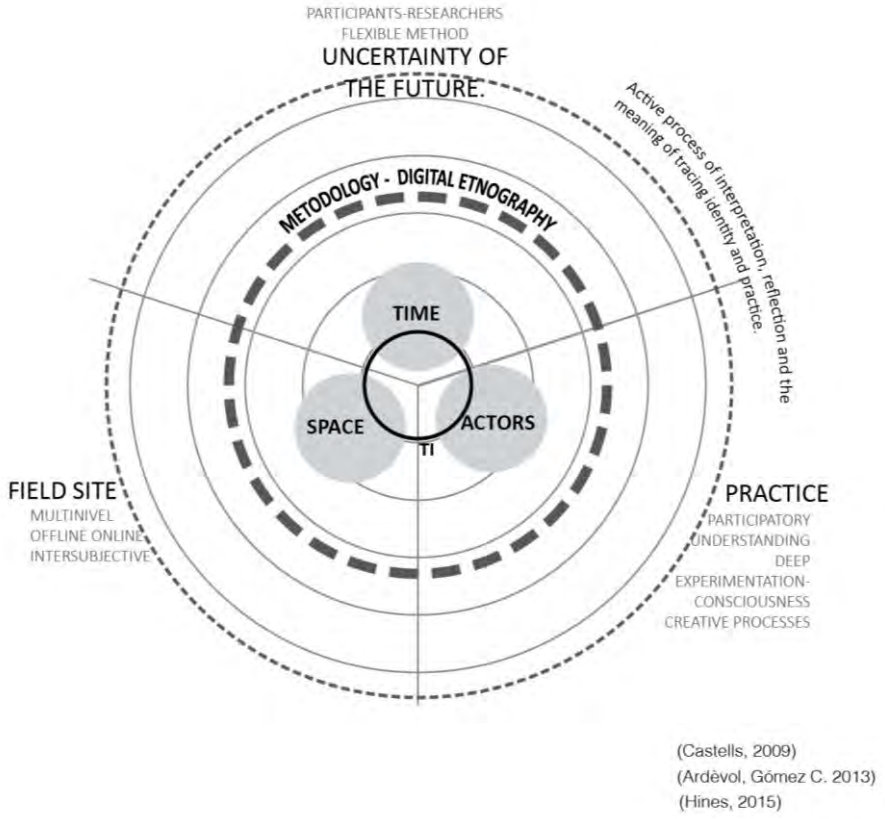

Figure 2 A diagram of flexible boundaries based on a digital ethnographic methodology

Deconstructing the dynamic space
Fieldsite: practice

There are different approaches to architectural space, but it is when speaking of digital ethnography that space can be based on the Practice Theory and become a space of action. Diverse thinkers adopted this "theory" approach in a loosely way: Schatzki, Dreyfus, Bourdieu, Giddens, Foucault, Lyotard, Latour, Rouse and Pickering; each one in his own field: philosophy, social theory, cultural theory and theorists of science and technology.

> *"Schatzki (1996) argues that social theory has always moved between two standpoints: that of the whole and the individual. From a philosophical discussion based on Wittgenstein's thinking, and in dialogue with ideas like those of Giddens or Bourdieu, Schatzki criticizes this dichotomy and proposes an alternative praxeological approach. However, Schatzki recognizes that there is no unified and clear 'Practice Theory', since it is more of a family of concepts. " (Gómez Cruz & Ardévol, 2004, p. 32).*

This “theory” analyzes the relationship between established structures of culture and the real acts of the people within it. Outstanding the idea that the social structure influenced the people and people influence their social structure as well. The social structure is based on social conventions that are observable through the rituals and ceremonials. All rituals according to Durkheim constitute the essence of society: they furnish actors with meaning for their actions, and they set the cadence of social and interior life. (Gobo, 2008, p. 164).

This “social practices are made up of minor actions, of apparently banal and superfluous ceremonials, which day after day sustain organizations and sometimes alter them” opt. ibid, p. 163).

Through these theories, you can link theoretical concepts with the personal empirical data across the technology paradigm. This allows the research “weave the relationships between **“particular things, events, subjects and connections show up and take on significance**” (opt Ibid, p. 34) or as Hines (2007) said, “the traces between people, objects and places”.

These relationships show us the practices of everyday life, which work as a paradigm shift that articulates "the media, society and culture" in an empirical field (opt Ibid, p. 29). This empirical field will be analyzed as a dynamic space and a holistic world where practices are mixed in theoretical concepts in order to reach a social understanding that depends on the ethnographer’s objectives.

> *“From a Practice Theory standpoint, the field is not conceptualized as a stationary point, nor as a place the ethnographer enters and inhabits; rather, the ethnographer’s movements and trajectories define it“ (Gómez Cruz & Ardévol, 2004, p. 33).*

The ethnographer participates in the co-creation of a multifaceted study that allows him or her to learn from the participants, thus creating a deep level of participation and enabling emotional attachment and understanding.

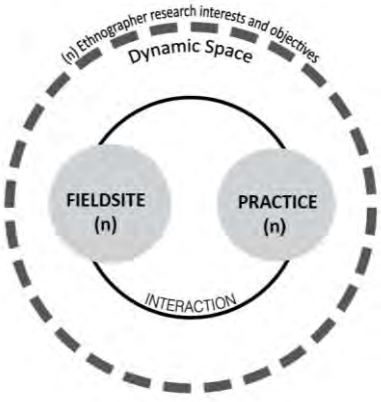

Figure 3 Diagram of Dynamic space

Uncertainty

Ethnography, as an evolving field, is based on uncertainty that embraces the temporary configuration where the validity of each diagnostic or method depends on time, since often both are overwhelmed by the speed of technological advances. However, it's not only ethnography that is affected by the uncertainty of time; we all live in this condition.

Within the architecture field, time changes the habitants, their needs and practices, so the dynamic space should be in constant valuation and intervention in order to fulfil the people's requirements.

Therefore, uncertainty becomes "a way of thinking across practice" through movement and knowledge. As Sarah Pink and Yoko Akama point out:

> *…multiple factors or sensory pieces of information crystallise momentarily and create an insight. Shortly thereafter all the factors and sensations move again" (2014,p. 10).*

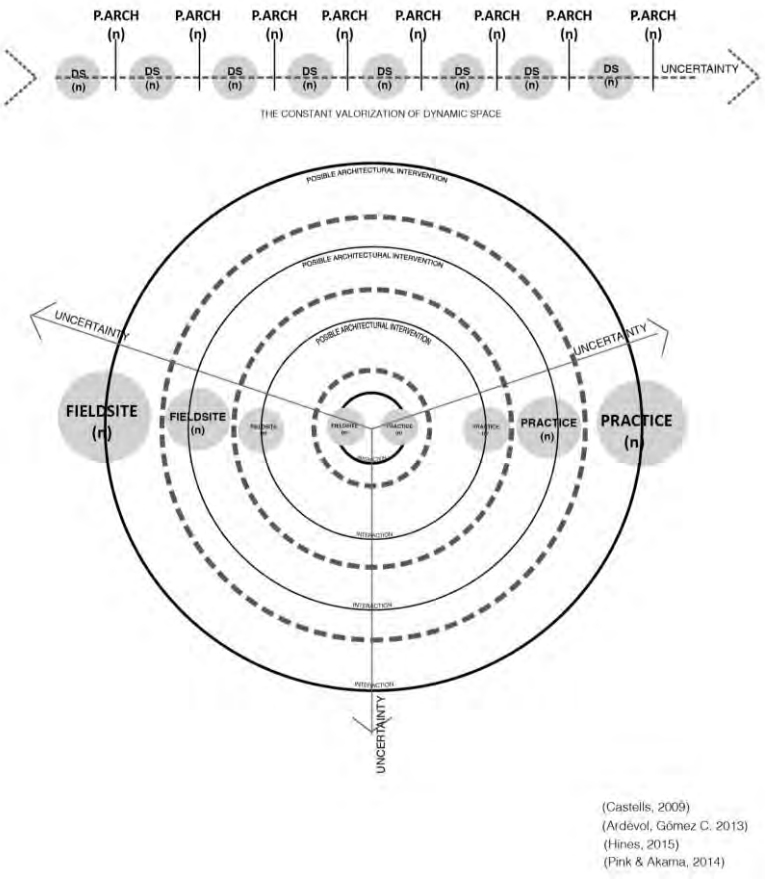

Figure 4 Diagram of dynamic space through uncertainty

Through this discussion, we have created a starting point for working together in practice. Space may be defined "not as a specific geographic area or a cultural unit, but as a **dynamic space**" (Hine, 2015, p. 58), which can be considered an expansion, depending on the objectives of the investigation and the needs of contemporary society. This view of space grants researchers the freedom to rethink the meaning of architecture as a practice.

Such a practice is open to changes in context based on the complexity, is free of formalism and stylistic-typological dogmas, avoids aesthetic whims, and insignificant buildings generated from political and economic interests.

Constructing the research model

Now, it is necessary to ask how we can start to analyze this dynamic space as architects and not as social researchers. This model is based on the deconstruction of the field site and practice concepts, which uses the definition of space developed in the Practice Theory used by Ingold,[2] Gómez Cruz,[3] and Ardévol.[4] In order to subtract analytical categories and subcategories that would guide every empirical observation.

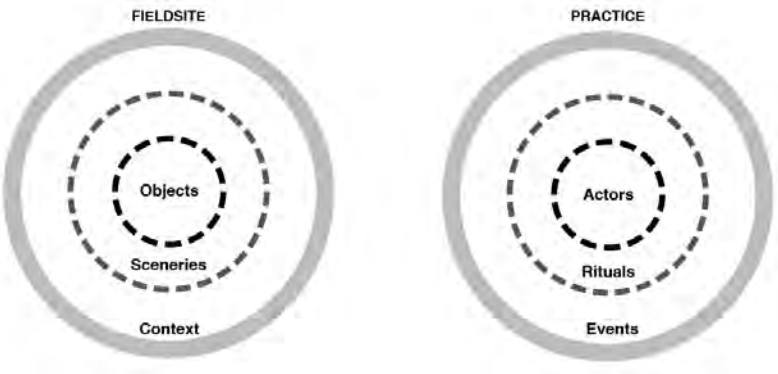

Figure 5 Diagram Categories and subcategories from the dynamic space

[2] Ingold researches and teaches the connections between anthropology, archaeology, art, and architecture (the "four As"), and considers it a way to explore the relationships between human beings and the environments they inhabit. This approach is radically different from the conventional anthropologies and archaeologies of art and of architecture, which treat artwork and buildings as though they were merely objects of analysis. Instead, Ingold looks at ways of bringing together the "four As" on the level of practice, as mutually enhancing ways of engaging with our surroundings.
[3] Gómez Cruz is interested in the relationship between technology and society, digital culture, visual culture, photography, new media, creativity, practice theory, ethnography and many others. He is urrently a research fellow at the Digital Ethnography Research Centre, RMIT in Melbourne, Australia.
[4] Ardévol's research focuses on media anthropology and the development of qualitative methodologies for the study of cultural practices and new media at the Universitat Oberta de Catalunya in Spain.

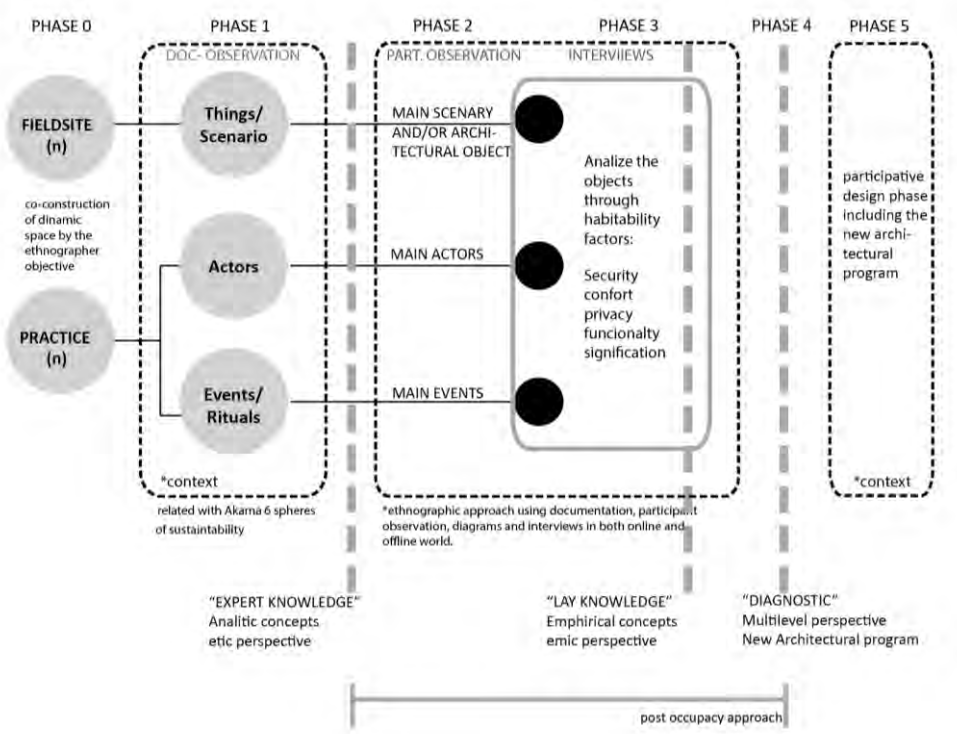

Figure 6 Research model of dynamic space

Strauss and Corbin (1990) divide their analysis strategies into three interwoven phases:

> *Deconstructive (open coding), constructive (axial coding) and confirmatory (selective coding). It generates a spiral reflexive process in which sampling (S), collection (C) and analysis (A) are repeated with a progressively narrower focus in each of the three phases…The ethnographer may already have a well-defined theory (constructed through previous research or drawn from another author), so that he or she can start his or her research from the second phase (construction) straight, or the third one (confirmation) (Gobo, 2008, p. 227).*

The research model proposed in this paper not only includes the three main phases addressed by Stauss and Cobin, but it also presents Phase 00 where the researcher's degree of knowledge and objectives about the topic of study guides the research, as well as two more phases (04 and 05) that clarify the architectural program and further design process. So the community needs can be transform by the architect in a complete architectural program.

PHASE 00

General Objective: Identify the type of relationship between actors, rituals, events, architectural objects and sceneries within a community.

Specific Objectives 1.-, 2.-, 3.-

DYNAMIC SPACE							
Comunity				Empirical Category	Subcategory	Observable	Method
Online Offline							
	Identifying the events-rituals, individual or collective actors, architectural objects and sceneries to outline the contexts. You can begin to	**PHASE 01 (deconstruction)**	**PHASE 03 (Confirmation)**	Actors	Demographic profile	Name, nacionality, age, sex	Observation-Survey
					Ocupation	Scolarity and current occupation otside and inside the community	Observation-Survey
					Life style	Cultural activities, interest and	Observation-Survey
				Sceneries	Context	Locations	Observation-Survey
				Objects	Buildings	Locations	Observation-Survey
				Events-Rituals	Activities	Main topic	Observation-Survey
					Duration	date/hours/updates	
					Influx	Number of posts, comments, participation.	
	Identify the relationships and positive values that emanate	**PHASE 02 (Construction)**		Actors - Object	Name generator Relationship type links	(+)Strength - Frecuency Duration Commitement level	Observation-Survey
				Actors - Practice	Name generator Relationship type links	(+)Strength - Frecuency Duration Commitement level	Observation-Survey
	Identify the negative relationships and values that emanate from each one. Translating it into demands and needs of dynamic space			Actors - Object	Name generator Relationship type links	(-)Strength - Frecuency Duration Commitement level	Observation-Survey
				Actors - Practice	Name generator Relationship type links	(-)Strength - Frecuency Duration Commitement level	Observation-Survey Observation-Survey
	Confirm if the demands and interests can be translated into architectural intervention, following the parameters of habitability.			Objects	habitability	security confort privacy funcionality signification	Observation-Survey
				Practice	Architectural program	New space requirements	Observation-Survey

Figure 7 Categories matrix of dynamic space

PHASE 00

The first phase of any research is to determine the phenomenon or the community to study, as well as the researcher specific interests and first hypothesis of architectural program. The research field should always be limited by the main and specific objectives of the study. Emerging issues and interpretations may arise that expand or limit this practice.

PHASE 01

Deconstruct the information from both online and offline worlds, using ethnographic methods, based on a non-intrusive observation or lurkin (Shoham's, 2004 Garcia et al., 2009, p. 59) and through an unsystematic procedure that involves being “ready to change focus whenever a noteworthy action or interaction occurs” (Gobo, 2008, p. 228). This phase requires the researcher to keep in mind the first boundaries, which are outlined in Phase 00. The data obtained in this phase should outline the context (historical, political, economic, social, spiritual, environmental, and technological) by:

- Identifying agencies related to the seven contextual themes according to the objective. This information can be official documents, laws, geographic data, etc.
- Look for the main online sites. Analyze the design features of each platform and sites that encourage participation and interaction between the different participants. Using an observable guide, highlight the use of colors, page layouts, images, profile photos, and graphic design, using screenshots as a method of collecting data. The web site www.web.archive.org can be used to observe changes in the physical appearance of a website.

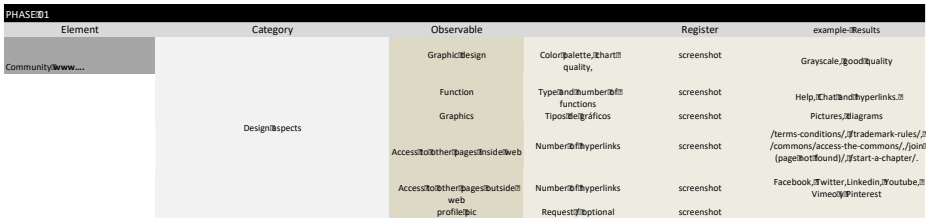

Figure 8 Observational guide Web Design interaction in Phase 01

- Identifying the most common events and significant rituals among them.
- Identifying the most common scenarios and architectural objects associated with those significant rituals.

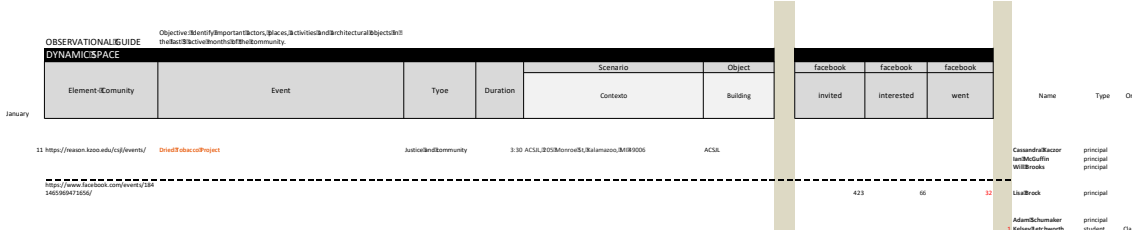

Figure 9 Observational guide events-objects-participants, example in Phase 01

- Identifying actors and gathering demographic characteristics, such as age, race, class and gender, and personal characteristics, from profile photos and personal web pages. It should be taken into account that participants can create fake profiles. However, some of these interactions may occur from a linked personal account, such as Gmail, Twitter, and Facebook. It is less likely that someone would generate a fake profile to use only on social media. Offline interactions should be contemplated if the official pages do not provide sufficient information.

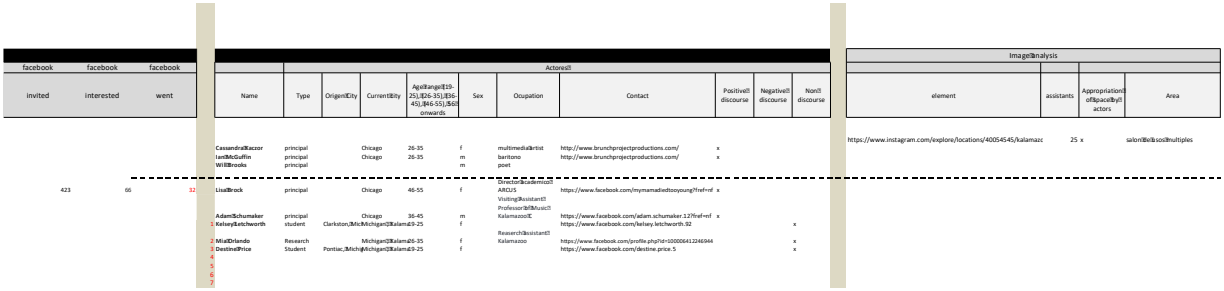

Figure 10 Observational guide list of participants, example 02 in Phase 01

PHASE 02

Reassemble the concepts with new patterns to construct a framework, and focus on the main rituals, scenarios, and architectural objects from the observational guide from Phase 01. This phase involves re-analyzing the hypothesis in terms of the systematic, regular, and categorized observations in both online and offline practices

- Identify the logic of significant practices among users by observing the files, comments, hash tags, and pictures in open-source formats over the last three months in order to draw a map of relationship through positive and negative values in the community. This information should be linked to a specific scenario or architectural object.

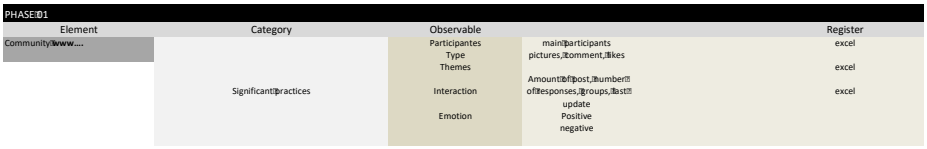

Figure 10 Categorizing and registering web interactions in Phase 02

PHASE 03

Return to the field and confirm data to clarify relationships that are still poorly defined between the scenarios, objects, and actors. Use a survey based on relationship questions and habitability factors, such as comfort, privacy, security, functionality, and signification to understand the current relationship between objects and people. This survey can be structural, semistructural, or deep, depending on whether online or offline distribution is used. It is recommended to use a structural online survey to achieve higher participation.

Empirical Category	Subcategory	Observable	No.	Survey Items	Multiple Options
				Apply this instrument after making the observation guide. It is possible to preside over the generators of factors if one already has a record of the main actors and if it is not sought to analyze the personal relations within the community. Generators of spaces and events can be reduced to a minimum of 1, (33 questions) or extended up to 5 max. (59 questions).	
Actors	Demographic profile	Name, nacionality, age, sex	0	Introductory greeting: If this survey has come to you, it is because you have a close relationship with [community] and your name has come up frequently in our first study. This project aims to analyze [community] in a dynamic way. Studying the relationships between places, inhabitants and architectural objects, through the events they perform is a community. This research is done for [purposes]. Thank you in advance for your participation, which is of vital importance for this research. The survey consists of [num] questions which you can perform in a maximum time of min.). All results will be confidential and used only for [purpose], which you can consult at [Web (link). If you want to know more about the investigation or you have doubts and comments write us to (email).	
	Ocupation	Scolarity and current occupation inside and inside the community	1	What is your role in [community]?	
	Life style	Cultural activities, interest and proximity with the community	2	What kind of activities do you participate in?	
			3	How many times a month do you attend an event organized by [community]?	None, rarely, once a month, several times a month, daily
			4	How many minutes does the drive to [community]?	5min, 10min, 15min, 20min, 30min, 1hr, over an hour
Sceneries	Context	Locations	5	What places within your community are important?	
Objects	Buildings	Locations	6	What spaces or constructions do you associate with these places?	
Events-Rituals	Activities	Main topic	7	What activities do you associate with these spaces?	
	Duration	date/hours/updates			
	Influx	Number of posts, comments, participation			

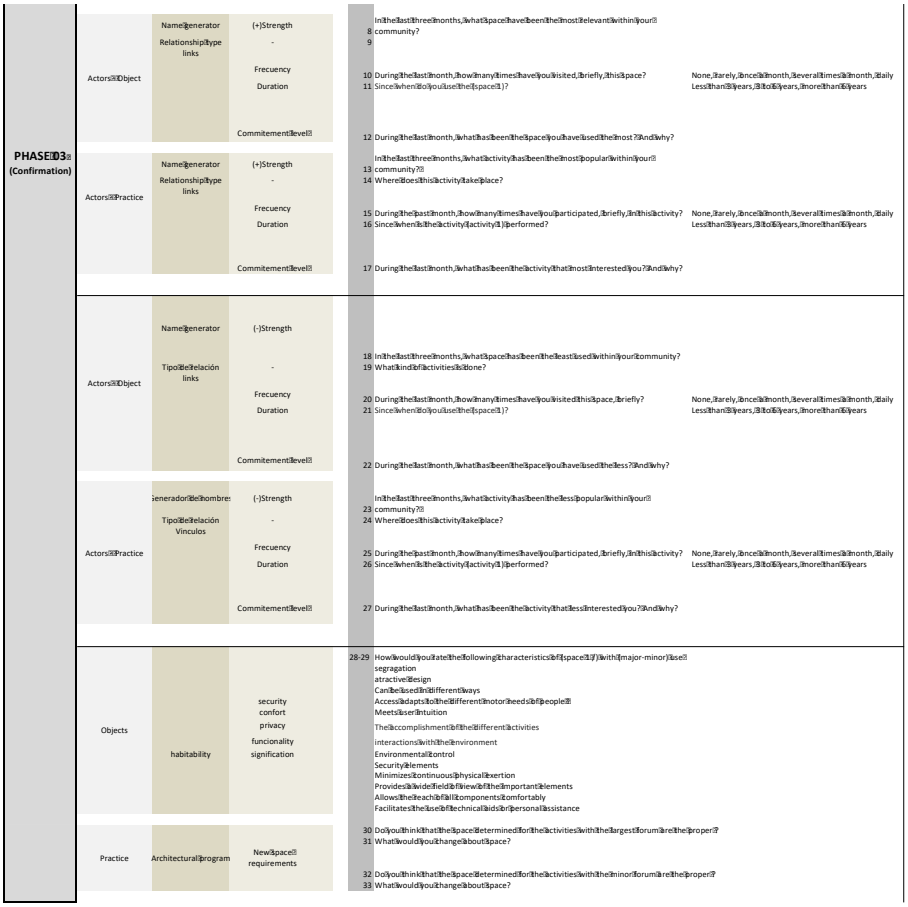

Figure 11 Survey guide of dynamic space Phase 03

PHASE 04

The Diagnosis will generate a new architectural program with the real space needs. This can be a new object in a specific scenario or an intervention in a pre-existing object. Feel free to innovate and break schemas.

PHASE 05

Based on the new architectural program, gather the main actors of the community and start a dialogue by creating a vertical structure to generate a transformational design, similar to what Akama suggested in *Designing Future Designers: A Propositional Framework for Teaching Sustainability* (2015).

Transformational design

It is recommended to use the same methodology to establish an empathetic relationship with the actors in the architectural design of the obtained requirements. Although, according to Dr. Akama, there are different phases of interaction (the user experience [UX], the co-design, and transformational or sustainable design), each depends on the role

of the user in the design process. While the UX marks an interest in how the user will experience the designed object, it fails to influence in any way the decisions of other actors and disfavors their interests and values. The interaction between both lay and expert knowledge may continue in order to give place to a "shared meaning construction" between the people and the spaces that are being designed. That is, the user must "intervene in the set of power relations" in order achieves the different objectives and purposes of the community (Castells, 2009, p. 45).

Instead of seeking the relationship by disciplines, connection between knowledge types (lay and expert) should be seek, being this same connection between knowledge and expert disciplines the one which will create more effective approaches. Now a days knowledge types tend to be increasingly interdisciplinary, such as quantum physics or geopolitics. But instead of focusing on comprehensive disciplines, focus passed to specific knowledge, greater freedom could be achieved when generating research, keeping the action as guiding axis, avoiding, at all costs, to fall into utopian concepts. In order to lay the groundwork for what could be the trans-knowledge, all of the transdiciplinary manifest items collected in the book "Transdisciplinarity" of Nicolescu, Basarab would need to be known (Nicolescu, 1994).

This proposed sustainable design is mixed with "transdiciplinary design, transformational design, participatory design and innovative social design" (Burry, 2013, Manzini, 2010; Sanders & Stappers, 2008; Sangiorgi, 2011; Steiner & Posch, 2006 Akama et al., 2014, p. 2).

Sustainability, as proposed in this context, should include the interactions between "social, political, economic, environmental, technological, and spiritual spheres," thus raising awareness of how everyday life is related to the world (Fry, 2009; Ingold & Gatt, 2013; Walker, 2006 Akama et al., 2014, p. 5).

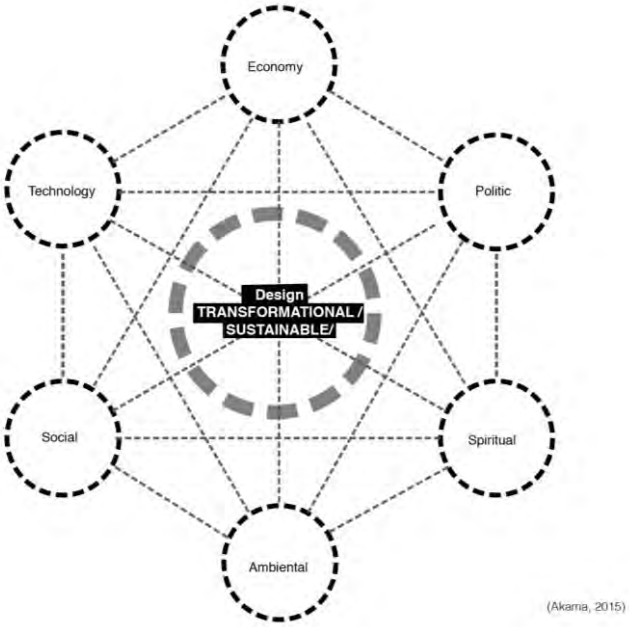

Figure 12 Dr. Yoko Akama's diagram of the six spheres of sustainability from Designing Future Designers: A Propositional Framework for Teaching (2015, p.5)

This "diagram" can be use both at the starting time of the project and to analyze its results in the community. Thus, the architect begins to resemble a sociologist or anthropologist who is "tracking, mapping, describing and connecting the 'controversies,' languages, interests, discourses of subjects and scenes involved" (De Grande, 2013, p. 15).

Recommendations

Both approaches, design and anthropology, take up the "do" from speculation, thus creating prototypes and testing as if in an "urban lab" (Pink & Akama, 2014, p. 51). However, this "laboratory" lacks structure and continuity; that is, the need to generate shared concepts that complement both disciplines. These two anthropological interpretations are similar in the sense that it is possible to start a paradigm shift in terms of what architecture can offer, as both can rethink big data and technological affordances from an anthropological perspective. "A medium that makes it possible to reach more people should not ignore the most appropriate sampling procedures" (Couper, 2000 in Rodríguez & González, 2014, p. 163). Thus, "datafication" is born, which is helpful to understand the cultural space through a new interpretation of habitus[5] (Curran, 2013, p. 64).

[5] The concept of habitus is one of Pierre Bourdieu's fundamental contributions to sociology and one of the key terms of his theoretical construction. However, he did not invent this concept. It dates back to Aristotle who said habitus was the Latin translation that Aquino and Boethius gave to the Aristotelian concept of hexis. For these authors, habitus plays a key role as an intermediate term

The relationship between "social media data" and the phenomenon of Big Data can be used to study the behavior of society in real time, without the need for invasive work (Casteleyn, Mottart, & Rutten, 2009 & Murthy, 2008 in Canhoto & Padmanabhanb, 2015, p. 1141). Taking our online activities (e.g., posts, tweets, and purchases) to understand our tastes and interests. As well as ethical questions about the use of the world´s personal data, - dreams, ideas, pictures and emotions. Extracting massive information from individual practices through different platforms, especially the social media where we can analize every day patterns, likes and dislikes.

However, in the right hands, these data banks can be of great help, instead of been use for capitalist ends. Although today access to social network algorithms is limited for researchers and there is still discussion about this massive methods in different fields. This has been raised attention by journalists, academics, and industry professionals, as well as many researchers[6], who have written essays about the limitations of Big Data (Curran, 2013, p. 69). These critics must be taken into account when investigating how to improve the credibility of qualitative study and knowing the limitations of digital interaction.

Ethical issues

Other concepts that can provide this feedback, such as public and private space, which can, in turn, influence both ethnographic field research and architectural design. Public and private (offline and online) spaces are generated through practice and activities that are often formed by "multiple orders of value and groups of people often parallel to each other" (Ignacio & Bender, 2010, p. 19). Their differences are based on the availability of each, and although it seems that cyberspace is an entirely public place, many of the interactions that occur are private in nature (Walstrom in García, Standlee, Bechkoff, & Yan Cui, 2009, p. 74). Therefore, it is necessary to rethink these ethical issues in order to avoid seeing the subject as dehumanized data. This should be done in order to counter personal narcissism, which influences “the absence of the sense of community in contemporary life" (Nesbitt, 1995, p. 72).

between the act and the power. On the other one hand, through the habitus, the potentiality that is generically ascribed to beings in a particular ability to perform actions is transformed. On the other hand, between the outer and inner, habitus explains the internalization of the external, thus linking the past to the present story updates. This problematic would be developed in our [XX] century, mainly due to the phenomenology of Merleau-Ponty and Husserl, which already provides a systematic theorizing that is always in terms of perception and individual action. Such concepts provide an analysis of perception and individual action that was taken up by Bourdieu. On the other hand, the concept is also found in the work of some classical sociologists, such as Durkheim, Mauss, and Weber who use it without defining or theorizing it. Other authors, such as Mannheim, uses "stratification of experience,” which is very similar in its theoretical function. However, it is in Bourdieu where habitus receives both a systematic and sociological formulation. Bourdieu explicitly proposes the habitus as a concept that serves to overcome the opposition between "objectivism" and "subjectivism." The "objectivist" theories explain social practices as determined by the social structure, meaning the subjects would have no role and would be a mere "carrier" of the structure of relationships. In turn, "subjectivist" theories take the opposite approach, as they explain social actions as the aggregation of individual actions. Román Reyes (Dir): Critical Dictionary of Social

[6] Such as Bell (The Lies of Big Data), Crawford (Big Data, Big Questions, 2014), and Boyd (Six Provocations for Big Data, 2011).

Thus, an ethically led project can generate close ties among all involved where "the researchers act as hosts" (Derrida, 2000 in James & Busher, 2013, p. 203) from the outset by clarifying the rules of engagement between participants (James and Busher 2009 in James & Busher, 2013, p. 204). This practice should be understood as "an interrelated set of bodily and material provisions" that is "organized around shared understandings" (Schatzki, 1996 in Ardèvol, 2013, p. 14). This allows the researcher to "avoid methodological individualism and to overcome sociological determinism" and to "put research in the field of everyday life" (Ardèvol, 2013, p. 14).

New opportunities

For an architect who has always acted through abstractions, digital ethnography could be more than a tool; it could be as a form of "collaborative epistemology" to understand reality. According to the social sciences, lay and expert knowledge should work together to create better understandings and theories; however, the natural flow between these two worlds does not come easy in the field of architecture. This model aims to bridge this gap by connecting the dots that each level of knowledge lacks instead of seeking a relationship between disciplines and falling into utopian concepts, such as postmodern architectural theory.

This progression between the two worlds (physical and digital) is what grants greater flexibility to the research model, and making it applicable to any of the design processes and post-occupational assessments of the architectural object. By acting systematically, nonlinearly, and flexibly; connecting technological advances with everyday social practices. This would create a construction practice, "a neo-geography where open collaboration deals with both local and global challenges through interoperability of empirical and qualitative data from different sources" (Armstrong & Shumack, 2011, p. 2) that determine the forms and spatial opportunities.

Finding concrete solutions was not the main objective of the present investigation. Instead, it aimed to open up an honest and open discussion about architectural design methodology for continuous, proactive, and collaborative experimentation that is based on digital ethnography and the design field by looking for replication and feedback in the processes of architectural design. This model is not base on predicting possible futures; cause “human sociality is so contingent and emergent that predicting historical change is not possible (not simply imperfect, due to our failure to try hard enough or develop the right tools)”. It can only be used for better understanding of actual human culture, cause “experimental methods need not be restricted to seeking predictive laws” (Boellstorff, 2010, p. 124)

Otherwise these designs can become transformational if they are appropriate for their time and undergo constant renewal. This model can be use as a general guide that can help to achieve a freer architecture in theory and practice with enough realistic sustainable and deeper connections between the architecture objects, the actors that interact with them and the decision the architect takes while exploring the dynamic space.

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HONG KONG DESIGN MANAGEMENT ACADEMY CONFERENCE 2017

RESEARCH PERSPECTIVES ON CREATIVE INTERSECTIONS

Managing emotion for a sustainable future

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doi: 10.21606/dma.2017.81

This paper seeks to theoretically explore the role of emotion in designing products that consumers will love and use for long. The new insights on value of product and visual perception are drawn from interdisciplinary scholarship: 1) product value consists of "utilitarian and hedonic values", 2) product personality consists of "semantic and symbolic personalities", and 3) product form consists of "shape and surface". These perspectives have been developed into patterns of consumer purchase and possession that are defined by the degrees of utility and emotional attachment that the product offers to consumers. Subsequently, a possible way of managing a consumer's psychological process towards a decision of "desired purchase" will be illustrated. Finally, these discussions of emotionally attractive products will be integrated with the emergent research area of artificial intelligence for consideration of future production.

keywords: emotional attachment; sustainable consumption; consumer perception; artificial intelligence

Introduction

In the contemporary world, many people readily throw goods away – not only because these goods may be broken, but also because they may no longer be of interest to their owners (Cox, Griffith, Giorgi & King, 2013). Considering the world's growing population, unplanned and endless mass production and consumption may result in irreversible damage to the planet, and jeopardise elements of its ecosystem – including humans – unless we take immediate action. The time has come for mankind to seriously seek out a kind of manufacturing compatible with environmental sustainability (Manzini, 2009; Manzini & Cullars, 1992).

Currently, it is the price of products that seems to be the outstanding determinant of consumer behaviour in terms of purchase and disposal of goods (Chang & Wildt, 1994; Wertenbroch & Skiera, 2002). However, Dhar and Wertenbroch (2000) have reported that people are more likely to keep products to which they are emotionally attached than products to which they are functionally attached if obtaining them at the same price. In addition, Mogilner and Aaker (2009) have shown that hedonic experience can sometimes even override monetary influence, and 'undoubtedly, emotion is one of the strongest differentiators in user experience' (Khalid & Helander, 2006, p. 204). This phenomenon of emotional satisfactions overcoming attraction due to functional utilities can also be found in the marketing community, where such consumer choice is regarded as irrational (Elliott, 1997; Kenrick et al., 2009). Thus, invoking positive attitudes from consumers towards products would be a crucial matter for driving purchases intended to grow into long-term ownership, and it is designers who know how to achieve this (Lockton, Harrison & Stanton, 2012).

Consequently, it is a crucial matter for designers to design more 'moving' products that emotionally engage consumers in order to dissuade people from readily disposing of goods – needless to say, products must be physically durable as well. However, the role of emotional attachment in the psychological process of how consumers would be attracted and lead towards purchasing has not yet been satisfactorily discussed. This paper therefore explores the possible patterns of consumers' purchase and ownership, and the decision-making process on the part of the consumer with consideration for emotional bonding.

1. Background

Industrial designers create the stuff that is all around us and that shapes our interaction with the man-made world. Design, hereby, is to be understood as an artificial process that aims to coordinate various physical factors, in order to embody a conceptual solution to a social need (Rosenman & Gero, 1998); that is to say, the process in seeking to 'make sense of things' (Krippendorff, 1989). Particularly, in recent trends, design has been regarded as more than what merely makes things functional; it is able to determine characteristics of products, known as product personality, that bring emotional satisfaction to consumers (see Govers, Hekkert & Schoormans, 2003).

The realm of management studies has recently seen the emergence of the design-driven approach "to manage innovations that customers do not expect but that they eventually love" by proposing a new sense in context of our life (Verganti, 2009, p. vii). The quintessence of the approach would be how to manage emotional attachment that engages consumers and potentially changes their behaviour towards purchase and consumption. This rhetoric has therefore refocused manufacturers' attention to the creation of attractive product concepts; the birth of strongly engaging concepts makes winners in a market (Cooper & Kleinschmidt, 2007; Leder & Kreuzbauer, 2007), and the strong product concept is often attributed to the core ideology and vision of manufacturers (Balbontin, Yazdani, Cooper & Souder, 1999; Collins & Porras, 1996).

Investigation of emotion can be also found in marketing and engineering. The fruits of the former academic field involves discovery of composing factors of emotions (Oliver, 1992; Oliver, Rust & Varki, 1997; Oliver & Westbrook, 1993); development of the measuring tool

of strength of consumers' emotional attachment to brands (Thomson, MacInnis & Park, 2005); the tendency that emotional attachment to brand influences future purchases whilst brand image determines current purchase (Esch, Langner, Schmitt & Geus, 2006); and the fact that consumers' emotional attachment to brand encourages purchase intention of brand extensions (Fedorikhin, Park & Thomson, 2008). But the marketers' perspectives are more likely to be on emotional response to overarching images of a company, rather than product itself, such as brand and advertisement.

In the engineering perspective, Kansei engineering deals with emotional dimension in the interaction between human being and industrial products as its etymological origin (Lee, Harada & Stappers, 2002; Schütte, 2005). "It is defined as 'translating technology of a consumer's feeling and image for a product into design elements' (Nagamachi, 1995, p. 3). The Kansei engineering has thus aimed to reflect consumers' emotion in product development by support of computers (Matsubara & Nagamachi, 1997; Nagamachi, 2002), and design innovation can be enhanced by such systemised data of emotional sensibility (Nakada, 1997). However, their perspectives tend to be limited to emotions which are relevant to usability, such as comfort, familiarity, and stylishness, rather than aesthetic and symbolic impressions.

These series of arguments across the different academic realms that nonetheless relate to design management may together indicate that better management of emotional attachment would result in a strong competitive advantage and effective strategy to engage consumers (Barnes, & Lillford, 2009; Dobele, Lindgreen, Beverland, Vanhamme & Van Wijk, 2007), and it would lead to the achievement of a sustainable society (Lilley, 2009). In order to better grasp the relationship between emotional attachment and intention for purchase and ownership, it may be helpful to start with revising the notional structure of value of product.

2. Value – Utilitarianism and Hedonism

In the context of business, the value for which one is willing to pay is perceived value determined by each consumer upon their judgment of price and quality (Chang & Wildt, 1994). Emotional attachment is one of the strong factors in generating value for a product in the consumer's mind (Schütte, 2005; Yamamoto & Lambert, 1994), and product personality has much to do with the amelioration of emotional attachment (Govers & Mugge, 2004). The perceived quality of product that leads purchase intention seems to be structured by the physical function and emotional satisfaction offered by the product, referred to as utilitarian and hedonic values, respectively (see Chitturi, Raghunathan & Mahajan, 2008; Hanzaee & Baghi, 2011; Hirschman & Holbrook, 1982). The utilitarianism and hedonism in products have been discussed and investigated in some studies such as Dhar and Wertenbroch (2000), Khan, Dhar and Wertenbroch (2005), Okada (2005), and Lim and Ang (2008), and this framework is useful to better consider what consumers find beneficial in different situations. However, value of products may not be understood completely if the goods are regarded as encompassing either of utilitarian or hedonic value. For example, some consumers may purchase automobiles for the purpose of transportation, whilst others may regard the same products as a representation of their artistic senses or symbols of their status. Thus, it would be more appropriate to posit that every product has innately both utilitarian features and hedonic features that together

compose perceived value of products, and that what matters is the ratio of the two – in this sense, this paper uses the terms *utilitarian value* and *hedonic value* to refer to the features. The use of these terms incorporates all of the senses that other scholars have proposed regarding the utilitarian and hedonic aspects of product value. Table 1 summarises the terms found in literature describing utilitarian and hedonic features of product value, and the fields of their studies.

Table 1 Proposers of utilitarianism and hedonism of products

Proposer(s)	Utilitarian value	Hedonic value	Field of study
Hirschman (1982)	Technology	Symbolism	Consumer research
Batra & Ahtola (1990)	Utilitarian attitude	Hedonic attitude	Marketing
Dhar & Wertenbroch (2000)	Utilitarian goods	Hedonic goods	Marketing
McDonagh-Philp & Lebbon (2000)	Hard functionality	Soft functionality	Ergonomics
Shah, Smith & Vargas-Hernandez (2003)	Utility	Novelty	Engineering design
Norman (2004)	Utility and Usability	Emotion	Design
Khan, Dhar & Wertenbroch (2005)	Utilitarian goods	Hedonic goods	Marketing
Okada (2005)	Utilitarian goods	Hedonic goods	Marketing
Lim & Ang (2008)	Utilitarian products	Hedonic products	Business study
Verganti (2009)	Technology	Meaning	Design management
Stock, Oliveira & Hippel (2015)	Utilitarian motives (for goods)	Hedonic motives (for goods)	Innovation management

The concept of utilitarianism and hedonism in product traces back to Hirschman (1982), who argued that symbolism and technology were the sources of innovations that were respectively brought by the reassignment of social meaning to an existing product and the addition or alteration of tangible features in a product that serve to distinguish it from prior models. The late 20th century saw these arguments mainly in consumer research and marketing, and this perspective gradually emerged in design-related areas such as ergonomics, engineering design, design management, etc. in the 2000s. McDonagh-Philp and Lebbon (2000) employ the terms hard functions and soft functions that respectively discuss products in "how it works, what it does, construction and materials..., and intangible qualities such as emotional bonds, familiarity aspirations, desire, sentimentality, aesthetics, personal taste, touch, smell, feel and personality" (p. 37). Shah, Smith and Vargas-Hernandez (2003) suggest that "an engineering design must not only be novel…but it must also…(have desired utility)" (p. 111). They clearly recognise that there are utilitarian and non-utilitarian items which need their own metrics for evaluation. But their perspective on the hedonic (non-utilitarian) feature is limited only to whether a new

product can be seen as distinctive and unique in comparison to the previous models. Norman (2004) emphasises the importance of product attributes that evoke various emotions, as well as their utility and usability which provide practical value. Finally, Verganti (2009) is the proposer of the design-driven innovation which aims to reform a meaning of product that people cannot help but get in love. In his framework, drivers of innovations are meaning and technology that interactively create a new value.

In summary, the perspectives regarding the product values which are brought by the physical function and the emotional satisfaction that respectively make changes in the real world and within one's mind have been challenged to be better described.

3. Visual perception

Things send out messages. People perceive them and interpret them to find meanings in the context of their lives (Csikszentmihalyi & Halton, 1981; Hassenzahl, 2004). Thus, product form tells, and sometimes asks, consumers what meaning the items would offer to them in their lives. And in general, it is often visual information that mediates first communication between products and consumers. Although Krishna (2012) claimed possible biases in visual perception and explored influences of the other senses to consumer perception in a marketing context, the physical appearance of products still have a dominant impact under the current shopping environment where products come into consumers' eyes at shops or online. Thus, this paper only focuses on the visual sense, and "perception" hereafter refers to visual perception. Subsequently, the physical features of product, such as form, colour, material, size, and so forth, provide ample information for consumers to judge usefulness and attractiveness of products (Creusen & Schoormans, 2005; Crilly, Moultrie & Clarkson, 2004). Thus, changing the physical form of a product also alters consumer recognition thereof (Cila, 2013; Kreuzbauer & Malter, 2005; Rampino, 2011). Different appearances of products then yield different strengths of emotional attachment, and here emerges the unexplored space to seek out what kind of product elicits what impression from consumers.

3.1. Product personality – semantic personality and symbolic personality

On retrospection of Platonism, an assumption could be drawn that all human beings universally share a common perception towards notions of objects (Dancy, 2004; Fine, 2003). This idea has also been found in the laws of Gestalt Theory that appear to lead our perception in more or less the same way (Chang, Dooley & Tuovinen, 2002). In contrast, there is another point of view that argues that socio-cultural background regulates our perception of the world (Bloch 1995; Khalid & Helander, 2006). Which statement would be true? Or may man's perceptions be sometimes universal and sometimes socio-culturally structured? Either way, there seems to be patterns in consumer perception of product personality. Prior studies in design management have discussed the diverse aspects of product appearance, such as aesthetic, functional, ergonomic, technological, sociological dimensions, and so forth (Bayazit, 2004; Berkowitz, 1987; Creusen & Schoormans, 2005; Demirbilek & Sener, 2003; Hirschman, 1982). These dimensions are sometimes overlapping and it is not an easy task to make clear borders amongst them. However, the information that product personality transmits to people can be summarised into two simple perspectives covering all the dimensions – namely, innate characteristics of

products and characteristics they endow on their owners. This paper refers to them as *semantic personality* and *symbolic personality* of products, respectively. And these concepts are the clues to better understand universal perception and socio-culturally regulated perception (see Belk, 1988; Blijlevens, Creusen & Schoormans, 2009).

Revising the various features of product attributes within the framework of the semantic personality and the symbolic personality may bring a plausible understanding to why people perceive products sometimes in the same, and other times in different ways. Some products lead users with their forms toward certain actions (Norman, 2002). The actions are intended by designers who design things to guide users on what to do (Lockton, Harrison & Stanton, 2010). The principles of such design methods to increase usability for everyone have been explored (Beecher & Paquet, 2005; Story, 1998). These studies imply the existence of certain patterns that are commonly shared amongst every man in perceiving semantic characteristics of products. In the meantime, people purchase products not only to utilise them but also to express their identities in a society (Belk, 1988; Wright, Claiborne & Sirgy, 1992). Sociologically speaking, products are objects that mediate and make sense of meaningful interactions among social members (Mead, 1934), and everyone behaves as if playing their roles depending on social context (Goffman, 1956). Metaphysically, meanings of goods which initially inhabit culturally constituted world move via products to consumers (McCracken, 1986). In addition, people living in different societies, which also involve cultural difference, tend to see the world in different ways (Athanasopoulos et al., 2015). Therefore, different cultural communities are expected to have their unique symbolisms which are reflected by their social interactions via products (Hirschman, 1986).

This series of arguments towards semantic and symbolic icons indicates that there is a difference between the patterns of consumer perceptions of semantic and symbolic product personalities. Specifically, semantic product personality tends to be more universally agreed upon across consumers with different cultural backgrounds, while perception of symbolic product personality tends to be more varied across socio- cultural backgrounds of consumers. Awareness of the two different types of product personalities may provide new opportunities to develop design strategies both in academia and in practice; these properties, by which designers try to shape product concept while consumers (even nonchalantly) interpret their own meanings of products, may have a great influence on consumer attitude in preference of product, and their decision of purchase. The next section will discuss the physically mediating features of product that communicate the metaphysical semantic and symbolic properties between products and consumers.

3.2. Product form – shape and surface

Consumer perception seems to have a tendency to associate certain features of product, such as shape, colour, size, etc., with particular product personalities (Blijlevens, Mugge & Schoormans, 2009; Creusen, 2011). Re-opening of the thoughts of McLuhan (1994) along with Gibson's (1986) idea may provide a new insight for considering what features of product would take the mediating role between product concepts and consumer perception.

McLuhan says that the material features of product components structure the product's physical features; for example, iron may tell of a product being heavy, cold and tough, whilst paper may make users find a product light, fragile and flexible, and so forth. Meanwhile, the product form into which materials are shaped also expresses messages; iron bent to shape the word "LIGHT" may suggest the meaning of lightness, and paper cut into the shape of the word "HEAVY" may express the meaning by the same token – there are also other ways to communicate messages by sounds, smells, feelings and tastes of materials, but this paper only focuses on the sense of sight. In addition to this idea, Gibson states that creatures recognise the world as the surfaces that separate substantial objects from the spaces in which they live. Consequently, the physical factors that compose product form, which communicates product personality, may be *materials* and *shape* of a product. Then, when this product form is perceived visually, the recognition of the material domain shall be altered as *surface*. As such, materials and shape, as product form, determine product attributes – colour, volume, weight, smoothness, hardness, possible functions, aesthetic pleasure, etc. – and consumers perceive surfaces to recognise the materials and the shape, and interpret semantic and symbolic product personalities.

This new lens to product form makes it possible to interpret existing studies on consumer perception of goods in new ways. Conducting further investigation of what kind of product form elicits what kind of product personality in consumers may have a significant implication both for research and practice of design management. Related to it, more focus on researching socio-cultural context that may better explain and improve design-driven innovative practice would be expected.

4. Designing emotional attachment for sustainable consumption

This section integrates the perspectives that have been discussed in previous chapters into a consideration and suggestion for attaining sustainable consumption. The four different types of consumer purchases that would each grow into the different ownerships will be illustrated. This framework may bring a new understanding and discussion to the previous studies such as the work of Chitturi (2009) that investigated different kinds of negative post-consumption emotions for the product that contained different portions of utilitarian and hedonic values.

Figures 1 and 2 respectively show the possible patterns of consumer purchase and possession which are defined by the two axes: the degrees of utility and emotional attachment (i.e. utilitarian and hedonic values) that a product would offer to consumers. The quadrant of the two figures corresponds to the same quadrant of each other, and the first (black) quadrants and the third (white) quadrants are the most and least ideal situations respectively, in terms of sustainable consumption. Each and every quadrant will be explained in detail in the following sub sections.

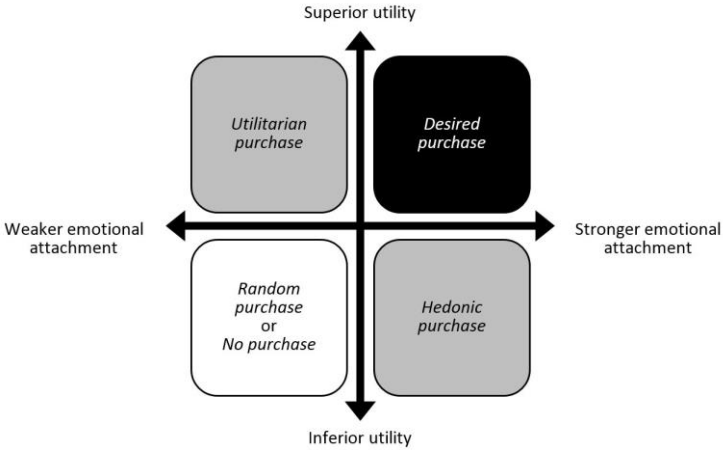

Figure 1 Consumer actions defined by utility and emotional attachment in purchase phase

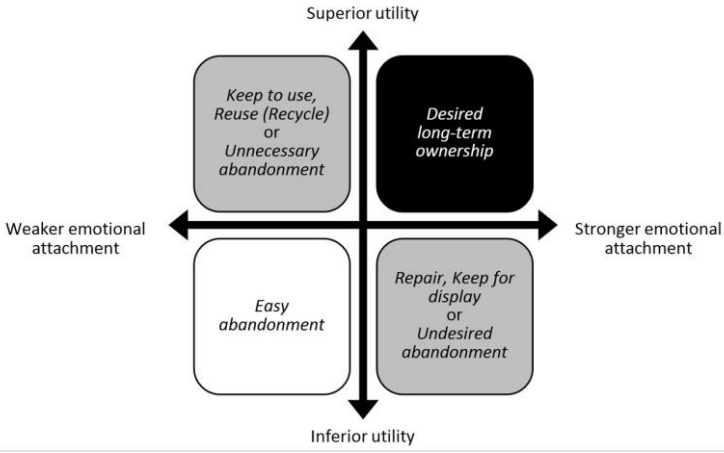

Figure 2 Consumer actions defined by utility and emotional attachment in possession phase

4.1. "Desired purchase" for "Desired long-term ownership"

Desired purchase occurs when consumers find superior utility and stronger emotional attachment in the products; this is, as its name suggests, a purchase that is ideal to grow as a *Desired long-term ownership* in the phase of possession. For achieving this, it would be a key practice to investigate socio-cultural factors that are to be involved along together with an advanced technology in the designing process of emotionally engaging products which will be cherished for longer time – seeking the why, rather than what, to consume.

As an example, there are the scarves that have been engaging people's minds – the places where you can find them are, however, not clothing shops but museums such as the Museum of Modern Art (MoMA) where the scarves have remained the best sold item for several years (see Ogaki, 2009). The producer is Matsui Knitting Crafts Mfg., Ltd (MKC) that is a small family-run knitting firm in a rural part of Japan. Their prominent design (see

Figure 3) is accomplished not only by their refined aesthetic sense but also by the combination of the technology which is the only one of its kind in the world and in-depth sympathy into the context of consumers' life. As a result, their scarves have been regarded as art objects to be worn in addition to providing the comfortably delicate, light, and warm feeling; meanwhile, the commonly pre-existing role of scarves is simply to protect the wearer against the cold. It is notable that these products achieve both superior utility and stronger emotional attachment by their unique technological advantage and deep insight into the society their consumers inhabit.

Figure 3 MKC's scarves ("Knitting Inn" is MKC's brand name). Source: MKC's Facebook page.

4.2. "Random purchase" may result in "Easy abandonment"

The opposite consumer action of desired purchase is *Random purchase*, or *No purchase* drawn in the third quadrant. When a product is found to be neither particularly useful nor attractive, people might obtain it provided the item is for free or very cheap, or they may not want it. *Random purchase* is therefore likely to result in *Easy abandonment* in due course, even if the item still works fine. In this light, in terms of sustainable consumption, *No purchase* is sort of better than *Random purchase* because there is one item that avoided being thrown away easily. But the item being not interesting to consumers is clearly unsuccessful business-wise.

4.3. "Utilitarian purchase" may result in "Keep to use/Reuse (Recycle)" or "Unnecessary abandonment"

The second quadrant is *Utilitarian purchase*. Consumers obtain a product that they find emotionally unengaging but strongly necessary because of its function; in other words, they just need it to solve the problems that they are currently facing. However, since this type of purchase does not involve emotional engagement, the consumers are apt to lose their attachment to the product once their issues have been settled. Subsequently, they might keep using the item out of habit, or let them go to *Reuse (Recycle)* by someone. Otherwise, they simply give it *Unnecessary abandonment* in terms of the product's function.

4.4. "Hedonic purchase" may result in "Repair, Keep for display" or "Undesired abandonment"

The fourth quadrant is *Hedonic purchase*. Consumers decide to purchase a product, while they have a wide range of alternative choices for their function, because they cannot help but love it. This purchase is more likely to result in longer-time ownership by *Repair* if the item breaks. Even if the item turns out functionally irreparable, an owner may keep it for display purpose, unless the owner is forced to throw it away for unhelpful reasons (*Undesired abandonment*). In this sense, the item tends to be given a new sense as one of the symbolic icons that structure the identity of the owner.

5. Managing emotional attachment for the desired purchase

This section develops a possible way of managing a consumer's psychological process of purchase decision, with emphasis on the role of emotional attachment. Figure 4 illustrates how consumers would be led by emotional attachment to determine their purchase of goods, and accordingly, the research focus will be limited to hedonic value that is key for purchase with love and longer ownership. Within the presented model, utilitarian value is premised just to satisfy the consumer's needs, meaning the products considered within this framework have no superiority nor inferiority in function which should be drawn in another dimension.

There are five screening stages that are shown in the coloured rounded-square boxes at the bottom of the figure. The arrow-shaped flow chart shows the strength of emotional attachment at each stage. As seen in the model, only two paths out of the eight possible routes reach consumer decision of purchase. Furthermore, there is only one successful route (i.e. "Expected success") that will be managerial knowledge for the future practice. The term 'willingness' connotes that a consumer has an attachment, or a positive attitude, to goods. Subsequently, the ownership and the decision of purchase that have been somehow forced should not be categorised in willingness to own and purchase. Consequently, this framework does not target the goods that consumers are reluctant but have to choose for the utilities and due to their limited property.

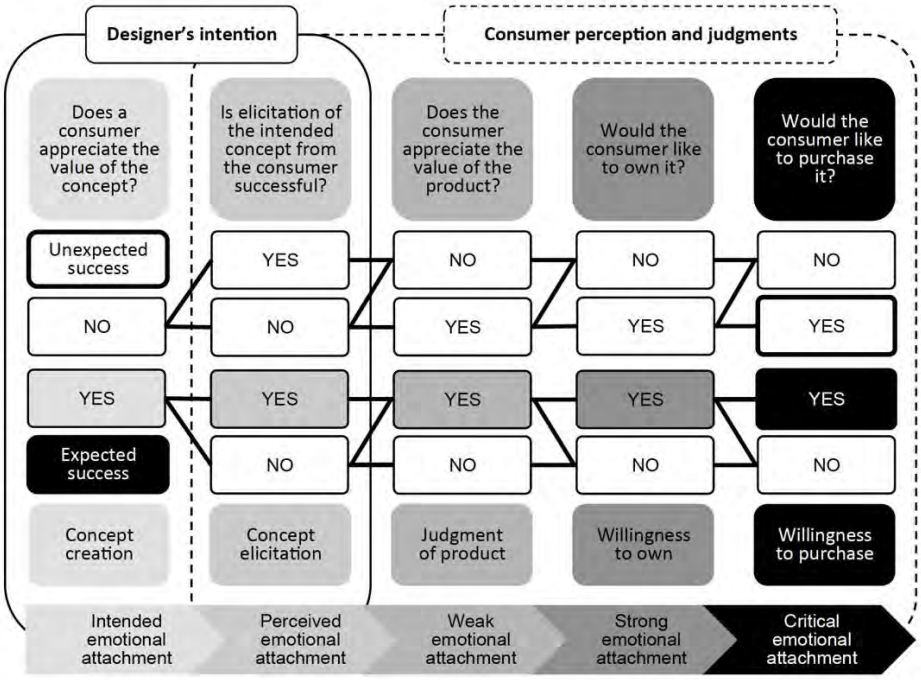

Figure 4 Process of how consumers would be led by emotional attachment towards purchase

5.1 Concept creation

At the first stage of *Concept creation*, designers (manufacturers) must set the product concept that consumers will appreciate; otherwise, they may immediately lose interest for the product that has been designed based on the concept. Thus, concept creation has attracted the attention of many researchers. For example, "surprise" was found to be a source of creative design (Dorst & Cross, 2001), as well as a source of innovativeness in design team (Stompff, Smulders & Henze, 2016). Another study has found it useful to generate several choices of concepts from which one can be selected upon comparative evaluation, rather than just to follow a single step of idea generation and evaluation (Liu, Chakrabarti & Bligh, 2003). Related to the selection, in idea generation in groups, sketches can stimulate individual creativity and provide a more integrated group process (Van der Lugt, 2005), and designers tend to prefer their own ideas (Nikander, Liikkanen & Laakso, 2014) – these findings may have an implication for co-designing. There are other empirical approaches towards what designers think while designing new products (Gonçalves, Cardoso & Badke-Schaub, 2014; Lloyd & Snelders, 2003). Attractive product concepts which have been generated as a result of such effort need to be successfully elicited from consumers, as the creators of the concepts intend, for making the products that consumers cannot help but eventually love.

5.2 Concept elicitation

Once the (potentially) attractive concept has been elaborated, it needs to be materialised as products which are meant to move consumers' hearts; it is *Concept elicitation*. Without

successful elicitation of the expected emotional response to the product from consumers, the elaborated concept would not maximise its advantage – even worse, the fewer consumers would be attracted and buy the product, the more the costs spent for the concept development would be of waste. Therefore, it is important to supervise whether the intended product concepts are perceived by consumers in the way that the producers expected. Ahmed and Boelskifte (2006) compared and contrasted the associations that were made by a user of a product and those that were the intentions of designers. Crilly, Maier and Clarkson (2008) presented theoretical systemisation of the relationship between designer intent and consumer experience upon the models across a range of disciplines. However, despite the significance of inquiry into such communicative perspective between designers and consumers via products (Crilly, Good, Matravers & Clarkson, 2008) and a number of studies that have looked into consumers' impression of product, the volume of research with this perspective may need to be increased.

5.3. Judgement of product

In the stage of *Judgment of product*, consumers evaluate a product. In theory, if designers (companies) successfully elaborated and elicited an attractive product concept in the first two stages, then consumers should also find the product itself attractive. However, even if the elicitation is unsuccessful, the failure could nonetheless bring success in this stage (see Norman & Ortony, 2003); if consumers perceive the item as anything but as designers intended, but if the perceived product concept is what the consumers appreciate, then they would appreciate the value of the product. This applies to the opposite case, too; assuming the initial concept proposed by the designer (company) does not attract the consumer, the successful elicitation may make the consumer not appreciate the value of the product while the unsuccessful elicitation might result in the purchasing action by the same reason. In other words, when consumers like a product by their misinterpretations of the concept that designers intended, it does not matter whether these consumers appreciated the initial intended concept or not – they simply get to like the product in the ways that they wish to appreciate it. Figure 5 shows the patterns of such judgements. Nevertheless, for the sake of design management, the successful judgment of product only brought by the expected emotional attachment – it means designers must create the concept that consumers would appreciate, and design the product by which the concept is elicited from them – is regarded as a single right answer to follow in the framework.

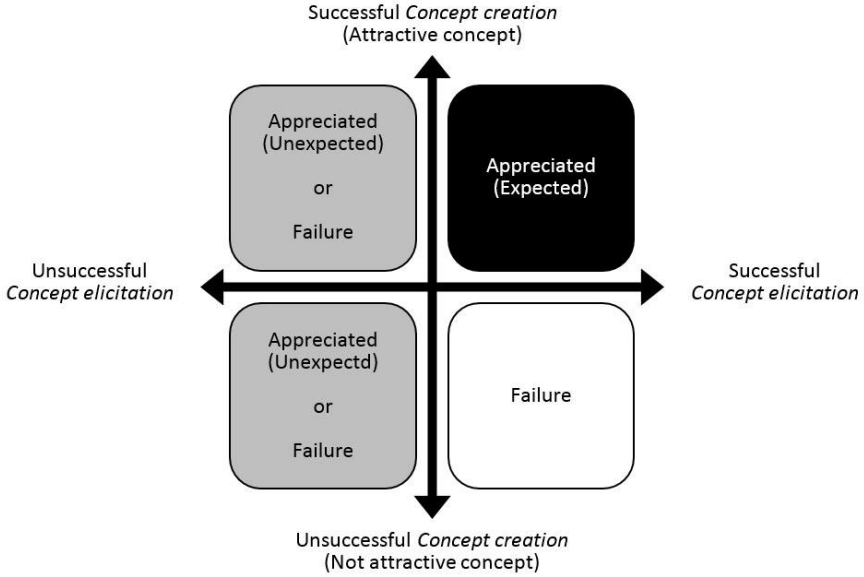

Figure 5 Assumed results of Judgement of product

5.4. Willingness to own

Even if the consumer has acknowledged the product, it is another matter whether they would like to own it or not. In the *Willingness to own* stage, it may be required to consider what motivates consumers to own a product beyond merely liking it. For example, people may like innovatively unique dresses exhibited at Paris Fashion Week but it is questionable how many people would like to obtain them for daily clothing. In this light, acquisition of own products should be discussed on a different level from the consumers' appreciation of products. A possible clue to better explore this perspective would be the concept of "internalisation" which is to be understood as acceptance of an object as being seen a part of self in a society (see Kelman, 1958); the status upon its completion should be called "ownership". That is, a product becomes a part of self-identity. People interpret and make a judgment to a person upon what the person says about themselves by their appearance that is a composition of cues of which diffuses symbolic messages (Livesley & Bromley, 1973). Such social influence from others can change one's behaviour (Ajzen & Fishbein, 1969; Burnkrant & Cousineau, 1975; Deutsch & Gerard, 1955; Kelman,1958). This indicates that people may consider how they appear to the rest of society according to what kind of things they possess and use.

5.5. Willingness to purchase

The product that has successfully passed the previous stages finally faces the last hazard towards the purchase at the stage of *Willingness to purchase*. There may be a countless number of people who want to buy but have to give up some things due to limited financial property. Given the situation, what companies can and need to do is raise consumers' priority of purchase for their products by increasing the perceived quality of the items. More specifically, the companies need to consider either increasing the

perceived quality or decreasing the value of a product (see Chang & Wildt, 1994), and as argued, emotional attachment may be potentially able to overcome the monetary influence (Mogilner & Aaker, 2009). To achieve such manufacturing, companies need to pay more attention of the context where their products are consumed, and visions of the futures that they would like to make come true by their products. Subsequently, the researchers in design management also should look more into this perspective as well.

6. Conclusion

This paper has expanded on new insights into value and visual perception of consumers, developing them into new theoretical models on how emotional attachment would encourage sustainable consumption. Possible patterns of consumer purchase and ownership which are drawn by utilitarian and hedonic values, and the psychological process towards the desired purchase that would result in longer-time ownership have been introduced. Revision on prior studies has concluded that the factors that would trigger emotional attachment are semantic and symbolic product personalities which are mediated to consumers by shape and surface of products. These new insights may contribute to further development of design management both in academic and practical perspectives.

6.1. Future implication

While this paper has placed its focus on emotion for sustainable consumption, the nature of improving our society requires the combination of emotional attachment and technological advantage. Therefore, the next step would be integrating the knowledge with the emergent technology which indeed influences the way of production and consumption (Anderson, 2010). A rapid progress of technological development influences socio-cultural structures around the world, and vice versa. The mutual interaction changes the market and our life day by day.

The epochal emergent technology that attracts industrial attention may be artificial intelligence (AI) (see Chan, Yuen, Palade, & Yue, 2016), which would have significant impact on our future. Up until recently, however, the research of AI in industry meant the investigation of how to utilise computers to achieve automated operation that executes orders by human beings (e.g. Chang & Wysk, 1997; Cheng, Harrison & Pan, 1998; Simmons, 1984; Uraikul, Chan & Tontiwachwuthikul, 2007). Many large manufacturers have already employed AI as automated systems that support their mass production in more productive and efficient ways (see Parunak, 1996). Nevertheless, one of the critiques to AI in manufacturing is that it is likely incapable to replicate the creativity of mankind.

> *Generating novelty [in applications] is not particularly difficult. Instead, the principal obstacle to computerising creativity is stating our creative values sufficiently clearly that they can be encoded in an program (Boden, 2003). Moreover, human values change over time and vary across cultures. Because creativity, by definition, involves not only novelty but value, and because values are highly variable, it follows that many arguments about creativity are rooted in disagreements about value…In the absence of engineering solutions to overcome this problem, it seems unlikely that*

> *occupations requiring a high degree of creative intelligence will be automated in the next decades. (Frey & Osborne, 2013, p. 26)*

Under such circumstances, Brown (2013) stepped forward and sought for creativity of AI itself. Kwong, Jiang and Luo (2016) further looked into the potential of AI that aims to integrate the perspectives of the three academic fields that this paper is based on – emotional design, marketing, and engineering – in order to design new products. Bringing the insight of this paper to these arising trends of AI research in manufacturing, the next question would be whether AI is capable of independently designing an emotionally engaging product. Simply saying, is it possible for AI to produce the scarves of MKC without explicit commands from man? I wish the frameworks that this paper has proposed will help to explore this question, and more research in this area will be conducted.

Acknowledgements

The author wishes to thank the following people and organisations for stimulating discussions during the writing of this paper: Dr James Moultrie of the University of Cambridge; Design Management Lab (DML) of Ritsumeikan University; AI & Society Laboratory of Keio University; and Matsui Knitting Crafts Mfg., Ltd, and for their financial support: Funai Foundation for Information Technology; British Council Japan Association; and the Research Institute of Science and Technology for Society (RISTEX), Japan Science and Technology Agency (JST), R&D project 'Human Information Technology Ecosystem' (HITE).

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HONG KONG DESIGN MANAGEMENT ACADEMY CONFERENCE 2017

RESEARCH PERSPECTIVES ON CREATIVE INTERSECTIONS

The what, how and who of social service design

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doi: 10.21606/dma.2017.84

Services are an important type of intervention used to address complex societal problems such as chronic health problems and climate change. Social services are defined as services that have a social purpose, and are based on high-quality social interactions between service deliverer and service consumer. This paper shows through three case studies what we are designing, how we design, and who designs when designing social services. The case studies show that while some are focused on the interface between service deliverer and consumer, an important type of intervention is a 'social infrastructure', which is a structured way of bringing service deliverers together to incrementally redesign their own service. Practices that support the design of social services include: developing a deep understanding of the needs of both service consumers and service deliverers, using design expertise to frame complex problems, and playing an active role in prototyping and implementing the intervention.

keywords: service design; co-design; social infrastructures; complexity

Introduction

The world is increasingly confronted with complex societal challenges such as climate change, poverty, crime, chronic health issues and an ageing population. Public and social sector organisations play a key role in developing interventions that address these issues. An important type of intervention in this context is the development of services. Examples include traditional services such as childcare, community health services, elderly care and social work, and more novel services such as Ozharvest – an Australian non-governmental organisation (NGO) that provides meals for people in need, prepared from 'rescued' surplus food (OzHarvest, 2017) -, and the service provided by the Dutch organisation Humanitas, that lets students live for free in elderly nursing homes to address elderly people's loneliness (Carter, 2015).

Many of these services are characterised by high quality interactions between human beings. A service deliverer – for example a care provider – delivers the service to a service consumer – for example an elderly person – through interactions that require high-level social skills. (Note that the roles of provider and consumer are often blurred, such as in the Humanitas case study where both the students and elderly people benefit from the service). These social services do not just have a social *purpose*; they are also based on social *interactions*. This is in line with what Cipolla and Manzini (2009) call 'relational services', which are services that are deeply and profoundly based on the quality of interpersonal relations between participants. In this paper I will discuss the design of such social services for complex societal problems.

What are we designing when designing social services?

The first objective of this paper is to discuss *what* we are designing, when designing social services. For this purpose it is relevant to look at the developments in the service design field. Secomandi and Snelders (2011) state that this field is rapidly evolving. In their paper on 'the object of service design' they analyse and discuss various concepts and theories found in literature. This study shows that scholars agree that services are intangible and that the service emerges in co-production between service consumer and service provider. Without the customer, there is no service. But if a service is intangible, then how do we design it? To answer this question the service design literature distinguishes between the interface of the service and the infrastructure of the service (ibid).

The service interface consists of those aspects of the service that are directly available to consumers, and the infrastructures are the resources that are indirectly available, also called front office and back office. For example, if we look at a teacher as a service deliverer, the interface is the social interaction between teacher and student, while the infrastructure consists of the classroom, teaching materials, smart board, the organisational structure of the school, the way the school teachers interact with each other and the principal, the school's educational philosophy etc.

Many scholars contend that since the service interface is intangible, design efforts should be focused on the service infrastructure. Edvardsson and Olsson (1996) for example argued that service design is about creating the right prerequisites for the service, including the resources of the service system – staff, organisational structure, physical/technical environment – that are within control of the organisation. However, Secomandi and Snelders (2011) argue that the focus on service infrastructure has neglected what is essentially the core of the service, the service interface, and claim that this should be the object of service design. In this paper I will contribute to this discussion by showing through three case studies what the object of service design is in the context of social services that rely on high quality interactions between service deliverer and service consumer.

How do we design social services, and who designs?

A second objective of this paper is to discuss the 'who' and 'how' of social service design. Over the past decade, design has become increasingly popular in the public and social sector. Dorst (2015) advocates that the new open, complex, dynamic and networked problems of our time require a radically different response, and that design can contribute to this as expert designers deal with the new types of problems in their professional field

without too much trouble. The application of design outside the traditional design domain is often called 'design thinking'. In their publication on design for public good the UK design council states that 'design thinking is the way to overcome common structural flaws in service provision and policymaking' (UK Design Council, 2013).

One of the key elements of the adoption of design thinking in the public and social sector is co-design, also referred to as co-creation or participatory design, in which users and other stakeholders are given an active role in the design process (Ehn & Sjogren, 1991; Muller & Kuhn, 1993; Steen, Manschot, & De Koning, 2011). As the focus of the paper is on services that are delivered through high quality interactions, it is particularly relevant to look at if and how service deliverers are involved in the design process. Co-designing services with service deliverers is important, as the design will likely have a large impact on their work as it often results in changing the nature of the job. This is in line with the original democratic ideal of the participatory design movement that started in Scandinavia (Ehn & Sjogren, 1991).

This paper describes and compares three case studies that provide insight into design practices for social services. The practices will show what is designed, how it is designed and who designs. In the next section I will introduce the research objective and research method, followed by a description of each of the three case studies. In the subsequent section I will compare the three case studies based on what is designed, how this was designed and who designs. I will conclude this paper with a discussion of the complex nature of social services, the challenges of social service design, and opportunities for improvement of social service design practices.

Research objective & methods

The objective of this research is to understand the who, how, and what of social service design practices. A case study approach was adopted in line with the explorative nature of this question. This allows the study of real-world contemporary events which do not require control over behavioural events (Yin, 2009, p8).

Case study one and two are part of a larger group of retrospective case studies to study the innovation practices of agencies working in the public and social sector, which address complex societal problems. To conduct the case studies we interviewed members from the design team as well as their clients in the public or social sector, and we analysed design documentation provided by the teams.

The third case study is a project conducted by a design and research team led by the author of this paper for an Australian NGO. Although the research method was different for this case study, it was added to this paper as it provides some interesting perspectives on social service design. The following section describes each of the three developed interventions, the approach taken by the design and research team, and the design rationale.

Case studies

Speed sharing event

The first case study is a project executed by MindLab (a Danish cross-governmental innovation unit) for the municipality of Odense. MindLab was asked by the municipality to

help them design interventions for primary school teachers who needed to adjust their teaching practice in line with a reform that was introduced by the education ministry. The reform required teachers to deliver the same quality of education with less preparation time (see also Nygaard & Reynolds (2015)).

The MindLab team used provocative prototypes, inspired by practices from other industries, and various co-design sessions with eight teachers and one staff member from the municipality to explore different types of interventions. An initial design proposal was a box with 'ingredients' for lessons (inspired by an 'Årstiderne-box', a meal-kit which contains ingredients and recipes to prepare a meal). In a next iteration MindLab invited teachers to help design and prototype the ideal content of this box. However, teachers did not accept this idea because they thought the box was too static. Rather than copying a complete lesson, they were looking for inspiration when developing their own lesson. This eventually led to the design of a more successful proposal, a 'speed sharing' event (based on the metaphor of speed dating).

Speed sharing is an event, facilitated by the municipality and/or schools, in which teachers share ideas about lessons around a specific theme, for example physical education. Teachers were very enthusiastic about speed sharing. The speed sharing event was prototyped and tried out by the participating teachers in their own school. This led to the design of two successful pilots in which the municipality offered the speed sharing service to schools. The initiative was subsequently further disseminated, on the one hand through facilitation of speed sharing events by a municipality staff member, and on the other hand through the design and implementation of guiding materials that schools could use to facilitate their own speed sharing events.

Kudoz

The second case study is a project executed by InWithForward (an international social innovation agency) for a consortium of NGO's in Vancouver, Canada, that each provide services for people with a cognitive disability. The initial purpose of the project was to address the social isolation of this target group. InWithForward applied a staged research and design approach. Stage 1 consisted of a three-month in-depth ethnographic study into the life worlds of people with a cognitive disability. Two staff members from the service providers were seconded into the design research team. One conclusion from this study is that the adults with a cognitive disability were not just isolated from other people, they were isolated from learning and purpose.

Based on these insights several prototypes were developed in a second stage. One of these prototypes was 'Kudoz', a learning platform on which volunteers – hosts - share their passion or interest in a specific topic with people with a cognitive disability – 'Kudoers' – through one-hour experiences. For example, a volunteer interested in photography would be supported to develop a session to introduce photography to a Kudoer (Kudoz, 2015). Interactions like these are specifically designed to get closer to five outcomes, including better mental health, meaningful employment and reduced stigma.

One of the inspirations for Kudoz came from a 'positive deviant' family. This was a family that participated in the ethnography and that was doing very well in comparison to other families. To tutor their sons, they would try out and hire different kinds of people through Craigslist and their own networks. The design team was furthermore inspired by several

social theories. They used Ryff and Singer (2008)'s theory about human flourishment to shape the research and questions. Later, when they started prototyping, they found the theory of 'social cognitive career theory' that further helped to develop how Kudoz could help people choose careers.

Most interactions in Kudoz were prototyped through dozens of iterations. In the first iteration the IWF team would take the role of hosts themselves. When they found that learning experiences indeed provided value to the Kudoers, they started a second iteration in which they recruited community volunteers as hosts to provide Kudoz experiences. The IWF team would deliver coaching and logistical support to hosts through a new role, the 'host curator'. . In a next iteration the IWF team would step back further, and hire a team to take on these support roles. This new 'Kudoz-team' combines delivery of the service with continuous improvement of their own roles, systems and touchpoints. For example, the online catalogue used to help people select experiences was improved using UX design. A new role that was successfully introduced, is the 'Taster', an experienced Kudoer who tests new experiences developed by hosts before they are added to the catalogue.

In a further implementation stage of the initiative, the team built more internal touchpoints to support the growth of Kudoz, including a knowledge management system, front-end and back-end technology, as well as processes for measuring impact and training staff. Figure 1 presents an overview of the different roles developed for the Kudoz initiative. InWithForward started with prototyping the roles at the top (the interface) and gradually added, prototyped and implemented the supporting roles below (the infrastructure).

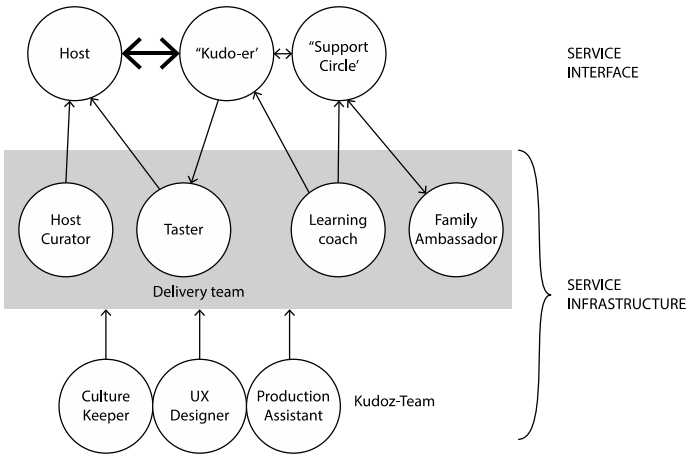

Figure 1 An overview of the different roles developed for the Kudoz initiative

A coaching team

The third case study is a project conducted by a design and research team led by the author of this paper for an Australian not for profit organisation. The client organisation was funded through a federal government initiative that was aimed at developing a systems response to support people with a severe mental illness. The project was aimed

at the problems that arise from the fact that many service providers are currently involved when people with a severe mental illness acutely need help when they are very unwell, for example when they are psychotic, severely anxious, and/ or suicidal. The current collective service response is very traumatising for these people, while there are also many conflicts between different service providers.

In this project we applied the frame creation methodology developed by Dorst (2015). We used various methods to identify the needs and interests of the various stakeholders of this case, including interviews, cultural probes and various participatory design sessions. In line with the frame creation approach we used principles of hermeneutic phenomenology to analyse 'themes' and develop frames and solution proposals. The term 'theme' is derived from phenomenology (van Manen, 1990) and based on the work of Dorst (2015) on how insights into themes support the creation of frames, the ability of designers to create new approaches to problems. Themes are defined as 'the structure of an experience' and are closely related to human values. This is further illustrated through the following example.

One of the themes we identified in this case study is that all the people in the service system had a strong *drive to make a difference*. For example, an ambulance paramedic mentioned: *"there's no better feeling than saving someone's life"*. One of the patterns in the experience of the theme 'drive' is that it can be sustained through feedback. For example, when cooking a meal for friends, observing that they are enjoying the meal can give the cook a sense of achievement which in turn can sustain their drive to keep inviting friends for dinner parties. Feedback is also required for 'growth' or 'learning' (figure 2). If the invited friends honestly provide feedback on what they did not like about the meal, the cook learns and can try to improve that a next time.

The need for feedback to sustain the drive is exactly what was missing in the problem context of an acute mental illness response. Police officers for example indicated a sense of futility and frustration*: 'If we do not hear from the person again, there is an assumption that one of three things happened to them: 1) they got better, 2) they moved away, 3) they died. We are essentially feeding our efforts into a 'cone of silence' that does not speak back.'*

To develop new frames, new ways of looking at this problem, we subsequently looked for other contexts where collective drive and growth is better supported and found that the mental health system is like a 'sports team' where each of the players is in the field at a different time, and has a different coach. We then designed a cross-organisational 'coaching team' consisting of team leaders who collectively reflect on what is happening on the metaphorical field through an 'observer'. The observer collects stories from the only persons that have a complete view on the playing field: the people with a mental illness going through an episode and their carers. The coaching team subsequently uses these stories to coach and provide feedback to the people on the ground.

The client organisation and participating stakeholders were initially enthusiastic about this idea and started a pilot to implement the coaching team without the further involvement of the design team. However, the implementation was unfortunately not successful. One of the reasons that the client organisation mentioned was that when they tried to

implement this intervention, the service providers did not recognise how this 'coaching' was different from what they were already doing.

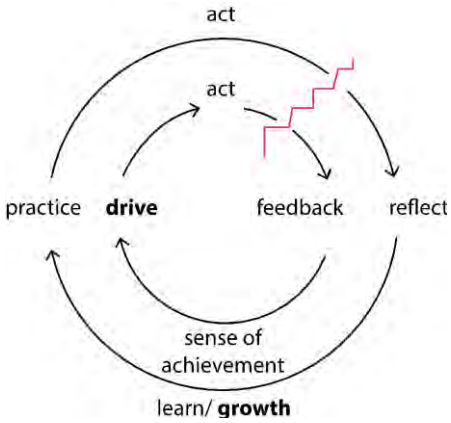

Figure 2 the structure of the experience of the themes 'drive to make a difference' and 'growth'

A cross-case study comparison

Without claiming to be complete, the three case studies show some interesting results with regard to the questions about what we design, how we design, and who designs social services.

What we design in social service design

With regard to the service interface and service infrastructure, we can see that case studies one and three (the speed sharing event and coaching team) were focussed on the infrastructure, while case study two (Kudoz) focused initially on the service interface between host and Kudoer and later designed the infrastructure to support these interactions.

What is interesting about the speed sharing event and the coaching team, is that they are both infrastructures that allow service deliverers to improve their own interactions at the interface of the service. The speed-sharing event provides teachers with the opportunity to create their own teaching practices, while the coaching team provides the mental health service providers with a structure to improve their collaboration and to improve the service for the person with a mental illness. Just like the service interface, these service infrastructures rely on high quality interactions between people. In a previous publication I have referred to these types of infrastructures as 'social infrastructures' (van der Bijl - Brouwer, 2016).

Social infrastructures are different from more traditional 'top-down' infrastructures that are popular in the public sector, such as protocols and scripts that describe in detail how service deliverers should behave. These types of infrastructures are helpful in predictable situations such as a call centre, where customers often call with the same kind of problems, and call center staff members can be instructed in detail how to respond to each of those problems. However, in more complex situations they are less useful. In the discussion section I will further reflect on the complexity of service organisations.

As Kudoz was essentially a completely new service, it is not surprising that the focus was first on the service interface. The team first had to find out whether their idea to provide new experiences to people with a cognitive disability had the intended effect, before they could design the required infrastructure. Just like in case study one and three, the infrastructure that was subsequently developed also includes elements of a social infrastructure that is focussed on continuous improvement of the service at the interface level. This is achieved through engaging hosts on a regular basis to make their learning experiences better, for example through peer2peer conversations, coaching conversations, feedback from Kudoers, and 'open experiences' where hosts take part in a learning experience as a learner.

How we design

There are some differences and similarities between the three case studies with regard to the design process. In this section I will particularly focus on the practices used to frame the problem, and the use of prototypes.

In all three case studies there was a clear (re-) framing of the problem. MindLab made extensive use of provocative prototypes, to seek inspiration from other parts of society through metaphors to develop new perspectives on 'sharing knowledge'. In the third case study we similarly used metaphors to develop new perspectives on the problem of collective growth and drive to make a difference. The frame creation approach provides a structured method to develop frames through the analysis of themes (Dorst, 2015). Although the MindLab case initially appeared less structured than the frame creation approach, the team implicitly used an understanding of the theme 'sharing knowledge' to develop their provocative prototypes. This practice does reflect Dorst's (2015) findings that the explorations that designers engage in to be able to reframe problems are a subtle process of analysis that is very *close to* the analysis of themes through hermeneutic phenomenology. The MindLab team was clearly expert in a continuous framing and reframing of the problem, by using inspiration from other industries, and carefully involving the teachers in this iterative process. In the Kudoz case study the framing of the problem resulted from their in depth ethnography while also using various social theories in a 'designerly way':

> *[team member InWithForward]: "So one thing that we did during the ethnographic research part is that we used quite a few different articles but without like specifically choosing for one or another. There was a stage where we just took what we thought resonated or was inspiring and then we tried it out in a design research tool and then we were trying like does this make sense. Is it something that helps our understanding of the population group or not?"*

The Kudoz initiative was further inspired by 'a positive deviant', a family in the population group that was doing really well, compared to others. Working with positive deviance is an idea derived from community development and social change, which states that rather than experts driving change from outside of a context, a more successful way to support change is by identifying people within a community who follow uncommon, beneficial practices (Kimbell, 2014, p83). The positive deviant, social theories, and prototypes were

combined and integrated in an iterative process, which eventually led to the development of the current Kudoz initiative and theory of change.

The use of the social theories for Kudoz, and the use of themes in frame creation in case study three, are both deep explorations of the underlying needs of stakeholders, where Kudoz is more focused on the service consumer – Kudoer -, and case study three was more focused on the service deliverer – the mental health professional. Both perspectives seem relevant, and both case studies suggest that these deep explorations contribute to the framing of the problem and intervention.

The case studies differed with regard to the extent that the service was prototyped. The Kudoz case included a carefully staged prototyping process from service interface to service infrastructure. The prototyping stage then flowed through to a piloting stage which included the development of an 'impact measurement model' that showed through evaluations what the impact of the initiative was on the chosen outcomes for people with a cognitive disability and community. The speed-sharing event developed by MindLab was also prototyped and subsequently tested in two pilots before further dissemination. In the third case study we failed to prototype the designed 'coaching team' and the client organisation went straight on to an unsuccessful piloting stage. This suggests that prototyping and experimentation is – just like in any design process – essential in the design of social services. In the discussion section I will further reflect on the need to bridge design and implementation.

Who designs?

All three case studies included a form of co-design or co-creation. The MindLab team involved teachers, principals and municipality staff members in the design process. The InWithForward team involved staff from the service providers in their team from the start, and in a later stage they also involved Kudoers in the design of experiences. In the third case study we organised eight co-design sessions including both service deliverers and consumers. We also set up a 'design team' within the client organisation with three staff members to help design the initiatives.

All case studies included a form of capability building which provided the service provider organisations with design capability. One municipality member at MindLab for example mentioned "We like to participate in these kinds of collaborations, but I also think we [developed a] mindset so we can do it more and more on our own", while another staff member mentioned "I can feel that I changed my way of thinking in two other projects based on what I learned in this project".

In the Kudoz case study one of the intentions of the secondments was capability building in the social service providers, and as such making the learning flow back into the organisation. As this did not happen as much as intended, a more elaborate capability building program was implemented called the 'Fifth space' to build-in social research and development as a continuous function in their organisations. In this initiative staff members from different levels at each of the three service organisations learn about co-design and prototyping through working on projects for one day a week.

What is interesting then in this context, is what the required design expertise is for a social service project, and to what extent service providers would be able to do this on their own. This was discussed in the MindLab case, where the municipality staff member

mentioned

> *"We need both. We are not as good as we want to be in this thinking. […]. The teachers came up with the initial ideas, but they did not call it speed sharing. They had help from MindLab. […] We would not have ended up with speed sharing without the MindLab thinking"*

And later added:

> *"[we needed MindLab because] we could not solve it in another way. We needed a different approach."*

This suggests that external expert designers might be required to tackle complex problems. At the same time, the speed sharing event and coaching team can be considered 'incremental' design processes in itself, where the service delivers continuously improve their own practice without the involvement of expert designers. This was nicely described by the municipality staff member in the MindLab case:

> *"In a way we have not solved the problem with this. But we have developed some very new ways of thinking about sharing knowledge. I think in many countries in the world, we have the same options and ideas about how teachers work. They have always done it in this way. Now, in a way, this project will help teachers to see that [they] can do it in another way. We have some very concrete methods, such as speed sharing, but also something about their mindset. I could see teachers were thinking in another way. Not in this stereotype way of how teachers work."*

This suggests that external design expertise, such as MindLab's, might be required in complex problems, while incremental innovations may be executed by service deliverers themselves. To be able to execute these incremental innovations, the service deliverers need to develop this capability, and a structure has to be set up in the system that allows service deliverers to innovate. One of the possible explanations of why the coaching team failed to be implemented in the third case study is that we had not provided the intended staff members of the coaching team with the capability to redesign their practice based on the stories that would be collected by the observer.

Discussion & conclusion

This paper presented the what, how, and who of social service design through comparing three case studies. In this section I will firstly discuss what we can learn from these case studies in terms of the way we perceive social service organisations and what that means for the involvement of employees in the design of services. Secondly I will briefly discuss the need to bridge design and implementation in social service design

Top-down versus bottom-up development of social services

The social infrastructures that were developed in case study one and three, the speed-sharing event and coaching team, can be considered a bottom-up approach to improving the social service. By implementing an initiative like this, the service organisation managers show that they trust service deliverers to fine tune, and create change from within. As discussed above, this is fundamentally different from a top-down approach in

which protocols and scripts prescribe in detail how the service deliverers should behave. This is in line with Cipolla and Manzini (2009)'s view that service scripts are not applicable to relational services. "People are personally involved, they are not representing someone else or operating to a definite plan" (ibid p.49).

This top-down view of services is inappropriate for the social services described in this paper, because of the unpredictability of the service situation. In an earlier publication (van der Bijl-Brouwer, 2016) I showed that the top-down view that is prevalent in the public sector, is based on the view that organisations can be managed in a linear way. In the Cynefin framework developed by Snowden and Boone (2007), this way of thinking relates to either simple or complicated contexts, where in the former situation problems can be categorised, and standardised responses can be developed (such as with the call centre case described above), and in the latter situation problems can be analysed by experts and responses can be developed based on evidence. In both cases the underlying idea is that the effect of a certain response can be predicted. However, the types of social services that are presented in this paper are neither simple nor complicated. For example, a teacher might be supported through their training, guidelines, and a school philosophy, but what happens in the classroom cannot be completely predicted or controlled. Even a very prepared teacher often has to improvise based on the behaviour of children on a particular day. And children's behaviour is influenced by factors outside the school (and outside the control of the teacher and educational institution), including their parents, siblings and peers. Furthermore the teacher's work is influenced by outside factors such as changing educational policies and procedures, new technology, societal developments etc. Controlling the teacher's behaviour would not be effective, because it cannot be predicted which specific teaching intervention is required in each specific instance of interaction between teacher and student. In the Cynefin framework this situation would be categorised as 'complex', where the relations between cause and effect can only be identified in hindsight, and the appropriate response is to 'probe, sense, and response' (ibid, p72). In other words, experimentation is essential to develop solutions. A further understanding of the complexity of organisations can be provided through Stacey's theory of complex responsive processes which states that "organisations are not actually existing things called systems but, rather, are on-going, iterated *patterns of relationships between people"* (Stacey, 2006, p39). He rejects the view that organisations are systems that can only be understood (and controlled) from outside that system and instead argues that creative action can come from interactions between individuals within the organisation. The social infrastructures presented in this paper are in line with these views: change comes from within and continuous experimentation contributes to the evolution of the service.

A second reason why a bottom-up view might be preferred over a top-down view is that it fails to make use of the intrinsic motivation of employees to make a difference. The MindLab case study showed that the project changed teachers' mindsets about how they could start improving their own work environment. This is in line with what Bason (2010, p.119) calls employee-driven innovation:

> *'An innovative work environment is also an environment with a high degree of job satisfaction. Still, many innovation efforts in government are*

markedly top down. Although top management must take responsibility for championing and enabling innovation, innovation is in practice essentially a bottom-up process'

Bridging the design – implementation gap

In the third case study the coaching team was not implemented, because there was no prototyping stage and the pilot stage was unsuccessful. We did not prototype the coaching team, because we were not invited to support this part of the process, and the client organisation was not familiar with prototyping and the difference with piloting. This is not uncommon in the public sector, where there is a strong focus on evaluation through pilots (Bason, 2010). These evaluations need to be summative, to provide the evidence that is required to justify funding of the initiative. However, this focus on pilots results often in neglecting the importance of formative evaluations through prototypes. Experiments with prototypes are aimed at refining the design of the initiative, rather than generating evidence for implementation. In an advise to the public sector in their publication on 'Design for Public Good', the UK Design Council (2013) therefore promotes iteratively testing solutions to prevent expensive and risky pilots. However, this issue does not only require a different stance from public sector organisations, designers also need to take their responsibility when it comes to the successful implementation of interventions and should negotiate an active role in this stage. As Norman and Stappers (2015) argue, designers cannot stop at the design stage: they must play an active role in implementation, and develop solutions through small, incremental steps.

Conclusion

In this paper I presented and discussed the what, how, and why of social services. Without claiming to be complete, the results present some interesting insights into *what* we are designing when designing social services, which includes the design of social infrastructures. The paper furthermore identifies some opportunities for how we might design better social services, including:

- Using deep explorations of the needs of both service consumers and deliverers to help frame the problem, through for example social theories, or hermeneutic phenomenology
- Developing social infrastructures that allow service deliverers to redesign and improve their own services continuously
- Involving service deliverers in the design of these social infrastructures
- Applying high level design expertise to frame and design for complex problems
- Playing an active role in prototyping and implementation
- Explaining the difference between prototypes and pilots to participating public and social sector organisation

Acknowledgements

The author gratefully acknowledges the contribution of all the interviewees of the case studies provided by MindLab and InWithForward/ Kudoz, as well as everyone who participated in and contributed to case study three. Special thanks go to Bridget Malcolm

for her assistance in conducting and analysing the case studies, and Lucy Klippan, Amira Vijayanayagam and Rodger Watson for their help in conducting the third case study.

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About the Author

Mieke van der Bijl-Brouwer is a researcher, designer and educator in the field that spans human-centred design and social and public sector innovation. She has a particular interest in the practices that are required to address today's complex societal problems.

HONG KONG DESIGN MANAGEMENT ACADEMY CONFERENCE 2017

RESEARCH PERSPECTIVES ON CREATIVE INTERSECTIONS

Together we do not forget: Co-designing with people living with dementia towards a design for social inclusion

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doi: 10.21606/dma.2017.93

Dementia is increasingly becoming a societal challenge worldwide. In order to address the needs of people living with dementia through design, it is important to develop products and services in collaboration with them. For this study, a co-design approach was used to involve people with dementia throughout the design process. With them we aim to find a solution for social inclusion. This resulted in 'Stay Tuned!', an easy-to-use messaging radio for people with dementia, that allowed them to stay up to date with the lives of their loved ones. In this study, we used a mixed method approach including a group session, probes and an in-context evaluation. With this study, we contribute on how to involve cognitively impaired participants in co-design processes.

keywords: co-design; probes; in-context; participatory design.

Introduction

Dementia remains one of the greatest global societal challenges facing our generation. The number of people living with dementia worldwide today is estimated at 47 million. By 2050 this number is projected to increase to more than 131 million. Most of our current healthcare systems are unresponsive to the needs of people with dementia and their families (Prince, Comas-Herrera, Knapp, Guerchet & Karagiannidou, 2016) and therefore we have to find alternative ways, such as design, to support people living with dementia.

Dementia is a syndrome caused by a number of progressive illnesses. On a cognitive level persons with dementia (from mild to moderate) mostly suffer from a deterioration of memory, difficulties in language and communication, the inability to perform purposeful

movements and/or orientation in time and place (Hendriks, Truyen & Duval, 2013). The most common types of dementia are Alzheimer's disease, vascular dementia, dementia with lewy bodies and frontotemporal dementia (Wortmann, 2015). Characteristics of Alzheimer's disease are impaired memory, apathy and depression (Wortmann, 2015). Vascular dementia is similar to Alzheimer's disease, but the memory is less affected, while the mood fluctuations are more prominent (Wortmann, 2015). In dementia with lewy bodies there is a fluctuation in cognitive ability and parkinsonism (Wortmann, 2015). Frontotemporal dementia includes personality and mood changes, disinhibition and language difficulties (Wortmann, 2015).

The progression of the dementia syndrome can be described by the Clinical Dementia Rating or CDR (Morris, 1993). This rating consists of five stages, namely: 0 - no signs of dementia, 0.5 - very mild signs, 1 - mild dementia, 2 - moderate dementia and 3 - severe dementia.

Dementia is most often seen in older adults, and currently there is no cure available. Therefore, new solutions are needed to keep people living with dementia at home to remain the quality of life they had.

Kujala (2003) found the following benefits of participant involvement within ICT systems design: higher quality of system requirements, higher system quality, a better fit between the system and participant's needs and improved satisfaction of participants. However, there are three reasons to being careful in relying on participant involvement in co-design processes: 1) participants may not be aware of their needs; 2) they may not be able to articulate their needs; and 3) they may not be willing to speak about their needs with a researcher (Kleef, Trijp & Luning, 2005). Therefore, it is important to trigger these needs of the participants. Thus, for co-design efforts to be effective (to deliver the intended benefits) it is important to select appropriate methods and ways of working, and to apply them appropriately (Steen, Manschot & De Koning, 2011).

In the area of technology design for people with dementia there is an evident need for more participant involvement (Topo, 2009). There are several examples in which people living with dementia are involved in design-driven processes (Lindsay et al., 2012; Wallace et al., 2013). However, these examples focus on the inquiry method rather than the design results themselves. Understanding the daily context of people with dementia in the development of new technologies is essential to cater to their, often complex, needs. As such there will be a better fit between the participants' needs and the resulting design (Kujala, 2003). However, the traditional participatory design methods are not fully appropriate for people with dementia, since these methods make inherent assumptions about for example people’s cognitive abilities (Lindsay et al., 2012). On top of that, the opinion of people with dementia is often replaced by proxies, such as a partner. Although proxies do, in fact, often have a good understanding of the person with an impairment, they also project their own norms and values in the co-design process (Hendriks, Slegers & Duysburgh, 2015).

Therefore, it is important to voice the individual traits and personal perspectives of the people with dementia by themselves in the design process, rather than being a unified category (Kontos & Maurits, 2013). This is in line with emerging trends in person-centered care for people with dementia (Clarke, Hanson & Ross, 2015), which focus on a personal

approach towards caring to ensure a higher quality of life. Therefore, we want to find out about people's individual needs and translate these to a final design.

Literature suggests that participants should be involved equally to the designer in a co-design process (Hendriks et al., 2015). However, to frame the design scope and move the design process forward a designer is needed to take the lead and synthesise the results. Therefore, we apply this in a combined manner, where participants act as equals in the individual sessions but not over the entire process. By doing so, and not just acting as a facilitator (Sanders & Stappers, 2008), we prevent ourselves from losing valuable insights the designer might contribute in this creative process (Mitchell, Ross, May, Sims & Parker, 2016).

To conclude, our research question for this paper is as follows: How can we involve people with dementia in co-design as part of the design process? With this we aim to contribute to the body of work on how to involve difficult target groups, and making their voice heard, using co-design methods in different stages of the design process. Additionally, in the case presented, a new design is explored as a potential intervention to enhance social communication and engagement between people with dementia and their surrounding social network.

Method

We used a mixed method approach through collaboration with people with dementia and their surrounding social network. During these iterations, the users and their social context were involved in different ways to push the design forward and develop it further by every step.

Design process

The iterative co-design process applied in this study is inspired by the “Human-Centered Design process” (HCD), which pertains to people being the focal point of the design and the design process (Brown & Katz, 2011). The HCD process begins by examining the needs, dreams and behaviours of the people we want to affect with our solutions. And then builds further on these to come up with a design proposal to address them. The process consists of three iterative phases (Figure 1):

1. Collecting stories by conducting field research (Hear)
2. Translating stories into frameworks, opportunities, solutions and prototypes, while regularly shifting between concrete and abstract (Create)
3. Testing the design in real-life context (Deliver)

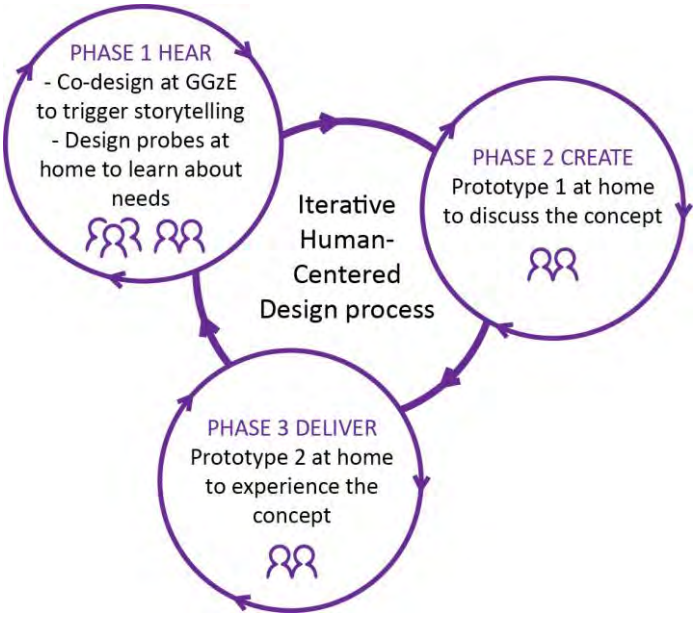

Figure 1 Visual of the iterative Human-Centered Design process consisting of three phases

Different phases including the participants

In this section, we will elaborate upon the three different phases in the iterative design process. Participants in this process were selected by professional caregivers of a mental health care institute (GGzE). This institute checked whether they were capable to start participating in this study and regularly checked whether they maintained in good condition by attending our meetings. From all the participants, two participants should be highlighted because they were involved in the whole process. We will name these participant A and B.

Participant A was a 72 years old male with Alzheimer's and was in stage 2 of dementia (CDR scale). The partner of participant A supported him during his conversation with for example specific dates or locations when he was telling a story.

Participant B was a 77 years old male with lewy body disease, but only showed mild cognitive signs of dementia. His intention to join this project was to become aware of the innovative products which are created, in case he needs those in the future. Also, he believed it is important to contribute to help others. In contrast with participant A his partner did not contribute to this project, because he did not want to burden her. As these two scenarios show, dealing with the impairments of dementia can be handled differently.

Phase I: Collecting Stories with Field Research (Hear)

The aim of this phase is to involve and connect with people with dementia, focusing on their personal situation and experiences rather than starting from a general perception on dementia derived from the literature (Kontos & Martin, 2013). For this we aim to gather stories from couples living with dementia. These stories allow for insight in the participant's background to inform and inspire the design (Kankainen, Vaajakallio, Kantola

& Mattelmki, 2012). In the literature, it is stated that participants should be seen as experts. However, they must be given the appropriate tools for expressing themselves (Sanders and Stappers 2008) such as for example design probes.

During these meetings probes were used as a tool to start a dialogue rather than a one-way interview. Probes originated as a method to non-invasively gather in situ insights about personal experiences of participants to open up the design space (Gaver, Boucher, Pennington & Walker, 2004).

The first phase consisted of two parts, namely 1) a co-design session with 15 participants at GGzE to gain an understanding of living with dementia and reflect upon a concept and 2) a design probe session at home to learn about individual needs and preferences.

First, during the co-design session about half of the participants where people with dementia, and the other were caregivers or close family members of people with dementia, to make them feel comfortable and trigger storytelling (Figure 1, phase 1: Co-design at GGzE). The focus of the design space was selected before this meeting, and was social inclusion for people with dementia. The cases of dementia varied between 0.5 and 2.0 on the CDR scale.

Second, during the personal session at home, two people with dementia who still lived independently at home with a caregiver, participated in the study. For this session at home we developed three different design probes inspired by Wallace and colleagues (Wallace et al., 2013) (Figure 2 and 3): 'the family necklace' (A) to understand the relationships in the participant's social network, 'the present' (B) to learn who they value most by asking "who would you like to thank?" and 'the sound jar' (C) to gain insight in their daily activities both in the past and present by asking "Which song or sound would you like to put in a jar and when opening it, hear it?".

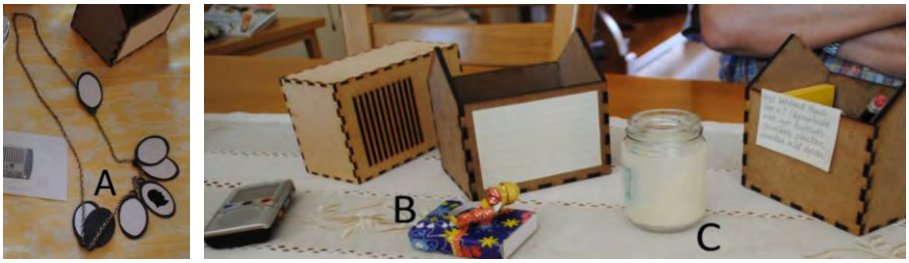

Figure 2, 3 The design probes 'the family necklace' (A), 'the present' (B) and 'the sound jar' (C)

Phase II: Translating Stories into Opportunities (Create)

The aim of the second phase was to translate the stories gathered in phase I, in values and key design decisions to inform the design process. Based on the gathered insights an aesthetic model was created (see results, Figure 4). This model was discussed with the participants at home to formulate a perspective in context (Koskinen, Zimmerman, Binder, Redstrom & Wensveen, 2013). In this session, we reflected on a correct translation of the insights from phase I with the participants and allowed them to contribute to the design as well.

Phase III: Testing the design in real-life context (Deliver)

The insights from phase II were translated into a final design. Following this, we used this third phase to evaluate and reflect upon the final design in their real-life context. In the development of assistive technology for people with dementia there is a shortage of evaluations in context of new technological concepts (Bharucha et al., 2009). By evaluating a design in context, we improve the ecological validity of the research outcome (Koskinen, Zimmerman, Binder, Redstrom & Wensveen, 2013). Therefore, we have developed a working prototype of our final design and evaluated this for 10 days at the homes of participant A and B.

The number of participants increased to 12 in total, since their surrounding social network was asked to contribute to the design intervention. For participant A, the family members that were involved in the test were mostly children (one daughter (47)) and grand-children (two boys (19, 23) and two girls (22, 24). For participant B, the friends that were involved in the test where mostly people from a similar age as the person with dementia (two male sports friends (65, 75), male neighbour (62) and a female friend (54)).

In order to further improve co-design practices in service design, there is a need for methods or tools to monitor and evaluate whether the intended benefits are actually realized (Steen, Manschot & De Koning, 2011). Thus, for this evaluation in-context we used three input methods.

First, to gather personal reflections, we asked the participant for daily written input through some questions about the concept. In this way, we could learn about their opinion about the prototype and how it integrated in their daily lives. Second, we logged how often the design was used by automatically sending this data to the email of the designer. And third, we send a questionnaire to the social network of the participants. These results were analysed in a qualitative way and used to formulate a conclusion on the design proposal.

Result and analysis

We gathered results based on the design process consisting of three phases.

Phase I: Collecting Stories with Field Research (Hear)

In the design process, it was decided to start with a concrete direction to address the need of social inclusion and communication (Moyle et al., 2014). To address this, we chose the design of a classic radio because this is a familiar object for elderly. Additionally, people with dementia are still able to understand the interaction paradigm and can use it. Finally, the function of a radio is reminiscent of social interaction and sound. This radio was used as a tool for brainstorming together during the co-design session and the probe session at home. Because we already had a direction the participants may have experienced the brainstorming easier, since they could imagine this particular idea as a part of their own daily lives, instead of coming up with an idea from scratch.

During the co-design session at the GGzE participants shared their opinion about the concept of receiving messages through a radio. The participants stated that it would be very important to them to have a familiar interface, because learning something new is often challenging.

In this session three messages were played to provide the participants with a concrete example to reflect upon and show the variety of the type of messages: 1) someone making an appointment to pick the participant up, 2) someone saying he got his driver license, 3) someone who played a part of the concert she was visiting.

The response of the participants was that making appointments through a radio were not the type of messages they would like to get from a radio: *"I would be afraid to miss an appointment"*. However, sound recordings of for example the sea or a music band, were considered valuable: *"I would love to hear my granddaughter who plays piano"*.

Moreover, participants came up with features they would appreciate in the radio such as: clear notifications of a new message, being able to replay a message and receiving a notification as a sender of a voice recording when the message is being listened to by the person with dementia. Most importantly, the radio should not play the messages automatically, because people may not be aware of where the sound comes from and this could result in people getting anxious.

During the probe session at home we understood more about living with dementia and the methods being used. A confronting example with 'the family necklace' (A) was that the person with dementia took the necklace in his hands and started filling in the blank portraits out loud: *"Grandson, granddaughter, daughter, son-in-law and people from daycare."* After a while his partner suggested she may also be part of the group of important people. The approach and patience of the informal caregiver became clear immediately. Also, this scenario showed that we have to interpret the results from these probes, as the partner was clearly important. Since that moment, we tried to empathize with the people with dementia as much as possible and especially did not fill in the blanks, but let them give the answer.

From these meetings at people's homes with the probes we could draw three conclusions:

1. Through using probes to get a personal perspective we concluded that the target group for the design proposal was bigger than only the close family members. Other people - like neighbours and friends - play an important role in their social network as well.
2. The probes method was experienced pleasantly by the participants. This was especially the case for the compliment box (B), because it evoked enthusiasm to tell their story.
3. The participants liked the empathic approach of the designer. They did not only have to fill in a questionnaire, but through probes a personal conversation was created in which they felt at ease.

Concerning the design, insights were gathered in the importance of the social network for the people with dementia. This motivated us to continue in this design direction.

Understanding people's current situation was important to be able to connect with their needs. We analysed this from a positive point of view by their hobbies, dreams and social connections, rather than their disabilities. People are not just the sum of their acquired impairments (Lindsay et al., 2012). Many of the researchers and designers in the workshops indicated that they prefer to choose and adapt co-design techniques based on their participants' abilities (i.e. their strengths and skills) rather than their disabilities (Hendriks, Slegers & Duysburgh, 2015). Especially the probing study catered for this and

generated input that would not have been found via general inquiry methods like for example a questionnaire (Gaver, Boucher, Pennington & Walker, 2004).

Phase II: Translating Stories into Opportunities (Create)

In the second phase, we designed an aesthetic model, based on the information gathered in phase I. This model is a non-functional design proposal, to discuss the concept and appearance with the participants (Figure 4). We found for our communication device that it is important that it is a familiar shape and interaction. This is important because seniors can relate to it and are able to use it (Brankaert, 2016). Thereby we found that the design should be simple to use and involve the entire social network (see phase I).

The final concept we developed is called “Stay Tuned!”. This is a radio with an old familiar shape, but with modern technology inside. Loved ones can record audio messages and send these through WhatsApp (an app used on smartphones to send messages to each other), to the “Stay tuned!” radio. Elderly people can play these messages easily by rotating the knob to a picture (Figure 4). The other knob was used to adjust the volume of the message. With this design people with dementia can stay up to date of the activities their loved ones do. This contributes to the feeling of independence and involvement of the person with dementia.

Figure 4 Stay Tuned! is a radio with modern technology integrated in an old familiar shape

This aesthetic model was discussed in an informal evaluation with two participants at their homes. This discussion was structured to cover the following three aspects: 1) simplicity 2) perspective and 3) usability.

1. Simplicity: keep the product both simple to use, logical and focusing on one function only. For example, *“I appreciate it that I can only receive messages from loved ones, and not advertisements or unclear other notifications like on my phone. This is also the reason why I would choose not to integrate the functionality of a normal radio, but only messages.” (Participant A, person with dementia).* Moreover, participants suggested to add other functionalities to the

design as well such as an alarm or music. However, this would make the interaction more complex, and the designer had to take charge of this part.

2. Perspective of participants: *"It could motivate people to relax since they hear a familiar voice." (Participant B, person with dementia)* and *"The radio does not look stereotypical, instead it looks just normal." (Participant A, partner)*
   For our participants, the aesthetics of the radio fit well in their houses. We frequently asked the participants to have critical feedback on the concept and aesthetics of the radio. However, they strongly suggested to make no changes on its appearance at all. They felt comfortable with the shape, colour and materials of the radio (Figure 4). On top of that, they did not feel like it was a stereotypical product for a disabled person. Instead, they explained several loved ones in their social network recently bought a retro product like for example a radio.
3. Usability: *"I would like to see whether the radio is turned on." (Participant B, person with dementia)* and *"I would not appreciate a new interaction, just stick to the old radio." (Participant A, person with dementia).* Furthermore, as the current design is rather too symmetrical, implying the two rotating buttons which are identical. It is suggested for the next design to make them obviously different to represent their function.

Phase III: Testing the Design in Real-life Context (Deliver)

In this phase, we translated the refinements and participant's feedback to improve the "Stay Tuned!" message radio, and got to our final design. To evaluate this design, we put a fully functional prototype in the home context of our participants for 10 days, which communicated via WhatsApp to a Raspberry Pi.

When a message was received on the radio, a blinking light at the specific picture of the person who send the message, shows who send a voice recording. When the elderly person listened to the message, a confirmation was automatically sent to the sender of the message. We performed this evaluation in the home context rather than in a lab setting (Figure 5) to see how the concept would be integrated in their daily lives.

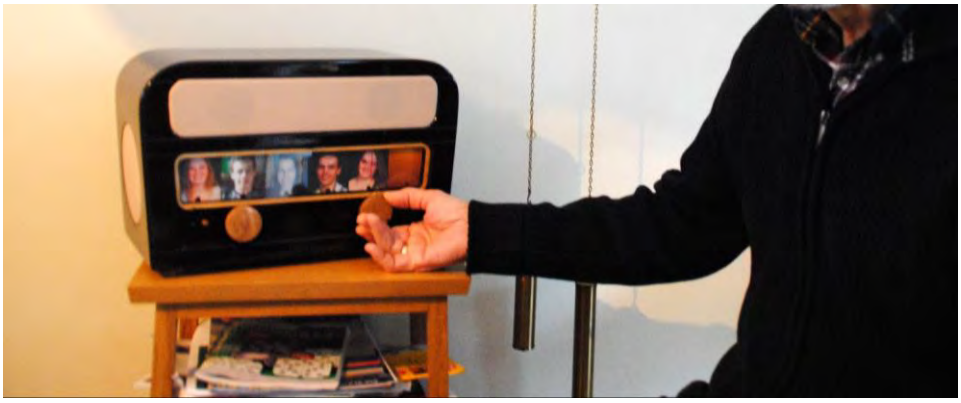

Figure 5 The fully functional prototype in the home context of the participant

Personal reflections

From the daily written input of the participants can be concluded that the feeling in

general was positive about “Stay Tuned!”, for example “We listened together. I did this to see his reaction. It gave me a warm feeling.” (Participant A, partner) and "Our granddaughter loves it if she is allowed by her mom to tell grandpa something through the radio." (Participant A, partner) and "I would prefer push buttons instead of a rotating knob, to select which message to play." (Participant B, person with dementia). It was interesting to see the different outcomes of the two participants again, since participant A focused on the social value, while participant B focused mostly on the functions of the prototype.

We found that both participants said they listened to the messages together with their partner which means it not only contributed to family communication, but also proposes a meaningful activity for the couple. This differs from their previous situation, because in both cases the partner was the translator of the messages of family and friends, towards the person with dementia. With our design, people with dementia hear the first story directly, rather than communicated by someone else. It gave him a feeling of being in control and an increase of contact moments with the family was measured.

The logged data

The logged data showed that early in the in-context evaluation both participants kept the radio on nearly the whole day, while later on this amount decreased to occasionally turning it on through the day. In addition, testing the design in real-life context resulted in finding out unexpected scenarios, like a broken internet connection in the house of participant B.

Questionnaire to the surrounding social network

The goal of this in-context evaluation was to explore the effect and use in general of the “Stay Tuned!” concept. Because it concerns an innovation for one’s social network, we asked this network to become a part of the evaluation as well.

The family members of participant A send about 3 messages a day (accumulated) to the radio and the couple listened about 5 times every day. The friends of participant B send about 1 message a day (accumulated) to the radio and he listened about 3 times every day.

As we found in the personal reflections, the intention of participating differed in the two cases. On the one hand the surrounding social network of participant A stated they liked to do it and that they were aware that their parents would really appreciate receiving a message from them: *"I just wanted to let them know I was thinking about them or to let my daughter sing a song."* On the other hand, the surrounding social network of participant B stated they participated because they were asked to participate in this research: *"I promised to do so in this test phase".*

Furthermore, one granddaughter, one daughter (Participant A) and a friend (Participant B) explained they found it annoying to receive a confirmation every time the participant listened to a message. They would suggest to only send this confirmation once, because they do think it is important and comforting to know the message is received.

At last, a participant could also imagine this radio to work in an elderly home: *"When I see how much my grandfather enjoys the radio, it is just amazing to see this. I talked to a friend who works in an elderly home and we both agreed that it would be very useful in an elderly home as well. Just because there are people who do not have family close by. It*

could even be recorded by the nurses. In this case people with dementia think they are in the centre of the attention, they are being included." (Participant A, granddaughter)

Discussion

Our research question for this paper was as follows: *How can we involve people with dementia in co-design as part of the design process?* With this we aim to contribute to the body of work on how to involve difficult target groups, and making their voice heard, using co-design methods in different stages of the design process.

This paper presents four activities where people with dementia and their surrounding social network were involved in a design process (Figure 6). These were the following: 1) a group session to trigger storytelling, 2) design probes at home to learn about individual needs, 3) the first prototype - focused on aesthetics - to discuss at home and 4) the second prototype, to experience at home.

Thereby, we want to elaborate upon the role of the designer in these activities and the progress of the probes over time to understand the user and their context. Additionally, we aimed for these activities to contribute to the overall design challenge.

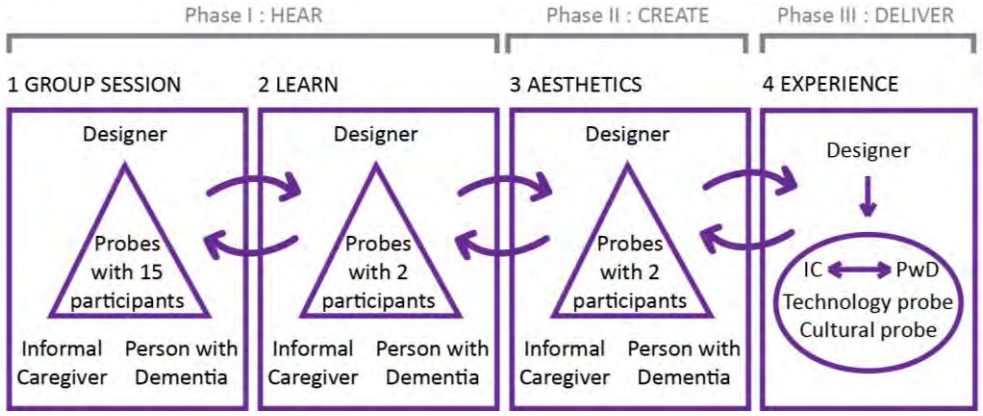

Figure 6 The four activities of the design process with the involved participants

We believe the difference in co-designing with people with dementia in comparison to other user groups, lies in the role of the stakeholders in each of the activities. When designing with people who do not have an impairment, everyone has an equal opportunity to express themselves in such co-design sessions. However, traditional Human-Centered Design activities often ask users to describe previous usage scenarios or imagine future ones, which is a challenging activity for people with dementia (Dawe, 2007). Therefore, facilitating them to voice their opinion was more challenging and one of the main contributions of this article. We found that tools such as reminiscence, a personal approach and a trusty relationship, were important as a motivation to let these people express their opinion and perspective.

The four different probes used in the design process enabled for different kinds of input by the participants. For instance, in the first activity (Figure 6), the group session, the main contributor was the informal caregiver, while the designer was the facilitator. In the second and third activity, the main speaker was the person with dementia, while the

designer took the lead in what topics to reflect upon to steer the design process further. In the fourth activity, the involvement of the informal caregivers (IC) and the person with dementia (PwD) within the technology probe, the radio, was equal. However, the designer did not have an active role during the use of the radio, but only in the reflection session with the participants after they used the radio for 10 days.

Reflecting on the steps taken in this order, starting the co-design process in a group setting made people feel comfortable sharing daily experiences with each other. This introductory meeting is a nice moment to get to know each other, before the home visits starts. A strong participant-researcher relationship is important when working with people with dementia (Suijkerbuijk, Brankaert, de Kort, Snaphaan & den Ouden, 2015). However, we could in future processes limit the first group meeting to an introduction, rather than a brainstorm. In this way, the individual needs can be better expressed in a personal setting at home by the people with dementia. After the individual sessions, it may be relevant to organize another group session to consolidate the input so far, to make sure everyone's voice is being heard and people are on the same page.

Balancing the participant's input

As a designer, you have to balance between collecting input from the participant and keeping a holistic view on how their input contributes to the overall goal of designing a product. An example of this study is that multiple participants separately have interesting ideas, but if you would merge these ideas into one design, it would not be a simple or fitting design anymore. To give an example, one family member wanted the functionality of recording a message. However, this would make the interaction more complex and confusing, because it is different from its original meaning. The radio could work as a trigger to make a phone call, rather than having the functionality itself. Also, as was mentioned by Steen et al. (2011) it is important that the people involved in co-design identify the desired goals of the project and align these. For example, informal caregivers found it valuable to add a medicine alarm in the radio, while people with dementia did not want to include care functionalities, but only positive features related to family and friends. This is a good example of how stories of participants are reflected in the design, or are deliberately chosen to be left out. Therefore, the designer selects, based on existing knowledge of the literature, needs and values of the participants to be included in the design.

How to get to know the participant

Concerning the probe evaluations at home, we found that probes were open enough to answer directly by the participants. In addition, it shifted the focus towards existing important relationships and values of the people with dementia. As these probes were very open-ended questions, we tried to connect with their most important memories and dreams. It is suggested to invest time and attention to people's personal situation and believes, to be able to create a match between them and the design proposal (Kujala, 2003).

The aim was to make the process of getting to know each other comfortable and inviting. Though one of the participants asked what his background information implied for the design process, which might illustrate a participant's feeling of being outside their comfort-zone. Yet, after explaining the importance of understanding them and their

context on a personal level for design it became clearer. Therefore, it is important to be transparent about the design and research goals when working with fragile users and check continuously if these are still simple and understandable.

Furthermore, it is important to share unfinished sketches and shapes in the beginning of the design process with the participants. As these are still unfinished people dare to give their opinion about the sketches and shapes. Later in the process, as the design becomes more detailed, people can imagine it as a real product in their own house if the prototype is close to a real product. We recommend in future research to keep this format of openness in the beginning of the design process and work closer to reality in the later stages when evaluating a concept.

We found in co-design processes with individuals with dementia, that it is important to not only involve the participant as subjects of study, but truly listen to their stories, needs and opinion, as also suggested by Hendriks and colleagues (2015). In addition, their perspective allows for valuable feedback on how you translate their input into a design proposal (being acknowledged and valued as stakeholders in the process). Therefore, we can confirm that it is important to keep them motivated to participate in the entire process, as mentioned by Lindsay et al. (2012).

The evaluation tool

In care the clinical and medical needs are often prioritised over personal and social needs. Even though we know the positive effect of social activity and personal well-being on the mental health of older adults (Renehan et al., 2012). Often, researchers focus too much on the illness, rather than the person. Therefore, we propose to involve participants frequently by a face-to-face meeting, as well as their surrounding social network. However, compared to the meetings with the people with dementia, the amount and detail of information gathered through questionnaires from the surrounding social network was limited in our study. Therefore, we propose for more explorative and qualitative involvement of them as well, which might result in even stronger design results in the future.

Further development of the probes

The designer did not have a very active role in the evaluation of the technology study at home, in this activity the informal caregivers were taking the researcher's role to gather and stimulate response from people with dementia. Therefore, we believe it is essential to create probes which express characteristics of openness and incompleteness, which allow the participants to contribute to the design (Brankaert & den Ouden, 2017). In this way, we try to stimulate a feeling of security that there is no specific answer expected on the design, but telling any story which is important to them is relevant for us to gain insights in their values to further develop the design.

In this study, we explored a number of probes and applied them as part of a design process. However, to develop this approach into a method it is recommended to increase the number of participants and the focus on analysing the probes as a method. In this way, a variety of probes used in our study can be investigated further concerning the amount and quality of the output.

Limitations

Over the course of the design process some limitations were found. This co-design process started involving elderly people from the moment there was a clear scope defined, namely social inclusion addressed by an audio concept. Starting with a concrete example was experienced as efficient and also supported the participants in reflecting on something concrete. However, defining the scope together with the participants could also have been meaningful, by for example targeting a hidden need generated in the first group session. The challenge would be to find the right tools for people with dementia to design from scratch, but probes could definitely be one of these tools.

Additionally, another limitation of this design can be found in the look and feel of the radio. We selected a radio design inspired by the 50's, however, this should adapt to the current generation of elderly continuously. Therefore, we would recommend making the product modular, with for example changing covers.

Collaborating with a low number of users, enabled us to dive deeper into the details of their background. However, having such a low number of participants does not reflect the population well. So, it would be interesting to investigate the difference between a personal design and a more general design when designing for people with dementia. In our case the personal approach was important and it would be difficult and time-consuming to extend this design process to a bigger target group. However, by developing concepts that are platform-based or adaptive both needs can be served. These topics therefore remain to be addressed in further research.

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HONG KONG DESIGN MANAGEMENT ACADEMY CONFERENCE 2017

RESEARCH PERSPECTIVES ON CREATIVE INTERSECTIONS

Using collaborative reflection in service design research

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doi: 10.21606/dma.2017.126

Recently, there has been increased attention to how service design can influence the behaviour of people and therefore has the potential to change communities and organizations. This transformative role of service design in changing people's mind-sets is being explored by design practitioners and a shift can be seen from designers in the role of consultants to the role of facilitators. Instead of providing solutions to problems, designers have started to provide tools to guide organizations towards solutions that are co-created by stakeholders and customers. In this paper, we describe how applying reflective practices during service design research can initiate a mind-set change in an organization. We present a case study in which we explore how collaborative reflection can bring people together during service design research and create mutual understanding.

keywords: collaborative reflection; service design; mind-set change; learning organization

Introduction

For years, design is established as a reflective practice. Designers are trained to constantly go back to past and present experiences, empathize with users, and look forward to imagine the implications for the future. Over a period of time, designers have developed effective tools and methods that trigger reflection during their research and design activities. However, in today's world, problems are emergent in nature, which makes them more complex to deal with. Although designers are constantly evolving to tackle these problems, new situations demand new ways of problem solving that go beyond the traditional ways of individual reflective practice. Within the framework of a service design project, we took a creative approach and aimed to introduce collaborative reflection in

different stages of solving a complex problem: from understanding user needs to designing new solutions. This paper illustrates the first step of our journey and focuses on our learnings during the research phase of the project. It is important to note that all research was done in a company setting, along with the execution of the project. The paper starts with a literature review on reflective learning practices and what has already been done in this regard in the field of service design. Then it presents a case study on designing a reflective research method, which is followed by the anlysis and results of using the method in the project. It concludes with a discussion section where is described how collaborative reflection has a potential to change mind-sets and bring people together during service design research.

Literature review

Reflective learning practices

Reflection is a commonly used process to improve practice. In a workplace context, employees often "reconsider (mostly implicit) how they performed tasks, and rethink what they can do better when doing them again" (Prilla & Degeling, 2012, p. 1). This process of memorizing what happened in the past, looking back at these experiences with an analytical lens, and evaluating the situation in order to gain a new understanding for the future is what Donald Schön refers to as 'reflection on action' in his book The Reflective Practitioner (1983; in Prilla & Degeling, 2012). Reflection is often triggered by external cues, such as disturbances, uncertainties, surprises, perplexities or puzzlements. A mismatch of expectation and the actual situation, differences in individual understanding and encountering contradictory or ambiguous information can all lead to a need to reflect. These cues elicit a 'state of discrepancy', which gives a feeling of psychological discomfort (Knipfer, Kump, Wessel & Cress, 2013). However, reflection is often unstructured and implicit and it is bound by human memory. This memory "may fade over time or may be incomplete in terms of all the necessary details that have to be known of the situation the experience stems from in order to re-assess it" (Prilla & Degeling, 2012, p. 2). Thus, this makes the process of reflection very challenging.

For many years psychologists have researched this topic and articulated reflection models from different angles. Kolb's learning theory (Kolb, 1984) states how observation and reflection on concrete experiences can lead to analysis and conclusion (abstract conceptualization). Whereas Gibbs' reflective cycle (Gibbs, 1988) asks to start with a description of the situation including the attached emotions, then evaluate and analyse the experience, and conclude with coming up with alternative actions that could have been considered in order to create an action plan for the future. Nevertheless, most of the empirical research on the reflective practice by Schön, Kolb, and Gibbs focus on individual reflection (Prilla, Knipfer, Degeling, Cress & Herrmann, 2011).

Recently researchers also emphasize on the social dimension of reflection, which is called collaborative reflection and "means that people reflect together by exchanging (similar) experiences, discussing them and deriving insights together." (Prilla, Pammer & Krogstie, 2013, p. 242). Teams often accomplish collaborative reflection in a communicative process, which is externally focussed. Learning from sharing experiences can be deepened by re-evaluating your own experiences from another perspective and together construct

new knowledge for the future. The relation between individual and collaborative reflection is reciprocal, spiral-like, which means that individual and joint reflection are closely intertwined. Knipfer et al. (2013) show how individual reflection is interrelated with collaborative reflection based on Stahl's model of collaborative knowledge building (Stahl, 2000). Degeling and Prilla (2011) further differentiate modes of reflection into three categories: scheduled reflection, which it is planned to happen, concurrent reflection, which happens continuously, and spontaneous reflection, which occurs impulsively and in an unscheduled way. Often reflective practice leads to no result or ineffective result because of unstructured and insufficient support. Degeling and Prilla (2011) also discuss the importance of the supporting a reflective practice by means of: articulation, scaffolding and guidance, and synergizing mechanisms. They identify:

> *(…) articulation as a means to capture experiences and communicate reflection outcomes, scaffolding and guidance as means to support the reflection process and synergizing mechanisms to converge reflection into outcomes to be three basic and decisive tasks to be supported in order to make collaborative reflection work (Knipfer et al., 2011). (Degeling & Prilla, 2011, p. 3)*

Knipfer et al. (2013) argue that individual and collaborative reflection is also a "major catalyst for modification of institutionalized practices and innovation of processes and routines" (p. 44). It takes a bottom-up learning approach by democratizing the decision making power with employees, hence increasing the adaptation rate of the changes and new practices. It also helps the management of a company to reflect on how to remove a barrier and disturbances within the organization.

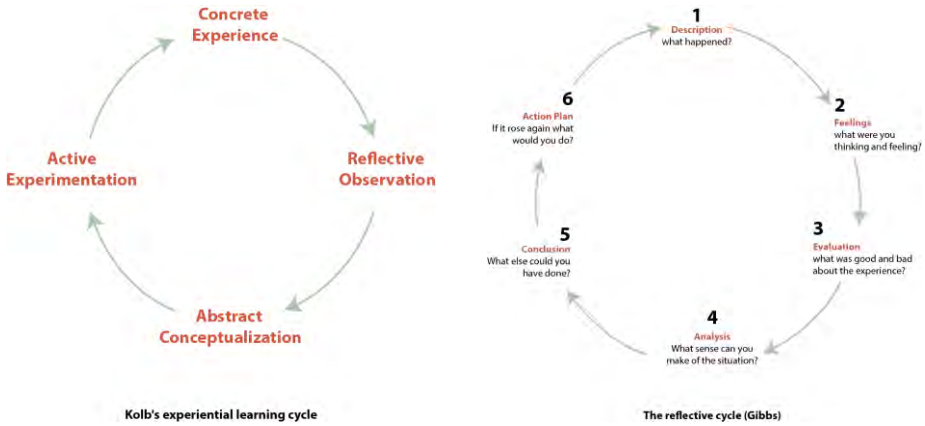

Figure 1 and 2 Kolb's experiential learning cycle and The reflective cycle of Gibbs

An evolving service design practice

Service design typically aims to design a holistic experience focusing on a customer's first touchpoint until the last along a journey of interactions with a company. And although service design practices and theories have been evolving with an increased scale and complexity of today's challenges, many organizations apply service design methods to

design service interactions at the periphery of an organization (Junginger & Sangiorgi, 2009).

As pointed out in the Shostack blueprint model (Shostack, 1984), service interactions on the surface are supported by a complex layers of an organizational system that determines the quality and efficiency of a service. Hence, service interactions directly impact operation, profitability and reliability of a service. In other words, there are deeper parts in an organizational system that determine the touchpoints at the surface.

There is an increased need to understand and visualize the complex systems and actors underneath a service, and service designers are scaling up to explore the contextual dimensions of services. Focus is shifting to the more systemic, organizational level (Sangiorgi, 2009). Working closely with organizations has changed the role of service designers; they have started to work within organizations instead of for them. Being part of the organization and in the role of facilitators service designers are making people aware of their own role towards a desired action or change (Sanders & Stappers, 2008).

When it comes to this transformational nature of service design projects, there has not only been attention to collaboration, participation, co-design and co-creation on the level of stakeholders, but also on the level of users of the services (Burns, Cottam, Vanstone & Winhall, 2006; Steen, Manschot & De Koning, 2011). As 'expert of their own experiences', users can become part of the design team, provided that they are given appropriate tools to express themselves (Sleeswijk Visser, Stappers, Van der Lugt & Sanders, 2005). Involving them in the decision-making process makes them feel engaged and involved and hereby more likely to adopt the service once it is implemented. Also, it will make people understand why implementation of solutions can take time or why things go wrong sometimes (Bradwell & Marr, 2008).

Only recently, authors have described the importance of reflection in service design interventions and how that can lead to changing mind-sets and organizations. Junginger & Sangiorgi (2009) aim to build a bridge between service design and organizational change and call for a joint-reflective process that enables learning. Sangiorgi (2011) makes a link between transformation design and community action research and emphasizes that participation and empowerment are key components to stimulate transformation of a system. She touches upon the importance of reflection in action research:

> *It is intended as a self-reflection and awareness process that leads from seeing oneself as an object responding to a given system to a subject that can question and transform the system itself (as cited in Ozanne & Saatcioglu, 2008). (Sangiorgi, 2011, p. 33)*

Madden and Walters (2016) describe overlaps between action research and service design tools and how participatory action research can make people question "what they are doing, why they are doing it and think more systematically about daily functions and operations" (p. 43). Lastly, Vyas, Young, Sice and Spencer (2016) touch upon the importance of reflection in action during co-design activities and describe the role and utility of inner values in the co-design process.

The next part describes a case study of a research method that was designed for the research phase of a service design project in which a reflective method was introduced to

specifically support collaborative reflection, with the aim to initiate a change in mind-sets during the research phase.

Background

The overall aim of the service design project was to improve the experience of associates who interact with the internal IT service provider of a global engineering company. The IT service provider has about 4000 employees in more than 250 counties, serving approximately 32000 customers. The IT support organization of the IT service provider is structured in three parts:

7. A multi-lingual IT helpdesk that acts as a call centre; providing first, second and third level IT support from different locations,
8. Local IT support representatives present in various countries,
9. Expert IT support teams in each corresponding business unit; who handle anything that is not covered by the two front line entities above.

Earlier research amongst associates revealed problems that seemed deep rooted. The concerns that associates had shared about their IT support organization were rather organizational in nature. In their opinion, the IT support organization;

- Lacks speed and coordination skills,
- Is inefficient and fragmented in its solutions,
- Chooses numbers over quality,
- Does not provide value nor transparency,
- Is not flexible,
- Does not communicate timely,
- Is insensitive to contextual and cultural differences.

Mid 2016, the IT service provider decided to address the deeper causes for the dissatisfaction of the associates and wanted to understand the perspective of the IT support staff as part of a service design project. The main objective of the research phase was to collect data on what was hindering the support staff from providing outstanding IT support to their associates, in order to inform the design phase.

However, the research method was also designed as a moment of collaborative learning. The aim was to use the research sessions as interventions to connect the support staff working in the worldwide IT support organization in a meaningful way. This idea was inspired by insights from another research[1], where it became apparent that the IT support organization is divided in silos and this fragmentation leads to support staff not being able to provide good customer experience.

The following case study describes how we explored the way in which collaborative reflection can be used during the research phase to change the mind-sets of people working in the IT support organization. The research method had three distinctive

[1] We were involved in an in-depth user research with the IT support organization to understand the knowledge management practices of their employees in the IT helpdesk, the local IT support and expert IT support teams.

elements that were designed to stimulate reflection: the session setup itself and two different visual stimuli.

Case study: designing a reflective research method

The session setup

In order to connect people, it was important to bring the IT support staff physically together during the research phase. Instead of the researchers listening to the stories of the participants during a one-on-one interview, we chose a group session in which participants were encouraged to listen to each other's stories.

We designed the session setup as a scaffolding mechanism to provide structure for the participants to go through the learning cycle together (Degeling & Prilla, 2011). Our intention was to let participants experience Kolb's experiential learning model, where they would learn by experiencing, without consciously knowing it. Rather than telling the participants that their colleagues are valuable, we hoped that participants would experience and understand the value of each other by participating in the session together. The session setup was designed to lead them through several smaller learning cycles as a group (Kolb, 1984; Gibbs, 1988). We mapped the process of reflection as described by Boud (1985; in Prilla & Degeling, 2012) to the session setup, so that it would automatically replicate the process of scheduled reflection (Degeling & Prilla, 2011).

While we expected that bringing participants together would make them see how they are all part of the same organization, we also realized that being part of a group session and sharing personal experiences could be challenging, especially when participants do not know each other. We therefore aimed to create a pleasant environment where participants felt at ease to share their thoughts with others. Our previous experience in doing research amongst engineers in our company taught us that not everyone enjoys doing creative exercises during a research. Activities like collaging made some people feel uncomfortable. In addition, we wanted to create a research mechanism where everybody would contribute equally during the research session. Without making the participants feel forced, we aimed to make sure everyone would be involved.

We brainstormed on how we could include visual triggers in our research methods without being too fuzzy, as well as ensure that the group had the same focus and a common purpose throughout the session. We chose a game concept as a research method, as games have a clear goal and guide participants by a set of rules, as well as bring in an element of fun to reduce the pressure of sharing personal experiences with others. A game setup would also be a good anchor to map the process of reflection, without participants noticing.

After exploring several game types, we selected the tile-based game Carcassonne (Wrede, 2000) as our source of inspiration, as we felt it reflects the right amount of seriousness and play. Moreover, it includes an element of collaboration, where participants are asked to build up a world together; an element that we used to stimulate harmony.

The game play

The game, Unison, is designed to encourage discussion amongst members of the IT support organization of the company. The word Unison refers to an action that is done

simultaneously: playing a game together or collaborating in a working environment. The game can be played by support staff in any role, working in different departments of the organization, sited in various geographical locations. Unison can be played with or without a facilitator, in teams of 3 to 4 players.

The Unison game box consists of the following components:

- 26 tiles depicting a piece of an island and/or a stretch of a path,
- 35 Statement cards describing a challenging situation,
- 10 Brainstorm cards describing areas of improvement,
- 4 tokens in the form of a lion, a polar bear, an elephant, and a hippo that represent each player in the game,
- A session guide, including the rules of the game, how to set up a research session with this game, and how to facilitate a research session.

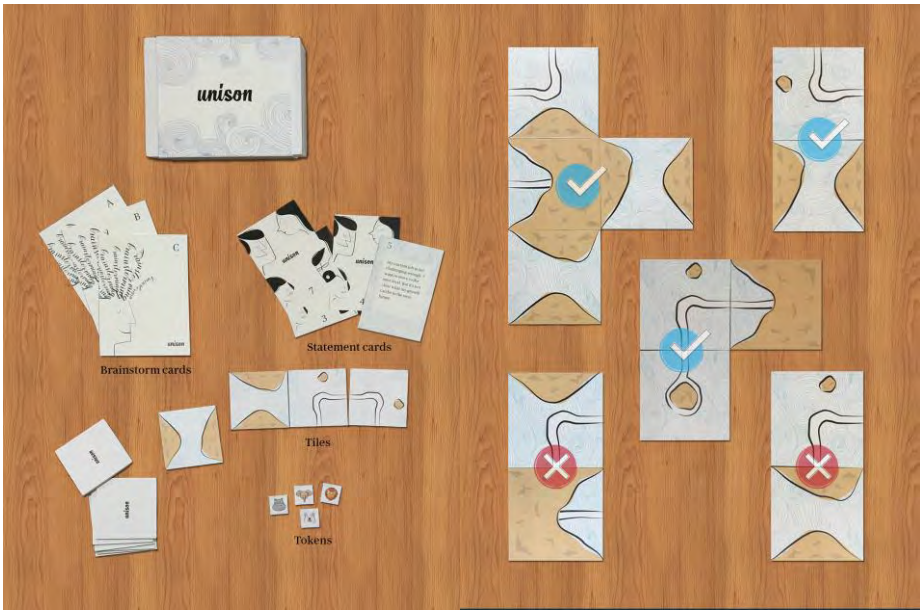

Figure 3 The components of the Unison game box and examples of creating islands and paths

The game consists of a fun part and a serious part. The fun part is aimed at making the participants feel at ease and bring in a small component of competition. It is the visible centre of the game, where players create one landscape of islands and paths together by - one after another- drawing 1 tile and place it face up onto the table, continuing the pattern. Completing an island or a path would give points and the participant with the most points would win the game.

The serious part of the game is linked to turning the tiles: turning a tile leads to playing a card- either a statement card or a brainstorm card. There are three options:

- In case you do not complete an island nor a path when placing the tile, you have to draw a statement card.

- In case you complete a path when turning the tile, you have to draw a statement card.
- In case you complete an island when turning the tile, you have to draw a brainstorm card.

Following these rules ensured that everybody got a chance to share their perspectives according to a pre-defined pattern. We consciously influenced parts of this framework to make sure reflection would take place according to the learning cycle.

While the session setup was meant to go through the learning cycle, the visual artefacts were specifically designed to evoke memories and emotions in the different stages of the learning cycle. The cards that were shown during the game focused on the reflection-side and the action-side of the learning cycle. Schön's reflective practice theory, specifically the notion of reflection-on-action, was influential on how we designed the visual elements (Prilla & Degeling, 2012). They were designed to stimulate the first phases of the reflective cycle of Gibbs (1988) and Kolb (1984). And by using these visualizations, we guided the participants through the phases of facts, feelings, evaluation and analysis.

The statement cards and the brainstorm cards were the two most important visual elements and will be described in more detail in the following paragraph.

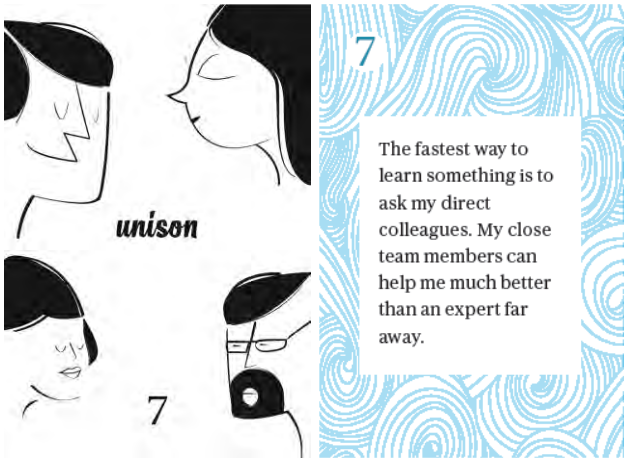

Figure 4 Four faces on the statement cards show a group discussion

The statement cards

The statement cards were the heart of the game and the content was informed by previous research. The card was played individually. When playing statement card, the participant was asked to read the text out loud to the other players and agree or disagree with the statement, explaining in 1 minute the reason why. The facilitator probed for more details according to the session script, in case the answer was general or not revealing anything new.

The statements describe situations that occur in the IT support staff's workplace[2]. Initially, we came up with around 300 statements and we grouped them into 6 design themes[3]. We cut them down to keep the most relevant 5-6 statements per theme, and we verified with the stakeholders whether these statements could be understood by the support staff. We designed the final set as a card set of 35 statements and though the individual statements fitted into one of the design themes, we presented them randomly to the participants.

The statements on the cards were constructed to stimulate reflection. The described situation was intended to recall memories and help participants to remember facts and feelings of past concrete experiences. Because the information in statements represented situations that had actually occurred in the past, it was supposed to help participants to recognize the situation and recollect the details.

Because articulation is important to stimulate reflection (Prilla et al., 2011), we carefully selected the tone and the words of the statements. We described situations in a clear and unambiguous way as we aimed to get the participants focused on a specific topic, so that it would give everyone a deeper understanding. Also, to stimulate the participants to think beyond the general and factual, we formulated the statements from the first person perspective in order to create a personal connection. Lastly, we came up with slightly provocative statements, so that it would help to spark feelings and emotions more easily and encourage to share opinions more impulsively and instinctively.

The brainstorm cards

While the statement cards were the heart of the game, the brainstorm cards were intended as a 'breaker' to the game-flow. Playing a brainstorm card was supposed to be an exciting surprise that would only occur a few times during a game. We selected the final set of brainstorm topics by reviewing concepts that the project stakeholders were already working on against the 6 design themes. The card is played as a group, and the person who draws it is asked to read the text out loud to the other players, after which the group can take 5 minutes to come up with concrete solutions.

When the group got to play a brainstorm card, the facilitator emphasized that it was to be a collaborative activity, where everyone could participate. In this way, the participants could build upon each other's ideas. They were asked to be specific and concrete while sharing their ideas. And the facilitator probed for more details on why and how they were foreseeing this future solution. The final set of brainstorm cards consisted of 10 cards. Because it is difficult for people to quickly jump to brainstorming, we ensured that in most games we played at least 5 statement cards before the first brainstorm card appeared.

[2] Examples: *Statement 4:* Existing channels are too limited for communicating worldwide. The person who knows best sits somewhere else and I don't know how to reach them. *Statement 17:* I always find the formal updates for solutions to be out of date. I don't rely on them anymore. *Statement 22:* There are too many channels for sharing my knowledge. I need more guidelines on what to share and how to create clear documentation.

[3] The design themes were 6 areas that seemed to determine the success of a support organization from an employee's perspective: service concept, capacity development, new product roll-out, knowledge practices, motivational concept, and customer interface.

We formulated the brainstorm assignment in the form of a question[4] and asked the participants what ideas they have to improve the current situation. We wanted them to think about what else they could have done in a certain situation, and to formulate what can be done in future. We hoped that this would give us some valuable ideas for the project.

But more importantly, although they brainstormed on future solutions, we aimed to make them realize whether they could do something themselves to change a situation. We asked them to articulate the solutions in detail, as that may help in sustaining outcomes and trigger follow up reflection sessions (Degeling & Prilla, 2011). We encouraged them to discuss a solution from different perspectives and experience how it is to jointly work on a solution that is beneficial for all.

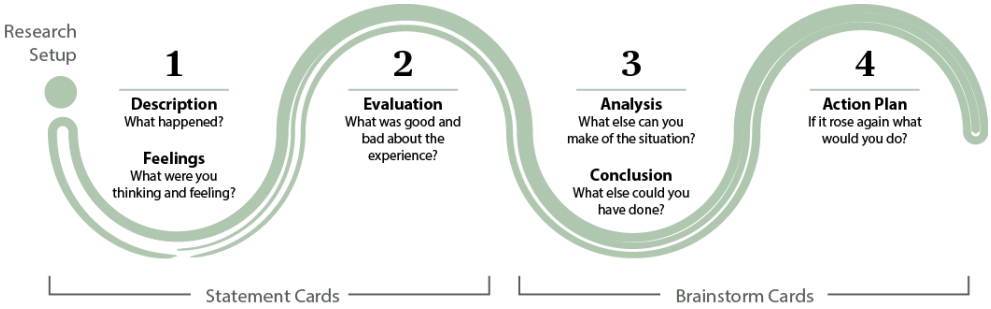

Figure 5 The collaborative reflection elements mapped onto the learning cycle

Method

The research sessions

In total we facilitated 40 sessions in teams of 3 to 4 players in 8 locations in APAC and EMEA (Bangalore, Manila, Shanghai, Suzhou, Berlin, Timisoara, Stuttgart, and Bamberg) covering the IT helpdesk, the local IT support and the expert IT support.

Each session lasted for 1.5 to 2 hours, was recorded with a voice recorder and pictures were taken while participants played the game. There were always at least 2 persons present to guide the session: 1 facilitator and 1 note taker. There were three teams conducting the sessions in different locations with various research and facilitation experience. Each team covered at least one location in APAC and one in EMEA. An additional benefit of a game as a research method is that –once the rules are designed- it is relatively easy to replicate the research as an unexperienced facilitator. However, as a support, a session guide was designed that contains instructions on the game and probing questions for facilitation, as well as a cheat sheet for the note taker, to look up the statements and brainstorm questions while documenting the discussions.

[4] Examples: *Card C:* How do you want to be guided while interacting with the customer? *Card F:* How can you align better with your colleagues in other locations?

Figure 6 and 7 The session guide and the cheat sheet

The participants

Because the scope of the research was wide, we created a few general parameters for the worldwide selection of participants:

- Comfortable to express yourself in English,
- Be open to a gaming setting (it will not be a role play, more like a board game),
- Mix of female/male representative to the location,
- Mix of age representative to the location,
- Mix of experience level representative to the location (no. years in the company),
- Mix in competence areas or area of expertise representative to the location (e.g. Microsoft Office, VoIP, RAS, desktop/laptop SW/HW related, new ID creation, MyCloudPC, etc.),
- Mix in support level representative to the location (e.g. first level, second level, third level).

The grouping of the participants happened according to what was expected to generate uncommon exchange of views in different combinations. For example: we had groups where all participants were providing first level IT support, but responsible for different products. And we had other groups where participants were providing support for the same product, but responsible for a different level. This way, all participants had something in common that made them feel familiar with each other, while the diversity in their background was expected to stimulate curiosity to each other's experiences.

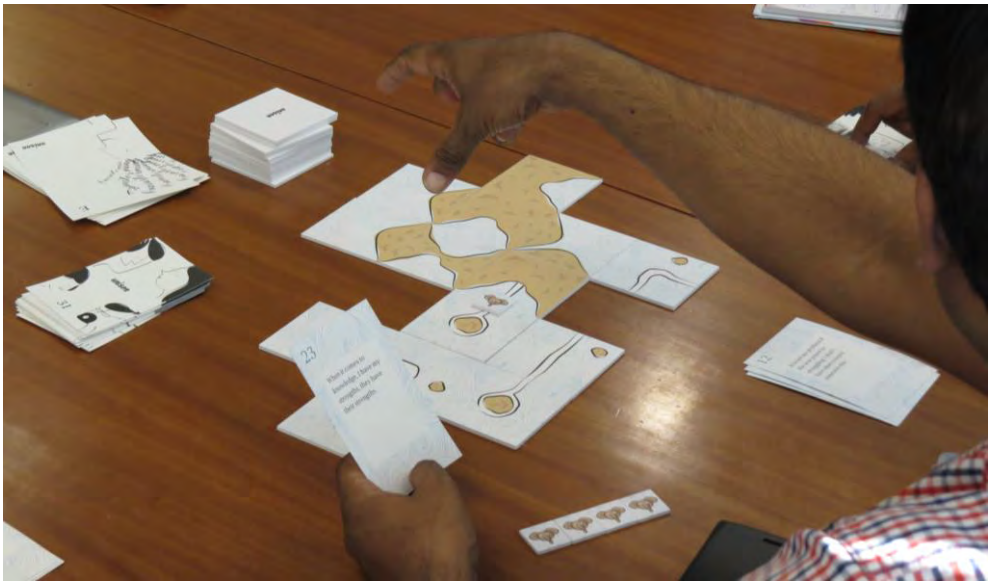

Figure 8 The participants during a research session

Analysis

At the start of each session, all participants were informed about the project goal and the primary aim of the research. They were also informed about the uncommon way of doing research, however this was shared with them in an enthusiastic and compelling way.

All sessions were facilitated following the session guide, so that the learning cycle would be a constant. However, the order of the topics varied depending on how the statement and brainstorm cards were shuffled. In most sessions the turning of the 26th tile was determining the game's end, however in a few sessions we had to stop before all tiles were played, due to time constraints.

To evaluate whether the intended reflective measures had the expected effect, several methods were used: observations (verbal response to each other, physical gestures while another person is speaking, building upon each other's ideas, asking each other questions, way of sharing individual opinion on statements, etc.), a formal written feedback form at the end of the session, and a short informal chat after the session.

Results

The game setting created a relaxed and open atmosphere

Enabling a relaxed and open atmosphere is an important parameter for creating space for reflection and learning. In our observations we noticed that in most sessions, we did not need to facilitate much anymore after the first round of playing the game. We saw that a focus on the game elements that were lying on the table, especially the tiles, contributed to making the experience of participating in a research a pleasant one. In some cases, we observed a few tensed faces before we started playing, but they became relaxed when it was clear that we were okay with them continuing the game, as how they would do it in a

family setting. In many cases, we saw participants cheering when they would score points, or secretly laughing when another person put the tile on the 'wrong' (less points) place of the pattern.

In the feedback forms and the informal chats we got the insights that a game setting helped to lighten the seriousness of the topic and encouraged participants to share their own experiences. They felt that the (perceived) unstructured way of the game method was a comfortable way to express their thoughts as compared to a formal discussion. It helped them to open up to us and to each other and identify the discrepancies together. An often heard point for improvement was to take more time to play a session.

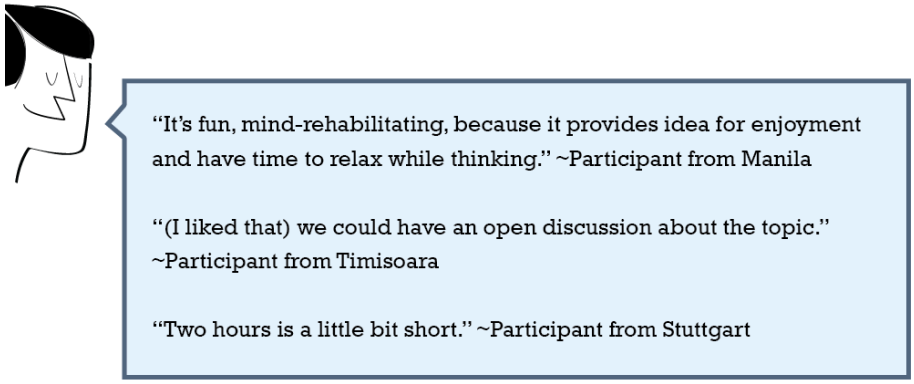

Figure 9 Quotes from the participants' feedback forms

From individual reflection to collaborative reflection

Although participants were recollecting individual experiences through the statement cards, we observed that it became joint reflection moments, as soon as they shared their experiences with the group members. By reading the statement cards out loud and (dis)agreeing to them openly, the perspectives of others became directly available for everyone, which helped to complement individual memories. The statement cards enabled the participants to remember past situations in detail, and the group setting helped them to critically reflect and evaluate the situations.

In many sessions, we saw that other participants also wanted to share their opinion on the same statement; confirm a similar experience, add something, or share a different perspective. Although this was not according to the game rules, participants took the initiative, because they were triggered to exchange their experiences and reflecting on the statement helped them to rebuild a past experience.

In the feedback forms, participants shared that they found it valuable that they got to listen to each other's stories and thereby learning other perspectives. They saw it as an opportunity to share their opinions to many different questions and it helped them in understanding each other's viewpoints. This way, the conversations about the statements were not only us collecting our data, but it was them learning from each other and creating a mutual understanding. Creating this shared understanding is needed to synergize within the group and has to happen before going to collaborative action.

Suggested improvements were to play the session with more participants and with more frequency; almost everyone was enthusiastic to spread this game wider in the organization.

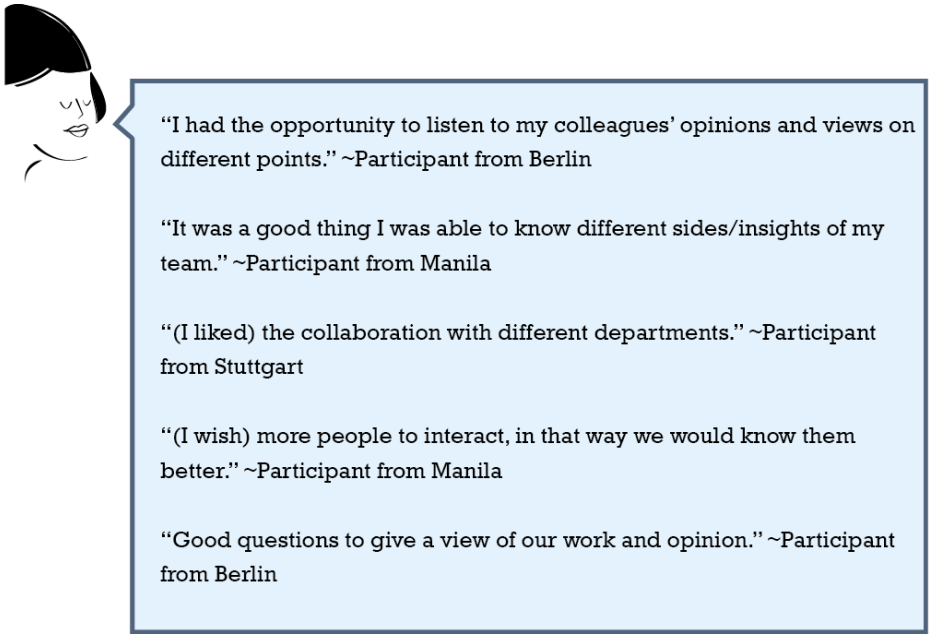

Figure 10 Quotes from the participants' feedback forms

From reflection to action

Although co-creating solutions was not the primary focus during the research phase, we did aim to give the participants the experience of how it is to move from reflection to action, and complete one learning cycle. This is why we included the brainstorm cards in the research phase. In sessions where more statements cards were played before the first brainstorm card, we could see that the brainstorm discussions evolved more around intangible ideas. Participants came up with ideas to change the norms and values in the IT support organization to become more open and improve collaboration between different units; rather than focusing on material needs.

In the feedback forms, we also read that participants wish to have this kind of discussion more regularly and with more participants in the future. They enjoyed to share their suggestions and ideas about common issues. And a few participants stated that they hoped their ideas to be implemented in the future.

"I think the brainstorming with cards makes the discussion more interesting." ~Participant from Berlin

"It opened my mind for creativity!" ~Participant from Stuttgart

"I liked the questions where everybody could participate in the discussion." ~Participant from Stuttgart

"(I wish) more participants to get more ideas and to share more information." ~Participant from Manila

Figure 11 Quotes from the participants' feedback forms

Discussion

Following the learning cycle during the research sessions was an iterative process which enabled the participants to get into a reflective mood, from remembering a concrete experience to evoking feelings and analysing the situation, into stimulating collaborative learning before going over to action. The presented case study shows how applying theories of collaborative reflection during a research phase of a service design project can enable employees of an organization to reflect together and build a common understanding.

Adding an element of collaborative reflection gave the participants the opportunity to understand similarities and discrepancies in the IT support organization from a collective standpoint. It enabled them to articulate deeper organizational differences, as well as collaborative solutions, more precisely. The analysis showed that collaborative reflection has the potential to make the participants aware to question - and in some cases co-design - deeper norms and values of the organization in which they work.

Although we believe that stimulating collaborative reflection helped the participants to go through a change in their thinking and adjust their mind-set to open up to the other participants, we also recognize that for a sustainable change in behaviour, more interventions are needed. The step from reflection to action is a challenging one and requires more time.

A month after the research, we followed up with an ideation workshop, where research results served as input. This time, we brought people together from different parts of the world to reflect collaboratively. The focus during the workshop was more on the action part of the learning cycle. However, without a proper reflection, there is no basis for action. Similar to what happened during the research sessions, we observed that our artefacts and exercises helped the participants to go through an accommodation process by acknowledging other people's experiences, and re-evaluating their own experiences

through the perspective of the other. They challenged their own understanding and interpretation of an experience.

Since the artefacts that we designed for the workshop were based on in-depth research results, we saw that participants were able to go deeper during the ideation and started to build upon each other's ideas. This brought in new perspectives for both sides, and made participants subtly realize how collaborative reflection can change their own viewpoint. As a result, they came up with solution directions that are not solely geared towards technical solutions, but aimed at designing the deeper-rooted behavioural norms and values of their organization. An example that came out of the ideation workshop was an idea to create a code of conduct which should form the basis for their worldwide collaborative work practices.

At the moment, this is where the project stands, and we are currently looking into taking the ideas from the workshop further in follow-up design interventions, again including collaborative reflection to keep on stimulating a positive change in the mind-set of the people working in the IT support organization of our company.

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HONG KONG DESIGN MANAGEMENT ACADEMY CONFERENCE 2017

RESEARCH PERSPECTIVES ON CREATIVE INTERSECTIONS

The role of inner values to teamwork during design for social innovation

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doi: 10.21606/dma.2017.127

Professionals can increase their performance by improved actions but true change occurs when the underlying 'inner values' change (Argyris & Schön, 1974; Smith, 2013). Applying a design process while working in teams during social innovation projects also requires certain 'inner values'. Schön (1983) suggested reflection as a way to improve professional practice by challenging and changing the underlying value system. Various literature identifies different inner values, which are considered important for teamwork during design for social innovation (DfSI), however this is not systematic, evidence-based research. This paper presents such a study conducted in this context.

Firstly, this study presents a review of key literature, which leads to a list of inner values considered important by authors for DfSI. Secondly, a survey method collected quantitative and qualitative data from 29 expert design practitioners who reflected on their teamwork experience during DfSI. The survey showed that most experts apply the list of inner values from literature, yet their understanding demonstrates a variety of interpretation and application, leading to more questions than answers and revealing the complexity of DfSI. The survey also found that whilst many inner values play an important role, the trade-off between them is essential, requiring wisdom and balance by the designer.

keywords: inner values; teamwork; design; social innovation

Background

McDowell, et.al. (2016) claim, "Hierarchical organizational models aren't just being turned upside down—they're being deconstructed from the inside out. Businesses are

reinventing themselves to operate as networks of teams to keep pace with the challenges of a fluid, unpredictable world." They give examples of restructuring in the U.S. military, GE, IBM, Amazon, Nestlé and many other companies, which report that the "network of teams" is governed by a common organizational strategy and yet the teams are empowered to set out their own goals. The members in such teams communicate openly within and across teams, and supply real-time information to stakeholders. However, working in teams can be stressful for various reasons and brings importance to 'reflexivity'. where teams can be collectively "cognizant of the issues of diversity and differentiation" (Cooke and Kothari, 2001). For such cognizance, the learning mechanisms employed are driven by the interactions, either interaction with other people (learning by participation (Platts, 2013)) or interaction with the surroundings (learning by acquisition (Sfard, 1998)) or even interaction with oneself (learning by reflecting (Schön, 1983)). However, competence during any learning comes not only from knowledge and skills but also by having an appropriate attitude. For example, when interacting with a rock, the attitude of an expert sculptor is different to that of a novice, which makes all the difference. Attitudes arise out of a core of inner values and beliefs. While beliefs are assumptions and convictions that are held to be true, based on past experiences, inner values are the worth of things, concepts and people in the mind (Thompson, 2013, p.34). Inner values have also been called 'Character Strengths' (Peterson and Seligman, 2004), 'Governing Variables' (Argyris and Schön, 1974) and 'Virtues' (Schwartz, 2009). The Jubilee Centre has been researching such inner values in a variety of human occupations and professions, and has published reports on the professions of law, medicine and teaching and more recently the British Army, nursing and business. However, similar research in the field of Design for Social Innovation (DfSI) remains vague.

The earliest contribution in developing individual design practice comes from Schon's "Reflective Practitioner" (1983). His contribution was considered seminal in the field of design to inculcate reflection in action and contributes to the development of professional practice by changing more than just actions. This can be understood using early work by Argyris and Schön (1974, 1987), which explains theories of change where professionals have certain espoused theories regarding their own practice and theories in action that denote what actually exists in their professional practice. The gap between such espoused theories and theories in action breeds the possibility for professional development, which leads to organizational change in teams, institutions and society. To explain change in the professional practice of teams, Argyris and Schön (ibid) propose two models: Model one is based on 'error detection and correction' (Smith, 2013), while model two "involves questioning the role of the framing and learning systems which underlie actual goals and strategies" (Usher & Bryant: 1989:87). To help understand the models of change, Argyris and Schön define three elements. The three elements are:

"Governing variables: those dimensions that people are trying to keep within acceptable limits. Any action is likely to impact upon a number of such variables or inner values–thus any situation can trigger a trade-off among governing variables.

Action strategies: the moves and plans used by people to keep their governing values within the acceptable range.

Consequences: what happens as a result of an action. These can be both intended (those which actors believe will result) and unintended. Consequences can also be for the self, and/or for others" (Argyris & Schön, 1974 as described by Anderson, 1997 in Smith, 2013).

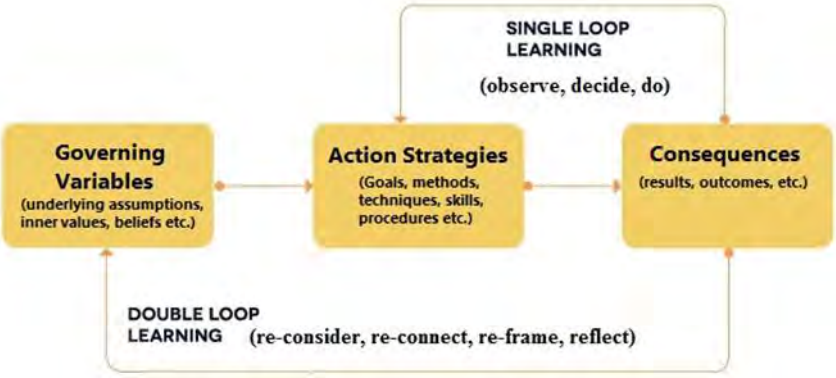

Figure 1 Single and Double Loop Learning.Source: Adapted from Argyris and Schon (1978)

This paper describes how a professional or team of professionals utilise or hope to utilise certain governing variables, called 'inner values', to devise action strategies during their practice, which leads to intended and some unintended consequences. Model one, based on 'error detection and correction' (Smith, 2013), depicts change in action strategies only with minimum reflection and no change in the governing variables. Here the focus is on 'technique and making technique efficient' (Usher and Bryant: 1989:87). It is called single-loop learning and it hinders the creation of sustained outcomes and leads to temporary change because the underlying assumptions, beliefs and inner values are unchanged (Argyris and Schon,1974, explained in Smith, 2013). On the other hand, model two, which "involves questioning the role of the framing and learning systems that underlie actual goals and strategies" (Usher and Bryant: 1989:87) leads to a change in governing variables (underlying assumptions, beliefs and core inner values) and in turn changes the course of action strategies being applied. The process is called double-loop learning where "reflection is more fundamental; the basic assumptions behind ideas or policies are confronted… hypotheses are publicly tested… processes are dis-confirmable not self-seeking" (Argyris, 1982:103-4). This leads to shared outcomes, which sustain scrutiny and such outcomes survive beyond the project intention. Thus, the role of reflection is highlighted for trading off those inner values that may become a hindrance to professional development while building up the necessary inner values, which support better professional practice. Schön (1983) also explains ways in which designers can practice such reflection in action to become better professionals, but does not highlight which inner values play important roles. He also does not clarify the designer's development as part of a team, or while working with participatory approaches. This may be because the importance of inner values is context specific and designers often work on projects across a wide variety of contexts. However, it should be noted that inner values cannot be considered important or un-important without the context in which they are applied. Therefore, the context for this research is defined as 'teamwork during DfSI' (Vyas, et.al., 2016).

Context

The term Design has been understood differently by different disciplines and the definition adopted during this research is: “The purposeful activity initiated by the recognition of a perceived problem or opportunity, which through the application of energy, skill and resources leads to re-arranging the reality, set against a particular contextual backdrop of broader change, so that the changes facilitate value and benefit to an identifiable quantity of people who come into contact with the changes” (Spencer, 2008).Also, during this research social innovations are “Innovations that are social in both their ends and means. Specifically we define social innovations as new ideas (products, services and models) that simultaneously meet social needs… and create new social relationships or collaborations. They are innovations that are not only good for society but enhances society’s capacity to act.” (Board of European Policy Advisors in Hubert, 2010).

Defining the context enables the literature on inner values with regard to teamwork, DfSI, to be judged as relevant to this research. It should be further noted, that certain inner values may be useful for traditional product or industrial design contexts (e.g. shrewdness as described in Kaufman, 2014) rather than teamwork for the DfSI context and such inner values are not considered relevant during this study. Thus, this research looks for inner values recognised in literature relating to the combined context of: teamwork, design and social innovation.

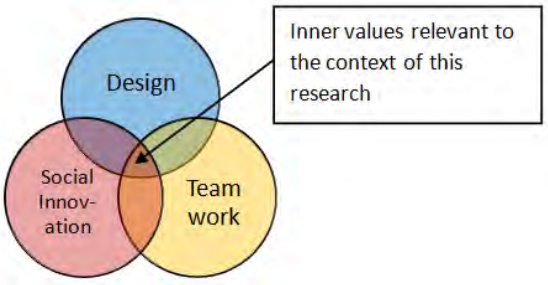

Figure 2 Context of Research. By author

This research suffered obvious time constraints, limiting the number of inner values that could be recognized in literature. The section below provides a set of inner values recurring in key literature on teamwork, design, social innovation and DfSI. The list is not exhaustive but a start of an enquiry and a beginning to gathering reflections on Design practice.

Inner values for teamwork during DfSI

1. Hopefulness for co-operation:

Table 1 Key literature on Hopefulness for co-operation during team work for DfSI

Author	Context	View
Nowak, 2011	Bio-economics	Symbiotic development
Peterson and Seligman, 2004	Positive psychology	Character Strength for initiating relationship
Luthans et.al., 2001 and Koya, 2014	Leadership	Decision making
Vikari and Tornaghi, 2010	DfSI	Inspiring possibility through participation

Table 1 shows the key literature on Hopefulness as inner value during teamwork forDfSI. With regard to Hopefulness, Nowak explains how human society requires hopefulness, that the first step of both parties will be towards co-operation. Similarly, Peterson and Seligman from psychology mention that Hopefulness is a virtue, a strength of character, which helps in initiating new relationships. Authors from leadership studies explain how hopeful leaders are able to make holistic decisions because they are inclusive and encouraging in their approach with others. Therefore, hopefulness as an inner value is considered important for teamwork during DfSI, because it helps to create new relationships that can benefit teams through encouraging participation, inclusive decision making and a positive approach to working together.

2. Generosity of Spirit

Table 2 Key literature on Generosity of spirit during team work for DfSI

Author	Context	View
Nowak, 2011	Bio-economics	Sharing benefits and cost of co-operation
Peterson and Seligman, 2004	Positive psychology	Doing more than what is fair
Amabile, Fisher and Pillemer, 2014	DfSI	IDEO's Culture of Helping by making collaborative generosity the norm

Table 2 summarizes key literature on Generosity of spirit during teamwork for DfSI. Generosity of spirit, according to Nowak, is the ability to accept a lower share of benefit or a bigger share of cost arising from co-operation with others. Peterson and Seligman mention Generosity is doing more than what is only fair and co-operating in the face of what seems to be a punishment and when kindness cannot be returned. From a DfSI point of view, generosity is needed for a user-centred, participatory or co-design approach

according to a survey done by IDEO published in Harvard Business Review (Amabile, Fisher and Pillemer, 2014).

3. Forgiveness for defection

Table 3 Key literature on Hopefulness for co-operation during team work for DfSI

Author	Context	View
Nowak, 2011	Bio-economics	Reciprocating defection with co-operation
Peterson and Seligman, 2004	Positive Psychology	Restoration of relationship
Kwon, 2013	Design	Fundamentals of DfSI

Table 3 summarizes literature which show forgiveness as an inner value for team work and DfSI. The inner value of forgiveness has been extensively studied by various disciplines including different religious studies. Nowak explains forgiveness with the example of a tit-for-tat strategy, where the consequences of non-cooperation are too harsh and forgiveness is required to reciprocate such non-cooperative action with co-operation, during the next interaction. Peterson and Seligman explain that forgiveness is important for the restoration of established relationships. Within design, forgiveness has been considered a fundamental aspect of DfSI (Kwon, 2013).

4. Patience to let events unfold

Table 4 Key literature on Patience during teamwork for DfSI

Author	Context	View
Osborn, 2008	Design	Patience towards unacceptable ideas
Nemeth, 2008	Design	Patience towards opposing ideas
Grossman, 2011	Psychology	Not reacting before letting event unfold completely
Hunter and Rigby, 2009	Gandhian Philosophy	Preserving balance in adversity
Swami, 2000	Culture Studies	Not waiting or enduring but actively seeking balance

Table 4 above presents the literature on Patience as an inner value during teamwork for DfSI. Many different authors in Design propagate patience. For example, Osborne promotes brainstorming and insists ‘do not interrupt’, which is patience. On the other hand, Nemeth explains discussion and challenging views build knowledge and warns that patience to let events unfold is required to avoid chaos. It is important to note that

patience as an inner value is not passive waiting but an active effort to find balance in the face of adversity.

5. Acceptance of situation

Table 5 Key literature on Acceptance of situation during teamwork for DfSI

Author	Context	View
Nemeth, 2012	Design	Acceptance of debate and criticism
Osborn, 2008	Design	Acceptance of creative out-of-the-box ideas
Heyes, 1994	Biology	Experiencing event without defence, as they are
Kabat Zinn, 2013	Psychiatry	Facing unexpected events
Peterson and Seligman, 2004	Positive Psychology	Steady thought process irrespective of faced events

Table 5 shows the key literature on Acceptance as an inner value for teamwork during DfSI projects. With regard to Design, Acceptance of a situation can include accepting other's opinions, as Nemeth explains, or acceptance of other's ideas, as Osborne describes. Acceptance is experiencing events in a balanced way. This is true for good and bad events. Therefore, Kabat-Zinn explains acceptance as 'facing unexpected events' and remaining steady in thoughts and actions.

6. Being Non-Judgmental

Table 6 Key literature on being Non-judgmental during teamwork for DfSI

Author	Context	View
Osborn, 2008	Design	'Do not criticize' strategy for creative input
Kabat Zinn, 2013	Psychiatry	Genuine account of reality
Biestek, 1953	Social Work	Avoiding personal bias

Table 6 summarizes the key literature on being Non-judgmental as an inner value during teamwork for DfSI. In Design, being Non-judgmentalis considered important in the words of Osborne who states, "*Creativity is such a delicate flower that a hint of judgement can hinder it*". Non-judgmental attitude is required to genuinely understand our own experience along with all associated emotions and feelings. It is an attempt not to let personal bias come in the way of our objectivity or another's creativity. However, being non-judgmentalshould not be equated to not being critical. As Nemeth points out, while critical review of ideas is necessary, being judgmental is a final permanent opinion, which can hinder discussions.

7. Keeping a Beginner's mind

Table 7 Key literature on keeping Beginner's mind during teamwork for DfSI

Author	Context	View
Uzzi, 2007	Creative studies	Correlation between Strength of Relationships and Creativity
Varela, 1993	Enactive cognitive science	Unlearning the fear based synaptic connections
Scharmer, 2010	Leadership theory	Burden of knowledge
Kabat Zinn, 2013	Psychiatry	Experiencing everything as if for the first time
Suzuki, 2000	Japanese wisdom	Letting go preconceptions

Table 7 summarizes key literature reviewed during this research to understand the role of Beginner's mind as an inner value during teamwork and DfSI. Human memory is made of fear based synaptic connections, which are required for survival. However, such old knowledge hinders growth and development through new knowledge. Therefore, Varela talks about unlearning and mentions keeping a beginner's mind as an important step for improving cognition. It is not an act of forgetting but looking at things from a fresh pair of eyes, as if for the first time. It is the ability to maintain balance between novelty and knowledge in relationships so that creativity can evolve.

Research Methods

After identifying the list of inner values from literature, it was necessary to confirm their importance to design practice within the DfSI context. A scientific, rational and objective method is key in determining if the inner values are actually important to Design practitioners.

Survey Method

A survey method was selected to collect quantitative and qualitative data from participants who are expert design practitioners with experience of working in teams during DfSI projects. In terms of ethical research practices, these participants are above the age of 18 years and are not categorized as vulnerable according to the Mental Capacity Act (2005). The survey was divided into four sections. Section A collected basic demographic information about the participants such as their age, experience in the field of teamwork during DfSI and the nature of their experience as either a design practitioner/design academic or both. This section also enquired about the organization the participants have been affiliated with. Section B was the main survey and consisted of seven questions about the inner values explained above. Each question was preceded with the table showing different sources of literature (as above), followed by a short introduction summarised from the tabulated literature. The questions were to be answered by selecting an option from the seven point Likert likelihood scale (Moors, et.al., 2014) for an inner value channelling your (or any designer's) decisions and actions while

working in a team during DfSI projects. The participants were provided with some space after every question to give a reason for their choice on the Likert scale. An example of the questions asked to collect the reflection of participant experience is given below:

Table 8 An example of qualitative and quantitative questions asked during the survey

In your expert opinion, do designers require the inner value of Hopefulness for co-operation as defined above during teamwork in DfSI?

○ Always true ○ Usually true ○ Often True ○ Occasionally true

○ Rarely true ○ Usually not true ◉ Almost never true

Reason for your choice:

Section C was created for the participants to provide additional comments e.g. any additional references they thought the research should look at, any other inner values they considered relevant. Finally, Section D provided the list of references. The participants were provided with a Participant Information Sheet, which provided the following information:

- Why the survey was being conducted
- Who were the expected participants
- The rights of participants
- Structure of the survey
- Informed consent

The participants confirmed their informed consent in accordance with ethical research approval. Any incomplete surveys were not considered for analysis.

Analysis

Process of Analysis:
The survey data was made anonymous and stored securely. The responses to the likelihood of an inner value being useful for teamwork during DfSI was collected with the reason for the choice. Therefore, the survey collected quantitative data from the Likert

scales and qualitative statements from the reason for the choice, which provide a deeper understanding of the expert design practitioners' perception of the role of an inner value. The quantitative data was analysed using descriptive statistics and presented in graphs while the qualitative responses were coded for the purpose of backtracking and review. For example, the response from the third participant to the role of inner value 1 was coded as P3Q1. The quotes were divided into for and against arguments based on the choice on the Likert likelihood scale with the reason provided for the choice. The outcomes of the analysis process are explained below.

Demographic Information

The demographic information of the respondents can be seen in the graph in Figure 5. It indicates that the study has an equal gender distribution and has used responses from experts across a wide range of design experience. The graph shows that all participants have expertise as design practitioners and some participants (less than 20%) also act as design academics. The participants came from a wide range of countries as shown in the table below:

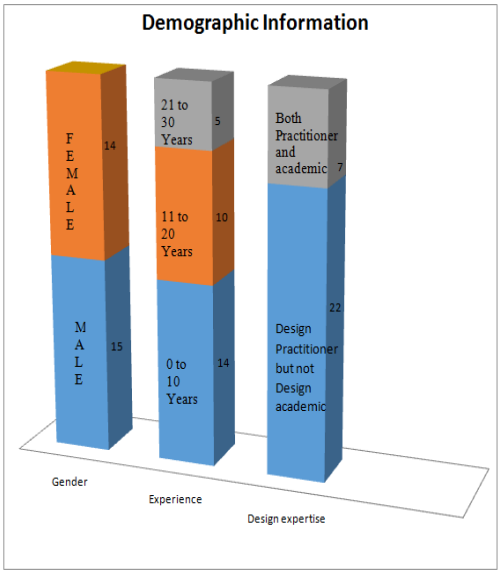

Figure 3 Demographic details of data

Organization(s)	Country
FHNW, Bazel (Switzerland)/Graphic design- Research, Elewijt	Belgium
Interactive Institute	Sweden
Barnbrook	GB
The Chase	GB
Design Intellect	GB
IBM	US
Central Saint Martins, University of the Arts London	GB
Newcastle University	GB
The Sage	GB
Northumbria University	GB
RISE Interactive	Sweden
Oslo University	Norway
IDEO	GB
Philips design	Netherland
Prefer not to mention	GB
Deisgn Solutions, IBM	US
Malmö University	Sweden
Accenture, Newcastle	GB
Glasgow school of Art	GB
Recreational Equipment, Inc. Co-op	US
RVI Bradford	GB
IDEO, Germany	Germany
Baltic	GB
Think Public	GB
MindLab	GB
thinkpublic	GB
JISC	GB
Baltic Centre	GB
Doors of Perception, Royal College of Art	France

Figure 4 Institutional background and Country of participants

Findings from the Quantitative analysis:

The graph below in Figure 5 shows the choices of the 29 participants on the likelihood scale during this survey. The lighter shades of grey in the graph show a high likelihood, while darker shades show low likelihood that the particular inner value has been considered useful for teamwork during DfSI by the expert design practitioners.

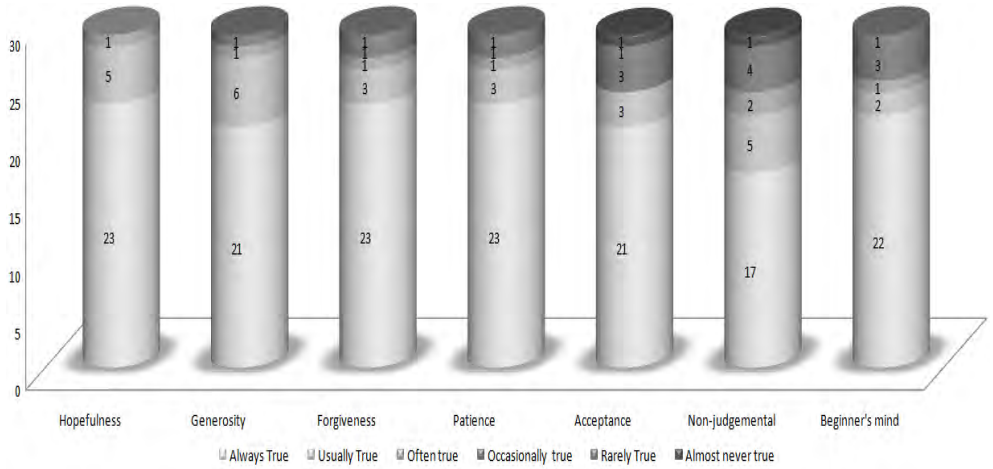

Figure 5 Results of likelihood scale from survey

Findings from the Qualitative analysis:

The analysis of the qualitative data was initially conducted by segregating data based on the corresponding choice on the likelihood scale. However, it was realized that this way was simplistic and would not do justice to the variety of interpretations of application of inner values provided by the expert design practitioners. Therefore, the data has been segregated to derive themes that recurred in the comments, to bring out these themes as arguments arising from data. Such analysis of data leads to more questions than answers, revealing the complexity of judgements that were being made by the experts. These themes arising in the form of questions are presented below. The relevant data is shown only for the inner value of hopefulness to keep within the word count for this paper.

Hopefulness for co-operation:

Do designers require hopefulness?

Quote P13Q1 explains the importance of hopefulness at a personal level, “Working in social innovation as a designer means having hope that you will succeed, that people will work with you and consistent efforts will lead to successful positive change.” Further, quote P1Q1 explains the importance of hope at the project level, “Without hopefulness, there is little point in starting anything. Designers always hope that their work will affect the behaviour of people and change things for the better ...”. Quote P8Q1 elaborates why hope is needed, “In all projects I worked on, the design team and I have remained hopeful. For example, in a social innovation project with the local community we required sensitive information, which could be embarrassing for participants to talk about. The hopefulness for co-operation shows in the approach to the participants and that is what they respond to and open up to.” In addition, quote P12Q1clarifies how hope works, “The designers in Social Innovation projects are working with intangible human feelings and having hope shows the stakeholders and participants in a project the confidence of positive change in the future. This attracts positivity from them, which makes the project move forward and complete successfully.” Quote P29Q1 exploits the creation of hopefulness and explains, “Hope co-exists with a prepared-ness for things to develop in an unexpected way - so I

have said 'often true' rather than 'always true'". Quote P7Q1explores the context of teams and clarifies, "It is important to be hopeful that the rest of the team will contribute in a likeminded way, otherwise there would not be a reason to collaborate with those team members." Thus, according to the expert design practitioners who participated in the survey, the inner value of hopefulness for co-operation is essential for teamwork during DfSI to start a project, build relationships with other team members, stakeholders and community members and to create a positive trusting environment during the project.

Can designers remain hopeful through the course of DfSI?

The process of team work during DfSI requires the inner value of hopefulness but data shows that maintaining such hope seems to be an issue. P5Q1 explains consistent hope is not possible, "*Hopeful designers perform better because their commitment shows. During the course of the* (design) *process there are high and low points for hope.*" The reason for these 'ups and downs' is explained in quote P24Q1: "*In my experience hope is important in social innovation projects as the problem and possible solutions are unclear. It could get really messy working through the uncertainty but hope keeps the project going.*" Thus, the data shows that even though hopefulness is an essential inner value, designers, stakeholders and the community may not always remain hopeful at all times due to uncertain circumstances that may suddenly change during the course of the project.

Who is responsible for remaining hopeful?

The quotes discussed earlier explain the importance of designers remaining hopeful (refer to quotes P1Q1, P5Q1, P12Q1 and P13Q1). The quote P23Q1 reinforces the point, "*Hope keeps designers going through thick and thin. But it is even more essential to a community that the people bringing change remain hopeful, it is equally important to funding organizations, local councils and other stakeholders that the team responsible for change remains hopeful. Hope builds confidence into the efforts of the team.*" Further, quote P3Q1 puts the sole responsibility of being hopeful during DfSI onto the designers, "*To start off, the design team needs to be hopeful but it cannot be expected from other stakeholders and community members you design for. DfSI needs designers to remain strong and hopeful even when morale is lowered by uncooperative situations.*" On the other hand, quote P10Q1 exclaims, "*It* (hopefulness) *is not necessarily a requirement for the designer, but it is for the stakeholders involved.*" The general consensus remains that the responsibility of remaining hopeful is shared by both designers/design teams as well as stakeholders/community and quote P4Q1 explains "*Hopefulness is important during social projects to create the enthusiasm about the work. Within design teams hopefulness is also important, but the community which you work for also needs to be enthusiastic*." The participants differentiated between the hopefulness of designers and the hopefulness of other stakeholders and community members for whom the project works and the data has also raised the question of who is responsible for creating and maintaining hopefulness during DfSI and the answer seems to be that everyone involved shares the responsibility of remaining hopeful.

Generosity of spirit:

Do designers require a spirit of generosity?
Expert design practitioners believe that designers need to take the first step and be generous so as to build trust with stakeholders and community members during DfSI. Designers cannot have the attitude of doing transactions and generously keep contributing even when such generosity is not returned immediately. Experts believe this is a very difficult and heart breaking process but essential to gain support. Further, some experts believe that during DfSI, designers act as facilitators or mediators and they need to be generous by giving up the control of the creative outcomes to the community they design with. Even within teams, experts believe that designers need to give importance to the input from other members and stakeholders. Thus, the importance of being generous is summarized by one of the participants: "*desirable social outcomes can seldom be imposed; a spirit of giving is usually a valuable factor*".

Is Generosity easy?
Expert design practitioners seem to believe that it would be good if everyone involved in the DfSI process showed generosity of spirit. However, a spirit of generous behaviour seems to be instigated mostly by the designers while other stakeholders and community members are not expected to do so during the initial stages. Yet many experts agree that reciprocal acts of generosity from the community and stakeholders are rare, making a continuing effort of being generous a difficult endeavour for the designer/design team.

Forgiveness for defection:

Is Forgiveness an important inner value?
Change is hard for a community and yet designers are responsible to create change making forgiveness an important quality for the designers. Expert design practitioners explain how they forgive other team members, stakeholders, community members and even themselves for circumstances arising during DfSI. A few expert design practitioners were not comfortable or familiar with the concept of forgiveness in the context of DfSI or they believed forgiveness depended on the situation (e.g. length of the project). However, the larger consensus remains that forgiveness is an essential inner value for team work during DfSI (quotes P1Q3, P2Q3, P3Q3, P4Q3, P5Q3, P8Q3, P12Q3, P13Q3, P23Q3 for forgiveness versus quote P10Q3 and P29Q3 against). Quote P12Q3 best summarizes our finding: "*Designers forgive and move on very quickly. This is what they call; fail early to succeed sooner. Without forgiveness, designers would be stuck at every failure.*"

Who forgives whom?
It is curious that forgiveness from the community or from stakeholders has not been mentioned by expert design practitioners who participated in this study. The greater consensus seems to be that forgiveness is an inner value primarily for the designer as they need to forgive themselves, their own design practice, others involved in such practice, such as stakeholders or members of community, and last but not least, designers forgive intended or unintended situations and outcomes arising from the complexity and uncertainty that surrounds the DfSI process.

Can designers always forgive?
Expert design practitioners seem to believe that designers as professionals gain insights from reflecting on their own design practice and this seems to make forgiving oneself difficult. The data shows that forgiving others during the DfSI projects seems to be a comparatively easier task than forgiving one's own choices.

Patience to let events unfold:

Is patience an important inner value?
The data indicates patience is an important inner value for designers during DfSI to work with others and to deal with uncertainty, but it is not always easy, either due to circumstances or because of the nature of design practice being solution oriented. Circumstances require designers to remain patient yet designers may not always have liberty to be patient due to impending deadlines. One of the participants cautions that designers sometime expect quick results rather than a long-term vision and design education needs to address such a problem. Yet, most expert design practitioners who participated in this research believe patience is important but a judgement call for the designer during DfSI. This is summarized in a quote from one of the experts: "*patience to let events unfold is usually true* (as an important inner value for designers) - *but sometimes the designer (or someone else) needs to throw a rock into the pool to stir things up*".

Who should practice patience and towards whom?
Expert design practitioners seem to agree that designers are primarily expected to keep patient to apply the design process during DfSI. Some experts mention that patience is an important inner value for everyone involved in the design process, but designers primarily need to keep patient during DfSI while other stakeholders may not remain patient.

Acceptance of a situation:

Is acceptance of a situation an important inner value?
Some expert design practitioners considered acceptance to be important for a variety of reasons while others interpreted the inner value of acceptance differently and considered it to be counter-productive. Acceptance has been considered important for designers, stakeholders and community members with regard to the limitations and boundaries of the project, limitations of people involved in DfSI, vagueness of the design process in general, uncertainty of outcomes, and most importantly accepting the complexity of DfSI, which may lead to situational mishaps and unavoidable circumstances. On the other hand, a few expert design practitioners described the designer as the person who always seeks a better answer yet they acknowledge that designers accept the responsibility for changing things throughout the project and after the project ends, they expect their process and outcomes to reflect and improve. The experts throw-up an important point, that within teamwork for DfSI, designers work towards consensus rather than just acceptance and this means sometimes designers do not accept an event and fight to change it. However, a few expert design practitioners have testified that during DfSI the designer needs to '*experience an event in a balanced way'* (Kabat Zinn, 2013), a quote from the literature discussed earlier and one which the participant aptly summarizes as: "*Social innovation with design requires you to accept but also have ability to change things. More importantly it is the wisdom to recognize when to accept and when not to*."

Being Non-judgmental:

Is it important to be non-judgmental?

The quantitative data showed that many participants (24 out of 29) considered being non-judgmental as a useful inner value for teamwork during DfSI. However, the reason provided for such choices covered a range of interpretations and usefulness of the inner value of being non-judgmental during DfSI. Experts seem to believe that designers primarily require the inner value of being non-judgmental to build 'trust with' and 'empathy for' the stakeholders and the community members. But many expert design practitioners considered making a judgement to be an essential part of design practice and some also believed that not all judgements designers make during DfSI may seem rational or instinctive and will require balance between 'rational', 'emotional' or a combination of both. Thus, the data shows that being non-judgmental may be important towards other people involved in DfSI but judging and exploiting situations may not be as counter-productive as literature suggests and a necessary step in the design process during DfSI.

Is it possible to be non-judgmental?

Expert design practitioners reflecting on the importance of being non-judgmental while working in teams during DfSI voice concern about this inner value. The point brought forward is that design is hardly a rational or structured process and requires designers to rely on being visionary, thinking out of the box, understanding and applying emotions. Designers should facilitate DfSI non-judgmentally to include other's contributions and then judge the value of the ideas/opinions to generate interpretations for building solutions. This makes being non-judgmental constantly an abstract idea and to some extent counter-productive during DfSI. Further, some experts spot that being truly non-judgmental is not humanly possible and even if it were, being always non-judgmental would not be beneficial during DfSI.

Who should be non-judgmental?

According to expert design practitioners, any acts of being non-judgmental need to come from designers when they act as facilitators. Thus, designers may judge situations, ideas and processes but should avoid judging people involved in DfSI, which include team members, stakeholders and community members. The literature and data describes judgements as 'after-thoughts' and those judgements contributing to blame are not productive and those contributing positively to the design process are important and remain the responsibility of the designer.

Beginner's Mind:

Is having a beginner's mind an important inner value?

Most of the expert design practitioners who participated in this research believe having a beginner's mind may be useful during DfSI. However, the reasons for their answer reveals that having a beginner's mind may entail a range of abilities. These include having an open mind to new ideas, observing old things in a new light and creating new things altogether. They explain the difference between newly learning as opposed to unlearning and highlight the importance of experience during DfSI. The important question brought out is

"*Yes* (beginner's mind is an important inner value)*, but how to distinguish between 'old knowledge', which is hindering the process and that which can be useful?*"

Who should have a beginner's mind?
Most expert design practitioners during this study put the responsibility of having a Beginner's mind and being creative onto designers. However, the data shows that designers are trained to keep a beginner's mind and learn things anew, but in DfSI projects, designers need the community to be able to do the same. A quote from one expert design practitioner summarizes what other experts mentioned: "*Unlearning old habits is an essential pillar to bring change and create social innovation. All our efforts as designers are to facilitate the unlearning process.*"

Other inner values important for team work during DfSI:
One of the questions to expert design practitioners during this survey was; are there other inner values that may be important for teamwork during DfSI. The experts provided a range of different inner values such as: empathy, trustworthiness, trustfulness, enthusiasm, altruism, tolerance, ingenuity, playfulness (ability to enjoy and make things enjoyable), leadership, courage, resourcefulness and being humble.

Conclusion

The study set out with an aim to identify, understand and verify the inner values that are important for teamwork during DfSI. The literature review identified seven key inner values, which may play an important part in teamwork during DfSI. These are: hopefulness for co-operation, generosity of spirit, forgiveness for defection, patience to let events unfold, acceptance of situations, being non-judgmental and having a beginner's mind. The responses collected from expert design practitioners revealed their reflection on personal experiences of working in teams during DfSI projects. These experts had a very different story compared to the literature and revealed the complexity that surrounds DfSI projects. Therefore, data from this study leads to more questions than answers.

Whilst the expert design professional believes the inner values that are promoted by literature are important to teamwork during DfSI; they also reveal that these values are not necessarily always applicable in every situation. Furthermore, even when they are applicable, it is incredibly challenging and difficult to apply them. It is deduced that the inner values are a situational remedy that assist designers during social innovation projects (DfSI). An expert participant explained inner values as, "tools in the belt of the designer". Thus, designers require the wisdom to recognise the strengths and weaknesses of different inner values and trade-off their respective value within the project context for the benefit of teamwork during DfSI.

Limitations:
The survey method started out to try and answer questions about the importance of certain inner values for the practice of teamwork during DfSI. Findings from this survey are the reflections from expert design practitioners. This is the first time that a study has attempted to correlate values that literature sees as important with the evidence from the experience of DfSI practitioners. Therefore, this paper appeals for an integration of knowledge from similar future studies. The restriction on time and resources has limited

the response to this survey from experts in the western world. Extending this study with views from experts from Eastern cultures seems to be an obvious next step.

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HONG KONG DESIGN MANAGEMENT ACADEMY CONFERENCE 2017

RESEARCH PERSPECTIVES ON CREATIVE INTERSECTIONS

Design practices: Where is the sense in that?

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doi: 10.21606/dma.2017.134

Design practices inherently cope with meaning making, but the semiotic notion of *sense* seems to be misled. Despite the evolution of Industrial Design over the past years, design research has been widely criticized for its groundlessness. In 2009, we proposed theoretical frameworks to overcome the absence of *specific* foundations to support empirical research in design semiotics. Funded by Whirlpool Latin America in partnership with Fapemig (2010-2012), such frameworks were built on ethnographic methods and had their assumptions empirically tested. The results showed that carrying out theoretical and empirical research *simultaneously* is epistemologically effective. In 2013, a theoretical-empirical phase started, yet several issues remain unclear. Some theoretical advancements have been achieved, such as The Trefoil Model, but now there is a need to face further questions, such as: How to cope with evidence in field research within design semiotics? Are we taking on the development of a *Theory of Design Consequences*?

keywords: design research; methodology; semiotics; pragmatism

Introduction

In a certain way, we are still facing and immersed in what Levitt (1990) referred to economies of scale. Due to technological progresses, corporations of every size are capable of providing products relatively adapted to local needs at low costs. Exposed to such context, human beings have been surrounded by all sorts of changing artifacts and services that arise from fast cultural, historical, and social changes.

In this scenario, according to Levitt (1990) and Kotler and Rath (1984), design practices, which inherently aim at what comes next, play an important role in foreseeing the shape of our surrounding world of artifacts and services. However, shaping such a world often

seems to begin with actual endeavors and subsequent inflections that, generally, drive design practitioners and researchers to fundamental reflections regarding concrete advancements in Industrial Design practices and research.

Industrial Design has evolved significantly over the past years. Its definition has been extended to a strategic problem-solving process which links, among others, transdisciplinarity, research, business, and customers (cf. ICSID, 2015). For instance, co-design may be considered a branch of Industrial Design research that supports the development of practical innovative solutions to social problems (Design Council, n.d.).

Nevertheless, design has still been criticized as a research field. Borja De Mazota (2014) stated design should have its outcomes measured, while, among others, Wolfgang (2000) and Findeli (2014) regarded it as a groundless field. Then, how to effectively deal with such an emerging field of research in which practice has not fully drawn on grounded-theory?

This paper starts with three research inflections in design semiotics research (Figure 1), in which information is shared and discussed on behalf of scholars' efforts to cope with intangibility in design practices. Then it explores unfolding possibilities of contributions from the evolvement of a Theory of Design Consequences [ongoing] to design activities and research in the long run.

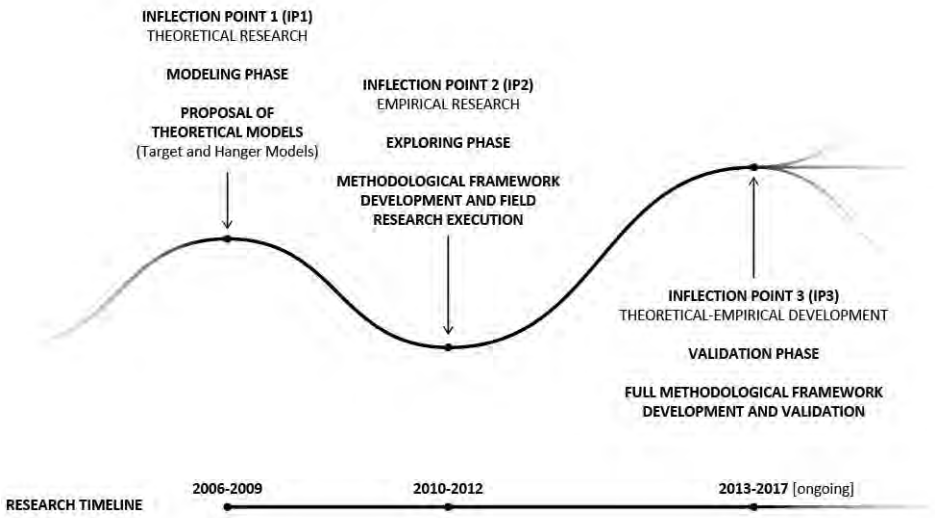

Figure 1 Research development and timeline. Source: Research data

Inflection Point 1 (IP1 [2006-2009]) consisted mainly of researching gaps in design semiotics and working on theoretical models to support further theoretical and empirical investigations into design and analyses of global products. To this end, Domingues (2008) theoretically tapped into how individuals, design, culture, semiotics, and artifacts interplay (Figure 2) with a view to understanding *how* such interplay may contribute to the development and positioning of global products.

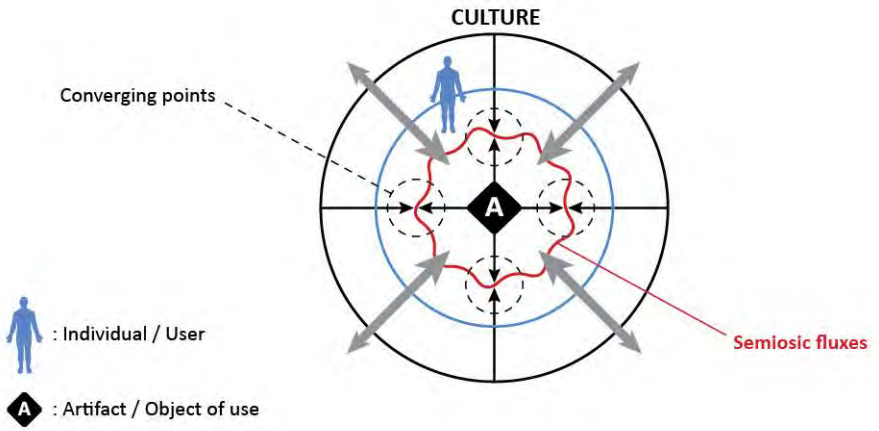

Figure 2 The Target Model: Interplay of individuals, design, culture, and semiotics. Source: Adapted from Domingues (2008)

The study showed that (1) design is deemed as a relevant tool to localize artifacts (cf. Kotler & Rath, 1984; McCracken, 1988), but (2) empirical contributions are incipient as only recently have scholars attempted to establish design as a solid academic discipline and *scientific* domain (cf. Borja De Mazota, 2014; Boztepe, 2007; Deni, 2015; Findeli, 2014; Wolfgang, 2000), which often relies on other disciplines (e.g., Anthropology). In answer to this absence of *specific* and *systematic* contributions to studies on design semiotics (cf. Chow, Jonas & Schaeffer, 2009; Deni, 2015; Wolfgang, 2000), The Hanger Model was developed in 2009 drawing on both Barthes (1972) and Eco (2015).

Inflection Point 2 (IP2 [2010-2012]) drew on an exploratory empirical investigation funded by Whirlpool Latin America in partnership with Fapemig (2010-2012). Supported mainly by ethnographic methods, the theoretical assumptions developed in IP1 were empirically tested 'in the field'. The full research process allowed to tap into *habits* (cf. Peirce, 5.400) and *cultural codes* (cf. Eco, 1980) as well as to *critically* improve the research methodology.

Now, the ongoing *Inflection Point 3* (IP3 [2013-To date]), which is considered as a theoretical-empirical stage, aims at developing a Full Methodological Research Framework. As a preliminary outcome, the combination of theoretical and empirical research has led to theoretical advancements.

The entire research process, from IP1 to IP3, aims at embedding *systematicity* in processes of research within design semiotics through sampling, searching, collecting, processing and analyzing empirical data following the Peircean Semiotics. By the end of the entire process, its contributions are expected to assist processes of attribution of intangible features in creative processes, and early stages of design of artifacts and services. Yet, several issues remain unclear, including: How to cope with evidence in design? How to frame design consequences from a *pragmatistic* approach? Are we in fact taking on the development of a *Theory of Design Consequences*?

2. IP1: Theoretical research

2.1 Design management, culture and users' semiotic value

Generally, in the management and production engineering literature on global products, design is still associated with two perspectives: standardization and adaptation/differentiation. However, adaptation/differentiation seems to no longer rely on the physical features of products, but rather on the capability of *attributing intangible* features to artifacts. In contemporary design practices, due to humankind's dependence on symbolic features (cf. Geertz, 1973), it is desirable that artifacts allow for superior responses to *cultural habits* and *codes* in order to provide better *fruition* and *differentiation*.

Design, as a discipline, has drawn on Social Sciences aiming at anticipating needs of future customers (Moraes, 2008), and eventually evolved as a multidisciplinary domain capable of providing timely responses and being open to interactions (Moraes, 2010).

Semiotics then emerges as an instrument to understand such issues as intangibility (e.g., cultural customers' feedbacks) in industrial artifacts, since it provides scientific basis/knowledge to better comprehend users' *mental behaviors* before designing products that carry *pre-figured* functions [primary functions] (cf. Barthes, 1972; Eco, 1980). This in turn may aid processes of identification of new functions [potential innovation] on the basis of users' unrestrained feedbacks [secondary functions]. Although Eco (2015) argues that designers are supposed to manipulate variable primary functions and leave secondary functions open, Domingues (2008) contends that designers should be skilled also to manipulate secondary functions (cf. Manzini, 2016), bringing them into early stages of design. Such claim is supported by contextual investigations carried out by Domingues (2011), but how to cope with manipulation of potential innovation on artifacts globally exposed to ethnic and cultural diversity?

Levitt (1990) argues that ethnic specificities are traces of cultural heritage, liking, and standards. However, as Levitt himself points out, some of such traces give way to changes while, controversially, others simply evolve globally and produce the homogenization of ethnic-specific standards at the world level. This does not entail the end, but the widening of specificity, says Levitt. Consequently, the design activities have been assigned as responsible of efficiently adapting products in the *use dimension* (cf. McCracken,1988), which has led immaterial features to emerge as crucial in product development.

Nonetheless, the relationship between design, management and other disciplines involved in the product development process is complex, and scholars have observed that intersecting approaches are relevant to understand how design may provide superior experiences and add value to users. Bearing in mind that fruition is a *consequence* of value, fruition is a matter of *senses in act* retrievable in contexts of use.

2.2 Understanding fields: Affordances, material culture, and identity

A brief review on the notions of affordances, material culture, and identity may help to better understand the use of semiotics in field research.

The term affordances refer to the potential actions available to individuals in a given context, i.e., how individuals *perceive* an environment and how this environment opens way to be acted upon and changed thereby (Gibson, 1986a, 1986b; Norman, 2013).

Therefore, affordances are directly related to the individuals' perception due to its dependence on their behaviors and tendencies to (re)act; it is all about *possibilities*.

In the design domain, this means that designers that develop user-oriented projects design products focusing on their *potential* meanings, rather than on their technical features (Krippendorff, 2006), their concern is on how users perceive the possibility of performing one action or another. As product design involves physical objects, designers should be attentive to how shared cultural conventions within social groups directly impact on the actual affordances, which may directly affect the potential purposes of actions that the individuals can perform. Therefore, the functions/values that the individuals both *directly* and *indirectly* attribute to the objects derive from cultural understandings/codes and habits, symbolic features that are intrinsic to *formal* and *informal* cultural productions – material and immaterial – and influences (Figures 3 and 4).

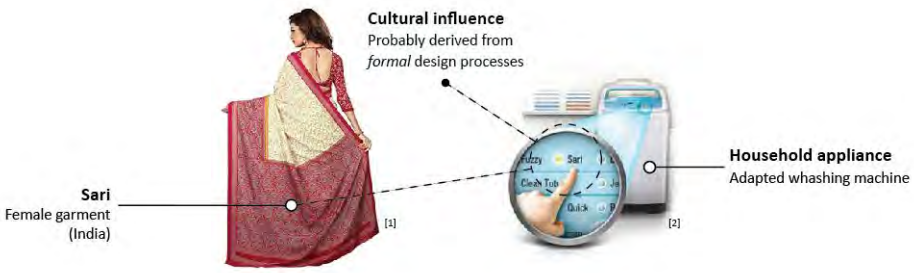

Figure 3 Formal influence on product design. Source: [1©] (Wow, 2017), [2©] (Samsung, 2017)

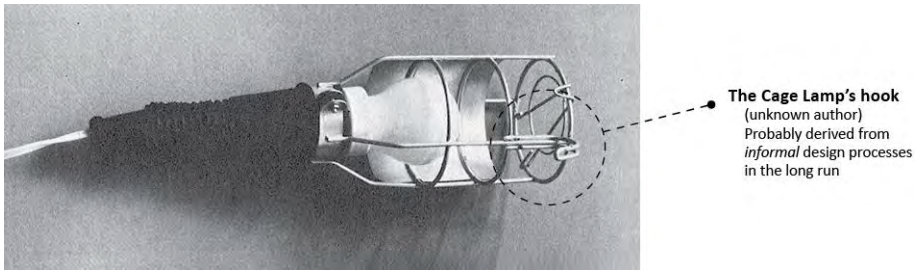

Figure 4 Informal influence on product design. Source: Munari (1997)

As Sahlins (2003) contends, objects exist in human society only because of the meanings that humankind assigns to them. Similarly, Santos (1994) claims that an object exists because of both human intentionality and materialization of identities, and then functional *and* aesthetic values are structurally linked to contexts, opening possibilities of symbolic interpretation of concrete features. It is the production of artifacts and values that generates and reflects the cultural identities of a society (Bomfim, 1999), which are not constantly coherent, as they change contingently and in the long run. Therefore, symbolic meanings are assigned to objects of use, which convey complex systems of signs.

2.3 Complex systems of signs: Objects of use and Barthes' Myth

Objects of use do not only function, they communicate (Eco, 2015). Every use is converted into signs with the existence of a social group enabling and promoting this existence (Barthes, 2006). Thus, the use of objects goes beyond their primary functions, allowing the existence of complex sign systems, *denoting* and *connoting* specific functions depending on the cultural system to which they belong (Eco, 2004).

The notions of denotation and connotation are crucial in semiotics. Concomitantly, the terms signified and signifier provide analytical tools to describe two types of meanings: denotative (signifier) and connotative (signified) (Hjelm, 2002). Both concepts refer to different levels of meaning, and this is the reason why Barthes (1972) introduced the notion of new orders of *signification*. According to Barthes, the first order is denotation: the sign comprises both signified and signifier. The second order is connotation: the denotative sign is used as a signifier, to which is assigned a new meaning (Figure 5). The signifier is referred to as cultural discourses, or as Myth (Barthes, 2006, 1972).

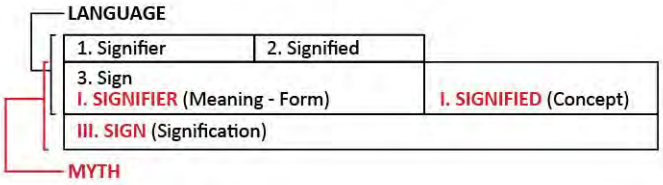

Figure 5 Barthes' Myth structure. Source: Adapted from Barthes (1972, p. 113)

The Myth involves only the sign resulting from the first semiological chain, but comprises two semiological systems: the language and its sign system [object-language and metalanguage] (Barthes, 1972) – Figure 6.

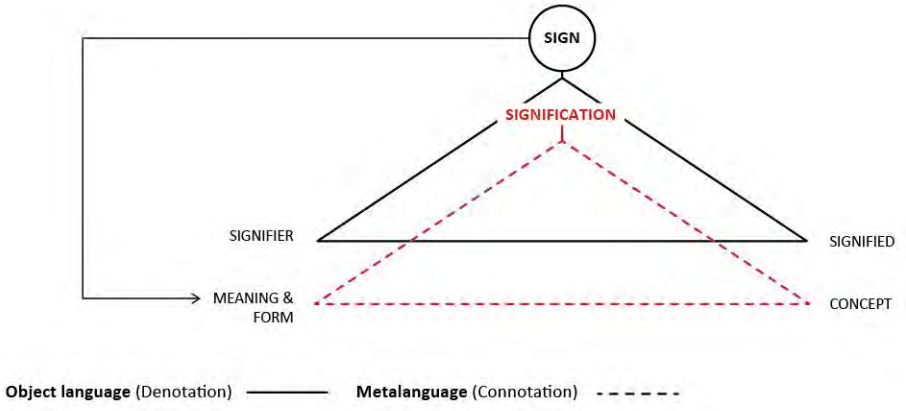

Figure 6 The double articulation of the Myth. Source: Adapted from Domingues (2008)

As objects of use can be deemed as sign systems, their signs should be characterized upon cultural contextualization of the signifier based on existing cultural habits (cf. Peirce,

5.400) and codes (cf. Eco,2015). This semiotic imposition admits the existence of a signifier in signs of the objects of use, and the meaning is the function enabled by such existence. Hence, it is necessary to make a difference between primary and secondary functions: primary functions [denoted] are the very functions, and secondary functions [connoted] are symbolically derived functions (Eco, 2004) – Figure 7.

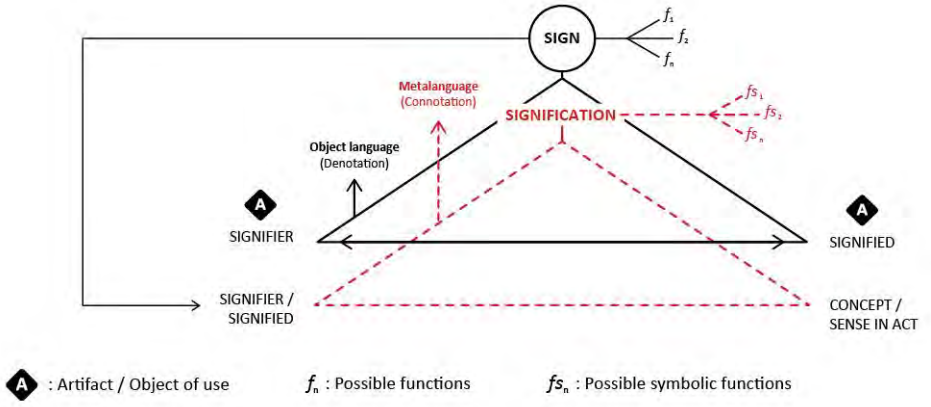

Figure 7 The Hanger Model: Model of interplay of senses in artifacts. Source: Adapted from Domingues (2008)

In denotative terms, an object of use is the precise signifier of its function (Eco, 2015). However, certain forms may be not recognized as determinants of functions of abstract nature and demand the *awareness* of a specific cultural habit or code to have fruition. That is, an object of use that has the function of promoting a new primary function may carry in its form the clues to decode new functions. Consequently, the assignment of functions also implies a wider range of all communicative attributions of an object, e.g., symbolic connotations (Eco, 2015). Hence, projection, design and production of artifacts go beyond logical conception and material efficiency (Sahlins, 2003), and may lie within the Social Sciences domain. This means that before turning into actions, the functions codified by objects of use are classes of possible functions – cultural units [habits] (Eco, 2004); and because the functions of artifacts correspond to habits, the codes for their conception are found in cultural, historical and traditional features. How then to empirically extract and analyze such cultural units and immaterial codes from contexts of use that vary contingently and in the long run?

3. IP2: Empirical research

3.1 Research methodology and settings

The empirical research was exploratory and qualitative (cf. Ceswell, 2012; Marconi & Lakatos, 2003). Bearing in mind it employed a semiotic approach, non-structured techniques were applied to empirically tap into a method, to systematically access and analyze cultural and symbolic features of artifacts (household appliances [fridges]). Building on field research in the Social Sciences, the sample was defined, the approaching

technique was set, and the data collection framework – participant and nonparticipant observations, photographic records, and in-depth interviews – was defined in such a way to allow for triangulation of methods (cf. Ceswell, 2012; Flick, 2004b), as shown in Figure 8. Once raw primary data were collected, they were content analyzed (cf. Bardin, 2010) as *discursive practices* (cf. Spink, 2013) and processed by means of software Pajek (cf. Nooy, Mrvar, & Batagelj, 2005).

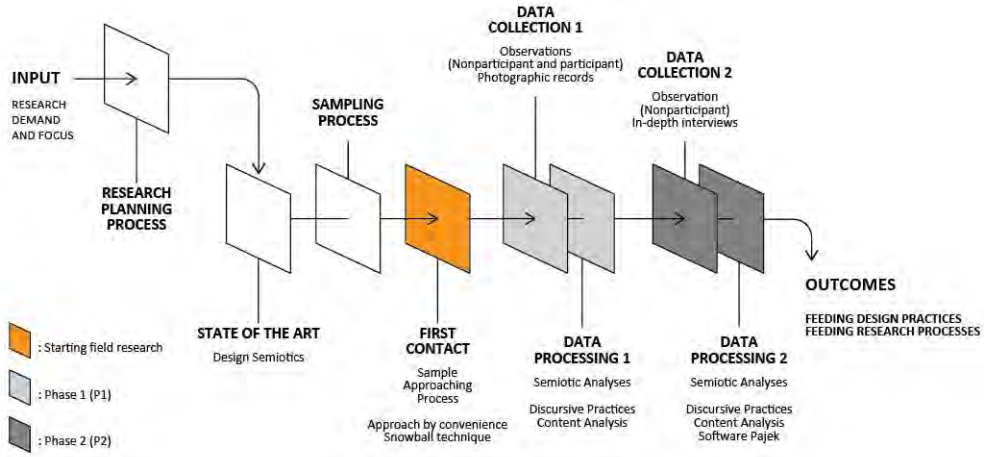

Figure 8 Research methodological framework. Source: Adapted from Domingues (2011)

The techniques were strictly applied in the order stated, and two phases of data collection and processing were set. *Phase 1* (P1): Data collection and analysis 1 included observations (participant and nonparticipant) and photographic records. *Phase 2* (P2): Data collection and analysis 2 included observation (nonparticipant) and in-depth interviews.

3.2 Sampling and accessing primary data

The field research took place in Belo Horizonte, Brazil [2011-2012]. As a pilot study, a non-probabilistic sample was estimated to correspond to 10%[1] of the 60 individuals intended for the final research sample [Ongoing IP3]. However, data collection involved 12 Voluntary Individuals (VI_{1-12}) from 10 domiciles, out of which 8 remained (approximately 33% above the estimated sample [6]). Both participant and nonparticipant observation techniques were applied, but the former was performed only in the case of VI_2.

Even though the individuals were sampled by convenience (cf. Cesswell, 2012), they all should belong to the same social class. After first contacts, the approaching process followed the Snowball technique to assure the participation of individuals with similar social characteristics (cf. Flick, 2004a). Personal acquaintance among researchers and VIs as well as participants among themselves facilitated the access to individuals as shown in Figure 9.

[1] cf. Werkema (1996)

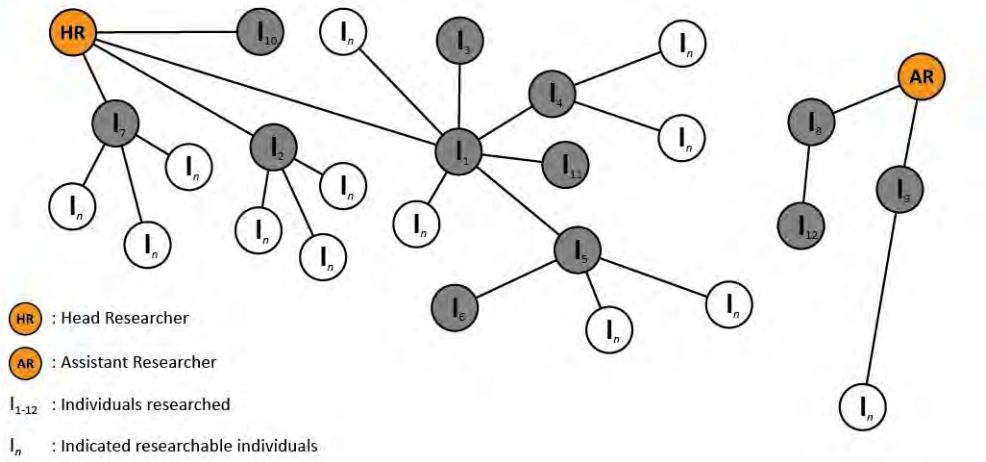

Figure 9 Participants network resulted from the employment of Snowball technique. Source: Adapted from Domingues (2011).

Once individuals were recruited, the data collection was divided into two phases and carried out as described in the following sections.

3.3 Data Collection and Analysis 1 (DCA1)

The participant observation, carried out by the Head Researcher (HR), extended over 15 days in VI_2's domicile. During his stay in VI_2's domicile, HR observed and shared the appliance used by the two residents. Photographic records were produced in 11 of the 15 days of stay with the aim to register possible changes in the object under scrutiny. No changes were observed in the object other than daily changes related to regular use and displacement of food in the internal space of the fridge and the inclusion of a calendar on the left side of the appliance. This item and other magnets previously placed on the fridge characterize the use of the external space of the object.

Given the impressions of the participant observation, further nonparticipant observation and photographic records were restricted to three visits to each domicile researched aiming to capture possible changes that could characterize interferences with the fridge. In total 277 images were produced, 78 of which resulted from participant observation and the remainder resulted from nonparticipant observations. The impressions (dialogues and images) collected through participant and nonparticipant observation and photographic records provided insights to the analysis of the preliminary data and the generation of *Preliminary Categories of Analysis* (PCAs), which supported the production of a script for the in-depth interview.

3.4 Searching for evidence: Tapping into users' interferences

The PCAs came out from a process of listing and analyzing all relevant features of VI's dialogues and utterances as well as all items that could characterize the users' interference with the appliances. The relevant features of the participants' utterances and dialogues were identified by means of comparative analyses of their discourses as registered in the first stage of the field research; PCAs were generated (i.e., cleanness)

drawing on these registers. Users' interferences were identified by means of nonparticipant and participant observation and captured in photographic records. With the aim to use the images as a productive source to identify relevant items of analysis and support the generation of categories of analysis to underlie the interview scripts, the appliance was divided in three major parts: upper, frontal, and side sections. The criteria of relevance to justify further analysis of each part were: at least 60% of the sample participants should have interfered once or more with the fridge, and the interference should have a semiotic/semantic nature. According to such criteria, interferences were identified in all three parts in mostly all users' appliance and were listed on the basis of the photographic records (Figure 10).

Figure 10 Photographic sample of data collection 1. Source: Research data

After listing the items (e.g., post-its®), detailed lists were generated to support the creation of PCAs that would be incorporated into the interview scripts. Nevertheless, the diversity and quantity of items led to the creation of *macro* and *micro*-categories of analysis. Macro-categories included organization, cleanness, support (upper part), and panel (side parts). Micro-categories included: adornment, information, and religion. Such categories were either directly or indirectly incorporated into the second stage of data collection and analysis.

3.5 Data Collection and Analysis 2 (DCA2): In-depth interviews

The interview script comprised two major parts. Part 1 had the aim to check concepts, and Part 2 had the aim to check semiotics [understandings]. The analysis of the individuals' responses led to the generation of 118 new categories of analysis, herein understood as *Semiotic Categories of Analysis* (SCAs). PCAs and SCAs are shown in Tables 1 and 2. Both tables display the correlation among PCAs and SCA[2]. SCA was generated after the analysis of the participants' in-depth interviews.

Table 1 Correlation of categories. Source: Research data.

Part 1 – Checking concepts	
PCA	SCA

[2] Letter "C" stands for Category/Categories and numbers (1-118) were used as a means of ensuring data confidentiality.

Fridge, organization, cleanness, rest, shelves, panel, adornment, ornament, information, religion.	C1-C70

Table 2 Correlation of categories. Source: Research data.

Part 2 – Checking Semiotics	
PCA	SCA
Fridge, adequate functionality, organization, cleanness, support, panel.	C71-C118

Once listed, the categories were converted into data to be processed by means of software Pajek.

3.6 Exploring the use of Pajek in design semiotics research

The employment of Pajek (Mode 1 Network[3]) took place *after* DCA2. Data processing comprised both Parts 1 and 2 of correlation of categories, resulting in the graphs displayed in Figures 11 and 12.

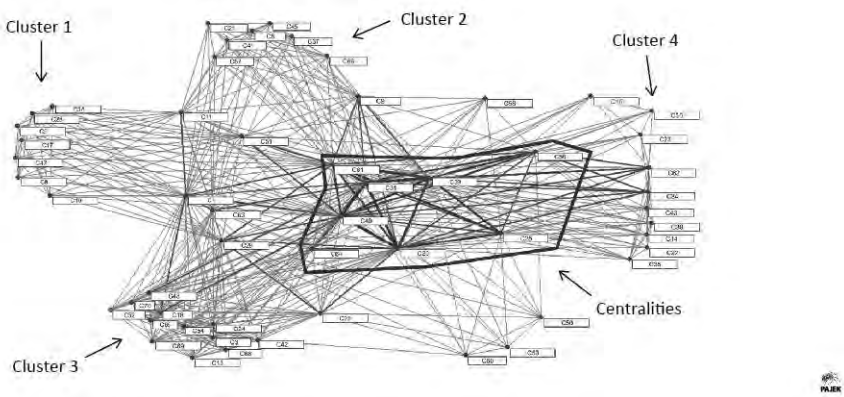

Figure 11 Part 1: Correlation of categories. Source: Research data

[3] cf. Nooy et al. (2005)

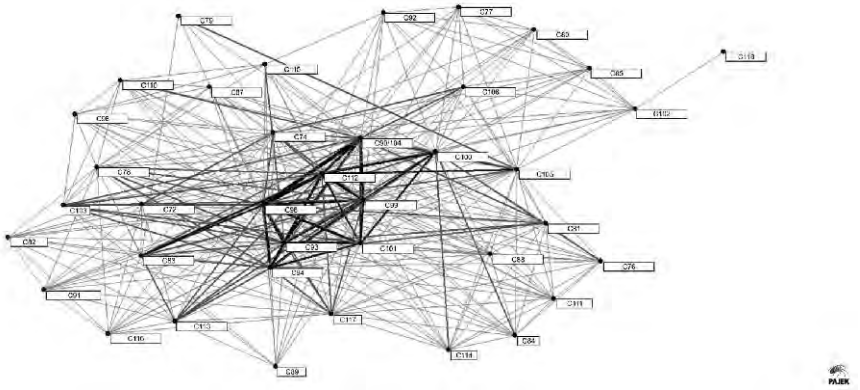

Figure 12 Part 2: Correlation of categories. Source: Research data

As shown in both figures, central categories emerged after processing data with Pajek. Going into details, Figure 11 displays four clusters and central categories, and Figure 12 displays central categories with stronger links to one another. The process of correlating all categories using a software intended to test the feasibility of employing it as a tool to aid further analyses with a larger amount of data, bearing in mind that IP2 was carried out as a pilot study to tap into empirical research in design semiotics. The results obtained through both field research and discussions within Whirlpool Latin America's Advanced Design team led us to further reflections on *how* to manage evidence, *what* to consider evidence in design semiotics research, and *who* designs.

4. IP3: Theoretical-empirical research

4.1 Linking theories: Senses as empirical evidence

IP3 aims at both fostering the debate on the understanding of processes of *sense* attribution to artifacts and, in further studies, introducing such understanding in design practices. The ultimate goal is to collect contributions to the development of a method of *systematic research* into and *analysis* of the relationship established among users and artifacts in their context of use and under specific circumstances (cf. Domingues, Zingale, & De Moraes, 2016a). The starting point is the semiotic understanding of *functions* (cf. Eco, 1980) and Peirce's Pragmatic Maxim (Peirce, 1931-1958).

As previously stated, understanding the notion of functions may be a complex task in the world of artifacts, which are designed to fulfill either specific needs or to solve problems. Throughout the product lifecycle users are the ones who usually incorporate functions and complete the product design chain (cf. Zingale & Domingues, 2015). From the users' standpoint, it seems that artifacts both function and communicate *possible* ways of performing tasks. Hence, designing *possibilities* is a provocation to semiotics:

> *Seeing functions from the semiotic point of view might permit one to understand and define them better, precisely as functions, and thereby to discover other types of functionality, which are just as essential but which a*

> straight functionalist [emphasis added] *interpretation keeps one from perceiving. (Eco, 1980, p.12)*

Peirce's Pragmatic Maxim also provides guidelines on designing possibilities into functions of objects:

> *Consider what* effects [emphasis added]*, that might conceivably have* practical bearing [emphasis added]*, we conceive the object of our conception to have. Then, our conception of these effects is the whole of our conception of the object. (Peirce, CP 4.402)*

The association of both emphasized terms – *effects* and *practical bearing* – with the notion of sense is relevant to the following statements, since the term *effect* also appears in Peirce's notion of sense: "Our idea of anything is our idea of its *sensible effects* [emphasis added]" (Peirce, CP 5.401).

The senses of industrial goods[4] are associated with *all* possible *interpretative answers* and *practical consequences* derived from the *mental responses/reactions* they produce or could produce (cf. Zingale & Domingues, 2015). Furthermore, Domingues, Zingale, & De Moraes (2017a) contends that processes of mental mediation[4] are affected by inferential mechanisms[5] such as deduction, induction and abduction, all typical of semiosic fluxes[6] (Figure 13).

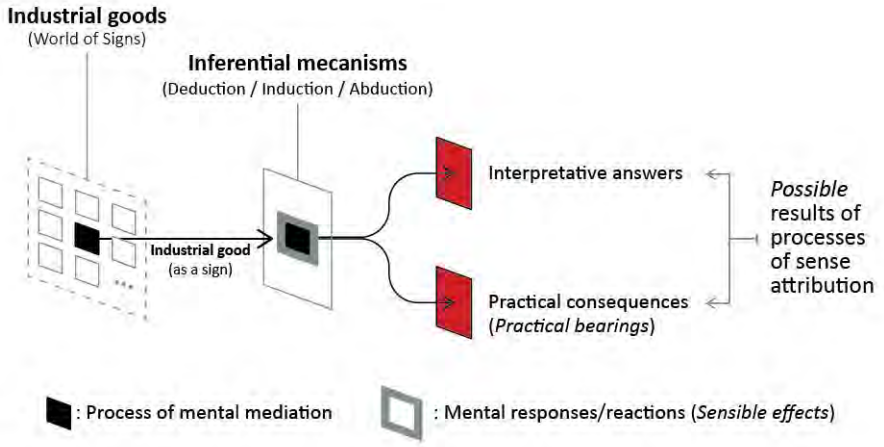

Figure 13 General framework of the semiosic fluxes. Source: Adapted from Domingues et al. (2017a)

Semiosic fluxes are subjective processes of sense attribution to artifacts (Domingues et al., 2017a). As such, they may be regarded as intangible processes that lead individuals, or social groups, to a series of mental actions, which possibly result in mental and/or practical responses in the social nexus. Such responses are either intentionally or tacitly

[4] *Industrial goods* and processes of *mental mediation* are considered *signs* in semiotics.
[5] cf. Domingues et al. (2017a).
[6] cf. Figure 15.

linked to the individual's cultural habits (cf. Peirce, 1931-1958), social codes (cf. Eco, 1980), and life experiences often *expressed* or *materialized* through *informally* designed artifacts and/or the individual's mental and practical behaviors, theoretically explained in Peirce's Pragmatism.

4.2 Pragmatism, functions, and design of artifacts

Industrial Design can be deemed as an act of communication of possible functions that emerge thereof from cultural habits that may be identified in the social nexus and in daily life. This holds especially true when we focus on sense attribution, which also concerns to the *mental actions* performed by users involved in configuration, fruition, and analysis of artifacts.

The placement of an artifact in human environments may provoke contrasting responses from users as well as social and environmental changes (e.g., psychological dependence, structural adaptations). In this context, *design-agents*[7] act randomly, *inferring* and *interfering* with artifact functions, as well as performing actions of standard use, redesign, invention and reinvention by expressing deep wishes in a fully unrestrained way (cf. Bianchi, Montanari, & Zingale, 2010; Deni & Proni, 2008; Domingues et al., 2017a). In other words, contemporary processes of design are far from being processes in which professional designers are the only ones who design. Professional designers are the ones who *formally* design artifacts, but end-users – including *all* players around the artifacts – *informally* complete the process, opening way for transdisciplinarity in design practices and research. However, coping with such a complex interaction of disciplines in which diverse actors take part in interplay demands a clear definition of *who* these players are and *what* their roles are in the processes of inferring and interfering with functions and conception of artifacts. Domingues et al. (2017a) theoretically framed three design-agents (Figure 14).

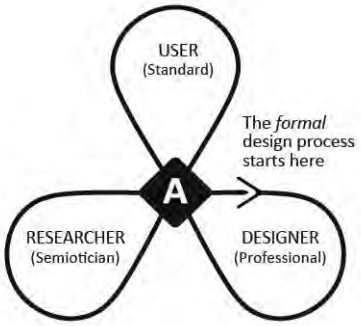

Figure 14 The Propeller Model. Source: Domingues et al. (2017a)

Naming users as design-agents is a step forward in processes of semiotic analysis, increasing the feasibility of understanding individuals' rationale of sense attribution to artifacts. Let us then consider artifacts as bearers of personal/collective

[7] Design-agents are *embodied entities* that are *affected* by their cultural backgrounds and habits, and consequently have *varying* mental behaviors (Domingues et al., 2017a, p.4).

senses/values/codes and communicators of possible functions. As a part of our material and cultural systems, they broaden the design activity's social responsibility, which may reasonably be approached by employing a pragmatistic perspective. The impacts of the notions of interpretative answers and their practical consequences on our cognitive and physical environments seem key to the comprehension of artifacts, since they can be replaced with the notion of sense.

Sense attribution to artifacts, on the basis of actual interpretative answers and practical consequences, is an advance in the contemporary processes of conception, adaptation and positioning of designed artifacts (cf. Domingues et al., 2017a). Such assertion leads us to search for answers in the applied social sciences (e.g., information science), and in the symbolism that arises from our material culture, instead of *only* in the artifacts themselves or in their semantic values (cf. Domingues, 2011, Krippendorf, 2006).

Geertz (1973) clearly conceives culture as a symbolic system, i.e., "a system of *inherited conceptions* [emphasis added] expressed in symbolic forms by means of which men communicate, perpetuate, and develop their knowledge about and *attitudes toward life* [emphasis added]" (p. 89). Two key concepts in this fragment can be associated with concepts in Peirce's framework. *Inherited conception* relates to *habits*: "what a thing means is simply what habits it involves" (Peirce, CP 5.400). *Attitudes toward life* relates to *practical bearing*: "consider what effects, that might conceivably have practical bearing" (Peirce, CP 5.402).

On the basis of said concepts, individuals located within the same cultural environment may have contrasting attitudes toward life. Then, interpretative answers and practical consequences that come out as problem-solving responses are *key information* to solve design issues. Although that is no novel conclusion, it still poses the question: How to tap into such a subjective matter in varying contexts? The notions of *belief*, *doubt* and *plausible hypothesis* emerge as guidelines to deal with symbolic cultural features in field research in design.

4.3 Belief, doubt, and plausible hypotheses and consequences

Symbolic cultural features are related to inferential processes in our minds, and such semiotic relation is linked to *belief* and *doubt*, which affect us in different ways. Belief does not make us act at once, but pushes us to a condition whereby we shall behave in a given way under specific circumstances. In contrast, doubt makes us inquire and leaves us in a state of probing (Peirce, CP 5.373). According to Zingale and Domingues (2015), such a state of probing can be related to the passage from a *problematic state* to a *problem solution* through the identification of an *interpretant artifact*, which characterizes the activity of design.

In daily life, design-agents deal with problematic realities, facing situations that are not immediately coped through interpretative answers in a state of belief. In a state of doubt, *plausible hypotheses* come out with the aim to provide possible solutions to problems. In fact, turning problems into processes of decision-making leads us to inferential design processes, which mentally take into account previous knowledge of correlated problems and the prefiguration of possible solutions (cf. Zingale,2012; Bonfantini, 2000). But how to research into, frame and better understand mental actions as inferential processes and plausible hypotheses? A reasonable way to deal with such issues may lie on *pragmatism*:

"the only way to discover the principles upon which anything ought to be constructed is to consider what is to be done with the constructed thing *after* [emphasis added] it is constructed" (Peirce, CP7.220). Peirce points out what Zingale and Domingues (2015) understood as the pragmatistic design method:

> *That which is to be done with the hypothesis is to trace out its* consequences [emphasis added] *by deduction, to compare them with results of experiment by induction, and to discard the hypothesis, and try another […] which shall resist all tests. (Peirce, CP7.220)*

In other words, artifacts *shall resist all inferential tests* prior to heading to the production phase. Since design-agents extensively interact with objects [mediation artifacts] exposing them to individuals' semiosic fluxes (Figure 15), new interpretant artifacts may appear, and *plausible consequences* may emerge and be suitable for Industrial Design, entailing informal to formal processes of design inquiry.

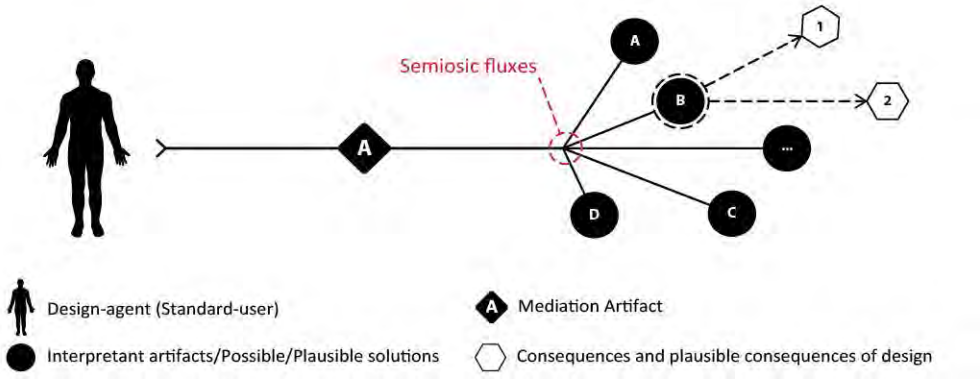

Figure 15 Semiosic fluxes unfoldments. Source: Adapted from Domingues et al. (2017a)

Given that the senses and consequences of artifacts change throughout their use, thereby continuing and completing their meanings (cf. Bonfantini & Zingale, 1999), mental and practical consequences of acts of use lead to the achievement of their complete sense. The use dimension/phase then is an extension of the formal design phase (Zingale & Domingues, 2015). Thus, the entire design process is composed of two theoretically conjoined cyclical phases: design [*formal*] and use [*informal*] phases. How then to join them in order to enhance earlier stages of design?

4.4 Design-agents and the pragmatistic approach

The pragmatistic approach aims at locating and analyzing the emerging senses by identifying design-agents' rationale and thus broadening the Dialogical Design Model (DDM), Figure 16. It allows for a dialogical correlation between conception phases and the interpretation employed by users (Zingale, 2009; Zingale, 2016).

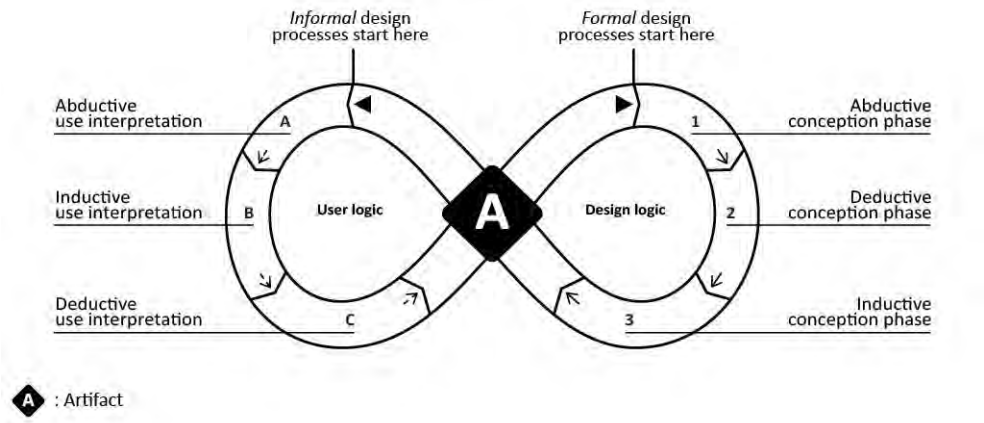

Figure 16 The Dialogical Design Model: User and design logical processes. Source: Adapted from Zingale and Domingues (2015)

The dialogic process may start with the conception and production of an artifact, a *formal* design process (Domingues et al., 2017a). Once it is released within a context, the user performs artifact-employment actions, and users' rationale *informally* ensures the permanent design process. In this dialogical process, the artifact assumes a mediation role, while designers *inscribe* senses/values and standard-users *infer* and *attribute* senses/values. Zingale and Domingues' (2015) contribution clarifies aspects of processes of sense attribution to artifacts[8], yet the model has limitations.

Following DDM, the design cycle is completed when standard-user infers senses/values from artifacts or attributes senses/values to them. But, who inquires into such senses/values? The Trefoil Model then emerges as a theoretical proposal that increases the comprehension of the interplay among design-agents (Figure 17).

[8] cf. Domingues et al. (2017a)

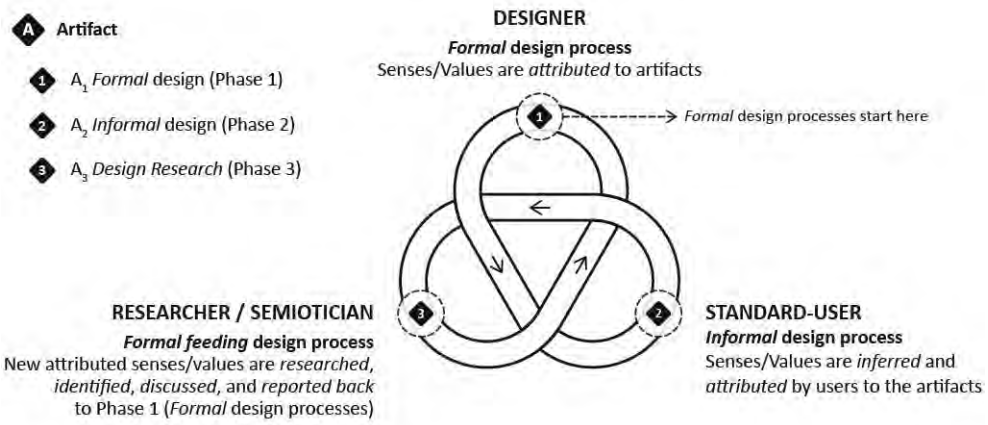

Figure 17 The Trefoil Model: The interplay among design-agents in the design cycle. Source: Domingues et al. (2017b)

The Trefoil Model proposes to define who the design-agents are and what roles they play in design semiotics, but how does such interplay operate in field research considering that inferential interpretation is often based on partial/personal knowledge? Peirce points out that

> *the object of reasoning is to find out, from the consideration of what we already know,* something else [emphasis added] *which we do not know. […] The question of* validity is purely one of fact and not of thinking [emphasis added]. *(Peirce, CP 5.365)*

Hence, both the past and the present acts of using an artifact may be open to a pragmatistic approach. The interest is "something else thereof that emerges from the fruition act" (Domingues et al., 2016b, p. 249) or both an *action* itself and a *fact* identified as *possible function(s)*, possibly related to plausible hypothesis and consequences.

5. Remarks and further studies

IP1 and IP2 achieved the objectives proposed. It was possible to assess the adequacy, efficiency and efficacy of the methodology and make inferences from the research model for analyses of symbolic cultural features. Although some adaptations are necessary in the methodological structure, the results pointed to the potential of empirically identifying semiotic interferences in the relationships among individuals and artifacts in contexts of use. The field experience proved to be valid, and further studies would add to the investigation of the design semiotics of artifacts. Suggestions for further studies include: (1) involving foreign researchers in the collection and data analysis to enlarge data and ensure accuracy in the identification of semiotic and cultural aspects (this suggestion draws on the head researcher's informal experiences in investigations overseas[9]); (2)

[9] Head Researcher informally collected data overseas, e.g., South America and Asia.

gathering together design-agents to increase research validity, adequacy, and data accuracy; and (3) developing semiotic metrics to collect and analyze semiotic and cultural features in different contexts and in the long run.

Furthermore, IP1 and IP2 can be considered as valid processes of design semiotics research. As an exploratory empirical investigation, due to its employment of discursive[10] and content[11] analyses, IP2 had its outputs *spontaneously* linked to the semantics of artifacts (cf. Krippendorf, 2006), raising such issues as: *What is evidence in design semiotics? How to cope with evidence in field research within design semiotics? Are we taking on the development of a Theory of Design Consequences?*

Taking into account the ways users make and negotiate senses [meanings] of objects (cf. Vossoughi,2013), the semantics of artifacts does not fully answer to contemporary concerns within design semiotics (e.g., translating [transferring] intangible cultural features into tangible products and/or services). Data gathered from the semantics of artifacts may be taken as a *type* of semiotic evidence (Table 3) within a holistic semiotic approach to design, given that, from the users' viewpoint, translating ideas/notions and/or behaviors into *something* concrete is a complex task.

Table 3 Speculative framework of evidence in design semiotics. Source: Research data.

Evidence in design semiotics	
Material	Immaterial
Semantics of artifacts	Interpretative answers
Interpretant artifacts	Cultural symbolic patterns
Design consequences	Social/Individual behaviors

In a pragmatistic approach[12] [IP3, ongoing], the semantics of artifacts should be used as a complementary tool in empirical research within design semiotics. It should work as a *bridge* to both reach and better understand interpretative answers, practical bearings, plausible hypotheses and plausible consequences (cf. Figures 13 and 15) from the users' point of view. These are the core evidence of what we would call a *Theory of Design Consequences* [ongoing].

6. Conclusions

Given that the design is in a transition phase (cf. Manzini, 2016), we believe it is possible to develop methodological research frameworks to aid design practices in shaping the meaningful [*senseful*] world of artifacts and services that surrounds us. Despite its generic employment of the notion of *meaning* in design practices and research, design semiotics is the field of study that provides a grounded theoretical basis that enables the advancement of design practices in coping with subjective issues, even considering the fragmented history of design semiotics (cf. Deni, 2015). Hence, the notion of *sense*

[10] cf. Spink (2013).
[11] cf. Bardin (2010)
[12] cf. Zingale and Domingues (2015), and Zingale (2016).

retrieved from pragmatistic semiotics may be more suitable for dealing with contemporary design issues.

As Domingues et al. (2017a) states, the evolvement of the notion of sense and its unfoldments in design semiotics research may provide key elements to develop foundations to better understand subjective features, mainly regarding *bottom-up* and *co-*practices of design (e.g., co-design). The influence of subjective features, such as mental behaviors (cf. Figures 13 and 15), in practices in which users [design-agents (cf.Figure 17)] are involved in design development and research can no longer be neglected. The development of specific design skills and culture that aid and enable both the comprehension and, when appropriate, the embedment of immaterial features in artifacts and services in early stages of *projection* would be fundamental expertise in *dialogical* design practices.

In conclusion, the use of pragmatistic semiotics (cf. Domingues et al., 2017a) should not be overdrawn. Yet, design semioticians – pragmatists and structuralists – are all becoming aware of and positioning themselves toward the development of research methodologies to enhance the engagement of semiotics in design practices, research, and pedagogy (cf. Domingues et al., 2017b). Consequently, the eminent evolvement of a *Theory of Design Consequences* might be an indication of scholars' movements to establish foundations to cope with the complexity of design research and contributions to the present debate on strengthening design practices.

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HONG KONG DESIGN MANAGEMENT ACADEMY CONFERENCE 2017

RESEARCH PERSPECTIVES ON CREATIVE INTERSECTIONS

Exploring articulations of Design Activism

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doi: 10.21606/dma.2017.143

Discussions on design activism generously embrace the activist ethos of designers, but are inconsistent in articulating how design activism makes a difference in relation to the various socially engaged design approaches generated. Committed to critically and transformationally engage with progressive socio-economic and political problems, the activist designer creates forms and situations within social processes. By mapping the fields of knowledge and concepts on which design activism draws, the paper attempts to bring an understanding of what informs Design Activism actions beyond the neoliberal paradigm. Drawing on the emerging discussions on design activism, the paper brings together articulations of design activism from scholars and design collectives to foreground the foundation for a more coherent understanding of design activism and a constructive dialogue within its community.

keywords: design activism; vision; social movements; grassroots innovation

Introduction

The paper presented is a stepping stone in a research part of doctoral studies. The work-in-progress involves developing an understanding of contemporary design activist practices, how it takes place, and what are its implications for design practice and design education. Within this paper, we bring together the existing literature and emerging discussions on design activism; we explore the relationship between design activism and activist practices, and illustrate three case studies of how design activism might manifest.

By depicting the fields of knowledge and concepts on which design activism draws, and entering in a dialogue with its growing community, the paper brings together articulations of design activism from scholars and design collectives to understand its actions, goals and future potential beyond the neoliberal paradigm.

While the 500th anniversary of Thomas More's Utopia should have filled the world with hope and celebration[1], the rise of populist right-wing wave and its impact on the socio-environmental scene, raise a series of questions about the future we are moving towards. The acceleration of post-2010 'activisms', from the Arab spring to the Occupy movement, the anti-austerity protests in Europe and the global-justice movement, has been at the core of social movement debates raising the question whether it is driven by a new activist generation, one that has broken with prevailing utopias (Biekart & Fowler, 2013; Glasius, Pleyers & Biekart, 2013; Chomsky N., 2012; Chomsky, 2016; Klein, 2012). While the previous social movements were related to improving material interests such as economic wellbeing, the so-called "new social movements" are associated with immaterial interests, primarily social and cultural, underscoring quality of life, pacifism, individual self-realisation and human rights (Habermas, 1982; Bucheler, 1995; Mayer, 2012). Activist waves often share the same infrastructure of networks that facilitate connections for participants sharing a common goal. Such networks give the possibility for new forms of collaborations to emerge bringing together civic energy, grassroots organisations, artists, architects, designers and other creative communities.

Meanwhile, design is branching away from the market toward creating 'alternative futures' through social practice. This intellectual expansion has generated a wave of alternative formulations of design, from "critical", "social", "activist", "disruptive" to "speculative", "speculative activist", "associative", "relational", "transition" design, formulations that are descriptive about the process, and foreground the (relation to the) subject and not the object of design (Mazé & Keshavarz, 2013). The myriad of terminologies strive to grab attention, while fragmenting the design community.

There seems to be a tension between the socially engaged design discourses developed in the comparatively privileged Western design community of the global North, and the discourses building on postcolonial theory, urging design to move away from the Eurocentric lenses, such as the series of events on political activism *Climactic: Post Normal Design* (2016), on *Speculative Design in the "Real World"* (2016) and the symposium on *Decolonising Design* (2016).

Within this new social turn (DiSalvo, 2016), design practice is engaging both in creative city politics such as 'hacking capitalism' adapted by the so-called 'creative class', as well as more heterogeneous spaces such as movements rooted in austerity urbanisms, anti-poverty work, mobilisations against welfare reform, unemployment, politics of borders and immigrant rights, homeless activism, local exchange and other solidarity networks (Mayer, 2013). While entering into such contexts, the challenge for design remains to understand *the social*, and critically appreciate what '*making the social*' means (DiSalvo, 2016). This concern of the design scholars has sparked various debates and generated discourses that have put the designer in a politically active subject, who can use its tools and skills to generate projects that would contribute to a society based on a different

[1] During 2016, London's first Design Biennale accompanied by a series of events and exhibitions explored the theme of *Utopia: A year of Imagination and Possibilities* at Somerset House in London. https://www.somersethouse.org.uk/press/utopia-2016-year-imagination-and-possibility

value-system than the current establishment. This establishment being the 'process of neoliberalisation' (Design Culture Salon[2], 2017).

Although, the term *neoliberalism* continues to spark various heated debates, we will only consider it as one context in which the contemporary design activists operate. In Julier's narrative design activism seeks to 'contest' neoliberal processes and "searches for alternative models of practice" (Julier, 2013a, p.216). It acts on the neoliberal frameworks that shaped design culture and aims to "produce other futures" (Julier, 2013a, p.232). This embraces the activist ethos of design, but leaves us questioning what these 'other futures' and 'alternative practices' might be, and ultimately, confirms the importance for further research in how design activism changes design practice and its implications for the future of design education.

Context of Design Activism

Activism(s) today

Activism and design are becoming practices embedded within our everyday life by engaging with often similar matters of concern. Activism implies change and transformation and providing visibility to the larger public. Jordan (2001) suggests that contemporary activists take into consideration ethical issues which "may underpin or inform future societies" (p. 9). They use tactics such as "non-violent direct action, dis/organization, pleasure-politics, culture jamming and hacktivism" (p. 9). According to Jordan (2001), contemporary activism integrates many different social solidarities that challenge different social hostilities "in the context of radicalized forms of democracy" (p. 10).

Being an activist involves often tackling a set of practices simultaneously to reach an overarching set of goals, to mobilise further, and get involved in movement activities. Understanding forms of participation and collective action has been a key element of social movement (Tarrow, 1993; Melucci, 1996; Polletta, 2002; Diani, 2004; Reiter, 2009; Graeber, 2009). Building on the concept of social movement explored by Diani (1992), della Porta and Diani (2006) suggest that "social movements are distinct social process" whereby actors, such as activists, "engaged in collective action: are involved in conflictual relations with clearly identified opponents; (they) are linked by informal networks; (and) share a distinct collective identity" (p. 20).

Such 'distinct social processes' have been studied extensively by scholars who have identified other important aspects such as: the motivations and collective identity (Melucci, 1995; Polletta & Jaspers, 2001), understandings of value (Habermas, 1982; Biekart & Fowler, 2013; Glasius, Pleyers & Biekart, 2013; Mayer, 2013), vision and survival of social movements (Tilly, 1977) and framings within social movements (Benford & Snow, 2000; Smith et al. 2016). More recently with the emergence of the 'new social

[2] The Design Culture Salons are occasional discussions and debates on the changing role of design in contemporary society, and the future of design culture, criticism, representation and practice https://designculturesalon.org/about/

movements' increasing attention has been given to practical projects and the politics underpinning their actions (Yates, 2014).

Vision

In terms of vision, the debate is ongoing: movements rarely have one goal, but usually they have several goals linked together, which vary in scale, precision and its target. This problematic aspect of activist movements has been raised by Alex Williams and Nick Srnicek in their manifesto for 'life after capitalism' (2015). In this manifesto, they ascribe the 'no clear vision' to what they describe as 'folk politics'. They suggest that under the subsection of the Left there is this urgency to turn towards various forms of *immediacy* such as spatial immediacy, environmental and economic localism, but most importantly a temporal immediacy, which often prefers short-term vision over long-term strategic thought. Furthermore, conceptual immediacy and an emphasis on the emotion over the rational, the preference of the personal over the structural, and affect being favoured over the reason. These aspects and attitude to address social, political and environmental issues are just as relevant for design(activist) practices as they are for activist movements.

From Dissensus to Consensus

Finding the balance between dissensus and consensus or the route from dissensus to consensus, is a central theme within activism and a core debate of social movement scholars (Habermas, 1981; Graeber, 2009; Stringer, 2015)

Consensus means the agreement between the political and social parties to find the common interest of the community. Within the public sphere, Habermas considers consensus as the 'rationally motivated agreement' that is achieved once participants 'overcome their subjectively based views' but which presupposes the power differences between participants to be neutralised (Flyvbjerg, 2000). Neutralising these power differences for Rancière (2010) means that consensus reduces political difference to homogeneity, and objectifies the nature of any collective situations. With political differences Rancière refers to what people do that challenges the hierarchical order of a given set of social arrangements (Rancière, 2010; Fjeld, 2016).

Mouffe (2000) too argues for a democratic model, in which people can express themselves over an issue and recognise themselves as political subjects, but she agrees that a pluralist democratic model is only possible with a certain consensus. In her terms this is a 'conflictual consensus', and dissensus is important as it "makes visible, what the dominant consensus tends to obscure and obliterate" (Mouffe, 2007).

Within activist communities, and social movements, activists claim the consensus model has many flaws, as it may compromise demands by not discussing them. It is also suggested that consensus-based meetings are less efficient (Graeber, 2009; Stringer, 2015). Graeber (2009) considers consensus as a process that builds upon mutual respect and creativity and "which tries to make sure no one is able to impose their will on others and that all voices can be heard" (p. 303), even if no decision will be reached in the end.

Dissensus, on the other hand, disrupts the power structures of the social order. According to Rancière (2011) dissensus is based on ordering of the 'sensible', which reveals and includes the 'inadmissible', what might be excluded by consensus. While consensus deals

with the redistribution of powers and negotiation, dissensus challenges the established framework of the perception. Graeber (2009) and Stringer (2015) suggest that by encouraging dissensus the possibility is given for conflicting views to play out. This enables everyone within the group to speak up and discuss, before they can move to a consensus.

Awakening to the political

While the political nature of socially engaged design has been mainly a concern of design scholars and researchers (Fry, 2003; DiSalvo, 2010; Mazé & Keshavarz, 2013; Tonkinwise, 2010), recently there is a growing awareness within design activist practices taking the political agency on board (Wood, 2017; Mediations, 2016; Menu, 2016; Design or Disaster, 2017; Civic University, 2017).

Within this design activist community, the meaning-making activity attributed to design (Simon, 1988) blends research, critical thought, activism, design and architecture practice to engage with progressive social, economic and political issues. Such design activist collectives design processes and frameworks in which the role of the designer and architect is challenged, often taking a mediator's role within the participatory processes and engagement forms they create. These engagement forms have been strongly informed by the agonistic approach to participatory design and public spaces (Mouffe, 2008), and the encouragement for dissensus over consensus (Rancière, 2010). Particularly, aesthetic dissensus (Rancière, 2009), has radically influenced social design (Koskinen, 2016), engagement with the publics, placemaking with communities, and design for debates. Design scholars have built on these theories to consolidate the various political implications of design as a 'practice' (Ingram J., Shove, E. & Watson M.,2007) engaging with the social dimensions of different futures (Mazé, 2014; Smith, R.C. et al. 2016) that evokes and engages with political issues and enables agonism (DiSalvo, 2010), disrupts the system (Markussen, 2011) creating 'alternative' futures (Julier, 2013a), and which designs for the marginalised (Björgvinsson, Ehn & Hillgren, 2012) and the undocumented (Keshavarz, 2016).

Relationship between Activism and Design Activism

Arguing for a pluralism of value, Mouffe (2008) foregrounds the agonistic model for a public space where critical practices can visualise 'that which is repressed and destroyed by the consensus of post-political democracy'. Her call is for an awareness to engage with and envisage current societal issues in a political way as political questions are not merely solved by experts. Choosing between 'alternatives' involves taking decisions in political questions (Mouffe, 2008), and this is where engaging with the alternative different to the dominant system is political. She argues for the aesthetic dimension of the political, the symbolic ordering of the social, a similar understanding of the aesthetic order as Rancière. Aesthetic for Rancière means a particular regime of artistic practice, that introduces heterogeneous subjects within the field of experiences by disrupting the socio-culturally entrenched forms inhabiting the everyday world (Rancière, 2010; Markussen, 2013; Koskinen, 2016).

Building on Mouffe's political theory regarding agonistic spaces, DiSalvo (2010) distinguishes 'design for politics' from 'political design' to analyse examples of design for democracy. He argues, that while design for politics seeks to offer solutions for immediate

needs by finding consensus, political design, recognises the inevitability of dissensus within society and aims to reveal the underlying issues behind initial perceptions by contesting and challenging the status quo, while enabling long-term impact. This definition of political design (DiSalvo, 2010) resonates with design activism, in the sense that design activism challenges the status quo and addresses the underlying issues behind what seems obvious.

While most design thinkers agree on the aspect that design(activism) should encourage more dissensus (Markussen, 2011; DiSalvo, 2010; Keshavarz & Mazé, 2013; Fuad-Luke, 2017), some consider that design through consensus or a combination of both opens more opportunities for design activism (Julier, 2008; Meroni et al. 2013). However, in the actual practice of design collectives, it is not explicit *how* and *why* one would exclude the other. Therefore, more research is needed to understand how dissensus articulates design activist manifestations, and what are its implications within the contexts it intervenes.

Design Activism

Advocates of micro-utopias implemented in the everyday, the activist designer uses its tools and skills to generate projects that envision a society based on a different value-system than the current establishment. Thorpe (2008) recognises that designers fulfil an activist role, either being themselves activists or by being 'activists for hire'.

Departing from the most emerging socio-political and environmental tensions we face today, design activism creates situations that challenge power-relations and articulate new courses for actions. Compared to other design practices, design activism acts on the established frameworks to create “other futures” (Julier, 2013a, p.232). Within discussions on design activism (at the Design Culture Salon, 2017; Design or Disaster Symposium, 2017; Civic University at Tate Exchange, 2017) the established frameworks are constituted of neoliberal doctrine. However, there remains nascent research on how design activism puts pressure on these frameworks and what the ‘alternative / other futures’ would be**.**

It seems, that striving to understand how design practice changes within the neoliberal paradigm leaves these discussions stuck: it misses to address the key problematics such as how design can contribute to positive transformational processes and what are the possibilities and realities of what design activism could do. What does it exactly mean *to act on* the dominant frameworks? Working towards this question, the next section brings together articulations and proposed frameworks from the existing literature in order to understand how design activism might achieve this.

In pursuit of a definition

Whether it comes to social design, participatory design, design anthropology or design activism, the place to start with is Victor Papanek’s (1985) seminal text titled *Design for the Real World*. Papanek’s work, that would underpin the global design activism movement of the 20th century, originated in the early participatory design activism of 1960s Finland and the emergence of the pan-Scandinavian student design movement (Clarke, 2013).

The timeline of design activism traced through design history is long and has been put forward already by scholars (Fuad-Luke 2009; Thorpe 2011; Julier 2013a; Clarke 2013).

Therefore, the focus of this section is to locate contemporary design activism by mapping the scholarly and informal definitions, identify its current relevance and how it makes a difference in the field today.

Design movement or design approach?

Often discussed as a **design reform movement** (Fuad-Luke, 2009; Julier, 2013ab) and a *design movement* (Clarke, 2013), design activism emerged as a result of the processes of change of advanced industrialisation and globalisation, and the discourse and practices of individuals and groups who wanted to find alternative ways to their practice from the mainstream industry (Julier, 2013ab). Based on social processes and *social movements* (Cetin, 2016; Thorpe, 2011) and borrowing from concepts of protest and resistance, design activism calls for change through unconventional methods, particularly through disruption of routine practices, systems and structures of institutionalised, or dominant power (Thorpe, 2008). Contemporary design activist impulses are trying to self-consciously respond to neoliberal circumstances, and "develop new ways of working that coincide with geopolitical, economic, and environmental crises" (Julier, 2013b, p.226).

Historically, design activism is not limited to neoliberal societies**.** It has taken place in other forms of political and economic structures such as during the cold war in the communist countries. It continues to exists today in countries which may not have neoliberal governments, most probably under different labels such as social or civic activism. Also, understanding it as a movement implies that design activism has a beginning and an end in a specific context, which then should be appreciated within that context.

For Fuad-Luke (2009, p. 29) design activism is "design thinking, imagination, and practice applied knowingly or unknowingly to create a counter-narrative aimed at generating positive social, institutional, environmental and/or economic change". In the past, Fuad-Luke (2009) used design activism as **an umbrella term to encompass various design approaches**. More recently, he (Fuad-Luke, 2017) distinguishes design activism from social design through its teleological orientation, and the way it uses consensus and dissensus. While social design has a more predefined purpose within the neoliberal agenda, and seeks public and social good within the dominant system, design activism focuses on 'alternatives' that challenge the existing power structures and relations (Fuad-Luke, 2017). In a recent essay on the teleological orientations of design activism, Fuad-Luke (2017) examines the framing of design activism in comparison to social design and highlights differences between them within the language characteristics, their goals, and how they use consensus and dissensus.

Meanwhile, the Social Design Futures research study (Armstrong et al., 2013) lists design activism as **an approach to social design** defining it as being:

> *more explicit in its political intentions than Design for Social Innovation and Socially Responsive Design. It includes the creation of artefacts and experiences associated with political discussion and protest, but also results in designs that intervene into everyday lives while raising political consciousness concerning collective challenges (Markussen 2013, Julier 2013). It usually sits outside commercial or governmental structures and*

works through settings such as grassroots activities, community action or pressure groups. (Armstrong, Bailey, Julier, & Kimbell, 2013)

Within this definition design activism becomes another 'voice' of the social design discourse. Chen et al. (2015) and Bugali et al. (2016) suggest that social design itself failed to establish an explicit definition. In a discursive analysis of the 'multivocality' within social design, Bugali, Fairburn and Halsall (2016) raise awareness about the presuppositions[3] within the field and argue for a more critical approach in order to understand social design actions.

Locating Design Activism in the field

The various approaches to design activism and narratives around it, confirm that there is an enthusiasm to return to understanding what design activism can offer, but they also reveal that these approaches and framings are not discussed in relation to each other. The definitions and goals of design activism mentioned above seem to all agree that design practice and design research needs to adopt a more critical approach to address the political and ethical tensions of the social futures it wants to address.

Frameworks

While there is no clear definition of what design activism is, the following frameworks have been proposed by scholars that discuss design activism:

- in relation to other socially engaged design approaches (Markussen, 2014; Fuad-Luke, 2017),
- the context in which it operates (Fuad-Luke in Walker et.al 2013; Julier, 2013b), such as when dealing with processes of neoliberalism,
- and its implications to design culture (Julier, 2013b).

These frameworks attempt to provide orientation within the narrative around design activism. Nevertheless, they miss to establish a dialogue with the context and conditions of activism or the grassroots movements where often definitions position design activism.

Based on the Design History Society 2011 conference, Fuad-Luke (Walker et.al 2013) develops a meta-framework in which dissensus, consensus and transitional practice transform the existing system within neoliberal societies. Within this meta-framework Fuad-Luke distinguishes design activist practices that *work outside the existing paradigm*, *within the existing paradigm* and *on the edge of the existing paradigm*[4]. While these

[3] Bugali, Fairburn and Halsall (2016) list a number of presuppositions in the field of social design.

[4] Within the meta-framework Fuad-Luke (Walker et.al 2013) lists examples for design activist practices that work outside the existing paradigm (such as the work of Markussen, Dunne and Raby, Gaspar Mallol's frictions, Walker's propositional artefacts), within the existing paradigm (Design Council, Architecture for Humanity 2006, Pilloton 2009, Julier 2011, Meroni 2007, Wood 2008, Mattelmaki and Visser 2011) and on the edge of the existing paradigm , such as quiet activism through craft practices (Hackney 2011), craftivism (Patel 2011), co-designing as making (Neuberg and Bowles 2011) and 'open design' (van Abel 2011).

categories can be useful aspects to map the activist efforts of various design practices, the umbrella term covering the examples he provides generalises design activism.

Meanwhile, the conceptual framework proposed by Julier (2013b) discusses design activism in relation to the processes of neoliberalism, and how, within the shift 'from' design culture 'to' design activism, design activism appropriates four key themes:

> *intensification - described as a density of designerly intervention; co-articulation - labelled as the marrying up of concerns or practices in a way that strengthens both; temporality - thought of as the way that speed, slowness, or even open-endedness may be dealt with; territorialisation - viewed as the scale through which responsibility is conceived. (Julier, 2013b, p. 227)*

With these concepts, he sets the time and space for design activism to intervene in the social, political and environmental modes of existence as a 'movement' that is 'broad in its scope and aims', and which intersects with 'social design, community design, participatory design, and critical design' (Julier, 2013, p.226), 'cocreation and sustainable design' (Julier, 2013a, p.146) However, these intersections are not discussed in relation to each other.

Furthermore, Julier (2011) distinguishes two design activist approaches: one that addresses massive change and another which emerges from within communities. Example of the former which tries to address global political issues with impact on a global scale are the *Massive Change: A Manifesto for the Future Global Design Culture* (Mau, 2004) and the *Design Like You Give a Damn: Architectural Reponses to Humanitarian Crises* (Architecture for Humanity, 2006). The later aims to support initiatives which stress the importance of social practices and where designers draw on expertise from local challenges as part of a world view on responsibility. Here the design activist becomes a facilitator, the listener who recognises the needs and aspirations of the community (Julier, 2011; Manzini, 2014). Focusing on transformation of the use of resources that support everyday life, these 'social innovations' are characterized by localism, small scale interventions and build on the crafts and capabilities of the local people, gearing social learning towards sustainability (Julier, 2011).

It is important to notice, that with this second approach Julier takes design activism into the social innovation journey**.** However, scholars such as Markussen (2014) and Fuad-Luke (2017) have already argued that design activism differs from social innovation. This also suggests that the views have not been consistent. The reason for this might be that: 1) within this new social turn design continues to be dematerialised; 2) social design and social innovation adapts various definitions depending on the context or the network it represents (e.g. DESIS); 3) the recent enthusiasm for adopting Rancière's aesthetic dissensus and Mouffe's agonistic pluralism, has conflated the vocabulary of design shifting the focus from aesthetic and function to the social forces (Koskinen, 2016).

Within the discourse of the social innovation journey, design activists are considered part of the Creative Community, defined by Meroni and Manzini "as people who cooperate in inventing, enhancing, and managing viable solutions for new (and sustainable) ways of living" (Manzini, 2014, p. 62). When offering alternative 'solutions' to the problems

addressed, the social innovation journey seeks consensus to co-create an infrastructure with different stakeholders.

To conclude from these ongoing debates, it seems that while social innovation aims to empower deeper democracy, design activism is trying to address the underlying tensions of democracy, often acting more as a form of enquiry, than providing solutions; being rather a state of mind examining transformative politically charged actions, than rushing to implement the idea in a business model.

More importantly, there seems to be a disconnection between the discursive framings proposed to understand design activism and how design activism is articulated in practice. As a practice, it is often situated within the grassroots initiatives, pressure groups and community design projects (Armstrong et al. 2013). To understand the dynamics and motivations of grassroots initiatives the grassroots innovation movement literature (Smith et al. 2016) provides a useful framing informed by social movement literature. Within social movement studies, concepts of framings are key in understanding how collective action is informed by the production of ideas and meanings that create 'bonds of solidarity'; how they inform 'alternative visions' and open up 'spaces for participation and action' (Smith et al. 2016). Smith et al. (2016) differentiates grassroots activities through contexts, framings, spaces and strategies, and pathways. This analytical framework could inform the spaces of actions of contemporary design activism, the 'pathways' design activism is proposing for positive transformation, and how attitudes within the design activist collectives are changing design practice. Bringing the grassroots innovation literature into this conversation, we seek to foreground the foundation for a more coherent understanding of design activism and a constructive dialogue within its community.

Forms of Design Activism: A Conversation between Activism and Design

Activism has different connotations and dynamics varying from the capitalist countries of the global North to the Eastern European Block and the global South. Similarly, design activism has been taking place in various forms around the world, not necessarily under the label of 'design activism'.

The Global Design Activist Survey conducted by Kaygan and Julier (2013) has started a conversation by collecting different understandings of contemporary design activism from designers, design scholars and historians. In the survey, they asked 1) how design activism has impacted design culture locally, and 2) what they found as a key challenge for design activism in that particular region.

Most responses shared the activist ethos of counterculture providing an alternative framework to the established system and empowering the marginalised, and that design activism acts more like an 'activism' on design culture. Beyond the enthusiasm for such an 'activism', however, there seems to be an overarching concern about design activism being surrendered by various too many discourses, tactics, styles or tools which, they suggest, might obstruct bringing meaningful change in the local context where design activists intervene.

In India design activism encourages design to be more self-reflexive beyond its connection with the nation-state and markets, while in Turkey design activism has mobilised design knowledge introducing the products and practices of marginalized communities. In Beirut design activism enabled an alternative framework of the practice to emerge locally, one that is motivated by critical inquiry and meaningful exchanges in the public sphere. It acts as counter-culture movement and more recently as a close ally to society in Denmark, and contributes to redefine the public role of design influencing the developmental agenda in Cape Town. Furthermore, design activism is influential in the field of ideas activating citizen's participation in Barcelona, and it generates citizen consciousness and educates the public in responsible consumption in Bogota, Colombia.

Finally, Kaygan and Julier (2013) conclude that design activism develops cooperation within the frameworks of groups, communities, even institutions.

The stories in the survey provide only a brief insight into the local context and meaning of design activism, and some of the articulations even share similarities with what others would consider social innovation**.** Overall, the responses reveal more about the thresholds where design activism intervenes, and where its future opportunities may lie. The survey foregrounds this important conversation between activism and design. Taking this investigation further, we argue for the importance of more in depth research on how design activism manifests and with what methods and frameworks it works to challenge the dominant system for a positive transformation.

Articulating Design Activism

> *Solidarity and transgression, collective and action, are the twins of activism. (Jordan, 2001, p.12)*

To understand design activism actions, this part of the paper will briefly portrait the ethos that is driving design activist practices.

The interventions and participatory processes used within design activist practices are informed by the position they take such as critical feminist economics, situationist psychogeography, postcolonial theory or radical democracy. Methodologies here include co-design and participatory design. According to Lenskjold, Olander and Halse (2015) these are not normalised yet and are highly interdisciplinary and subject to experimentation. This interdisciplinary exploration is paired with an eco-socio-political consciousness emerging from the precarious economic condition that has influenced the designer's attitude towards the subject of design and the responsibility they see designers should take in society.

While they are taking the political agency of design on board, there seems to be an urge to act on the immediate problems that the current social, political and economic scene is causing. A similar tendency towards the political awaking is seen by Srnicek and William (2015) more as political common sense and not a political moment, a horizon of understanding where political action and tactics can be conceived, but which might not be a constructive position for envisioning a better future. The visionary-dilemma, or favouring short-term goals over long-term thinking, however, in the case of design activist practices is arguable. Most of these collectives emerged as a result of an era of austerity,

young design graduates struggling to find secure employment as experienced practitioners (Wood, 2017; Menu, 2016; Design or Disaster, 2017). This awareness of the current economic and political conditions shapes the design activist's methods and fuels commitment to critically and transformationally engage with current progressive socio-political issues, such as increased borders, structural racism, economic inequality or the erosion of the welfare state. Within design activist projects change has many dimensions, and it varies from small symbolic to global scale.

Design activism is heavily connected to urban design movements and planning (Mayer, 2013), as well as architectural practices that use design as a tool for collective benefits (Wood, 2017). Here design activism emerges as a way to address social and spatial issues. Such practices combine strategies to reorient subjectivities and articulate claims for a transformational change for the marginalised within the urban or address other tensions fuelled by neoliberalism.

For example, these can take form as occupying land and setting up spaces for knowledge and skill exchange, repair cafes, participatory pedagogy and co-designing with communities for local ecosystems and exploring forms of collective governance (AAA[5] at Civic University, 2017). These strategies make things visible, problems more tangible and give people access to these forces and roles of architecture and design. While they produce slow transformation on the local level, there is an emerging question coming both from critiques (Wood, 2017) and the collectives themselves (Civic University, 2017; Design or Disaster, 2017), whether these strategies and forms of design engage enough with the opportunities available for the change design activists claim to address.

Case Studies

The three selected case studies included below illustrate how design activism might manifest and how it can act on the dominant systems. Transgression is one of the key elements of activism (Jordan, 2001) and also present in design activist interventions. It means an action that goes against a rule, challenges the status-quo, thus it involves some change in the normal state of affairs. The case studies illustrate how design activism might disrupt power structures by creating 'alternative routes' through use of storytelling within architectural processes (La Rivoluzione Delle Seppie), by incorporating a strategic satire within design interventions (Two-Tailed Dog Party) and lastly by utilising collaborative formats to design for disagreement (Planning for Protest).

Conversations that transgress the current political system

One way to challenge the status quo of the system, is the way *Stories from the front*[6] engages with the refugee-crisis in the region of Calabria of Southern Italy. The initiators, **La Rivoluzione Delle Seppie**, are an interdisciplinary practice formed by a group of experts from different backgrounds, who explore ways to address topics such as education (lack

[5] atelier d'architecture autogérée / studio for self-managed architecture (*aaa*) is a collective platform which conducts explorations, actions and research concerning urban mutations and cultural, social and political emerging practices in the contemporary city.
http://www.urbantactics.org/research/r-urban/

[6] http://larivoluzionedelleseppie.org/
https://www.kickstarter.com/projects/827906908/stories-from-the-front

of), immigration and integration. They explore methods that instigate conversations that transgress the current political system in Italy; and examine playful ways to address pressing issues, using storytelling, puppet cinema, communal cooking in the case of Stories from the front.

Designed in the format of a series of workshop-experiences it explores the geographical, the social, and cultural to highlight and bridge the clash between African and European cultures caused by recent migration (Figure 1). Within the socio-political agenda they are developing, the architect / designer becomes someone who facilitates strategies, convenes with various actors and most importantly links marginalized communities to those in power.

Figure 1 Busy minds at work. Building the Storytelling Studio. Photo: Stories from the front, 2016

A slightly similar initiative involving asylum seekers in various activities, is the *QurciaLAB*, a community economies research and resource centre set up by the collective called **Brave New Alps**[7] in Rovereto, Italy. The collective's practice lies at the intersection of communication design, spatial interventions, DIY and critical pedagogy. The vision of QurciaLAB is to grow into 'an interface that through making, research and cultures foster the creation of alternative socio-economic relations between old and new inhabitants of the region and beyond'[8], most recently. At the core of their work are values of the commons and mobilising through making, research and design education.

[7] https://www.salto.bz/de/article/08032017/design-ist-mehr-als-form-und-farbe
[8] http://www.brave-new-alps.com/news/

Strategic use of humour within interventions

Activism that integrates satire, the absurd and other forms of humour is often a successful tool to mobilise people in Hungary for example.

Humour is an important tool for disruption, subversion, and central in the formation of the social and political identity is the active, strategic use of humour. It is tied to the local context and can only make sense to the people who are familiar with the references it makes. While it is arguable to say that its use in social movements is universal, there are several examples showing how satire, humour and the absurd are engaged in the construction of political subjectivities challenging the norms of the given social order (Karakayali & Yaka, 2016; Weaver et al. 2016). Such an example is the work of the fringe political party called the **Two-Tailed Dog Party** (MKKP)[9].

During 2016, MKKP has raised 29 million HUF (~£80000) from citizens in just two weeks to launch a billboard campaign countering Prime Minister Victor Orbán's controversial anti-immigrant referendum on a mandatory resettlement quota. This initiative mobilized Hungarian NGOs who urged the public to boycott the referendum by either not attending or discarding the vote by ticking both 'yes' and 'no' on their ballots. The 'deadly serious' billboard designs that covered the country with slogans satirising the government's xenophobic billboards (Figure 2, Figure 3), triggered other smaller opposition liberal parties to initiate small scale billboard campaigns calling on people not to go to vote. Most Hungarians indeed stayed away or gave invalid or unclear answers misleading the question. The result was that the referendum failed, given that the number of valid votes did not reach the threshold of 50%.

Through their often humorous street art, graffiti, stencils and poster formats, MKKP provides stark criticism of company policies, the state of Hungarian railroads, sabotage large billboards signs while providing a meta-humour that mobilises both the local and the Hungarian diaspora.

[9] https://www.theguardian.com/world/2016/jan/06/hungary-two-tailed-dog-viktor-orban

Figure 2 Counter-billboard campaign to Viktor Orbán's anti-immigration referendum. Photo: Béla Szandelszky (Karáth, 2016)

Figure 3 Counter-billboard campaign to Viktor Orbán's anti-immigration referendum. Photo: MKKP (Földes, 2015)

Collaborative platforms for designing forms for disagreement

While developing networks design activist practices often join forces in collaborative projects, or happen to respond to similar provocations in the frame of large scale events. Such an example is **Planning Protest**, a project with 12 collectives participating as part of the Lisbon Architectural Triennale 2013, which explored the social and architectural

definitions of protest in light of the 2008 financial crisis. The aim was to understand how public spaces shaped the subsequent global protests, by gathering proposals from twelve architectural offices in twelve global cities that examine the role of architecture in defining, or limiting the flow of protest within their respective contexts. The outcome was an exhibition and a publication that compiled the proposals in the format individual cards. Such projects could intervene and inform the built environment, but what often happens with projects curated as part of large scale events, is that the content and insights from projects remain stuck in a well-designed publication.

Figure 4 Publication of Planning for Protest (Lisbon Architecture Triennale, 2013)

Conclusion

While there are various understandings of design activism, views are inconsistent and discourses are often disconnected from the local dynamics and meanings of activism. Drawing on contemporary notions of activism and discussions within social movement theories we aimed to further the dialogue between activism and design in order to consolidate understanding, the shortcomings and future opportunities of contemporary design activism.

Literature and discussion within activist and design activist communities confirm that they both are working towards structures which will support the development of more equal and ethical forms of societies. While contemporary activist impulses are merging into new definitions of a moral society (Jordan, 2001), design activist collectives are curating new forms of design within social practices finding inspiration in 'alternative futures' that deviate radically from the current establishment.

Just as activism is not proposing a plan in the sense of a utopia, not even a blueprint by which we could achieve our immediate goals, design activists shy away from envisioned

futures. Instead they design situations, spaces for solidarity networks alternative to the dominant system.

Beyond the strong commitment and dedicated explorations to critically and transformationally engage with issues emerging from the precarious condition, there is also a strong sense of developing an identity as a collective, a collective-lifestyle independent from the current establishment. Identity has a critical role in mobilising and sustaining solidarity, commitment and participation, and collective identities among activists are also used as a strategy to mobilise groups around a certain issue (Polletta & Jasper, 2001). In understanding design activist collectives, it is important to recognises the risks of being non-conformist, a dissenter, and its economically precarious condition, as well as its potential to pressure the establishment and contribute to positive transformation.

From the three case studies presented here, the Two Dog-Tailed Party has managed to fundamentally change something that the government wanted to impose on Hungary. Quercialab and *Stories from the front* engage with the tensions asylum seekers face by subverting the existing power structures. Working from the margins towards centralised issues, addressing the underlying matters of concern, design activism can redirect the narrative, empower causes of the marginalised and engage communities in articulating possible future visions. While there are many similar projects and cross-collective collaborations, the question of how to sustain such initiatives and scale up positive transformation remains a question for a future research.

By mapping the debates around design activism from the past decade, we started working on a framework that could help understand the ambitions and processes of design activist collectives committed not to depend on the dominant system in society. This is necessary for two reasons. First, designers committed to address progressive social, political and environmental issues have changed the attitude towards the subject of design, and are changing design practice. Second, the growing network of design activist collectives are building processes and frameworks to challenge power structures imposed by the 'dominant' systems. Better understanding of these processes will provide a knowledge which can contribute to further develop design activist practices as well as design education to inform future design activists.

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About the Authors

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Dr Erik Bohemia is the Programme Director in the Institute for Design Innovation at Loughborough University London. He led to completion an AHRC funded project exploring how new digital technologies are affecting and changing knowledge translation in New Product Development and innovation. He is interested in Design as a cultural practice and the material effects of design.

Dr Sharon Prendeville is a lecturer in design innovation at Loughborough University's London School. She researches new contexts for design and their potential to enable sustainable futures. This encompasses how sustainability manifests in urban spaces such as grassroots movements and circular cities.

Section 4.b

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HONG KONG DESIGN MANAGEMENT ACADEMY CONFERENCE 2017

RESEARCH PERSPECTIVES ON CREATIVE INTERSECTIONS

Introduction: Challenges and Obstacles to the Enactment of an Outside-In Perspective: The Case of Design

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doi: 10.21606/dma.2017.240

Preferences shape perceptions of product usefulness, utility, ease of use, as well as price sensitivity and the time that people attend to something so contributors are invited to consider factors that shape preferences and influence an organisation's ability to enact an Outside-in perspective. Relevant factors include *nationality* (the best contributions will be considered for a Routledge book 'Nationality, Design and Marketing'), *personality* (how this shapes creations and preferences), *gender* (the role of culture and physiological in men and women's visuo-spatial abilities) and *organisational* factors (the homogeneity principle and its influence on designer selection with potential conflicts with external customer preferences) A consideration of these factors singly or in combination would be encouraged.

This track therefore explores the challenges/ obstacles to achieving an Outside-in perspective using design with key issues being: the way that the involvement of people can shape notions of design excellence; the way that organisational concepts of design excellence may be at odds with those of consumers; and how obstacles in the way of an Outside-in perspective can be identified and addressed. Added to this, an understanding of the way that segmentation variables (personality, nationality and gender) impact design creations and preferences and whether there is an 'opposites attract' effect, through the design of these variables (such that for example a design created by someone of nationality x would be preferred by someone of nationality y) or whether there is a 'like attracts like' effect such that designs created by men are likely to be preferred by men over women).

The two papers submitted in this section increase our understanding of these issues. The paper by Alana James and Marsha Aftab, 'People as an essential tool for considering ethics in the product lifecycle' shows how during the design process people create added value with a participatory approach, whilst during production consumers can become prosumers in consumer---led innovation to help drive forward an ethical agenda. In the second paper by Gloria Moss, Gabor Horvath and Eszter Vass, 'The impact of gender on children's design preferences' we see how boys' and girls' design preferences are influenced by the gender of the creator of the design with empirical work showing a strong statistically significant tendency for boys to prefer designs created by men and girls to prefer designs created by women. These findings mirror findings of preferences amongst adults.

These two papers conjointly show the extent to which factoring in customer preferences can benefit the organisations creating the designs.

About the Track Facilitators

Gloria Moss PhD, FCIPD, Professor of Management and Marketing at Buckinghamshire New University, has undertaken research on the impacts of nationality, personality and gender on design and marketing decisions. She is the author of five books and over thirty peer-reviewed journal articles.

Cees de Bont is the dean of the School of Design at the Hong Kong Polytechnic University (PolyU), Swire Chair Professor of Design and Alex Wong Siu Wah Gigi Wong Fook Chi Professor in Product Design Engineering. Prior to his appointment at PolyU, he was the dean of the Faculty of Industrial Design Engineering at the Delft University of Technology in the Netherlands.

Gabor Horvath is a Senior Lecturer in International Business and Marketing at the University of South Wales. He has 22 years in academia, 11 years with the University of Glamorgan/University of South Wales and 11 previously at Pannon University, Hungary.

HONG KONG DESIGN MANAGEMENT ACADEMY CONFERENCE 2017

RESEARCH PERSPECTIVES ON CREATIVE INTERSECTIONS

The impact of gender on children's design preferences

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doi: 10.21606/dma.2017.240

Design has a vital role to play in the Marketing Mix and can shape a person's overall reaction to a product including its pricing. Designers, for their part, are key cultural intermediaries between the product or services and the consumer but empirical research testing children's preferences for products, segmented by gender, shows that the value placed on designs by children can vary widely. This paper will help designers and marketers perceive the strength of an interactionist rather than universalist approach to design, permitting an understanding of how others negotiate meanings.

keywords: gender; children; preferences; design

Introduction - Importance of design in the Marketing Mix

Literature review

Design has the potential to impact the Marketing Mix at each of its four points, whether in respect of Product, Place, Price or Promotion. Self-evidently, it will influence the look of the product and its promotion and can have an influence the price people are willing to pay for non-commodity products, adding a premium of up to 66% on the price people are willing to pay (Hassenzahl, 2007). Its strategic importance is such that it shapes a person's overall reactions to a product (Roy and Wield 1989), replac[ing] nature 'as the dominant presence in human experience' (Buchanan 1995, xii) and serving as 'an important strategic asset, both in the business and academic arenas' (Dell'Era & Verganti, 2010, p.124).

The product design field encompasses the functionality, aesthetics and ergonomics of a physical product that comes into contact with a consumer (Coates, 2003) and consumer reactions to the aesthetic aspects of products are recognized as important determinants

of consumer behaviour (Vezyer, 1993; Creusen et al*.,* 2010) and key sources of differentiation (Schmitt & Simonson, 1997). These aesthetic aspects consist of those characteristics that create a product's appearance and include materials, proportion, colour, ornamentation, shape, size, and reflectivity (Lawson, 1983). In today's increasingly competitive marketplace, companies need to take into account the aesthetic preferences of consumers when they make decisions about the appearance of their products (Creusen et al*.,* 2010, p.1437-8). Design, therefore needs to interact with consumers, leading Buchanan (2001, p.11) to speak of "interaction design", a term he explains as being rooted in how:

> *human beings relate to other human beings through the mediating influence of products. And the products are more than physical objects. They are experiences or activities or services, all of which are integrated into a new understanding of what a product is or could be.*

Buchanan goes on to state (p.13) that "interaction design" leads designers and design theorists to seek an understanding of products:

> *from the inside—not physically inside, but inside the experience of the human beings that make and use them in situated social and cultural environments… we have an opportunity for new understanding through an investigation of what makes a product useful, usable, and desirable.*

This objective of understanding the experience of human beings links with Bourdieu's notion of 'cultural intermediaries' (1984), one that Nixon (1997) has argued demands a 'differentiated picture' which is:

> *sensitive to differences aligned with educational background and training, and which is aware of issues of gender and race.*

Regrettably, as Buchanan himself states, the issue of 'desirability' is thought to remain one of the 'weakest topics of design research today' (ibid p.16), reinforcing an earlier observation that 'there has been relatively little investigation of how this variable [aesthetics] affects preferences for products' (Vezyer, 1993). Even into the twenty first century the gap persists, with recent commentators lamenting the fact that 'a deeper knowledge of the area is lacking' (Noble & Kumar, 2010).

This paper seeks to address this gap through empirical work testing the preferences of children, segmented by gender.

The importance of markets of children's products

Whereas the kind of products marketed to children has remained fairly constant over time, the buying power of children and adolescents has increased exponentially over time (Institute of Medicine, 2006; Calvert, 2008). The affluence of today's children and adolescents Children as Consumers has made youth a market eminently worthy of pursuit by businesses. In the US alone, youths now have influence over billions of dollars in spending each year (Economist, 2001). From holiday choices to car purchases to meal selections, children have a tremendous power over family spending. Experts estimate that in the US, two- to fourteen year-olds have sway over $500 billon a year in household

purchasing (Institute of Medicine, 2006; Calvert, 2008). Thus, to influence youth is to influence the entire family's buying decisions.

Understanding young people's preferences is therefore of great importance. As we shall see, where visual preferences are concerned, a great deal of the literature on preferences concerns itself with identifying universal factors that influence preferences. There is, however, also a literature that seeks to understand the extent to which preferences are moderated by intermediate variables. In this paper, we look at the case of gender to discover the extent to which children's visual preferences may be segmented by gender. Before examining the empirical literature, the paper will explore the two approaches to understanding preferences indicated above.

Two contrasting approaches to design

Broadly speaking, there are two approaches to understanding the process that leads people to perceive aesthetic value in objects. One is the universalist, Kantian approach which holds that the judgement 'this is beautiful' would be universally held insofar as every normal spectator would acknowledge the validity of the statement in relation to a particular object or work of art. As a consequence, this approach seeks to find rules and solutions that will satisfy everyone rather than just a sample of people. By way of example, Maeda's *Laws of Simplicity* (2006) offer ten principles for achieving design simplicity, with the presumption being that simplicity is a goal of universal appeal. Likewise, Nielsen's 113 design guidelines for homepage usability rest in the belief that the applied results will have universal appeal applicable across demographic groups. Two of these guidelines are shown below by way of example:

10. Limit font styles and other text formatting, such as sizes, colours, and so forth on the page
11. Use photos of identifiable people who have a connection to the content as opposed to models or generic stock photos. People are naturally drawn to pictures; so gratuitous graphics can distract users from critical content.

It can be seen that these guidelines presume a single best way of presenting information which in turn presumes a common aesthetic response on the part of all users. In fact, much design research is dedicated to isolating the visual principles that will universally optimise design. Veryzer (1993), for example, conducted empirical work with twenty-four undergraduates with a view to isolating the non-conscious design processing algorithms, the so-called 'internal processing algorithms' (IPAs), that produce positive reactions to design. He concluded that proportion and unity 'may play an important role in many if not most consumer decisions' (p.227). In the same way, and more recently, Creusen et al. (2010) sought likewise to establish universal rules concerning the effect of complexity and functionality on aesthetic preferences, testing reactions among a sample of 431 subjects. In neither of these studies were the results segmented by variables such as nationality or gender in spite of Veryzer's view that research should examine the role of biological and cultural influences in the development of IPAs. Something similar could be said of studies examining web design aesthetics which are likewise rooted in a universalist paradigm (Schenkman & Jonsson, 2000; Van der Heijden, 2003; Lavie & Tractinsky, 2004).

So we can see that the universalist approach seeks to identify the factors in the attribute that will have universal appeal and this stands in stark contrast to so-called Field theory (Lewin, 1936) or the interactionist approach (Mischel, 1977), the latter of which presumes that individuals will not necessarily view physical and social settings in the same way, producing, as a consequence, different 'life-spaces' and consumption behaviours (Gehrt & Yan, 2004). Both Field theory and the interactionist approach assume that gaining an understanding of people's reactions to the stimulus object ('format preference') relies on an understanding of the interactive impact of the stimulus object ('attributes'), the individual and the situation. So, rather than seek out solutions or laws that will apply to *all* situations, followers of this way of thinking seek out solutions that work in *particular* instances, thereby shaping products around the 'unique and particular needs' of the customer (Hammer, 1995) with purchases offering a vehicle for self-expression (Karande et al., 1997).

The interactionist approach to aesthetics has a distinguished history with a notable follower being the Scottish philosopher Hume who held the view that aesthetic value does not in objects but is bestowed on them by the beholder. According to this way of thinking, the assessment of value is subjective rather than objective, with design optimisation following on from careful definition and targeting of the decision-maker and user. This entails a focus on the demographics of the target group and an understanding of its 'diversity in terms of ethnicity, age, gender, personality and educational background' (Dell'Era et al*.,* 2010, p.126). Allied to this and in order to 'promote creativity and problem-solving capabilities', is the recommended reliance placed on diverse teams which it is thought can offer 'a variety of perspectives in a way that homogeneous teams will not' (*ibid*).

The evidence here of interactionist thinking as applied to design is in step with thinking in the management arena where it is widely acknowledged that people are more attracted to and influenced by others who share similar attitudes (Hendrick et al., 1970; Reagor & Clore, 1970). A focus in the social arena has been on research examining the positive impact of attitudinal similarity between individuals (Byrne, 1971), with positive consequences extending not simply to incidental similarity between a salesperson and customer (e.g. similarity in terms of birthdays) but to also to attitude favourability and positive purchase intentions even when the interaction with the similar other was a brief encounter (Jiang et al*.,* 2010).

The interactionist perspective then is one that, in contrast to the universalist approach which seeks to uncover rules and IPAs influencing all observers, seeks to understand the processes and elements that may influence individual responses. This paper tests the relative merits of these two approaches through empirical work testing the relative value of a universalist and interactionist framework in understanding the elements that influence 'desirability' and visual aesthetic in a sample of boys and girls. Before introducing the empirical work, some background will be provided on the focus given to gender as a key segmentation variable.

Gender

Opinion on the impact of gender varies (Caterall & Maclaran, 2002) with opinions ranging from the post-modern view that gender is an unproductive dichotomy (Firat, 1994) to the

evolutionary psychological perspective that plays down the influence of sociocultural factors (Jackson, 2001), emphasising instead the role of innate factors (Lupotow, Garovich & Lupetow 1995). According to recent commentators, this second approach is gaining ground in several disciplines and should not be overlooked (Caterall & Maclaran, 2002). When considering the preferences of adult females, their control of 83% of consumer spending (Barletta, 2006; Silverstein & Sayre, 2009) is cited as a major factor in wishing to better understand this segment.

The question addressed by this article concerns the extent to which boys' and girls' visual preferences differ or cohere, the interactionist and universalist position respectively. In the section that follows we will summarise the findings of existing research comparing male and female design preferences, starting with those of adults and moving onto those of children. Before tackling the subject of *preferences* it is important to first examine the topic of aesthetic *creations* since the question of the stimuli used in experiments to gauge preference is all-important. In doing this, it is important to consider the likely equivalence of reactions by males and females of childhood and adult age. This last point will be our initial focus.

The equivalence of reactions by males and females across different age groups

If we examine the literature on sex differences, then we find that it is normal to make inferences about adult behaviour from evidence relating to children as well as adults. For example, the sex difference research in the 1970s by Corinne Hutt (1972) of the Department of Psychology at Reading University regularly traced behaviours from childhood through to adulthood. In the same way, the authors of a classic book on sex differences, Eleanor Maccoby (one-time Chair of Psychology at Stanford University) and fellow academic Carol Jacklin (1974), trace a particular behaviour from childhood through to adulthood. For example, writing about aggressive behaviour, they conclude that males appear as the more aggressive sex right across the age spectrum. Archer and Lloyd (1976) follow a similar approach, as does Kimura (1992). In fact, Kimura suggests differences in the hardwiring of boys' and girls' brains early in life:

> *'The bulk of the evidence suggests...that the effect of sex hormones on brain organization occur so early in life that from the start the environment is acting on differently wired brains in girls and boys' (ibid. 81)*

Since these studies of sex difference have embraced research involving children as well as adults, it makes sense in any new study of sex differences to explore the subject in relation to children as well as adults. In the context of designs, this means comparing the designs of boys and girls as well as those of men and women.

Male and female visual creations: a comparison

Research comparing male and female-produced designs across the fields of graphic, product and web design has uncovered a number of sex differences which parallel those found in drawings and paintings (Moss, 2009). These differences have been shown to be statistically highly significant with a greater tendency for male-produced than female-produced designs to use straight lines, fewer and darker colours and a technical

appearance and for female-produced designs to make greater use of rounded shapes, brighter colours and a less technical appearance and greater use of detail (ibid; Gunn & Moss, 2006; Moss et al., 2006a; Stilma & Vos, 2009). The last of these studies compared the output of sixty Masters-level graduation product design students in Holland, with the designs rated against the twenty-three criteria used in the earlier studies of male and female-created web design (Stilma & Vos, 2009). The findings showed that fourteen of the twenty-three features produced a positive correlation with the differences found in the web design study and five of the features demonstrated significant differences between the male and female-created products. The significant differences are shown in Table 1 below:

Table 1 The features which showed significance differences in the way they were used in male and female-produced product designs (Stilma & Vos, 2009).

Feature	Level of significance of the differences in use of this feature in the male and female-produced designs	Whether significant in the Moss et al, 2006 study of web designs
Female use of bright rather than darker colours	*P<0.05	Yes
Female use of organic rather than 3-dimensional shapes	*P<0.005	Yes
Female use of greater humour	*P<0.02	Yes
Lesser use by females of moving objects (eg cars)	*P<0.005	Yes
The theme of the design focused on the gender of the designer	*P<0.005	Yes

Many of these differences in creations mirror those found in numerous studies across several decades and countries comparing boys' and girls' drawings, with the differences in the forms used summarised in Table 2 below (Moss, 2009):

Table 2 Summary of the differences found in the forms used in drawings created by boys and girls (Moss, 2009)

Male	Female
Vertical line Alschuler and Hattwick, Fisher	Rounded lines and structures Alschuler and Hattwick, Erikson, Lippard, Majewski*, Chicago
Angles Franck and Rosen*	Blunt lines Franck and Rosen*
Structures built up Franck and Rosen*, Erikson	Stimulus is built down, low Erikson
Realistic Kerschensteiner	Less realistic Kerschensteiner, Ballard, Lippard
Sharp perspective	Loose perspective

McCarty	Kerschensteiner, Ballard
Concern with function	Concern with aesthetics Neubauer, Lark-Horovitz
	Pinks and pastels/ more intense, warmer use of colour Alschuler and Hattwick, Lippard; Minamato; Iijima et al

These studies have also discussed the issue of the subject matter used in the boys' and girls' drawings and paintings and summaries show consistent differences (Moss, 2009) here too. One of the many differences relates to the tendency for boys and girls to depict people of their own gender.

Male and female visual preferences: a comparison

Alongside studies comparing designs produced by men and women there are those testing for the effect of gender in design preferences. Typically, these have asked male and female subjects to rate male and female-produced designs (graphic, product and web design) and these have focused exclusively on the preferences of adult men and women. There have been no studies until those new ones reported below that investigate the design preferences of boys and girls. There have however been studies exploring children's preferences for toys which are reported below.

Adults' preferences

From the 1990s, studies of men and women's design preferences were conducted with the stimuli consisting of graphic and product designs (Moss, 1995; 1996; Moss & Colman, 2001).

The results consistently showed a tendency for each gender to prefer the designs created by their own gender. Where web design is concerned, the first study of male and female design

preferences (Flanagin & Metzger, 2003) set out to establish the impact of gender on perceptions of site credibility but regrettably the study was based on the evaluation of just two websites with the gender of the sites' designer(s) unfortunately not revealed. Despite these methodological drawbacks, the study had the merit of distinguishing website *production* and *preference* aesthetics. In order to correct the shortfalls of this study, a further study was conducted in which men and women were asked to rate websites which had, in a previous study of design creations, been identified as exemplifying masculine and feminine design tendencies.

The ratings showed a significant tendency for sites and features of those sites to be rated most highly where the site was created by someone of the same gender as the person doing the rating.

The extent to which this tendency to 'own-sex preference' operated for ratings is shown in Table 3 below with levels of 0.01 showing high levels of significance:

Table 3 Ratings by men and women of male and female-created websites: the statistical extent to which ratings showed a tendency to rate websites created by people of their own gender more highly than those of the opposite gender (Moss et al, 2008).

	Male preferences	Female preferences
Overall preference for website	0.01	0.01
Language	0.01	0.01
Pictures	Preference for female production aesthetic	0.01
Shapes	No significant preference	0.01
Layout	0.01	0.01
Typography colours	0.01	0.01

This study of design preferences limited itself to reactions to websites, with reactions limited to those of UK respondents. It therefore failed to offer evidence on reactions across different nationalities to a wide range of design stimuli.

In order to fill this gap, a further study (Moss & Horvath, 2014) asked 481 men and women in the UK, Germany, France, Hungary and China (see Table 4) were asked to indicate their preferences as between six pairs of design stimuli shown in a PowerPoint presentation. Each pair consisted of a single product category with one object in each pair designed by a man and one by a woman. Of the six pairs, two were pairs of products from the IKEA catalogue (chairs and cushions); a further third pair consisted of two separate canned drinks and a fourth pair consisted of fish finger packets; a fifth pair consisted of images of two Christmas cards, both illustrating an outdoor scene; and the final pair showed two London underground interiors. The preference responses are shown in Table 5 below:

Table 4 Respondent numbers in the five-country preference tests

	British	*German*	*French*	*Hungarian*	*Chinese*	*Total:*
Male	38	68	57	36	26	225
Female	41	60	80	33	42	256
Total	79	128	137	69	68	481

The designs were selected on the basis that they contained features that exemplified the male or female design production aesthetic based on features identified in earlier literature (Moss, 2009; Stilma & Vos, 2009), although the pair of children's chairs were more similar since both used bright colours and a child-like design to appeal to children. The designs consisted of product designs (chairs, cushions), graphic designs (Christmas cards), packaging designs (drinks cans and fish finger packages) as well as interior designs (underground designs) and the quality of the items in each pair was comparable since each pair was targeting the same or similar markets.

The results across all the responses show a statistically significant tendency by respondents from all five countries to prefer the design produced by someone of their own gender (see Table 5).

Table 5 Preference test results across five nationalities with an indication of the statistical extent to which male and female responses differ

	Significance (difference between choices of male and female respondents)	MALE designed product preferred (M = by male respondents, F= by female respondents)		FEMALE-designed product preferred (M = by male respondents, F= by female respondents)	
Pictures 1 -2 Children's chairs	.536	M <u>55.6%</u>	F 52.7%	M 44.4%	F 47.3%
Pictures 3-4 Cushions	.000**	M <u>59.1%</u>	F 30.5%	M 40.9%	F <u>69.5%</u>
Pictures 5-6 Christmas cards	.000**	M <u>61.8%</u>	F 35.2%	M 38.2%	F <u>64.8%</u>
Pictures 7-8 Drink cans	.003**	M <u>65.8%</u>	F 52.3%	M 34.2%	F 47.7%
Pictures 9-10 Food packaging	.009**	M <u>60.0%</u>	F 48.0%	M 40.0%	F <u>52.0%</u>
Pictures 11-12 Underground Stations	.000**	M 41.9%	F 23.0%	M 58.1%	F <u>77.0%</u>

** Significant at p<0.01 level

These results confirm the finding of 'own-sex' design preference noted in earlier studies (Moss, 1995; 1996; Moss & Colman, 2001; Moss & Gunn, 2008). The case of the pair of children's chairs (Pictures 1 -2) was the only instance which did not illicit significant differences between the responses of male and female respondents. The similarity of response to the two chairs may be rooted in the fact that both chairs were child-like in character, drawing on elements of the female aesthetic with use of bright colours, and so were not as differentiated aesthetically as the other pairs of designs.

Taking the results overall, across the respondents from the five countries, it can be seen that in eighty per cent of men's preferences (five out of six pairs) and in sixty-seven per cent of women's preferences (four out of six pairs), respondents displayed a preference for the designs produced by those of their own gender.

Children's preferences

Unlike the studies of adult preferences that were mentioned above, there had been no studies documenting the reactions of children to designs created by men and women. This gap prompted the new study that is reported on below.

Before discussing this, it is worth mentioning a recent study of children's toy preferences (Todd *et al,* 2016). Although it did not document toy preferences in relation to the gender of the person who had created the toy, it did document boys' and girls' reactions to different toys. The 101 children in the study were in three age groups: 9 to 17 months when infants can first demonstrate toy preferences in independent play (N=40); 18 to 23 months when critical advances in gender knowledge occur (N=29); and 24 to 32 months, when knowledge becomes further established (N=32).The findings showed that children

as young as 9 months-old preferred to play with toys specific to their own gender, showing that in a familiar nursery environment significant sex differences are evident at a younger age than has been found before. The toys used in the study were a doll, a pink teddy bear and a cooking pot for girls, while for boys a car, a blue teddy, a digger and a ball.

The absence of studies documenting the extent to which boys' and girls' design preferences correlate with creations by men and /or women was the prompt to the study described below that tests boys' and girls' preferences as between designs by men and by women.

Methodology

In the interests of impartiality, measurement, objectivity and repeatability (Aliyu et al., 2014), a positivist methodology was employed . This involved asking a sample of primary age school children (aged less than 12 years of years) to select their preferences as between pairs of design, each pair presenting a similar category of design (eg drinks cans) with one design in the pair designed by a man and one designed by a woman. The fact that the designs were created alternatively by men and women was not revealed to project participants.

In terms of respondents, these were from a Welsh schools (Porth Juniors School) and the children, briefed by the Head teacher, were offered the opportunity of taking part in the research or undertaking recreational activities instead if they preferred. In fact, the children were very keen to take part; with 111 responses received. The proportion of girls and boys in the cohort were very similar with a slightly higher proportion of boys. There were 27 Year 3 respondents (15 boys and 13 girls), 26 Year 4 respondents (16 boys and 10 girls), 27 Year 5 respondents (12 boys and 15 girls) and 30 Year 6 respondents (15 boys and 15 girls). The age groups were the followings: Year 3 – aged 7-8, Year 4 – aged 8-9, Year 5 – aged 9-10 and Year 6 – aged 10-11. The nationalities of the pupils were mainly British, with only 4 students originating from abroad.

These children were asked to determine which design in each of five pairs of designs they preferred. The pairs of designs used were the same as those used in the experiment with adults across five countries (for the results of this, see Table 5 above) but the first pair of designs used in that study, a pair of IKEA chairs, was excluded from this study since the researchers took the view that the aesthetics of the two chairs were insufficiently differentiated to justify their inclusion in the design questionnaire.

Before presenting the five pairs to the children, the relative quality of the designs was assessed by independent third parties. 32 students from a mixed nationality class, aged between 22-28 were involved in this process. The 17 males and 15 female respondents were asked to rate the design quality of the ten designs on a 1-5 scale with 1 being very poor and 5 excellent quality. The ratings of these respondents showed no statistically significant differences within picture pairs as can be seen from Table 6 below:

Table 6 Quality ratings of the five pairs of designs and the extent to which design quality may vary within a pair

		Mean	Sig.
Pair 1	pic1	4.1875	.625
	pic2	4.1250	
Pair 2	pic3	4.2813	.414
	pic4	4.3750	
Pair 3	pic5	3.7813	.083
	pic6	3.5938	
Pair 4	pic7	3.4688	.263
	pic8	3.3750	
Pair 5	pic9	3.2188	.768
	pic10	3.2500	

Moreover, there were no statistically significant differences between the responses from the two genders as related to picture quality as can be seen from Table 7 below:

Table 7 Quality ratings of the five pairs of pictures and the extent to which picture quality may vary within a pair

	Gender	Mean	Sig.
pic1	M	4.1176	.487
	F	4.2667	
pic2	M	4.1765	.646
	F	4.0667	
pic3	M	4.4118	.180
	F	4.1333	
pic4	M	4.4706	.248
	F	4.2667	
pic5	M	3.6471	.100
	F	3.9333	
pic6	M	3.4706	.190
	F	3.7333	
pic7	M	3.3529	.269
	F	3.6000	
pic8	M	3.2941	.470
	F	3.4667	
pic9	M	3.1176	.398
	F	3.3333	
pic10	M	3.1765	.519

F	3.3333

In terms of the selection of the designs, the prime criterion was the presence in the design pair of elements typical of the male and female design production aesthetic, with an understanding of gender aesthetics rooted in earlier literature (Moss, 2009; Stilma & Vos, 2009). The designs consisted of product designs (cushions), graphic designs (Christmas cards), packaging designs (drinks cans and fish finger packages) as well as interior designs (underground designs). For each pair, the respondents were asked to indicate the item in each pair they preferred.

The designs were shown to the children using a PowerPoint presentation and this was considered acceptable since all of the product images bar that of the underground stations were either taken from a sales catalogue or were reproduced in the same vertical position in which they would be displayed online or offline (this was the case of the pair of Christmas cards). In this way, the PowerPoint images were a proxy for the situation confronting the consumer offline or online. The photographs of the underground interiors were, unusually for the product images, not taken from a catalogue but this was justified on the basis that no such catalogue images were available and that the images were not qualitatively different from those of the other product images. It should be added that presenting respondents with images displayed in a PowerPoint presentation was the only practical and consistent means of showing clear images of the stimuli to the large numbers of respondents taking part in this study. The children's responses were analysed using SPSS software and t-probe.

A further study was conducted replicating the 'Draw a Person' test in which subjects are asked to draw a person. Asking the subject to give their newly drawn person a name served to identify the putative gender of the person depicted.

Results

The responses were analysed using t-probe in SPSS to measure the differences in the answers given by the two genders. The results across all the Primary school responses showed a statistically significant tendency by male and female respondents to prefer the design produced by someone of their own gender (see Table 8 and Table 9).

Table 8 The design preferences of the junior school respondents and whether these were for male or female-created designs (Children questionnaire overall results, age: 7-11)

	Significance	MALE designed product preferred		FEMALE-designed product preferred	
	(difference between choices of male and female respondents)	by % of total male respondents	by % of total female respondents	by % of total male respondents	by % of total female respondents
Pictures 1 -2	**.000****	67%	27%	33%	73%
Pictures 3-4	.793	36%	33%	64%	67%
Pictures 5-6	**.000****	55%	21%	45%	79%
Pictures 7-8	.936	59%	60%	41%	40%
Pictures 9-10	**.005****	62%	29%	38%	69%

*Significant at p<0.05 level, ** Significant at p<0.01 level

Table 9 The extent to which the design preferences of Primary School respondents showed evidence of own-sex preference

	Year 3		Year 4		Year 5		Year 6		Overall	
	Sig.	Mean Diff.	Sig.	Mean Diff.	Sig.	Mean Diff.	Sig.	Mean Diff.	Sig.	Mean Diff.
Pic1	**.038***	-.978	**.009****	-1.675	**.005****	-1.818	**.001****	-1.400	**.000****	-1.422
Pic2	.130	.786	.082	1.063	.309	.600	.087	.800	**.004****	.750
Pic3	.187	-.412	.669	-.200	.900	.067	1.000	0.000	.670	-.092
Pic4	.946	.033	.440	-.463	.459	.333	.748	.133	.962	.011
Pic5	.051	1.275	.097	.963	**.041***	1.167	.414	.333	**.000****	.955
Pic6	**.027***	-1.247	**.021***	-1.363	**.002****	-1.667	.726	-.133	**.000****	-1.098
Pic7	.412	.555	.111	-.863	.054	-.917	.658	-.200	.351	-.255
Pic8	.210	-.791	.382	-.500	.837	-.117	1.000	0.000	.164	-.370
Pic9	.089	.868	**.023***	1.163	1.000	0.000	.057	.800	**.005****	.709
Pic10	.777	.104	**.032***	-1.125	.051	-1.217	.893	-.067	.052	-.514
Pic1-2	.161	-.262	**.014***	-.488	**.032***	-.417	**.009****	-.467	**.000****	-.397

Pic3-4	.139	-.273	.664	.088	.933	-.017	.767	.060	.793	-.025
pic5-6	**.010***	-.469	**.033***	-.433	**.013***	-.467	.835	.036	**.000****	-.341
Pic7-8	.558	.129	.944	.015	.653	-.083	.702	-.067	.936	.008
Pic9-10	.393	-.139	.051	-.450	.125	-.310	.473	-.133	**.005****	-.282

*Significant at p<0.05 level, ** Significant at p<0.01 level

As can be seen, there is a marked tendency to own-sex design preferences in the case of six out of the 10 designs shown to the children. A significant tendency to own-sex design preferences emerged in three out of five of the design pairs.

In terms of the 'Draw a Person' test (see Table 10), the results show an extremely strong tendency for the children to depict someone of their own gender, with significant differences across the four ages groups:

Table 10 results of the 'Draw a Person' test

Gender of drawing: MALE		Gender of drawing: FEMALE		Significance
by % of total male respondents	by % of total female respondents	by % of total male respondents	by % of total female respondents	(difference between drawings of male and female respondents)
93%	9%	7%	91%	**.000****

	Year 3		Year 4		Year 5		Year 6		Overall	
	Sig.	Mean Diff.	Sig.	Mean Diff.	Sig.	Mean Diff.	Sig.	Mean Diff.	Sig.	Mean Diff.
Drawing	.000**	-.779	.000**	-.938	.000**	-.767	.000**	-.867	.000**	-.837

** Significant at p<0.01 level

Discussion

These results exemplify the tendency for design *preferences* by gender to strongly show a favouring of designs produced by people of the same gender as the beholder. These results add weight to the suggestion that design aesthetics can be optimised by following an interactionist rather than a universalistic process. As a consequence, internal processing algorithms (IPAs) should make allowance for differences in aesthetic response across demographic groups. A key variable, according to the research presented here, is gender.

Implications for design and marketing

Although some argue against a specific "feminine sensibility" (Harris and Nochlin 1976), some agree with Erikson in speaking of a "profound difference in the sense of space in the two sexes" (1970, 100) and the evidence explored in this article adds weight to this view. What are the implications of this for design and marketing?

The form of a product relates to consumers' psychological and behavioural responses (Bloch, 1995), and research has demonstrated that a positive aesthetic response to a product will not only lead to enhanced purchasing where the function and price of

competing products are equal (*ibid),* but will also correlate with an enhanced estimation of the product's utility (Tractinsky, 1997) and value (Hassenzahl, 2007). The results presented here show that preferences can be segmented by gender and the importance ascribed to preferences in the literature highlights the need to factor gender into design decisions.

Implications for strategies and processes

The findings presented here suggest that design is optimised when there is a match between the gender of the producer and the beholder. Such a finding suggests that organisations would

do well, in order to give consideration to the purchasers gender and then achieve as much of a math as possible with the gender of personnel servicing these customers. This is to offer what Baden-Fuller (1995) calls the 'inside-out' and 'Outside-in' strategic perspective.

If a difference in demographics and perceptions emerges between those inside and outside the organisation, then it is possible that a paradigm shift will be required on the part of the organisation's thinking. The radical options involve the recruitment and promotion of staff whose perceptions and aesthetic preferences match those of the target market. A less radical and more evolutionary strategy would encourage greater diversity in people's thinking through a process of training and development. The first option may lead to more permanent change than the second since the effects of training may be temporary rather than long-lasting in nature. However, injecting a demographic into an organisation where that demographic constitutes a relatively small minority can cause difficulties for the demographic concerned, with failures to adequately acknowledge the talents or skills of that demographic. As discussed elsewhere, only an organisation finely attuned to these problems can put in place systems to prevent the worst effects of unconscious bias (Moss, 2009).

The efforts of doing this will be richly rewarded through enhanced customer satisfaction and a customer focused mind-set, in conjunction with an interactionist viewpoint, will be essential tools in the battle to win and retain customers.

Research limitations

The number of design stimuli was limited to five pairs due to the difficulty of obtaining design histories of designed objects across a greater range of graphic, product and public design and of finding within the pairs of designed objects for which design histories were available examples that exemplified aspects of the male and female design aesthetic.

A further limitation relates to culture and the fact that the research was conducted in a single country namely the UK. In earlier research testing reactions to the same set of stimuli with adults in five countries (Moss & Horvath, 2014), reactions across the five countries were broadly similar, with a strong tendency for people to prefer designs created by people of the same gender as themselves. The extent to which children's preferences may likewise be constant across social and religious boundaries remains to be tested however, creating a priority for future research.

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HONG KONG DESIGN MANAGEMENT ACADEMY CONFERENCE 2017

RESEARCH PERSPECTIVES ON CREATIVE INTERSECTIONS

People as an essential tool for considering ethics in the product lifecycle

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doi: 10.21606/dma.2017.117

This paper explores the vital engagement of people at different stages of the product lifecycle. The incorporation of human values in the creation of empathy allows for ethics to be considered across the design and make process. A case study approach was adopted utilising data obtained from two large consumer goods companies. From this, a relationship was found to lie between the involvement of people as active participants and the creation of empathy. These empathetic values consequently facilitated the consideration of a responsible approach to be implemented. Conclusions show that during the design process people create added value with a participatory approach, whilst during production consumers become prosumers in consumer-led innovation to help drive forward an ethical agenda.

keywords: ethical product lifecycle; empathetic values, consumer-led innovation

1. Introduction

The product lifecycle is often a long and complex process involving many vital stages of design and production in order to reach a successful outcome. This process can involve many operations, people and even countries before the final product is ready to be delivered to market. The value of design has been widely researched in both academic and industrial fields (Gardien et al., 2013; Press & Cooper, 2003) however, the value of efficient and responsible manufacture requires further exploration to discover its full potential. This paper aims to explore the breadth of the product lifecycle, gaining insights into both the design and manufacture phases through the investigation of people as active participants in the consideration of responsible practices.

The design phase of the process is crucial in order to ensure product innovation and originality, with many companies adopting different approaches to design in order to ensure that these high levels of innovation are achieved. Methods such as co-creation and participatory design are often adopted; facilitating the engagement of stakeholders, including end users, to ensure that the end product is desirable and functional. This allows for different parties to work collaboratively towards an end goal of mutual value. Approaches such as co-creation, co-design, and participatory design are the very first instances when people are involved in decision-making.

Sanders & Stappers (2008, pp. 6) define *co-creation* as any act of collective creativity, i.e. creativity that is shared by two or more people for the purpose of co-production of ideas, products, etc. Frow et al. (2015) describe co-creation in more general terms, where its application ranges from physical to meta-physical and in some cases, spiritual involvement of participants. Another term also commonly used is *co-design* which differs from co-creation. Sanders & Stappers (ibid.) describe *co-design* in a broader sense referring to the creativity of designers and people not trained in design, working together in the development process. According to Jungk (cited in Cross, 1972, pp.192) both these terms are part of participatory design. Sanders (2008) believes that such interactions with consumers, users or potential users lies at the crux of user-centred design, which is traditionally similar to how design practitioners and researchers work. Brecht (1932) and Benjamin (1936) argued the existence of a socialist concept of *prosumers* that promotes a collective media production by all and for all, leaning towards mass collaboration.

Today, *prosumers* are seen as key drivers for social activism which has influenced public awareness on sustainable brands, influencing buying behaviour to a certain extent. Tapscott and Williams (2007) illustrated the emergence of *wikinomics* and its positive impact on profitability; a concept also based on mass collaboration. They highlighted seven *wikinomics* business models, namely, *peer-pioneers, ideagoras, prosumers, new Alexandrians, platforms for participation, global plant floor, wiki,* and *workplace*. Conclusions found that these allowed firms to tap into the external knowledge and resources, allowing collaboration with users. These models are applied by many organisations, including LEGO, who were able to turn hackers into loyal open access programmers (*prosumers*), IDEO who have used *ideagoras* in their recent social innovation projects and SAP who have applied the use of open access platforms and i-clouds as a method of participation.

Tseng & Piller (2003) and Prahalad & Venkatswamy (2004) have clearly advocated co-creation bringing businesses and their consumers together. Prahalad & Venkatswamy (ibid.) clearly highlight the benefit of consumer participation in creation of value when they state; "*The meaning of value and the process of value creation are rapidly shifting from a product- and firm-centric view to personalized consumer experiences. Informed, networked, empowered and active consumers are increasingly co-creating value with the firm*". The commonality between these terms however remains simple, the involvement of people as a vital tool in the design process. This involvement of people is believed to not only enhance the usability of the product being designed but also to create added value in the process of collaborative working. Consumers are seen to be a vital stakeholder in the process of design, which has resulted in a number of approaches and

methods being developed as a result of the recognition of the value that their involvement can bring.

When considering the production phase of the product lifecycle however, the engagement of people as stakeholders is rarely considered. Unlike the design phase there are no methods or tools which allow for collaborative working to create added value or a mutually beneficial outcome. Co-production or co-manufacture are not recognised as ways of working, indicating that at this stage of the process people are no longer valued stakeholders. This contrast of the involvement of people is to be explored in this paper, with both the design and the production phase being considered. Within this context, the value of people will also be explored. This contrast can be seen as a transference of power, where consumers are initially held in high regard as a valued contributor to the design process, in comparison to later in the lifecycle where they are rarely involved until the retail stage of purchasing behaviour.

When considering ethical values in the product lifecycle, it is the design phase where this initially has to be considered. The role of the designer is to reflect the values of both the brand and the target customer with regards to social and environmental responsibility. This has dramatically grown in the past decade with companies now seeing the benefit of these considerations across the lifecycle of the products they produce (Zadek and Chapman, 1998; Wales et. Al., 2010; Burchell, 2008). However, it is during the production phase where the majority of social and environmental non-compliances occur, with issues such as working conditions, carbon emissions and water pollution often being seen in the product supply chain. This has been heavily evidenced in the fashion market in recent years, with social disasters such as that seen with Rana Plaza in 2013, where 2,132 garment workers were killed in the collapse of a garment factory in Dhaka, Bangladesh. Named as the deadliest garment factory disaster in history (BBC, 2013), it was thought it would have an impact on fashion consumer's purchasing behaviour, where more responsible decisions were expected. This however was not the case, the leader in the fast fashion market Primark reported annual profits for November 2013 to a 44% increase to £514 billion, with a revenue increase to £4.3 billion equating to £11.7 million per trading day (Hawkes, 2013). This lack of consumer response is said to be due to a limiting knowledge of the supply chain and the production process which occurs prior to a product being available in-store. This lack of connectivity and empathy on behalf of the consumer can be identified across the consumer goods market. A study involving fashion consumers showed consumer awareness was a key prohibiting factor when it came to the consideration of ethics (James, 2015). This paper acknowledges this lack of consumer knowledge, connectivity and empathy to the product supply chain and aims to explore the potential engagement of people across the lifecycle of products.

The following hypothesis will be tested during the collection of primary data:

The engagement of people as consumers are needed across all stages of the product lifecycle in order for ethics to be considered

In addition to the testing of the above hypotheses, the paper also aims to explore the following key elements:

- To investigate the impact that the involvement of people can have in the consideration of ethics

- To explore the involvement of people in the design stages of the product lifecycle in comparison to that in the production phase
- To determined if there is a relationship between consumer empathy and the consideration of ethics

Through the utilisation of a qualitative methodology, this paper will explore two case-studies across the product lifecycle including the fashion and consumer goods market. The consideration of ethics will remain the focus during this investigation with the incorporation of people at all stages of the product lifecycle. The creation of empathy will also be a key focus with the relationship between empathy and responsible values also being explored. The paper aims to conclude with the rationale for the involvement of people at all stages of the design and production process in order to consider responsible values throughout the product lifecycle.

2. Literature Review

2.1 The Consideration of Ethics

Defining ethics as an understandable term has proven difficult for researchers and academics alike. There is currently no industry standard or working definition for the term and consequently is often a misunderstood and confused area. It has been said that the definition has become an issue with factors often being subjective or situational (Bray et al., 2010). The lack of precision in defining this area has resulted in an array of inter-related terminology being used (Szmigin et al., 2009). It has been utilised to cover a range of activities in industry including; material sourcing, worker rights, transport, chemical usage etc. However, this raises an argument that if a product complies with some ethical factors but not others, can the product be considered to be ethical or not? This argument could also be reflected in the brand of Fairtrade. This certification currently only refers to the raw material, in the case of the clothing industry, this can only be applied to cotton. It has therefore been suggested that due to the whole of the supply chain not being covered the application of a certification can be contradictory and misleading for the consumer (Fashioning an Ethical Industry, 2010).

To refer to the origins of the term ethical, it derives from the meaning *arising from the character,* the Greek *ethikos* or *ethike* and the Latin *moralis.* They also carry the connotation of arising from habit or custom (Baggini & Fosl, 2007). These definitions, however, rely on the subconscious of the individuals being aware of what may be wrong or right behaviour. This appears again to be a very hard area to define and could be described as far too subjective to be relied upon. Aristotle described human beings as rational animals, implying that humans begin to reason using techniques of logic, science and analysis (Baggini & Fosl, 2007). This assumption of humans being rational again is potentially flawed, as it relies on the specific individuals use of their rational sense when making decisions.

Taking quite a realistic viewpoint when discussing ethics, it has been suggested that the term ethical is far too broad in its definition, too loose in its operations and too moralistic in its stance (Devinney et al., 2010), leading to the conclusion that ethical consumption is, therefore a myth. This argument again raises the issue of ethical awareness levels amongst consumers. The individual's perception and understanding of the term could also

be an issue. It is acknowledged that consumers do not currently have enough information and understanding of the terminology to make a fully informed purchasing decision (Ritch & Schroder, 2009). Another practical line of reasoning would be the idea of a moral relativist, who believes that all people do not hold or obey by the same morals and ethics during their day-to-day lives (Baggini & Fosl, 2007).

This inconsistency in terms of the application of ethics across the supply chain can also be compared to that of the engagement of people in the product lifecycle; sporadic and unpredictable. The involvement of people throughout the product lifecycle can help incorporate ethics in a more holistic way, in preference to compliance being evident in only some areas of the design and make phases.

When considering ethics in the product lifecycle, there are many stages in which people can become engaged. However, when doing this, a large proportion of literature and academic debate is dedicated to people as consumers and how they purchase in relation to their ethical values. Although this area of engagement will be considered in this paper, it is a more holistic overview of the engagement of people in the product lifecycle that is to be taken. People will be considered at both the design and production phase of the product lifecycle in addition to people as consumers and how their ethical beliefs and values are reflected in their interaction with products during the use phase.

When considering people as consumers, it is to be acknowledged that every consumer is individual regardless of their background and interests, and therefore the key is to identify their specific needs (Barrie, 2009). However, consumer typologies have often been utilised as a tool to group sectors of people together as a reflection of their responsible values (Clouder & Harrison, 2005; Cowe & Williams, 2001; Szmigin et al., 2009; Carrigan & Attalla, 2001; Morgan & Birtwhistle, 2009; Mintel, 2007). These typologies aim to categorise consumers into generalised groups ranging from the non-ethical to the super-ethical. For example, Clouder and Harrison (2005) divide consumers into three key groups; distancing, integrated and rationalising. Realistically, however, there is often little consistency in demographics and consequential consumer behaviour (Devinney et al., 2010).

It is believed that the lack of connectivity and therefore compassion towards the social factors in the product lifecycle can often lead to non-ethical engagement. Carrigan and Attalla (2001) believe that the consumer importance of self-continues to emerge, where if unethical behaviour affected them personally, they may care more. This begins to form one of the key arguments for the rationale of this research, relating awareness of ethics to the development of empathy with the consumer. The growth of knowledge and awareness of ethics in the development of a product could aid in the creation of consumer empathy.

A lack of ethical engagement is said to often be due to low awareness levels and an overall lack of knowledge (Ellen, 1994). However, 52% of consumers in the UK admit to being ethically aware but are currently not actively purchasing ethically (Worcester and Dawkins, 2005). Ritch and Schroder (2009) believe that a fully informed consumer is unattainable, it is also thought that growing levels of ethical awareness is due to academic interest, increased media levels and a greater choice of ethical products (Newholm & Shaw, 2007). However, researchers believe that consumers think more ethically than they actually do. This is said to be due to weak research methods being used, leading to an

inflated measure of intentions (Carrington et al., 2010). Ellen (1994) reiterates this point, as consumers are not as knowledgeable as originally thought, and not aware enough to make an informed decision. This demonstrates that the absence of empathy leads to an inconsistency of ethical engagement as a reflection of a lack of knowledge and awareness. The further engagement of people and the development of empathy could aid in ethics to be considered across the product lifecycle, not just during the use phase of the process. The need for empathy to be considered early in the lifecycle process will be discussed later in the paper with a user-centred approach to product development utilised.

2.2 The Product Lifecycle: Design

Historically design has been at the centre of the product life cycle. It is design that provides the spark in form of a new idea, and then it also plays a vital role in bringing the idea to life, i.e. bringing a product to market (more commonly known as innovation). This unprecedented connection between innovation and design has recently caught the attention of manufacturing business which has led to a number of revelations regarding design.

First, design is *adaptive*, *resilient*, and *transformational* (Miemis, 2010); transforming business growth whilst carefully considering the implications of the new ideas on the society. Design is not just an event or a *eureka* moment, but a process, where design thinking plays a very important role (Brunner, Emery, and Hall, 2009). Design thinking on the other hand, is a human-centered innovation process that causes business strategy and innovation to be more human centric (Lockwood, 2010). Brown (2009, p.227) argued that "*design thinking can not only contribute to the success of companies but also promote the general welfare of humanity*", perhaps suggesting that design thinking could make corporates (that use it) think ethically. He explained that the power of design thinking is to discover new possibilities, generate new ideas, and get new solutions. Moreover, leading designers to make better societies, more profitable businesses, and more valuable living.

There is no simple way to describe what goes on in a design process; this poses a challenge to the claims that design is actually human-centred as well as business focused. Attempts to visualise such creative processes are limited due to the growing complexity of the activities associated with design, the fluid nature of the context within which design is applied, and also the rapidly changing environment of the organisations within such processes are applied. Sanders and Stapper's (2008) model for the design process, illustrates the complex and probably most realistic description of the journey that is taken by a designer (Figure 1). The suggest that a problem in form of a brief is explored in the fuzzy front end, following which design ideas are developed.

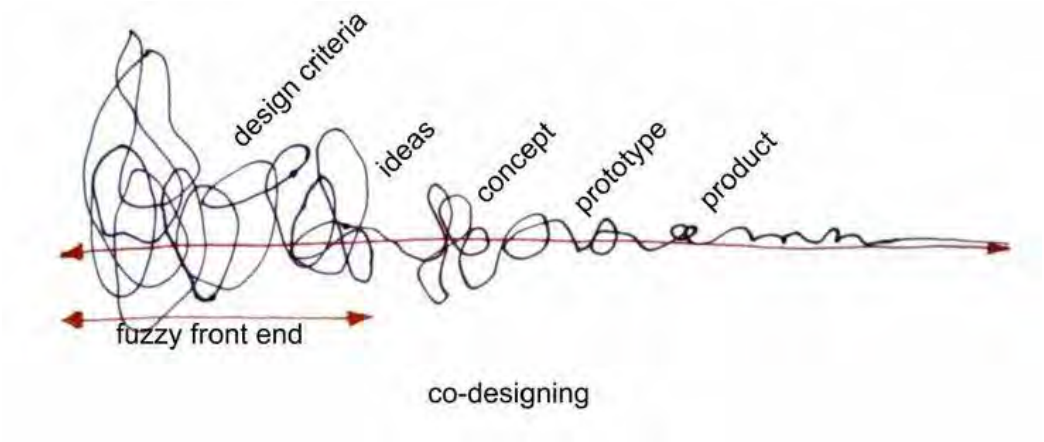

Figure 1 Model for design process. source: Sanders and Stappers (2008)

A more simple interpretation of the design process was provided by the Design Council (UK) (2007) famously named *the double diamond*. One of the strengths of this process description is the visualisation of both the divergent and convergent thinking, which helps explore and focus on the problems and solutions during the four distinct phases; *discover, define, develop* and *deliver* (Figure 2). This convergent and divergent thinking is seen to influence a designer's decision on who to involve within each stage and for what purpose. However, the double diamond simplifies the process ever so much that the scope of the human-centric aspect is lost completely.

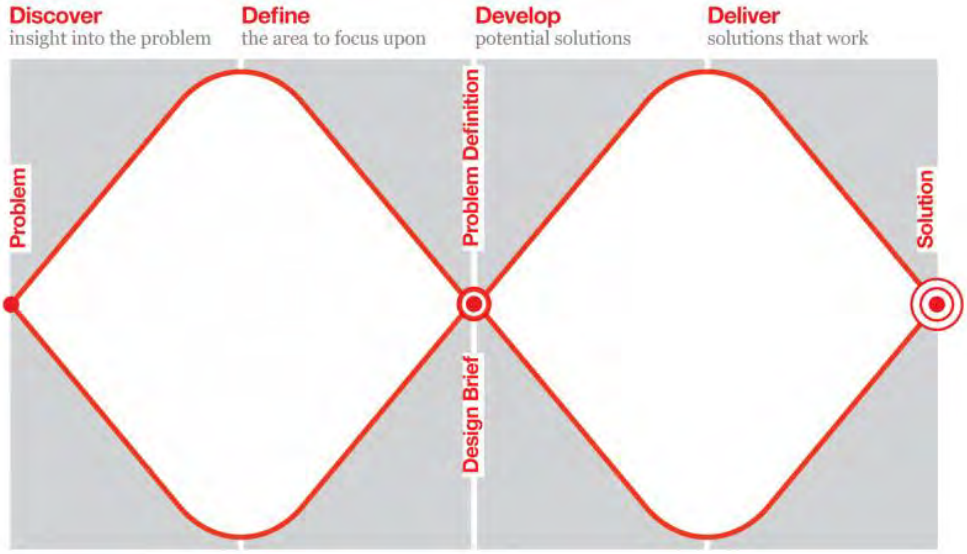

Figure 2 Double Diamond Design Process. source: Hunter (2015)

This poses a fundamental question for design, how do designers claim that they are making organisations human-centric and at the same time deliver business success?

This is answered partially in the third revelation on design, which is that design is participatory, and requires people in form of users, consumers and participants to add any value. The design process does not take place in isolation and requires constant interaction with members of the public. The user-centred prototype driven design process developed by the Hasso Plattner Institute of Design at Stanford (Dschool, 2009) follows a similar set of phases to the double diamond, but includes *empathise* as the first stage (Figure 3).

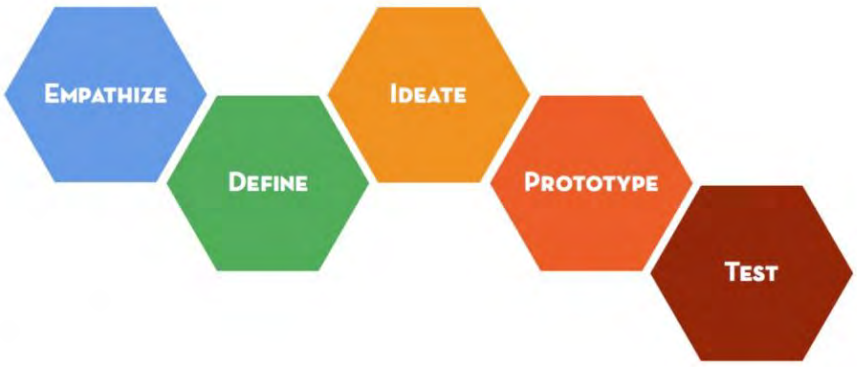

Figure 3 Five stages of a design process starting with empathy. source: Dschool (2009)

In this model, the human-centred approach means that the starting point is the one in which the designer responds to human needs ensuring that the outputs are both useful and meaningful to people. However, there is a need for a more outside-in approach towards participatory design for product development and the manufacturing process. This would allow people to be stakeholders and not mere users throughout the product development process, and also not just in the early stages.

2.3 The Product Lifecycle: Production

The lack of knowledge and awareness of ethics in the product lifecycle needs to be addressed through the further involvement of people at various stages. It can be seen that people are widely considered as vital tools during the design phase of the development process through the application of co-design or participatory design approach, for example. However, it is at this stage of the process is where the involvement of people can quickly diminish. When taking an overview of the product lifecycle, it can be seen that there is a prominent gap in the involvement of people between the end of the design process until the use phase, where people then become users and regain the power of influence once again. Despite this being the case across many market sectors, when considering ethics in the product lifecycle, the consistent involvement throughout is necessary.

In comparison to other production industries, the production of clothing carries a significant amount of social risk due to the complexities of supply chains and routes of manufacture (Burchell, 2008, p. 104). While in theory, retailers should hold control over their supply chains, it has been questioned if retailers alone have the power and skills in

order to develop and adapt the production of clothing to a more ethical business model. It has been suggested that partnerships with groups such as non-governmental organisations can drive forward change through collaboration, however conflicting literature also suggests that it is a strong direction from governments that is needed for rapid change in ethical development (Wales et al., 2010). There has been a lot of the previous exploration into a number of influence retailers have over the ethical engagement of their customers, however when considering what has been termed as the intention-behaviour gap (an identified disparity between individuals purchasing intentions translating into actual behaviour), it is thought that consumers are over stressing what they believe to be ethical behaviour, consequently having implications of the plausibility of this influence (Cowe & Williams, 2001).

The engagement of people within the manufacturing phase can be potentially problematic due to not only geographical location but also on the reliance on the retailer to share information regarding their supply chain. Transparency of supply chains has been discussed heavily in academic literature and remains a prominent area of research. For example, Mol (2015) describes transparency as the disclosure of information, with specific attention paid to ethics and sustainability. Whilst O'Rourke (2003) described it as a central factor on which to base the judgement of a company's supply chain. The most basic definitions begin with the amount of information a company is willing to disclose about their supply chain practices (Carter and Rogers, 2008), adopting a trace and trace approach to production (Doorey, 2011; Laudel, 2010). Transparency has also been related to many similar business ethics practices including legitimacy (Carter & Rogers, 2008; Kell, 2013) accountability (Dubbink, Graafland & Van Liedekerke, 2008) and trust (Augustine, 2012). The engagement of people in this phase of the product lifecycle relies on the disclosure of information through communication of business practices.

Increased transparency has also been described as a process, with the transference of power from the company to its external stakeholders also adding to the discourse (Martinez & Crowther, 2008). This again encourages not only further transparency but also the involvement of people during the production phase of the process. Whilst external individuals cannot be part of the production phase as they are during the design process through approaches such as co-design and user-centred design, the potential influence the engagement of people as consumers have on the manufacturing supply chain is to be recognised.

3. Methodology

With the growth of ethical research, academics have begun to question the methodological approach taken whilst undertaking such work. It has been suggested that studies have been utilising similar research methods and are therefore producing a series of comparable results. Auger and Devinney (2007) suggest that the use of similar survey instruments may overstate the importance of ethical issues as the participants have little to no incentive to answer truthfully. The methods used are accused of often restraining answers and of using simple rating scales, giving inaccurate and undetailed answers.

This research recognises the methodological issues that have been identified as common problems during research of this nature. With this in mind, a mixed methods approach has been utilised, trying to minimise issues that have been previously identified that could

potentially be questioned for their rigour at a later date. By challenging the academic norm of using an established methodology, a more selective approach has been taken in order to use the most appropriate methods to address the problem space. This mixed method or *bricolage* approach was utilised to not only overcome methodological issues identified in previous research but to also address the gaps in knowledge in a creative and innovative way (Yee & Bremner, 2011).

This investigation adopted a qualitative methodology, utilising a case study approach to investigate both the design and production phase of the product lifecycle. Both cases studies are comparable in the sense that they are both global brands that cater to consumer goods such as fashion, accessories, home appliances and/or electronics. Both cases studies have been detailed below:

- Case Study 1 is a global consumer goods organisation based in The Netherlands. For the current investigation, this case study provides the product development process for the design function within the organisation, demonstrating a heavy involvement of people in the early stages of idea generation. The evidence then illustrates the reduction in the level of participation by people in the later stages of the product development process.
- The case study applied an emerging methodology to explicitly define the organisation's value proposition and development process and build a consensus amongst the stakeholders on the process description (Aftab, M. & Young, R, 2016). For this purpose, the lead author was embedded as a participatory observer in the Research Development and Innovation (RD&I) team for the duration of 11 months. A methodology that combined the Delphi technique, one-on-one and workshops were used. Whilst Delphi technique was a well-established method for achieving consensus, it did not have the capacity to engage the innovation practitioners in any reflective exercise, nor it had the means to create a reasonable common language amongst the stakeholders. Therefore, this led to the inclusion of reflective interviews that enabled the innovation practitioners to apply reflection-in-action, and describe their practice in detail. Also, workshops were introduced as a platform to uphold transparency amongst all the stakeholders, and create a common understanding and description of the process.
- Case Study 2 is a prominent British high-street retailer, bringing multiple product types to the mass market, including fashion, accessories and homeware. The data collected demonstrated the need for the involvement of people in the latter stages of the product lifecycle, specifically in the manufacturing supply chain in order for ethics to be considered.
- With the researcher acting as the participatory observer, data collection methods included semi-structured, informal interviews with company representatives including The Head of Sustainable Business and The Ethical Trade Manager. In addition to the data collected utilising interview methods, observations were conducted through the attendance of meetings and engaging in projects for the company. Furthermore, the secondary analysis of company documents was also explored, including any information made public on their website and in-stores informing consumers about the ethical and sustainable practices of the company.

Analysis methods utilised were reflective of the methodological issues previously identified and aimed to overcome the conclusion of predictable outcomes. Qualitative methods such as coding and content analysis were utilised alongside an iterative interplay of data collection and analysis, which allowed for sampling on the basis of emerging concepts.

4. Findings

4.1 Case Study 1: The Design Phase

Case Study 1 highlights thirteen steps of the strategic level design innovation process, which deals with creating new product proposals for the future (Figure 4). This process is carried out predominantly by the design function with some involvement from marketing and business functions, and it evidences a very heavy involvement of people in its early stages. The design process does not partake in the production, marketing and use stages, as this is the domain of marketing and manufacturing processes in this case study.

This data was attained with the second author embedded within the design process team as a participatory observer. The thinkers and the practitioners within the process were involved in Delphi technique, workshops and interviews in order to arrive at a consensus on their innovation process. This entailed explicit definition of the process through the definition of its purpose, steps, methods, tools, stakeholders and outcomes.

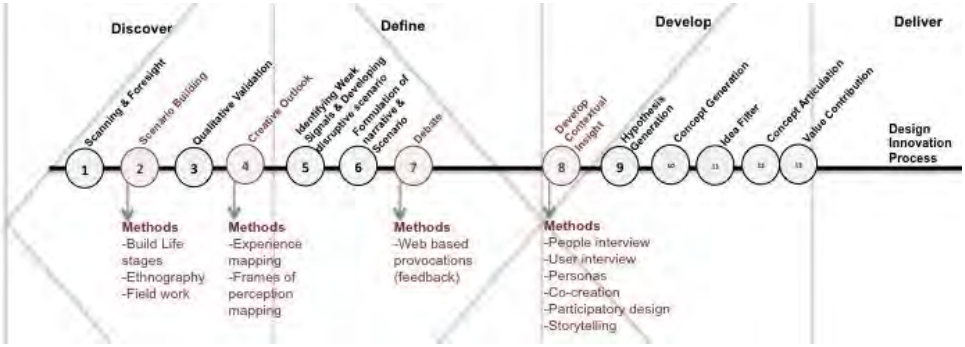

Figure 4 Methods of key external stakeholder engagement/empowerment in the design innovation process source: authors

4.1.1 Inclusion of People in the Product Development Process

The key steps within the design process that evidence higher level of inclusion of people through empathic engagement is scenario building (step 2), creative outlook (step 4), debate (step 7) and developing contextual insight (step 8). The purpose of step 2 is to engage potential users and identify people's real needs through extensive empathy-led socio-cultural investigations. Whilst this is a typical participatory design approach, the people involved in this step are a source of critical information that informs the later stages of the product design process and the development of value propositions. One example of these three methods has been evidenced in the 'Chulha' project (Philips, 2008).

People are seen playing a more important role in step 4, where they are able to persuade the design process team to consider 'people's' perspective. This step involves more focused discussions and debates on the value propositions identified in stage 2. In step 4 the design process team are the empathic listeners, whilst the participating 'people' play the role of advocates. This stage sees a significant refinement of the value propositions.

In step 7 people are merely providing feedback on future scenarios. Whilst his step allows the team to gain wider and more global feedback on highly provocative and futuristic design propositions, it does not give significant power to the people. However, evidence suggests that people's opinion in this stage does matter. The feedback received at this stage enables the design process team to choose propositions that could go into development and use, however many propositions that seem too outlandish are sent back to the previous stages to be re-configured and refined.

Finally, step 8 involves people in co-creation and co-design activities. This step enables people involved and the design process team to share equal say in decision making, and in the creation of functional and user-centred prototypes. This significant equalisation of people's rights and the rights of the design process team is a significant validation of author's argument in this paper. Specifically because, as soon as step 8 finishes, the involvement of people ends, and only returns when the design process re-starts for the new cycle of idea generation (in case study 1). However, case study 2 demonstrates that the involvement of people increases again during the production stage, discussed further in the next sections. The discussion around the involvement of design and people as potential users during marketing and production in case study 1 is outside the scope of this paper. Aftab et al. (2016) elaborate on the overall process further.

4.2 Case Study 2: The Production Phase

This stage of the process concentrated on the production stage which sees the product being manufactured prior to being brought to market. The focus looked specifically at the relationship between the retailer and the customer and how the power changes hands from the consumer to the retailer. During this stage of the purchasing scope, customers are susceptible to influential messages and information being provided both consciously and subliminally through advertising. The data was obtained through the engagement of a high-street company which brings fashion, accessories and homewares to the mass market. Several employees were interviewed alongside observations and secondary analysis of information obtained whilst the researcher was positioned at the company headquarters in London.

As previously mentioned when involving the consumer in the production phase of the product lifecycle, the physical engagement during manufacture is not possible. This engagement, however, happens with people as consumers, interacting with brands and their supply chains. This method of engagement can vary from company to company, but in this case involved the following tools:

- Communication of company ethical values to a public audience
- Engagement of the consumer through brand initiatives or campaigns
- The execution of projects which are driven by consumer-led innovation strategies
- The creation of brand trust through supply chain transparency

From the data collected, the findings can be summarised into key themes which address the initial hypotheses and aims proposed at the beginning of the paper.

4.2.1 The Power of the Retailer

When considering the production phase of product development, it was found that retailers are positioned in a powerful and influential role. Opposing the views of Wales et. Al., 2010, this paper believes that it is the retailers retain this ability to influence change due to their position, residing as a middle man between both the supplier of goods and the consumers that purchase these items in store or online. The relationship that retailers have with consumers is that not only of a provider of products but also a certain amount of control and influence over the purchasing process. With suppliers, their relationship is more customer based, where suppliers need to offer the right products at the right prices in order to maintain a business, working relationship. This again gives retailers a certain amount of power and control over the production supply chain.

Whilst in this powerful position, retailers are creating a barrier between consumers and suppliers, which is resulting in consumers often having little appreciation and the inability to relate to the social conditions in which products are often made. With relatively low knowledge and awareness, there remains a lack of connectivity between a consumer and workers employed in the production of goods. As highlighted by Ellen (1994), the consumer lack of knowledge leaves them unable to make informed decisions regarding their product purchases made. As a consequence of a low knowledge base, consumers have very little to no connectivity with the people who are involved in the production and as a result, no empathy with their social situation. This relates to the views of Carrigan and Attalla (2001) where it is believed that if people had a better connection to the supply chain they may care about social and environmental issues more. Figure 4 demonstrates the current relationship that suppliers, retailers and consumers have and demonstrates the barrier that is being put in place by retailers between suppliers and consumers. The further involvement of people across the product lifecycle could aid in not only the development of empathy through an increase in knowledge and awareness of ethics but also create a more consistent approach to the involvement of people.

Figure 5 Supply Chain Relationships. source: authors

4.2.2 Effective Communication Methods

A key finding across many of the interviews carried out was the need for effective communication methods in order to fully engage consumers in the company's supply chain. As identified in case study 2, it was highlighted that several methods were being implemented across the product ranges but the commonality between these was that preaching about ethics was not effective and could potentially have an adverse effect on the message being communicated. In preference to preaching, the brand opted for more engagement strategies such as campaigns and initiatives where participants could feel they were making a difference. Relating to the previous finding of the power residing with the retailer, further disclosure of information could see the transfernence of this power to the consumer thus giving them more responsibility and leverage to make a difference (Martinez and Crowther, 2008). The company studied initiated many schemes where the consumer could engage and be rewarded for their participation. Thank you, campaigns were also implemented, enabling the participant to see how their engagement has helped to make a difference. This relates to Maslow's Hierarchy of Needs where consumers are reaching the final stage of the pyramid *self-actualisation;* feeling the need to give something back to society through their behaviour.

Through internal consumer research, the company found that their customers had a desire for information regarding where and how their products had been produced, however they wanted this delivered in a series of simple messages related to responsible practices. This indicates not only a desire for information to be made available but also stresses the need for effective methods of communication to engage and inform the consumer. This desire for engagement also shows that transparent business practices are paramount in the provision of publicly available information regarding social and environmental responsibility.

4.2.3 Consumer Led Innovation

When considering behaviour in relation to ethics, a shift in thinking was identified by the company in terms of the relationship with their customers. Previously the company had taken the lead in striving for ethical practices in the product supply chain, however, consumers quickly took the lead in this. This was a change in what the company could do, to what they can facilitate their customers to do which again relates to power struggle identified previously by Martinez and Crowther (2008). Through levels of consumer engagement, the company were able to allow their customers to guide and the action taken to implement more ethical practices in the supply chain.

This transference of leadership was also an indication of brand trust, where consumers were recognising the brand as a company who took action on responsible business practices. When interviewing The Head of Sustainable Business he believed that consumers, if wanted, could leave their worries at the door and merely trust the company to make the correct decisions. The progress made with consumers, however, indicated that they wanted to engage and be involved in striving for the consideration of ethics in the product supply chain.

5. Discussion and Conclusions

Following the analysis of the data collected in case study 1 and 2, it can be summarised that three distinct contributions have been made:

1. There is an inconsistency of the involvement of people throughout the product lifecycle, indicating
    a. a very high level of importance given to people during the early stages of the design, and
    b. a very high level of engagement of people during the use phase, but
    c. a gap of involvement during the production phase.
2. There is a need for the involvement of people at all stages of the product lifecycle to create empathy and consequently ethical considerations.
3. This empathy could be instilled by involving design and its empathic approach (Dschool, 2009) throughout the product lifecycle and not merely during the early phases of the design process.

From the analysis of the product lifecycle through the utilisation of two case studies, it has been identified that the involvement of people as key stakeholders throughout the product lifecycle is necessary for the consistent consideration of ethics. It has been evidenced that the value of people has been recognised within the design phase of the product lifecycle, however, this level of engagement is inconsistent later in the process. There lies a prominent gap of the involvement of people between the end of the design process and the start of the use phase where people become engaged with the product again through purchasing and user behaviour. Despite the involvement of people in the production stage not always being possible, the power of people as consumers should influence this gap in the product lifecycle.

It has been evidenced that in order for consumer to be effective *prosumers* in the latter part of the product lifecycle a number of adaptations need to be made. These have

included the balance of power between the consumer and the retailer in the consideration of ethics. This can be further facilitated through greater transparency of the supply chains and effective communication methods. However the retailer, often acting as a middle-man needs to be trusting of the consumer in order for the transferenece of power to work.

A relationship between the creation of empathy and the consideration of ethics has been found, further emphasising the need for the involvement of people in order to create such values. This relates to the Dschool (2009) model of design, where the process begins with empathetic values in order for the process to be successful. This human connection between people as consumers and people as producers is vital to ensure ethics is a key decision-making factor in the manufacture of products in addition to that of design.

The value of engaging people in all aspects of the product lifecycle has been evidenced during the case study research. During the early stages of the cycle, people are seen to be adding value to the process through the use of a participatory design approach. During the production phase, consumer-led innovation has been evidenced where consumers and becoming *prosumers* and are beginning to take the lead in striving for more responsible considerations during the product lifecycle.

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Section 4.c

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HONG KONG DESIGN MANAGEMENT ACADEMY CONFERENCE 2017

RESEARCH PERSPECTIVES ON CREATIVE INTERSECTIONS

Introduction: At the Intersection Social Innovation and Philosophy

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doi: 10.21606/dma.2017.232

Increasingly, designers are asked to play a role in innovation processes taking place in society, either by initiating new approaches to weave social tissue, by amplifying or scaling up existing initiatives or by creating the preconditions for these initiatives to prosper (Manzini 2014). In doing so, they touch upon new meanings and values that are about to emerge in society, often increasing their visibility and moving them towards the centre of our everyday lives. For instance, a new sense of community and citizenship emerges where designers attempt to increase citizen participation in co-designing new services for their cities. As time progresses, the meaning of notions such as politics, aesthetics and citizenship shift and designers need to adapt to these changes and help to initiate or steer the adaptation process. Thus, they no longer just work to create new services: they are engaging in a cultural operation (Margolin and Margolin's 2002 and Manzini 2016). This raises important questions such as: Are we designers always aware of the cultural implications of our work? How to take these implications into account? Are we always aware of the shift of meanings and values to which we contribute when working on social innovation? Do we deal with it critically?

Philosophy has traditionally dealt with the interpretation of meanings and values produced throughout history. As a discipline, it can help us to better frame the new meanings and values that we designers are uncovering, (re)shaping or amplifying in society. Which meanings and values are we talking about? Can philosophy help us to critically assess these new meanings and values, framing them culturally and increase our awareness of their implications on our culture? Can philosophy help to bring more critical awareness and continuous reflection in processes of social innovation? Which philosophical traditions are better suited to look into in this sense? How can these reflections help us in our design practice aimed at social innovation? This track puts into dialogue meanings and values emerging from practices of social innovation with diverse philosophical traditions.

All the contributions presented in this track register a shared need to further develop a critical reflection on design for social innovation, and to an integrative approach, involving other disciplines. They touch upon a variety of philosophical perspectives and approaches in order to contribute to the growth of a kind of *design wisdom*, e.g. activity theory, constructivism, pragmatic aesthetics, science and technology studies. In this context, this session tries to create a dialogue between different attempts to research the potential role of a philosophical reflection for design research, in which design philosophy becomes a real *"philosophy-in-action"*.

There are many red threads connecting the papers to be presented in this track. For instance, there is a shared attention towards the political implications of design experimentations in social innovation (Koskinen 2016 and Tonkinwise 2016) and an acknowledgment of the need for further reflection on this issue in design research (Keshavarz & Maze, 2013 and Dilnot, C. 2005), particularly when it comes to the topic of power relationships between the different actors involved (Keshavarz 2015 and Sangiorgi 2011). Besides the need to better address political issues, there is also a shared attention towards the aesthetic dimension of such projects, particularly in relation to their political dimension. We need to create arenas for discussions where different issues arising from the phenomenological observations of cases of design for social innovation are put into dialogue with different philosophical traditions, and to explore new ways for having these disciplines interact more with one another. In this section, particularly, there is a focus on the issues of aesthetics and politics raised by these practices. What also equally emerges from these papers, is the need to look at experimentations in marginalised communities while avoiding the risk of a stereotyped western-centric perspective fuelled by the dominance of European examples in literature.

The first paper (*Social Design for Services Framework: Capturing Service Design for Development Framework*), draws on eight doctoral theses produced by the World Design research group, to present a framework for social and service design in marginalised communities, applying constructive design research (Koskinen et. al., 2011) and thereby focussing on the development of design solutions through iterative processes and reflective design. Drawing on case studies in Namibia and South Africa entitled 'My Dream World', which took place between 2013 and 2015, this paper stresses the importance of storytelling in social design. It describes in concrete terms how storytelling proved to be a structural element underpinning and supporting the functioning of the other elements of the framework for this project (NEPIDE: Social Design for Services Framework) i.e. ethnography, participation, identities, development and economic opportunity. It is asserted, that the latter elements of the framework can eventually serve scalability in developmental contexts.

The second paper presented *(Objects of Design: Activity Theory as an analytical framework for Design and Social Innovation*), discusses how within an ongoing project in Bangkok Activity Theory proved helpful in order to take multiple perspectives into account within the design process, taking the local and cultural context into consideration, while focussing on the stakeholders motivations and their own power relationships.

The third paper of this session (*Thoughts and reflections on design wisdom: a cross-disciplinary path towards social innovation)* addresses the importance of aesthetics when it comes to tackling societal challenges, reducing inequality and inequity, promoting inclusive growth, particularly referring to the idea of pragmatic aesthetics in the philosophy of Shusterman (Shusterman, 2000).

Finally, the last paper of this session *(Designing Good(s)? Exploring the Politics of Social Design Processes)* addresses the need to be more critical towards the "good" that social design projects aim to achieve, questioning the idea of "good" as such. Moreover, it addresses the need to be more critical towards the instruments used to achieve this "good" - for instance design methods. It questions the latter's nature of being a construction of reality while being a representation of reality, and thus being a tool for power. Drawing on Science and Technology Studies - particularly Haraway (1988), Mol (2002), and Law (2004) - the authors underpin the multiplicity and complexity of reality that design for social innovation needs to deal with, and point to the need for a more critical reflection on the political implications of such experimentations.

All works presented in this session share the need for further experimentation - showing not only the achievements but also the limits of ongoing experimentations - where also a deeper understanding of how the reflections on issues such as aesthetics and politics addressed from a philosophical perspective can empower new approaches to design experimentations in societal contexts. Far from willing to conclude the discussion, this session raises a wide range of new questions - particularly concerning political issues emerging from practices of design for social innovation - thereby opening up new or at least enlarging existing areas of discussion around topics which merit further study.

With similar research interests, Satu Miettinen and Melanie Sarantou, in their article *Social Design for Services Framework: Capturing Service Design for Development Framework*, examine a service design project carried out in Namibia and South Africa. The main intention of the article is to propose a social design for services framework that can be applied in development contexts, and illustrate and discuss this framework through the description of the project.

In *Together We do not Forget: Co-designing with People Living with Dementia towards a Design for Social Inclusion*, Marjolein Wintermans, Rens Brankaert and Yuan Lu present a design process in which cognitively impaired participants are involved in the design of products and services for themselves. Demonstrating each phase of the co-design process in detail along with their personal reflections, the authors share their observations regarding the role of designer in co-design activities as well as the methods and tools used within the process.

Another article that is empirically based on a collaborative activity is *Using Collaborative Reflection in Service Design Research*. In this article Merlijn Kouprie and Soumava Mandal aim to show how applying a methodology based on collaborative reflection in the research phase of a service design project enables employees of an organisation to reflect together and build a common understanding. In a similar way to the previous article, the

authors discuss and evaluate the research tools they have designed for the workshop, and place much emphasis on their observations as design researchers.

In *The Role of Inner Values to Teamwork during Design for Social Innovation*, Pratik Vyas and Robert Young's goal is to identify and verify the inner values that are considered to play an important role in teamwork during design for social innovation. The paper draws on a survey (that generates both qualitative and quantitative) with design professionals. In the conclusions the authors highlight the context-dependency of inner values, arguing that the trade-off between inner values is essential, yet requires wisdom and balance by the designer.

Locating itself at the intersection of the fields of aesthetic experience, design management and social innovation, the article titled *Thoughts and Reflections on Design Wisdom: A Cross-Disciplinary Path towards Social Innovation* by Eduardo Tapia Olmos argues how these fields construct themselves with emergent paradoxes from drifting points, and how such paradoxes and the insights driven from them constitute a directional bridge for a philosophy-in-action.

Objects of Design: Activity Theory as an Analytical Framework for Design and Social Innovation by Cyril Tjahja is an article that addresses the lack of the critical analysis of the initiatives within the area of design and social innovation. The author examines three social initiatives in Bangkok utilising activity theory as an analytical framework in order to understand he motivations as well as the limitations of the stakeholders, and the impact of the local social and cultural context on the role of design in the social innovation practices.

Another article that adopts a critical stance towards social design processes is *Designing Good(s)? Exploring the Politics of Social Design Processes* by Josina Vink, Katarina Wetter-Edman and Vanessa Rodrigues. Inspired from the field of STS, the authors investigate two co-design projects considering three issues: the recognition of situated knowledge, the multiplicity of reality, and the performative nature of methods. They conclude by underlining the significance of self-reflection in social design processes and acknowledging the politics of design embedded within these processes.

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About the Track Facilitator

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HONG KONG DESIGN MANAGEMENT ACADEMY CONFERENCE 2017

RESEARCH PERSPECTIVES ON CREATIVE INTERSECTIONS

Social Design for Services Framework: Capturing Service Design for Development Framework

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doi: 10.21606/dma.2017.89

This paper addresses the fields of social and service design in development contexts, practice-based and constructive design research. A framework for social design for services will be explored through the survey of existing literature, specifically by drawing on eight doctoral theses that were produced by the World Design research group. The work of World Design researcher-designers was guided by a strong ethos of social and service design for development in marginalised communities. The paper also draws on a case study in Namibia and South Africa titled 'My Dream World'. This case study presents a good example of how the social design for services framework functions in practice during experimentation and research in the field. The social design for services framework transfers the World Design group's research results into practical action, providing a tool for the facilitation of design and research processes for sustainable development in marginal contexts.

keywords: social design; service design; value

Introduction

Social design is mindful of designers' roles and responsibilities in society by using design processes as a tool for bringing about sustainable social change. Within design worlds social design is often defined as a process that contributes to improving human well-being and livelihood based on the inspiring ideas of Victor Papanek that designers and creative professionals have a responsibility to instigate change through good design. This means that designers can contribute to responsible design by being mindful and careful about the

materials and processes they choose and use. Papanek's idea that designing for people's needs rather than their wants underpins responsible design for marginalised communities globally.

This paper proposes a practical social design for services framework that can be applied in development contexts (Kuure & Miettinen 2017). The framework has been identified through the analysis of eight doctoral theses that were produced by researcher-members of the World Design research group. The framework informs social and service design and serves as an analytical tool for the case study presented in this paper. The case study, a service design project, will be used to illustrate this framework and includes a design for economic opportunities perspective.

The case study 'My Dream World', is a service design project that was conducted in Namibia and South Africa between 2013 and 2015. The project goal was to facilitate empowering development processes for participating youth through new service solutions using art and design, was included in Cape Town's official World Design Capital program. The case study will demonstrate how the social design for services framework can be applied in development contexts or marginal conditions as the 'My Dream World' service design project reached out to indigenous communities and unemployed youth in South Africa and Namibia. The social design for service framework is used to analyse and present the elements of change in social designers' work (Miettinen, Kontio & Huhtamaa, 2016).

Miettinen (2006) published a World Design research group manifesto for social design, which was a collective process for conceptualising social design. The manifesto described social design as strategic thinking that facilitates discussions between traditional communities and market economies. Social design is described in the manifesto as a professional activity that improves local livelihoods and profitability through economic opportunities while increasing a sense of ownership. Another statement highlights the importance of a holistic approach that includes communication, new product development and environmental concerns in both social design and design for systems.

The World Design research group published a book edited by Miettinen (2007a) that focused on practical social design and policy implementation for craft and design development and education and new models for improving design on a local level. Both publications stressed at the core of social design, the importance of economic, policy and design for systems development, strategic management, understanding development contexts, developing a sense of ownership and commitment when working with social design and innovation. The World Design research group also initiated a Wikipedia page for social design (https://en.wikipedia.org/wiki/Social_design), presenting a social design framework that places responsibility, strategic thinking, performance design, systems design, and the role of social worlds at the core of the field.

Methodology

This paper presents a longitudinal study of more than a decade of research that has been executed in various global locations, including Brazil, Colombia, Finland, Indonesia, Mexico and Namibia, by the World Design research group. The core group was based at the Aalto University, formerly known as University of Art and Design Helsinki, between 2002 and 2014, although some theses were produced at universities elsewhere. This group was

established by the doctoral candidates themselves, recognised by their supervising professors and funded through various sources.

The World Design research group was formed around the ethos of improving human livelihoods using social design methodologies. The cross-disciplinary research resulted in the production of eight doctoral theses, various seminars, design for development projects and exhibitions. The projects carried out by the research group were innovation orientated and explored the processes and impact of social design in countries outside the European Union and North America.

The methodological approach of this paper focuses on the narrative literature review (Green, Johnson & Adams 2006) of the World Design research group, as well as relevant social and service design research literature. The goal of the literature review is to identify central themes in the eight studies produced by the World Design research group and to identify a sound social design for services framework. This is an applied longitudinal study (Singer and Willett 2003) with a methodological approach constituting the a) survey of literature including theses and some publications produced by the research group (Miettinen, 2006, 2007a, 2007b, Bello, 2008, Reijonen, 2010, Huhtamaa, 2012, Nugraha, 2012, Sarantou, 2014, Judice, 2014 a, 2014b), b) data presented by the research group over a period of twelve years, c) a case study 'My Dream World' and d) the application of the social design for service framework exemplified in the case study.

The World Design research group's doctoral dissertations form a sound body of data for the literature review. This set of data was selected for the study as an exemplar of social design examined in this article. The data was well documented and analysed as the studies were supervised and defended as doctoral studies. This body of data is familiar to the first author as she was not only a World Design research group member, but also acted as opponent and examiner for many the theses.

In applied longitudinal studies it is important to recognize elements of change. In this paper the social design framework that was defined by the World Design research group through publications (Miettinen, 2006, Miettinen, 2007a) and a Wikipedia page will serve as references for studying elements of changes. The period chosen for this longitudinal study, twelve years, is a time frame suitable for identifying and making apparent the changes in the social designers' research.

The role of designer has been well studied and documented in design research literature (see Cross, 2001 and 2006, Press & Cooper 2003, Valtonen, 2007 and 2009). Structural changes in industries, globalisation and digitalisation effects the roles of designers and resulted in changing the designers from designer-makers to agents for innovation, and from coordinators and co-creators to capacity builders. During the twelve-year period service design has also emerged from a marginal to mainstream research field (Miettinen, 2013).

Survey of existing scholarship

The multi-disciplinary social design research of the World Design research group examines the relationships between social innovation, globalisation (Bello 2008 and Reijonen 2010), crafts design and development (Miettinen, 2007b, Reijonen, 2010, Huhtamaa, 2012, Sarantou, 2014), development issues and communication design (Judice, 2014b), graphic

design (Judice, 2014 b), industrial and strategic design (Bello, 2008, Nugraha, 2012), service and social design (Miettinen, 2007b, Judice, 2014a), and tourism (Miettinen, 2007 b, Sarantou, 2014). Thematically the World Design research group expanded into a wide spectrum of research, from designing concrete objects, strategic design for service delivery. The spectrum also includes themes such as indigenous cultures and tradition (Huhtamaa, 2012, Sarantou, 2014), crafts development (Nugraha, 2012, Reijonen, 2010, Sarantou 2014), while expanding to graphic communication and social design (Judice, 2014a, 2014b) to investigate design areas such as strategic and service design (Bello, 2008, Miettinen, 2007b).

Making and acting, crafts and services

Several World Research members explored crafts research. Huhtamaa (2012) studied, from crafts people's points of view, how the appearances of objects constructed meanings in everyday contexts in her work titled 'Namibian Bodily Appearance and Handmade Objects'. Nugraha (2012) studied craft production processes by proposing the ATUMICS method: Artefact, Technique, Utility, Material, Icon, Concept and Shape for product development. These two dissertations define the relationship of a designer within crafts traditions and development. Miettinen (2007), on the other hand, proposing the designing of experiences, thus shifting the focus from craft making to designing systems and experiences.

Sarantou (2014) explored the role of narratives in sustainable artefact making and marketing by mapping Namibian craft and design. Similar themes, sustainable artefact making and marketing, were also explored in other world locations during the earlier work of the World Design research group. However, Sarantou's unique abstract concept of 'narratives of care' explores narrative processes and practices that empower artefact makers and their communities.

Findeli (2001) described, in the beginning of the millennium, the epistemological and methodological shift in design from making to a performance, or acting. This shift is noticeable in the World Design research group's work as their practice changed from concrete craft and design processes to abstract concepts related to research in craft and design. The researchers engaged in the dualistic positions of being researchers, craft and design makers, *and* actors for change through concepts of service design and development.

Participatory design

Participatory design (PD) thinking, especially the research of Ehn (1993), impacted on the projects executed by the researchers of the World Design group. Ehn, Nilsson and Topgaard (2014) discuss several PD themes including how design for politics enables improved governance, the use of an iterative approach, while enabling prototyping in social design supports social innovation. The value of both the Judices' (2014) doctoral theses is the practical design contexts and use of design tools within the community of Vila Rosario. The Judices illustrate the ability to use social and empathic design (Koskinen & Battarbee, 2003) in their participatory methodology. Ehn's contribution to a participatory design approach and the inclusion of users in design processes shapes both the Judices' research as they are not only participatory observers, but include users in

their design processes. Their design interventions in communities forms a valuable contribution to the development of social design approaches underpinned by co-design that is a flexible and open design approach based on participation and co-creation.

Andrea Judice's (2014a) thesis enriches PD discussions as it embraces service users as the participants of product-service development processes. Her approach to PD places the health agents and community of Vila Rosario at the center of her design process, thereby contributing to the understanding of designers' roles in user and community centered design processes that are based on contextual understanding. These processes stimulate local community development through the identification of design drivers that are solution oriented whilst permitting the monitoring and evaluation of local development within communities. Her thesis illustrates that contextual understanding supports transformational change as all stakeholders are involved in the design processes.

Cultural aspects of bridging social and service design

The World Design research group drew on several social and service design themes, culture and design theories to move between research and design practice. Margolin and Margolin's (2002) suggestions that design is a vehicle for disclosing human intentions for the making of worlds, and design as a function of culture, inspired the World Design research group to employ social design in conjunction with cultural theories. These authors also introduced a social model for product design, suggesting affordable housing, the redesign of government tax and immigration systems as good examples for social design, but these examples are relevant to service design as well. Another suggestion by these authors is to consider the role of social design and social work practices in tandem to improving the position of marginalised communities.

Papanek (2006) is another author that inspired the work of the group as he studied the role of design and the designer, stressing the moral responsibility of designers to consider sustainable practices within their own societies as well as what he refers to as 'underdeveloped' communities elsewhere in the world. Papanek considers designed products in sociological, psychological and ecological contexts, but he also stresses the importance of design approaches that are based on interdisciplinary teamwork, participatory design and systems design. Papanek's ideas are at the core of design thinking and are well applied service design practice. Additionally, Bonsiepe (2006) reminds designers to focus their activities on communities that are socially and economically marginalised, an ethos that was strongly shared by the World Design research group.

The group utilised the work of Manzini (2014) that recognizes social innovation as a process of change based on the creative recombination of existing resources. He introduces a bottom-up approach to social innovation that is driven by local communities. Manzini resonates well with development economist Amartya Sen, who strongly influenced the work of Reijonen (2010), one of the members of the research group. Reijonen uses Amartya Sen´s (1999) capability approach to discuss the multi-dimensional roles of welfare and the ability of individuals to achieve purposeful and valuable lives. Sen suggests the moral importance of the freedom to achieve wellbeing and that individuals and groups' capabilities are underpinned by having opportunities to achieve effectivity.

Appadurai's (1996) proposed a framework for studying cultural flows and the disjuncture between economy, culture and politics in the globalised world through 'scapes', such as ethnoscapes, mediascapes, technoscapes, financescapes and ideoscapes. Influenced by Appudurai, Bello (2010) introduced the concept of goodscapes for the intertwined global and local structures that are produced by the conception, production, distribution, exchange, use and disposal of goods. Inspired by John Urry's (1995, 2002) ideas about the tourist gaze, Miettinen (2007b) explores globalization and tourism industries from three different perspectives, including the experiencing of local identities, globalising of the tourist's gaze through technology and how the tourist's gaze is constructed through signs and semiotics, thereby producing a powerful analytical tool.

Narrative, identity and community

Narratives and multivocality underpin the work of Miettinen (2007), Huhtamaa (2012), Sarantou (2014) and Judice (2014). These researchers' fieldwork and methods, that are based on ethnographic approaches, present local contexts through the narrative voice of community members. Based on a narrative approach, Sarantou's (2014) research introduces 'narratives of care' that were shared through empowering and caring discussions and experiences that took place during crafts production in Namibia.

Another of Sarantou's (2014) thematic contributions are the tensions experienced around the identity constructions of craftspeople and designers. She discusses crafts and design practice as both empowering for the community and care for the individual craft and design makers. Miettinen (2007) identifies processes of empowering identity constructions of craftswomen through the learning of crafts skills, while Judice (2014a) discusses identity constructions in relation to the work of health agents in Vila Rosario. Themes of empowerment and identity construction are central to the research group's work as they explore changing processes within communities when their members need to reposition themselves during engagements with new activities and processes.

Andrea and Marcelo Judice's (2014a, 2014b) research is based on community centered design that highlights storytelling, inclusive decision-making and participatory community meetings as important social practices. Placing communities at the centre of development work demonstrates their social design approach. Judice (2014a) discusses the complex but important role of instigating trust between researchers, designers and community members, based on long periods of presence in the field, interviews, co-design workshops and discussions that strengthen personal relationships with the local communities. Relationships are built during intensive work in the field that enables ongoing communication with the community as well as opportunities for continued work. The case study presented in this paper is an example of the trusting relationships that were built by the first author in the field that enabled her to continue her research ten years after her first fieldwork experience.

Flexible research design methodology underpinned by ethnography

Ethnographic methods including participant observation and interviewing are sound research methods for fieldwork. These methods support the contextual understanding of the communities that participate in research, which is also an important requirement for social design as it places designer-researchers in interactive relationships with the

participating communities. Margolin (2002) illustrates the suitability of interviews, surveys and participant observations as methods for social design. These methods are also widely applied in service design. Both these design areas use ethnographic methods in the development of design solutions for objects and services, a core underpinning of research for design (Frankel & Racine 2010, Falin 2011).

Sarantou (2014) discusses her research subject through an ethnographic lens, lending methodological rigor to her research practice, especially through her methods of data collection and analysis. Her focus on the role of narrative in craft and design processes in the lives of Namibian artefact makers underpin her application of ethnographic methods in the field such as interviews, observation, journal writing and analysis. Huhtamaa (2012) and Miettinen (2007b) also selected ethnographic methodology for their research projects, while Andrea Judice's (2014) research methods are constructed around a social design framework with a strong presence of ethnographic elements in the design tools she, and many of her peer design researchers and designers (see Mattelmäki, 2006, Miettinen, 2007b, Huhtamaa, 2012), apply in their theses.

The constructive design research (Koskinen et al. 2011) approach, on the other hand, focuses on the development of design solutions through iterative processes and reflective design, thus applying tools such as sketches, prototypes and experiments in research processes. Marcelo Judice applies constructive design research in his project, while the same approach is used by Miettinen (2007b) in her service design research, illustrated through a serious of iterations in her workshop processes and exhibitions that outline creative tourism experiences. Both researchers also use co-design approaches, which means the collaborating with and inclusion of the participating communities in their research, design and analysis processes. In Nugraha's (2012) thesis the constructive design research process is identified in the utilisation of the ATUMICS method through workshops and conferences. Rigorous research design methodology that consists of cross disciplinary and mixed approaches, combined with the knowledgeable application of ATUMICS research tool ensures a flexible research design methodology that is underpinned by an ethnographic focus.

The role of economic development in social design

Strategic management, underpinned by design thinking, play significant roles in successful organisations, including small businesses, the not for profit and social sectors in marginalised communities. Commercial businesses with the prime motivation to earn profit, and not for profit (NFP) organisations with a focus on addressing identified social needs, benefits from social design and ethnographic research approaches to manage essential economic development processes for sustaining livelihoods (Miettinen 2007b). In the not for profit and business for good sector the beneficiaries provide the needs that should be addressed while the donors supply the funds to address these needs (Austin, Stevenson & Wei-Skillern, 2006).

Ethnography is a popular methodology in business marketing and consumer behaviour research (Kotler at al., 2012). Business processes and service design, for example in areas of strategic, marketing and operations management, uses observational studies, focus group, behavioural data and experimental research as approaches to gain in-depth understanding of business users, consumers and employees (Kotler et al., 2012, Slack et

al., 2012). Popular research tools in business include questionnaires, interviews and the use of technological devices to capture data in the research field.

Nugraha (2012) addresses product design for enhancing economic opportunities for artefact makers in marginalised contexts. Sarantou's (2014) ethnographic methodology, underpinned by a narrative approach, permitted her research and analysis of sustainable marketing approaches for Namibian craft and design artefacts. She argues that it is the narrative function that sustains holistic craft and design making in marginalised communities. Her findings include that sustainable business and marketing practices, that draw on narrative, allowing the voices of marginalised craft and design communities to emerge, assisting in the marketability of their artefacts and services, thus creating economic opportunities for supporting livelihoods. Both authors consider the role of cultural identities, supported by the use of local materials and cultural symbolisms in sustainable design for development settings.

Case study: 'My Dream World'

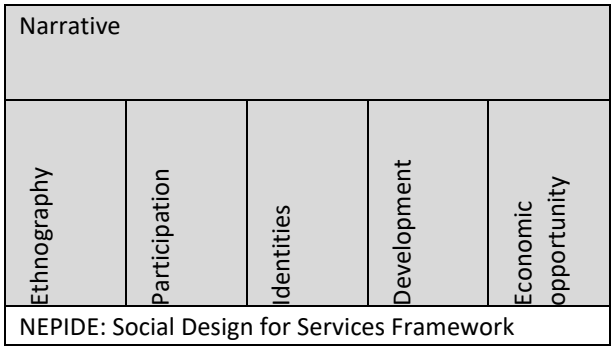
The service design project 'My Dream World' presents the post-doctoral research of former World Design research group members. This project followed similar principles to the research projects of the World Design research group as it included methodological elements such as participant observations during the fieldwork, inclusive processes for stakeholders, and the visual presentations of the research and design activities through exhibitions and publications. With a strong emphasis on multidisciplinary approaches, the project's stakeholders represented organisations that support (a) indigenous rights and development issues in South Africa and Namibia, the South African San Institute (SASI), (b) Namibian youth participants in areas of HIV-prevention, sexual health awareness, alcohol and drug abuse, discrimination and stigmatisation, the Ombetja Yehinga Organisation (OYO). Other stakeholders include various cultural and educational institutions such as the Cape Peninsula University of Technology, Namibian University of Technology and Krunuhaka Secondary School.

The participating researchers and service designers had to select suitable methods for the different contexts and problems they faced. These contexts included the understanding of the main challenges, development topics, and institutional issues were considered whilst collaborating with the stakeholders in the field. The field work teams consisted of designers, community members and staff from the various institutions. Social and service design ensures that sustainable development initiatives that involve processes of change include the needs and of all stakeholders.

The project was well documented as research data included transcribed interviews, group discussions, video documentation and self-documented design processes by the workshop participants. The project planning, management and reporting was also well documented. The project produced a current set of data with the goal of developing a framework that combines social and service design. This project serves as an appropriate example of how the social design for services framework, discussed hereafter, function in practice during research in the field and experimental research. This framework, titled NEPIDE, is based on the role of narrative, ethnography, participation, identities, development and economic opportunity. In this framework narrative serves as an underpinning element to the functioning of the framework.

Suggested framework: Social Design for Services

Diagram 1: Social Design for Service Framework



Narrative

The narrative function underpins all the processes of the social design for services framework. Without the narrative function this framework fails to function as all the researchers of the World Design research group, in one form or another, argued how the narrative function impacts on business, ethnography, development, participation and identities. The project strongly drew on narrative practices as the application of several service design tools engaged the youth in storytelling or sharing of narratives.

Youth participants worked with storytelling probes that stimulated the self-documenting of their lives while considering their identity processes within their communities. Storytelling tools enabled the youth to write about their everyday life, hopes, dreams, wishes, likes and dislikes. Participating youth were also presented with 'magic wand' probes that encouraged them to write about, and thus document, ideas about an ideal situation or a dream life. The storytelling probes were analysed and the findings shared with the participants.

The participants' narrative, as well as the processes of sharing narratives, shaped the empowering processes that were experiences amongst the participants. Another example of a narrative tool that shaped identities during the project was the use of the 'Hero's journey'. This activity enabled the youth participants to apply the monomyth of Joseph Campbell (1949) as a drama and video tool. They imagined, performed and enacted their roles as Campbell's hero that journeyed through hardship and in the process, they engaged in processes of self-mentoring and empowerment. These journeys were developed into video by Kontio (see https://vimeo.com/102132331). This empowering activity and video platform illustrates the potent use of narratives in identity processes of the participating youth.

Ethnography

The project included ethnographic methodology in the fieldwork, including methods such as participant observation, group interviews, photograph and video documentation for collecting data. Miettinen's (2007) visualised research processes inspired the sharing of date through an exhibition format, but the research design of the project was more structured compared to her earlier research. The cycles of the research were constructed

around first (2013) and second (2014-2015) phases with the goal to design for the research process, or design for research. The project plan was developed in separate stages for the first and the second phase of the project. This approach allowed the separate analysis of the data produced during the two phases which were well documented.

This project applied the constructive design research (Koskinen et. al., 2011) and design science (Hevner, 2007) approaches. As research structure a flexible design was selected that progressed through cycles of data collecting, the implementation of design activities and evaluation of results. Interesting findings include the dualistic role of designers working with community and engaging the community members while processing new service concepts and outcomes, yet at the same time the designers are observing participants and processes, documenting and analysing data. This dualistic positioning is common for both the social and service designer.

Participation

The project engaged in participatory process that included the stakeholders and community members in project and research development processes. The youth evaluated and commented on the processes they were involved in and their participatory experience. Comments and feedback were recorded and transcribed. Many of the participants' comments descripted the value of learning new skills and experiencing activities they never could imagine. One example was when participants learnt to sew a garment that was an element of a proposed new service concept that served as a touchpoint in the service design process.

New ways were identified to promote the participation of youth in reforming service structures within their communities, thus emphasising their role as agents of development in their own communities. By using service design tools youth participants in Namibia and South Africa explored solutions to unemployment with the aim to develop their career paths in spite of difficult employment and educational situations. The project workshops acknowledged the central role of connectedness amongst participants and within communities when exploring new creative service concepts using various resources, networks and peer-to-peer ideologies (Miettinen et al., 2014).

Identities

The participatory processes of this project stimulated the shaping of individual and community identities. The project enabled youth participants to discuss and identify key themes related to unemployment, feelings of oppression due to national bureaucratic employment systems, and challenges accessing education. Social challenges, including alcohol abuse, drugs and teenage pregnancy, were also explored. Participants immersed themselves in the workshop processes with informal small group discussions that allowed them to draw on their personal experience without committing to a public narrative of their life situations.

This phase of the workshop was followed by collaborative activities that explored and identified key words, concepts and storytelling as part of creative explorations based on collective experiences and learning in contrast to the initial individual creative exploration phase. The groups used forms and shapes to express their stories and create a shared

understanding of the themes related to the challenges they face. The collaborative nature of the sharing processes in this workshop empowered youth participants through the applied narrative and visual processes (Du Preez et al. 2015). Additionally, the project explored the complex identity shaping processes that are associated with individuals and groups, the self and other.

Development

The project produced and published two research papers (Miettinen, Du Preez, Chivuno-Kuria & Ipito 2014; Du Preez, Cilliers, Cheung-Nainby & Miettinen 2015) that explore the formats of the service design workshops, as well as the tools used during the processes. When evaluating the project using the social design for service framework it becomes clear that the research formed an integral part of the process, building links between service and social design in this project's development context that is situated in marginal communities living in Namibia and South Africa. The selected design methods led to a holistic research project that enabled the development of various media and design tools that were used to enable youth participation while delivering visual results and data for the benefit of the participants. The project outcomes empowered the participating communities as one of the youth participants commented 'I was so happy I could sew and produce the item. I couldn't have believed that I could do this!' Sarantou (2014) argues that the power of narrative is the underpinning element to sustainable development as it enables rendering audible the voices of craftspeople and designers in marginalized communities.

Economic opportunity

Business strategies and processes are associated with organisations in the for-profit and NFP sectors, including government agencies and departments, welfare organisations and services, health services and research organisations to name a few. Strategic design in NFP business sectors is usually complex and conflicting due to social, economic, environmental and political factors (Slack et al. 2012). Whatever form a business adopts, it remains a tool for economic opportunity, development and profitability through maintaining a sustainable competitive advantage (Thompson et al. 2014). In the NFP and social sectors, business also serves as a potent tool for social change (Austin, Stevenson & Wei-Skillern 2006).

Due to the complex mixture of products and services in business operations, concepts of production management have been replaced by process management (Slack et al., 2012). Design thinking is a strategy that shapes these processes, and consequently, the resulting products and services in both for profit and NFP sectors. Design thinking also drives the 'flow' through business processes, allowing lean business synchronisation that meets demands fast, without waste or lack in quality (Slack et al., 2012).

In 'My Dream World' similar lean economic development principles were stimulated through the collaboration with, and drawing on the existing resources of, stakeholders in the field that work for social change. This strategy supported the development of knowledge in the social design field at the lowest possible cost in resources, thus upholding lean business principles and maximising the value of design in a marginalised context.

Conclusion and recommendations

The social design for services framework aims to stimulate scalability, whether in for profit or NFP organisations, social or economic development fields, by optimising the usual minimal resources in marginal contexts to drive the greatest results for sustainable development. The identified framework is a practical facilitation tool for development processes. The framework considers the local and cultural contexts of the communities that product-service designers choose to work in, but it also asks for all stakeholders' participation in discovering and designing new solutions to the problems they encounter. Thus, the framework facilitates a bottom-up approach that allows all stakeholders to explore feasible opportunities for sustainable economic development. This practical check-list provides a plan for taking into consideration the elements that social and service designers should consider when entering their fields, especially for scalability in developmental contexts.

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HONG KONG DESIGN MANAGEMENT ACADEMY CONFERENCE 2017

RESEARCH PERSPECTIVES ON CREATIVE INTERSECTIONS

Objects of Design: Activity Theory as an analytical framework for Design and Social Innovation

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doi: 10.21606/dma.2017.120

Design and social innovation is a developing field of study. The current lack of critical analysis of initiatives and the dominance of insights and methods from European cases in academic literature are not sufficient to construct an image that could be considered as comprehensive. This paper aims to address both issues by introducing Activity Theory as an analytical framework, as its ability to examine phenomena in their native context through multiple perspectives is considered to be well-suited to study design and social innovation initiatives. The analysis of data obtained during a field study investigating three social initiatives in Bangkok contributed to understanding how they work and why they exist, in addition to highlighting the influence of the Thai social and cultural context on the role of design in the social innovation process.

keywords: design and social innovation; activity theory; Thailand; methodology

Introduction

With an increasing amount of initiatives sprouting up across the globe, the field of design and social innovation appears to be gaining momentum. However, its popularity in practice is overshadowed by the gaps in knowledge that currently exist in its study. Academic publications tend to focus on certain aspects of design and social innovation, such as its definition (Jégou & Manzini, 2008; DiSalvo et al., 2011; Manzini, 2015), issues regarding implementation and continuation (Camacho Duarte, Lulham & Kaldor, 2011; Hillgren, Seravelli & Emilson, 2011; Cipolla & Moura, 2012) and the role that design(ers) play in the process (Brown & Wyatt, 2010; Thorpe & Gamman, 2011). However, their

mode of operation, the stakeholders' motivations and underlying power structures are usually not reported and analysis of what actually works is rare (Mulgan, 2014; Komatsu et al., 2016). In other words, *how* and *why* these projects work is often unknown.

The dominance of European best practice examples in literature problematises this further. As design and social innovation projects are connected to their respective social and cultural environment, the transfer of methods and ideas that have proven to be successful in the west might or might not be appropriate or desirable in a different context (Brown & Wyatt, 2010). Local knowledge and practices are in danger of being substituted by imported solutions and paradigms (Bala-Miller, 2008; Akama & Yee, 2016), that are not necessarily better suited to address local issues and could also serve as good examples for the west. Without a framework that can analyse how design and innovation initiatives operate, their effectiveness and sustainability in the long-term, in any context, cannot be ascertained.

The aim of the paper is to highlight the suitability of Activity Theory (AT) to study design and social innovation initiatives by presenting findings that have been obtained during a preliminary field study in Bangkok where AT was used as a framework for data analysis.

Activity Theory is a framework that can 1) study an initiative along with its 'native' ecosystem instead of a viewing it as an idea, process or method developed in isolation, 2) reveal how an initiative functions through examining its internal dynamics as well as its stakeholders and 3) provide a means of evaluating and analysing an initiative in order to establish *what* works and *why*. It connects individuals to their culture and society by studying the *tools* and *signs* that mediate between them in relation to the wider community, along with the multiple perspectives of its stakeholders (Engeström, 1999). Motivations, (power) relations, restrictions and issues can be identified and analysed by constructing the stakeholders' respective *activity systems*, the primary units of analysis.

The current discourse on design and social innovation presents a view that leaves room for expansion. Analysis is often limited to the description or prescription of how the implementation of design methods have been beneficial to solve a perceived social problem (Jégou & Manzini, 2008; Camacho Duarte, Lulham & Kaldor, 2011; Meroni, Fassi & Simeone, 2013). However, this approach, although useful in demonstrating the potential merits of design, reflects a singular perspective on the process and does not take into account the perspectives of other stakeholders involved. Without knowledge regarding their motivations it remains unclear whether any value has been created for anyone other than the researcher(s).

Background

The Bangkok field study is part of a PhD research project investigating what constitutes design and social innovation initiatives in the Asia-Pacific region. In particular, the research aims to determine *why* design and social innovation projects are initiated, *for whom* they create value and what role *design* plays in creating this value, by constructing a select number of case studies varying in type of project and locality. The paper presents findings from Thailand, the first of three countries that will be examined in the course of the PhD research project that is currently on-going.

Design and social innovation

In the last decade, there has been increasing interest in design and social innovation, which is often attributed to the rise in popularity that social innovation itself has experienced in the same time period (Hillgren, Seravelli & Emilson, 2011; Mulgan, 2014). Design methods such as visualisation, prototyping, participatory design and strategic design are perceived to contribute in a positive manner to the social innovation process (Brown & Wyatt, 2010; Murray, Caulier-Grice & Mulgan, 2010). Along with its popularity in practice, the number of academic publications on design and social innovation has been increasing steadily in the past years as well. However, the study of design and social innovation is still considered to be developing (Irwin, 2015); Significant improvements can be made in terms of what is studied and how it is studied. The current lack of critical analysis, and the exploration and discussion of methods, values and practices of cases that are less represented in literature need to be addressed for design and social innovation to continue its development towards a field or discipline that could be considered as mature.

Activity Theory

Activity Theory, also known as Cultural Historical Activity Theory, is a framework that can be used for analysis of qualitative data. Originating in Classical German philosophy, the works of Marx and Engels and the Soviet cultural psychology of Vygotsky, Leont'ev and Luria, AT provides an alternative to the traditional view in which individuals are perceived as separate from their surrounding social structures. As this dualistic perspective falls short of explaining contemporary complex social transformations, AT aims to connect the individuals and their surrounding social structures by pursuing a *monist* approach in which both are studied at the same time by focusing on the generated activity (Engeström, 1999). AT is very well suited to analyse design processes as it can constructively describe its activity structure and development in its own context (Lauche 2005; Tarbox, 2006; Tan & Melles, 2010). It therefore has the ability to look further than design and social innovation as an isolated method, process or idea by also providing insight into the ecosystem in which an initiative takes place and to which it is inextricably linked.

AT has been applied in various fields of study, such as learning (Wells, 1993; Jonassen & Rohrer-Murphy, 1999), human-computer interaction (Nardi, 1996; Kuutti, 1996) and organisation studies (Blackler, 1993; Chatzakis, 2014). Although AT has not been frequently used to study design, there are studies that have used AT as a method to examine graphic design (Tan & Melles, 2010), service design (Sangiorgi & Clark, 2004) and interaction design (Kaptelinin & Nardi, 2006).

The Activity System

Activity Theory is rooted in the idea that an individual or group (*subject*) should be studied together with its surroundings or social context (Nicolini et al., 2003, cited in Chatzakis, 2014). Subjects make use of concepts and/or artefacts (*tools*) to achieve their goals, intentions or desires (*objects)* (Kaptelinin & Nardi, 2006). The relationship between subject, tools and object can be considered as an *activity* conducted by a subject to achieve a certain outcome (Tan & Melles, 2010). Collective activities are driven by communal motives, which are formed when collective needs might potentially be fulfilled by certain objects. The motive for the activity is embedded in the object of the activity

(Engeström, 2000). Linking the subject-tools-object relationship to the wider social context are *rules,* which can be implicit or explicit, the broader *community*, consisting of other activity systems and, if applicable, shared and coordinated by a *division of labour* (Chatzakis, 2014). The relationship between these different elements make up the *activity system*, the basic unit of analysis in AT (see figure 1).

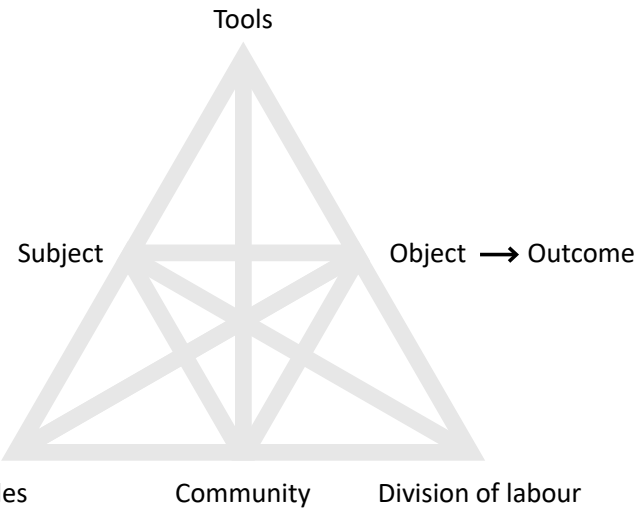

Figure 1 The activity system – adapted from Engeström (1999)

The Advantages of Activity Theory

Activity Theory has several advantages which make it suitable for studying design and social innovation:

1. The activity system allows for a rich description of *what* people do, *how* they do it and *with whom*, including the relevant context in which this takes place while taking into account both the relevant internal and external elements (Chatzakis, 2014). It therefore can provide insight into the (power) relations between the stakeholders in a design and social innovation project. Furthermore, AT allows the (cultural) context to be preserved as this is embedded in the activity system framework.
2. Innovation networks can be analysed as networks of developing activity systems with each having their own objects, knowledge and resources (Miettinen & Hasu, 2002). Using the AT framework on a design and social innovation initiative would enable analysis of specific activities, issues and motivations from multiple stakeholders' perspectives (see figure 2).
3. AT takes both the researcher's and the subject's view into account, thereby avoiding objectification of the subject (Engeström, 1999; Tan & Melles, 2010). As the construction of an activity system requires the input and interpretation of both the subject and the researcher, it is less susceptible to bias from the researcher's side.

4. By studying their own history, activity systems can focus on certain issues and track them over time (Engeström, 2001). Historicity can serve to extrapolate the past situation, via the current situation, to the future. It is therefore particularly relevant to design and social innovation as this might facilitate *infrastructuring*, an organic approach that focuses on long-term commitment to the project by building relationships with stakeholders using a flexible allotment of time and resources, resulting in an open-ended design structure without predefined goals or fixed timelines (Björgvinsson, Ehn & Hillgren, 2010; Hillgren, Seravelli & Emilson, 2011)

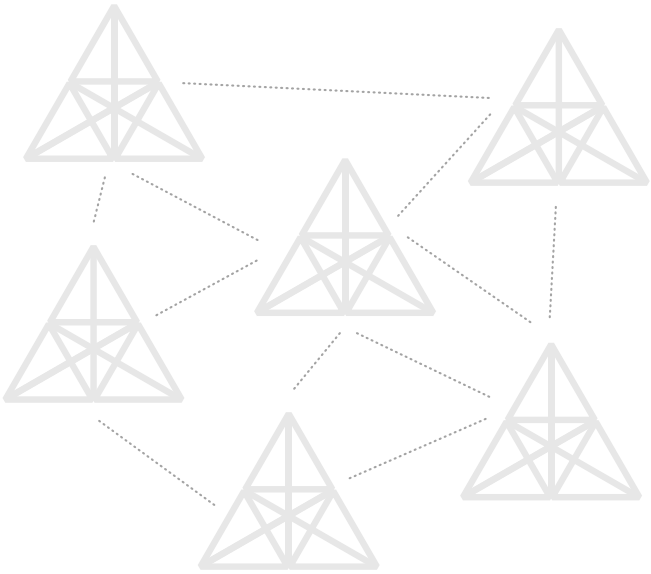

Figure 2 Innovation networks as networks of activity systems

Alternative approaches

Actor-Network-Theory (ANT) was initially considered as a method of analysis due to its ability to map out actors in networks of agency. Originating from the sociology of science and technology, ANT does not distinguish between humans and objects, considering all entities, individuals and non-individuals, as *actants* (Latour, 1996). Furthermore, ANT argues that all interactions are mediated by actant networks which not only participate, but are also responsible for actively creating all social life (Law, 1992). However, its assumption that society, and therefore culture, is created through the interaction between actants implies the absence of any pre-existing society or culture, including the one that which gave rise to the networks themselves (Bloor, 1999). Moreover, as the notion of success in the ANT paradigm is not based on the value created, but instead on the length on the network, any normative questions cannot be properly addressed (Radder, 1992). ANT is therefore not able to analyse issues surrounding culture, norms and values in design and social innovation, making it unsuitable for this study.

Participatory action research has also been considered as a possible strategy for both collecting and analysing data. Central to this approach is the desire to promote change by

actively being involved in a certain practice, which is achieved by researchers collaborating with the those who are the focus of the research. Oftentimes, action research will be conducted in a cyclical manner, where planning, acting, observing and reflecting on a change it will repeat itself throughout the process (Robson, 2013). Passive participant observation, which demands a lesser degree of involvement, was also considered. Here, the researcher collects and analyses data obtained through observation to find out what is going on in the field, becoming an accepted member of the group, but without directly participating in the process (Robson, 2013). Both participatory action research and passive participant observation were eventually dismissed as viable approaches to collect and analyse data as they were too demanding on the time and resources available for the research project. In addition, their dependence on the availability of, and access to, design and social innovation initiatives that were still on-going or in the process of starting up, made it impractical to pursue these approaches.

Methodology

Pilot study

To test whether data collection using AT would yield the desired type of data, a pilot study was conducted several months prior to actual field study. Students of the MA/MSc Multidisciplinary Innovation, a project-focused course taught at a UK-based university in which multidisciplinary teams of students and academics collaborate with external organisations on commercial and social innovation projects, were invited to participate in an AT workshop.

At the beginning of the workshop, a brief explanation was given on how to use the AT framework, followed by a session in which the students were given the opportunity to analyse multi-stakeholder group projects that they worked on in the previous term. The students were asked to team up with their original project members and use the AT framework to analyse their respective projects from the perspectives of at least two of the stakeholders involved. For this purpose, handouts with a diagram of the activity system (similar to figure 1) were distributed on which the students could write. The groups discussed among themselves for 30 minutes after which each group presented the result of their analysis to the other groups, which were then discussed with the entire class. After the session, the handouts were collected, the findings summarised by the researcher and distributed to the students.

The results of the groups' analyses using the AT framework revealed who the stakeholders were, how they related to one another, how they influenced each other's decisions and how they attempted to achieve their goals (see figure 3 for an example). Interesting findings include the notion that a *subject* could be utilised a tool by another subject, as one group of students felt that they themselves were being used as an instrument by their direct client to achieve a politically motivated goal within the client's organisation. Another group reported that (negative) comments on social media regarding the project led to their client reconsidering the *object*, which in turn affected the design process.

For the student project teams, AT proved to be useful as a reflective tool, enabling them to identify possible reasons why certain stakeholders behaved in a certain manner, what motivations underpinned this behaviour and how this influenced the outcome. For

example, after conducting the analysis using AT, one group of students realised that the friction experienced in their project might have occurred due to the difference in underlying motivations of the different stakeholders, leading to expectations that were ultimately not met, thereby causing conflict.

The pilot study, although limited in scope, confirmed that analysis using the AT framework can successfully answer questions regarding *how* and *why* projects operate the way they do, viewed from the perspective of different stakeholders.

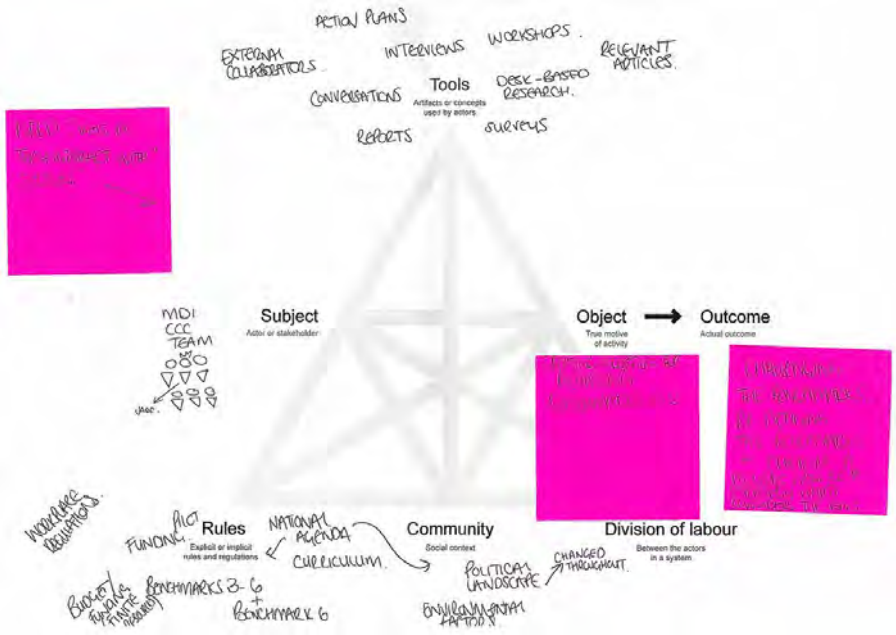

Figure 3 Example of an analysis conducted using the AT framework by student project team for one of the stakeholders involved in their project

Field study

After the pilot study, a one month field study was conducted in Bangkok with the intention to gain insight into the types of design and social innovation initiatives present, identify who the initiators and stakeholders are within these initiatives, map the relations between the stakeholders and examine their mode of operation, as part of the larger on-going PhD research project. The Design and Social Innovation in Asia-Pacific (DESIAP) platform, a network and community of practitioners and professionals from various disciplines, regularly organises events where those who are either active or interested in the field of design and social innovation can connect and exchange ideas. Its symposium and workshop held at the Thailand Creative and Design Center (TCDC) in Bangkok marked the beginning of the field study and provided an opportunity to connect with local academics and practitioners. Those that were willing to provide more in-depth information regarding their projects were contacted after the symposium for a follow-up meeting or interview.

Three initiatives were eventually selected to be further developed into case studies, based on the availability and willingness of the stakeholders to be interviewed. Other selection criteria include the type of project (top-down or bottom-up) and scale (small, medium or large). The majority of the meetings were arranged in an informal manner and conducted in a casual setting, such as a coffee shop. Three formal interviews were conducted, one face-to-face and two via Skype.

The format used in the pilot study, during which the students analysed their own projects using the AT framework explicitly in a workshop setting, was not used in the field study as gathering all the stakeholders involved in the respective initiatives was not feasible. Instead, the AT framework was used implicitly during individual semi-structured interviews with practitioners and stakeholders by loosely directing the questions along the prescribed categories (subject, object, tools, rules, community and division of labour). The interviews were then transcribed and the answers grouped according to the six categories, thereby constructing an activity system for each stakeholder interviewed (see figure 4 for an example). The activity systems were then analysed by identifying patterns and interactions between categories and compiled into broader themes.

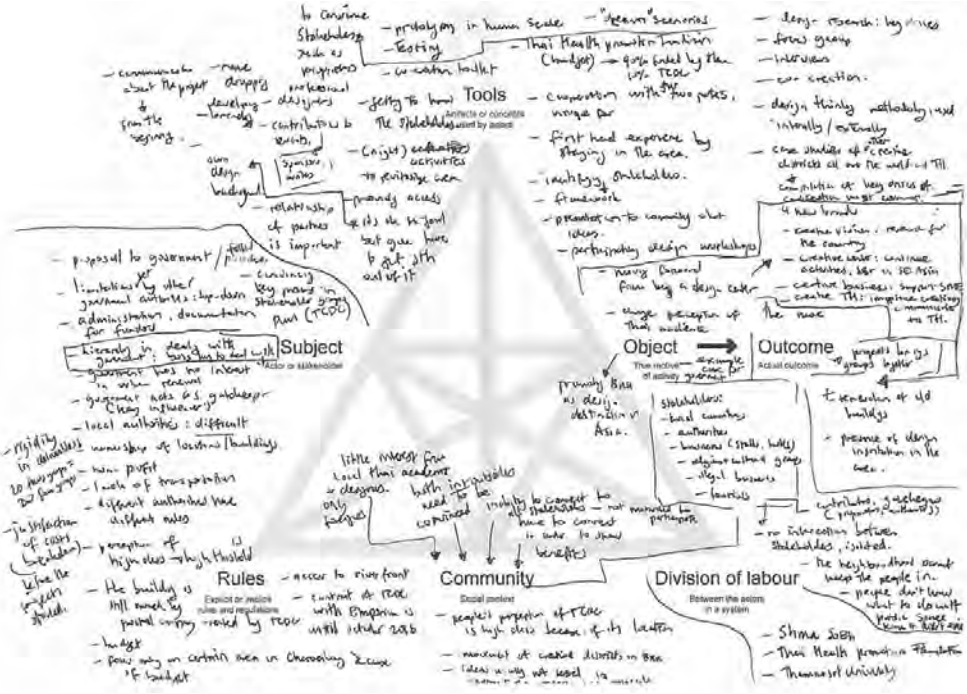

Figure 4 Example of an analysis conducted using the AT framework for one of the stakeholders of the Co-Create Charoenkrung project

Findings

Co-Create Charoenkrung – A pioneering urban renewal project

Context

Co-Create Charoenkrung is a large-scale high-profile design and social innovation project initiated by the Thailand Creative and Design Center (TCDC), a knowledge and education centre focused on promoting design and creative practice in Thailand. Currently located in the centre of Bangkok, it is planning to move to the historical *Grand Postal Building* located in the Charoenkrung neighbourhood. This relocation was taken as an opportunity to 'introduce itself' while simultaneously starting a process of urban renewal, co-created and co-designed with residents and other local stakeholders; an initiative that is unprecedented in Thailand. Two stakeholders in the project were interviewed: the initiator and overall project manager at TCDC and the project manager from the design agency Shma SoEn.

Mode of operation

The management and execution of the project is distributed among three equal partners. TCDC is responsible for the overall management of the project. Shma SoEn, a local design firm, oversees the execution of design-related activities and Thammasat University provides support in terms of design research and consultation. Adding to the complexity of the project are the many stakeholders, such as various local authorities, commercial businesses situated in the neighbourhood (international hotels and corporations, galleries, shops and stalls) and diverse groups of community residents (elderly, students, ethnic and religious minorities). TCDC utilises its own proprietary design thinking approach, formalised into the *Co-Create model*, in which a series of steps guide those who would like to start an urban renewal project in their own neighbourhood.

Selected findings

Object: the motivation of TCDC for initiating the Co-Create Charoenkrung project was driven by a desire to move forward as an organisation. By combining their relocation with a process of urban renewal, it wishes to remove the threshold that was perceived to exist by 'ordinary' Thai citizens and instead place itself in the middle of society. Shma SoEn's design team perceived Co-Create Charoenkrung as a 'dream project', combining their professional expertise in design with the need to do good and give something back to the local community.

Tools: Co-creation and co-design workshops were conducted at different stages throughout the process and with different participants: the partners, stakeholders and wider community of residents. In some instances, co-creation tools were custom-made to ensure the participation of all stakeholders, regardless of age or seniority, which can be a sensitive issue in Thai culture. Visualisation by design and prototyping on actual scale (1:1 prototyping) were mentioned as being particularly useful in convincing key government officials, private parties and the local community itself of the value of the project as both interviewees expressed that Thai people in general need to be shown concrete results in order to support an initiative. For example, it took significant effort for the project team to convince the Grand Postal Building's property management to allow the construction of the *Green Pocket Space,* one of the planned 1:1 prototypes, in front of premises, despite

the fact that TCDC is the building's tenant. However, after seeing the result, the property management staff requested to extend the three days that were initially planned for the prototype to seven days, and installed benches around the Green Pocket Space area for customers and passers-by to relax, which have become a permanent fixture.

Communication about the project was perceived to have played an important role. Internal communication managed the expectations of the stakeholders as the lack of knowledge regarding the project sometimes restricted the process and caused it to slow down. External communication, on the other hand, helped to prevent inaccurate representation of the project in the media.

Rules: As Co-Create Charoenkrung's aim of urban renewal inherently entails the modification of public and private spaces, the stakeholders involved here are (local) government departments and private corporations or land owners, who control access to these spaces. The interaction between TCDC and the various other government stakeholders encountered at different levels was characterised as being difficult. The general attitude towards the project was perceived to be polite but uncooperative and even those who were willing to help were only able to do so within their own jurisdiction. Hierarchy played in important role as key senior officials needed to be convinced to obtain access and cooperation. A top-down approach was therefore considered to be the only way to make the project succeed.

Community: Both interviewees found the most significant limitation of the project to be that some stakeholders could not be contacted or could not be persuaded to participate in the project. This was attributed to the fact that there was no real incentive for them to participate. Involving stakeholders and partners in the co-creation process who are normally not consulted, such as the Thai Health Promotion Foundation, which funded 90% of the project, was experienced to have a positive effect as this increased the sense of ownership. In addition, its success has prompted an exchange of ideas between the Co-Create Charoenkrung project group and other initiatives taking place in Bangkok as the concrete results it produces show that their approach actually works.

Afterword – A crowdfunding platform for books

Context

Founded by two former university classmates, Afterword is a small company that publishes books about niche topics. Founded in 2013, the company helps individuals who wish to publish with concept development, editing, design and crowdfunds the funds required to produce the book. Although initially Afterword was only involved in the activity of crowdfunding activity, along the way they realised that they also had to take on role of incubator for the book projects. The founders believe that topics that might not be commercially viable for major publishers are nonetheless important as they fulfil an educational demand that would otherwise not be met through traditional channels. One of the founding partners agreed to an informal meeting where she elaborated on the company itself, the books they publish and how their publishing process works.

Mode of operation

Although stakeholders may vary per project, those typically involved are Afterword itself, the client or author(s) who wishes to publish a book, a design agency who is responsible

for the book's layout and the people who crowdfund the book. Co-creation processes often take place, involving the company and the authors. Although the two founding partners are a stable factor in this smaller-scale bottom-up initiative their collaborators shift constantly as the books they publish can have different authors, (crowd)funders and audiences.

Selected findings

Object: Although the founder indicated that she aspired to ultimately become a global brand, the motivation for starting Afterword was rooted in the desire to use a design thinking / human-centred design approach to tackle social problems, and in particular, issues surrounding reading and writing in Thailand. After an initial exploration of the problem, Afterword was founded as a crowdfunding platform for non-mainstream books. The partner who was interviewed stated that she is motivated by the Buddhist belief of doing good for most aspects in life, although not specifically for this company.

Tools: Afterword uses many design methods at various stages of the process. Design thinking is used to understand authors and readers who lack resources, both when exploring the issue as well as during the project. Rapid prototyping and tests are conducted to establish whether the ideas work and brainstorm sessions are organised together with stakeholders. Communication design is frequently used as crowdfunding requires a significant amount of online and offline strategic communication, which involves the design of messages and channels to reach the target audience. These messages are considered to be important to help build both Afterword's as well as the book projects' respective brands and communicate these brands a visually and verbally attractive manner.

Rules: Every publication has its own contributors and stakeholders; The clients dictate the amount of involvement of the company in the process, which can differ depending on the publication.

Community: The limitations encountered by the company is the commitment level of its stakeholders, which in some cases is perceived to be low. According to the founder, this might be due to the fact that although Thai people often will help those in need, they are less inclined to help those who are deemed to be of similar or higher standing. The government is perceived to be mostly focused on urgent issues, such as poverty, health and safety, instead of supporting the publishing of books. Afterword therefore did not request funding from the government nor attempt to contact them. Funding for Afterword in its early stages came from incubators (a public organisation and an international non-profit organisation). The individual book projects are funded through crowdfunding. As Afterword believes in crowdfunding and people's participation, there was no government involvement to begin with.

Deschooling Games – A collective that teaches skills through games

Context

Instead of solving problems themselves, Deschooling Games' aim is to teach their clients the skills needed to solve problems on their own, believing that games are a suitable medium for accomplishing this. Communicating mainly through Facebook, the multi-disciplinary team consists of three core members: a training facilitator, a teacher/activist

and a designer, and occasionally enlists the help of volunteers. One of the team members of Deschooling Games provided information about his collective during an informal meeting after one of their workshops and a Skype interview.

Mode of operation

Deschooling Games organises training workshops for educators to improve (*gamify*) their teaching skills through the designing and playing of board games. For this purpose, the collective designs games that aim to achieve three goals: 1) Getting information (knowledge), 2) Developing specific skills and 3) Opening perspectives (attitude). For example, in a workshop given at a nursing school one of the teams of participants made a game where the objective was to guess nursing vocabulary.

Selected findings

Object: Deschooling Games believes that it is a challenge for design to improve education in Thailand in the broadest sense. Not limited to formal institutions such as schools or universities, but including educating certain target groups regarding important issues that are often complex in nature, such as policy, healthcare or the economy. The collective believes that *design for learning* tools are necessary to achieve this goal; Games are but one of the many possible directions that can be taken. The interviewed member's personal motivation was that commercial design is not meaningful enough, it needs a social side that is driven by the notion of tackling issues together instead of financial gain.

Tools: By emphasising on the transfer of the skills involved to develop these games, Deschooling Games hopes to achieve a more permanent effect. The *gamification* of the learning experience is considered by the collective to be an alternative way of learning that is fun and in which everyone can participate. The professional networks of the collective's members, social media and word of mouth were reported to be the reasons clients became interested in the Deschooling Games workshops.

Rules: As the individual members are involved in the Deschooling Games on a part-time basis, alongside their respective careers, time management is considered to be important. Furthermore, most projects need to be planned two to three months in advance and need to cater to clients who have different needs. The individual members of Deschooling Games have different views how to move their collective forward. The member that was interviewed expressed a vision that was not shared by the others, which is the need to expand to a different type of audience, emphasising diversification instead of replication. Since the team members are not involved in the initiative full-time, financial gain is not considered a priority. They therefore currently do not see a reason to rush into business.

Community: The learning through games workshops are perceived to highlight the value of their approach to the community by creating tangible results: the transfer of skills. Situations are simplified into a game format to enable participants to view the situation from different perspectives and promote discussion. In addition, Deschooling Games hosts a Facebook group where they can share events and information with active teachers who are interested in using games in the classroom and wish to design their own, helping them in the design process.

Discussion of findings

Although the findings discussed in the previous section are all perceived to be relevant to the study of design and social innovation, there are some patterns that are either recurring or interacting, leading to the identification of several broader themes.

The importance of education

All three initiatives, however different, perceive the current level of education as a problem and have their own way of addressing the issue. TCDC's mission is to educate Thai people on design and it views its relocation as an opportunity to position itself closer to the community it serves. Afterword aims to educate by publishing books which might not be considered commercially viable by mainstream publishers, but address topics which it feels strongly about. Deschooling Games hopes to improve education by offering a broader perspective on teaching through alternative learning tools, such as using games as a source of inspiration. The importance of education underscores the notion that initiatives are created in response to local needs and motivations, and can differ between cultural contexts (Bala-Miller et al., 2008).

The influence of the Thai cultural context

Although the following factors might not be unique to Thai culture, they were emphasised by the interviewees to influence Thai people's perception and attitude towards the initiatives. Akama and Yee (2016) note that motivations can lie beyond design, shaped by religious, spiritual and philosophical evolutions. Buddhism, practiced by most Thai, and/or the general desire to do good were reported by several interviewees to be their underlying motives for initiating or being involved in their respective initiatives. Hierarchy played in important part in all initiatives, albeit in a different manner. The Co-Create Charoenkrung project team encountered issues surrounding professional hierarchy when approaching government officials, which made a top-down approach necessary. Hierarchy in the form of seniority, as described by Yasuoka and Sakurai (2012) in their Japanese case study, was encountered in Co-Create Charoenkrung's co-creation process. To combat its potentially negative effects, custom tools had to be developed that removed perceived thresholds and encouraged all to contribute, regardless of their age or status. Deschooling Games, however, challenges educational hierarchy by empowering the bottom and giving ideas to the middle in order to create movement in the Thai educational system.

Hierarchy played a different role altogether in the case of Afterword, as the perception that only those that are worse off are entitled to being helped, was thought to be the cause of low levels of participation. A recurring factor present in both Co-Create Charoenkrung and Deschooling Games was the need for tangible results, especially when proposing design solutions. Several interviewees stated that plans and proposals are usually not enough to convince Thai people, as they will only believe that something works by being able to see it with their own eyes.

The many faces of the government

Co-Create Charoenkrung, led by the government organisation TCDC, demonstrated that other manifestations of the same government can be encountered at different levels (local, municipal, departmental) and can assume different roles (authority, gatekeeper, influencer, funder, participant, initiator) within one project. It can also have different attitudes towards the initiative (facilitating, antagonising, indifferent). Other government

agencies are therefore able to set limitations or boundaries for the project, for example, if they have jurisdiction or ownership over public space or buildings. The notion put forward by Mulgan (2014), that the application of design thinking within the public sector has become quite common around the world, is unfortunately not yet a given in Thailand. Local practitioners still need to work hard to gain the trust and cooperation of government bodies that does not seem to have much affinity with design nor social innovation.

The role of design

Co-Create Charoenkrung showed that design can be used to negotiate access, both literally and figuratively. Literally, by providing access to spaces which were inaccessible before through the redesign of public space. Figuratively, as a tool to convince stakeholders such as governmental departments, private parties and the community to lend their support through visualisation by design and prototyping proposed solutions on actual scale (1:1 prototyping). Here, design assumes the roles of *framework maker,* where design is used to create meaningful conversations that drive initiatives forward, and *community builder*, where design provides a conducive atmosphere and the tools for the stakeholders involved to co-create with one another (Yee, Jefferies & Michlewski, 2017).

Current limitations and plans for further study

Several key stakeholders of the respective initiatives provided the data that was used for the analysis. However, it was not possible to contact or set up interviews with all of the stakeholders originally envisioned due to the restrictions in time and resources available for the field study. A second, more extensive field study is planned where the stakeholders will be interviewed again to elaborate on the themes that were identified in this paper. This will allow a more extensive analysis by reconstructing the AT framework at a different point in time, thereby enabling the examination of the historical development of certain issues. In addition, other stakeholders that were involved will be contacted and their views incorporated in the analysis to furnish a deeper understanding of the three initiatives.

Conclusion

In the previous decade, we have established what design and social innovation is and how it can be implemented. In the next, we need to turn our attention towards how it works, why it works and for whom it works. The current gap, combined with the dominance of European examples, paints an incomplete and generalised picture of design and social innovation practice. This paper has shown how Activity Theory can potentially be an effective analytical framework for design and social innovation initiatives through its ability to study initiatives as they occur in their own context, revealing what motivates the stakeholders, how they achieve their goals, what their limitations are and how they are influenced by their social environment.

The themes that were identified through this analysis show that local context can exert considerable influence on how design and social innovation is practiced. The desire to improve education appeared to be a recurring motive in all three initiatives. In addition, religion, hierarchy, the need for concrete results and the role(s) of the government were of significance. These factors, in turn, affected the role of design in the process.

This paper aims to contribute to the building of an increasingly rich and multi-faceted understanding of design and social innovation as it is practiced in regions outside of the western, developed countries by presenting findings obtained from three Thai social initiatives. As design for social innovation practice emphasises reciprocity in its approach and methods, this principle should equally be reflected in its study.

Acknowledgements

The presentation of the paper at the DMA Conference 2017 in Hong Kong was supported by the Design Research Society. I would like to thank the interviewees from Afterword, Deschooling Games and TCDC for sharing their insights and providing comments which greatly improved the paper.

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HONGKONG DESIGN MANAGEMENT ACADEMY CONFERENCE 2017

RESEARCH PERSPECTIVES ON CREATIVE INTERSECTIONS

Thoughts and reflections on design wisdom: a cross-disciplinary path towards social innovation

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doi: 10.21606/dma.2017.125

The present article exposes key insights from the field of aesthetic experience, design management and social innovation. Reflections are made in relevant literature and its practical applications in the contemporary scenario for design discipline. Drifting points on each of these fields are exposed together with the paradoxes that emerge from such drifts allowing the continuous self-construction of the knowledge hereby embedded. Reflections are made in directional bridges for Corporate Social Responsibility Programs and Design Philosophy in respect of solving relevant social problems and addressing root causes of human needs by encompassing social changes. Conclusions in this regard are discussed so to build design wisdom.

keywords: aesthetic experience; design management; social innovation; design wisdom.

Introduction

Aesthetics is a fundamental aspect on design, and it yields deep meanings for several scientific fields. Design discipline and the culture that emerges, from designers and the communities they serve, are responsible for their aesthetic and societal developments. Design discipline reaches organizational philosophy and business management becoming a tool of differentiation that firms are incorporating.

Social innovation, in the other hand, exhibits an emergent field of research drawing attention from business and operations management. Social Innovation is broadly defined as the development and implementation of new ideas (goods, product, services, model) to

meet social needs and to create new social relationships and collaborations. The article presents the relations and assumptions in these matters. The first section exposes the importance of aesthetics and human experience to face relevant changes to social structures by solving social problems. The second section presents the importance of design specialized knowledge together with its relevance for causing local development to occur by meeting social and technological challenges. The third section exposes the state-of-art of social innovation in regards of programs of Corporate Social Responsibility and its leveraging with cross-disciplinarity. Conclusions on future directions for research and development are elaborated

Aesthetic and human experience

In this paper, experience will be defined as to know facts by completely giving up to one's own fabrications, where one directly experiences one's own state of consciousness and there is no yet a subject and an object defined (Nishida, 1990). In pure experience knower, the object of knowing, and knowledge are completely unified and dualistic views are non-existent. The circularity of mind is not separated from body and such unity is a habit that can be trained and its dissociation a habit that can be bent.

The nature of beauty is a fundamental and clouded substrate in the theory and practice of design. Historical attempts to grasp its objectification have been broadly made. In design discipline attempts are made to the perception and construction of aesthetics of interaction systems. In this domain, simplistic notions of aesthetic experiences in regards of visual appearance and functionality have drifted towards vitalized notions of deeper and newer insights of the environment. In the philosophical scene, aesthetics has been elaborated on a) aesthetic judgements, b) aesthetic emotions, and c) aestheticized ethics; where human experience is the vehicle of its manifestation, appreciation and appropriation.

Aesthetic judgements are judgements of beauty and ugliness, taste and displeasure which are specified by a subjective principle of personal feeling, and a transcendental principle of universal validity emerging from a cognitive mastery (Varela et al, 1991). Aesthetic emotions are the elicited emotional content from that which is related, and the causes of the arousal of such emotional content (Yeh, 2015). Ethics (Von Foerster, 2003) has been linked with aesthetics relatively recently in the Western moral grid of understanding, and the discussion is extensive, therefore it will be mentioned that such unity points out to the notion of living ethically (learning how to act) by living aesthetically (learning how to see). If such unity can be pondered with this article in respect of design discipline, then it shall be said that the perception of beauty is elevated by the number of choices increased by our designs.

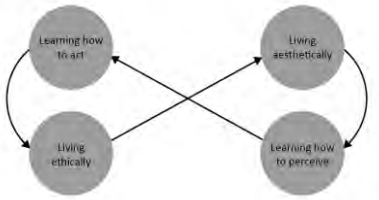

Figure 1 Symbolic representation of an aesthetic paradox. source: Own illustration.

In Pragmatic aesthetics (Shusterman, 2000) three core dimensions are identified: a) Socio cultural context; b) designing for mind and body; and c) instrumentality of aesthetics. In this vein, such theories have been applied in the design of products (Ross et al, 2010) and intelligent systems (Petersen, et al 2004). Principles for unfolding design in these matters have been elaborated so to account for these cores.

First, design of aesthetic experiences presents beauty being rewarding by itself and making a practical difference at the same time. Secondly, it has an ethic dimension for design since aesthetics influence and modulate human behaviour through value creation. Third, design of aesthetic experiences considers form of objects to unfold behaviours of interaction thus opening design up to the dynamic of use. Fourth, aesthetic experiences involve the whole of human physiology: sensori-motor coordinations, cognitive and emotional functions and social abilities. The third principle has been elaborated for designing behaviour, and therefore the product architecture maintains a clear societal importance in regards of the structural and organizational change of living social systems. Design of behaviours is design of sensori-motor coordinations that user shall perform.

The drift in aesthetic experience, from arts to other fields and from visual appearance to deeper environmental insights have been approached by design methods such as multisensory design, which directs senses to specific expressions (Schifferstein et al, 2008); synesthetic design, which connects cross-sensational modalities of sensory channels for selecting features of products (Calvert et a, 2004); participatory design which brings users and relevant stakeholders to participate actively in the design process (Wilkinson, 2014), and design of experience framed under the broadly known economy of experience (Pine et al, 1998). Such methods compiled in approaches of Design Thinking (Dorst, 2011) have been used by firms and organizations for increasing the acceptance of a product and therefore its sales revenues and earnings levels. Also, design thinking methods have been used by firms for reducing cost and complexity in a system and optimize a capital binding and time management. The generation of value from service offerings and so building brand identity by using product/service systems as a stage that engage customers and users in a memorable event, has been a successful practice with reported benefits for firms and organizations.

Design of aesthetic experiences embedded in objects (commodities, goods, services and experiences) with a clear value on large-scale societal challenges and social change, have been conditioned mainly to fit economic interests of firms rather than the communities from which objects appear to emerge, and assume objectivity. The question then arises: how such methods and tools can better serve social values while generating business models with architectures and research strategies that construct themselves. Especially

when in such state of affairs a clear majority of the generated design language, design knowledge and design cultures that allows the engagement of such architectures have been framed under moral and differentiated grids of understanding which rejects the essence of key drifting points.

Such drifting points that articulate innovations and are source of creativity, constitute the coordinates for the unity of a collective consciousness on social needs (operations) and societal change (organization). Therefore, design philosophy (which main thought-object is aesthetics), design epistemology (which main thought-object is ethics) and design phenomenology (which main though-object is experience) oriented to social change should account paradoxes as facts. Paradoxes that yield one meaning when apprehended in one way, and one meaning when apprehended the other.

Such matters for innovators (discoverers and inventors) where design discipline appears as a sophisticated and differentiated self-producing coordination of dealing with the unknown and uncertainty by making it visible and useful, must be directed to build *design wisdom.*

Table 1 Key drifting points in the fields of aesthetics, design, and social innovation.

Field	Focus	Drift
Aesthetics	Pragmatism. Neuro-aesthetics	From visual appearance (materialistic reductionism) to deeper environmental insights (non-dualism)
Design	Design Management. Design Thinking	From design of objects (integration) to a way of thinking and doing (holistic)
Social Innovation	CSR. Business and operation Management.	From manufacturing and production technologies (market oriented) to social technologies (value oriented).

Design Philosophy and Design Culture

Design as mentioned above, has also experimented drifting points that have leverage the discipline. At its foundations, the traditional view of design (Manzini, 2016) considers the engineering of products for serial production by using appropriate industrial technology. The traditional view of design also accounts for the process from which products arrive to the hands of end-users. From the traditional view of problem-based and solution oriented perspectives, design has drift towards a way of thinking which involve a learning-while-doing. The second road of design points out to the generation of meaning, social and economic value while generating methods of quality criteria. Such drifting point grasps the notion of meta-design (design the designing process) (Fischer, 2003) where creating the socio-technical conditions of participation is as important as creating the object itself.

As the creative industry has evolved so has design in its paradigms. Design Thinking as a descriptive view of the discipline (Dorst, 2006) has been broadly acknowledged with extensions in business and operations management. The establishment of a frame between the space of the problem and the solution, implies that applying a working principle on a system a specific value is caused to occur. Since the nature of problems is

always changing and the knowledge needed to solve them is never complete, they are called 'wicked problems' (Buchanan, 1992). The strategy of reframing by constantly challenging the state of affairs present in the problem system shall generate an appropriate and original solution system. Therefore, design consists on the dynamics of complex and not-finite open-ended systems to closed-circular and finite systems and back again. In other words, face the paradox of creating closed-circular solutions to open-ended problems by creating open-ended solutions to closed-circular problems. The core of such paradox is change in conformity with the interests of organizations.

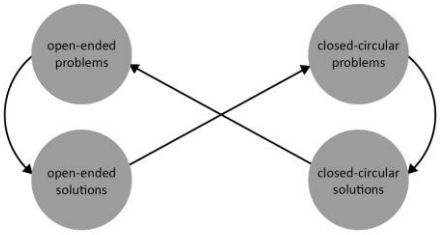

Figure 2 Symbolic representation of a design paradox. source: Own illustration.

Designers count with strategies with degrees of differentiation and specialized knowledge to do so (Francis et al, 2005), (Verganti, 2003), (Fine, 2000), (Ulrich, 1990), (Meyer, 1997), (Schön, 1983). Such specialized knowledge that accompanied by a solid business and marketing perspective compose the ground of design management, portrays a career pathway for professional designers leading to senior executives and directors that range from academics to consultants. Specific tools and evaluative methods of design management are currently being developed as design drifts from design of objects to a way of thinking and learning-while-doing. Design management is focused mainly on process innovations, where internal and/or external activities of firms and organizations are targeted and improved, especially in regards of time management and strategic planning.

Innovating on external activities can be seen oriented to augment competitive advantages of firms, this by performing market studies, conducting benchmarking, analysis of key competitors to visualize new market acquisitions and business opportunities. Innovating on organizations' internal activities can be seen oriented to improve quality management, this by performing optimizations on internal logistics and supply chain evaluations, analysis of core competences and strategies of modularization, differentiation and diversification on firms' portfolio. Companies and organizations report benefits that effectively differentiate their businesses by incorporation of design activities in their operations.

The creative abilities, divergent skills of designers are broad in applications of technology. And as such, designers can hit interests from private and public sectors and fit appropriate and original solutions. A unified and autonomous design wisdom should encompass the closure and opening paradox as fruit from current drifts of design discipline to social empowerment and citizen participation, from where other domains of science such as

Cybernetics, Computer Science and Material Engineering are providing meaningful breakthroughs.

As stated in the previous section, design of behaviors through intelligent product/service systems with emphasis in sensory activity is a promising vein. Furthermore, design management and process innovation are receiving particular attention from adjacent scientific domains, which are complementary to design. Design culture and its core in aesthetics have served so far to interest of large-scale companies and in the current century, with its advances in science and technology such discussion is also experimenting drifting points. Developing societies are striving towards sustainability while the communities from which design cultures emerge, are scouting and experimenting into design activities and initiatives in an endeavour for meeting immediate needs such as education, healthcare, transport and energetic systems among others.

Such communities mainly from South America, Asia, Western Europe and some in North America such as Brazil, Mexico, India, Russia, Romania, Czech Republic and Canada have been introducing design philosophy and wisdom into their local businesses and social innovation programs with a focus on public policies. Such countries have visualized the potential of the drifts in design, and are taking measures into action and thus leaving linguistic consensus to the academic bodies of design, entrepreneurship and innovation.

In regards of facing societal needs, where the same design culture is produced autonomously among local communities the question of identity then arises, in domains of culture, organizational philosophy and territory. A defined identity on these domains is a core on developing technologies that support a collective consciousness so to face universal needs that go beyond the immediacy of experience.

A defined identity on these domains holds positive values on societal change that facilitate transitions and change management. In the same way that design discipline has elevated itself towards important plains and dimensions through the methodologies discussed, so have local communities which sparsely aiming for social entrepreneurship and critical thinking have made their way into new markets and industries. Is clear from these reflections, that design wisdom has a bridging and integral responsibility where innovation and creativity have a task on unification, or in *gramscian* words to reshape the form of hegemonies into ecological and sustainable settings. Such reflections accompany the critiques made to industrial design and its harmful impact on society (Papanek, 1972).

Social Innovation, Corporate Social Responsibility and inclusive growth.

In the other hand, social innovation (SI) has presented a rapid growth on literature and interest in these early young years of the XXI century (Van der Have et al, 2016). Engaging citizen participation and collaboration from sectors of the population that share common visions of a possible future (Manzini, 2014) is becoming an attractive initiative for companies in desire of address their impact on society. Social innovation, as well as aesthetics and design presents drifting points from where paradoxes emerge that allow the self-construction of the field. For instance, four areas for action of social innovation have been identified by Van der Have:

- Community psychology: Multistep process for systematically producing change in social systems grounded under scientific evidence of effectiveness. Examples in

India with the National Social Assistance Programme (NSAP) in initiatives such as Old Age Pension Scheme, Disability Pension Scheme, Family Benefit Scheme and Annapurna.

- Creativity research: Research in the creative process of innovation and technology as a way to generate and implement new ideas of social organizations and relationships to meet common goal. Authors in these area elaborate examples as the formation of an International Monetary Fund or Boys scout among others.
- Social and societal challenges: Innovative solutions to societal and technical problems looking for sustainability of climate, environment and health provision. For example, Danish initiatives in the field of design scouting on bringing down the price for clean potable water in Africa through low-tech means using the sun.
- Local Development: Satisfy needs in communities, neighbourhoods, regions, rural and urban settings by empowering and changing the relations between local civil communities and governing bodies. For example, in Hungary the enterprise MOL Nyrt developing the initiatives of THANKS! Program, an alliance between local organizations and education institutions for school community service; and the MOL Greenzone program: a nationwide program for developing and rehabilitating greenbelts with community functions.

SI is based on criticism to dominant business models with narrow economic visions that have been historically present in developing societies hindering meaningful societal change and significant advances of society. SI has the potential for causing change to occur on large social structures in conformity with corporate identities and strategy making by focusing innovations on solving societal problems rather than cutting-edge technologies. The core concepts hereby involved in the paradox of SI consist in encompassing significant societal change in structures by solving a relevant social problem and human need. Therefore, create positive economic and exchange value through business innovations (introducing new objects (i.e products, processes, services, experiences) while at the same time transcending these objectives towards policy making by generating meaningful social value. The paradox hereby involved then it has its origin in the notion of social technologies where meta-design plays a fundamental role. The paradox consists on a bifocal approach to social innovation where social needs are met while encompassing a societal change, and social value is produced by generating business innovations.

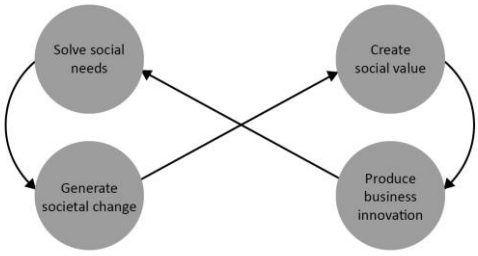

Figure 3 Symbolic representation of a social innovation paradox. source: Own illustration.

At difference from cutting-edge technologies which main driver is manufacturing, production and information systems oriented to different markets targeted with business innovation, social technology points out to involvement and empowerment of human interactions rather than physical engineering. In social technology, designing behavior and procuring that knowledgeable people coordinates is a key. Therefore, besides coordinating design resources for causing positive economic value to occur, the exchange of knowledge and agreements is fundamental for societal goals.

Such approaches have been incorporated in large and medium scale firms in the concept of Corporate Social Responsibility (CSR). CSR gathers the development of a business ethics in business practice with a voluntary management towards a sustainable development (Szegedi, 2016), where the main challenges for organizations is the implementation of CSR programs that cope with their brand identity. CSR as well as SI is based on the degrees of involvement and empowerment of multi-layered stakeholders where the company's expression of its awareness to the local communities through development programs (Rudito, 2014). CSR initiatives is on a circular relation with SI, social entrepreneurship and thus conform Corporate Social Innovation (CSI). CSI bridges the paradox between social innovation and business innovation, by making clear the social and economic values to be generated in the background. CSI and CSR are part of an innovation culture, where design culture relates to, and by extension so it does design wisdom.

Firms and organizations by expanding towards CSI and CSR have reported quantifiable benefits as shown in the literature referenced, by empowerment of communities for causing local development to occur and meeting socio-technical innovations of societal change. Design can play a decisive role in this state of affairs, and indeed it seems clear that so it should be done since meaning, social and economic values are key directional drivers for designers.

The challenge for CSR and CSI is to fit value propositions with market preferences and formalize the structures hereby produced. Methods derived from case studies and good practices that account for the unity of aesthetics, design and social innovation are a necessity for the involved actors. Since CSR and CSI programs present numerous difficulties and challenges in developing countries which root causes are the ones hindering local development and societal change. Facing root causes by constructing realities based on common future visions with a validity based on evaluated methods is the main challenge.

Design philosophy and design wisdom should then be oriented to face root causes and by constructing realities through dialogs among actors are factors that may cause Design culture to emerge. Root causes have to do with historical sense and culture, that embedded in moral grids of understanding among the key social actors are the ones causing in communities a resistance to change. Strategic flexibility and fluency are core principles in change and design management, where such principles are present from the ideation of a concept to the manufacturing of a product and its logistics of processes. Therefore, knowledge proliferation oriented to action in regards of flexibility and fluency is a corner stone in design philosophy, since is the creation of focus and structure in the empowerment and engagement among local communities which must provide empirical tools for CSR, CSI, and SI.

The drifts identified in Table 1 are the stable 'hinges' from which social innovation can engage into action, and make design philosophy a philosophy-in-action. A practical direction from which such philosophy should be oriented, would be inclusive growth, which points out to reducing inequality and inequity. Inclusion and creativity are two related concepts. These concepts are present in socio historical debates, and hold a possible integration for philosophy and social innovation to act. Inclusion, inclusive design or universal design, acknowledge the need of change in social structures. It addresses more contemporary and local debates present across developing and developed societies such as racial and ethnic discrimination, gender segregation and inequality, exclusion of persons with special educational needs and barriers in access to healthcare systems. And as the same as SI, it seeks an outcome in policy and strategy making.

Inclusion (Author, 2016) and universal design points out to the maximization of access to information, technologies and processes (Rose et al, 2010). Universal design for learning (UdL) proposes principles for designing inclusive processes that can serve aesthetics, design and social innovation to achieve their goals.

The basic three principles are a) provide multiple means of representation; b) provide multiples means of action and expression; and c) provide multiple means of engagement. Such principles are based on another key debate across societies which is the wide range of applications lead by neuroscience, as a science eminently devoted to brain research. An oversimplified division of such field can be described in 1) pattern recognition capabilities in posterior regions of the cortex (mostly attributed to language); 2) motor and executive functions in the frontal regions of the cortex (mostly attributed to 'higher' cognitive operations); and 3) affective and emotional capabilities in the medial regions of the central nervous system (mostly attributed to hippocampus, amygdala, and limbic systems). The neuroscientific objectives of UdL in conformity with SI can be described as the innovative development of novel and appropriate technologies (social and cutting-edge) for value generation (meaning, social, and economic) for causing social changes to occur.

CSR, CSI and SI in this regard may find a directional bridge from being corporate discourses to becoming effective business strategies. And design philosophy may equally find a directional bridge from being a linguistic consensus to becoming an effective holistic methodology and transcend the discussions of the academy to the practical field that they can elevate.

Conclusion

Social innovation is recent field of research, and furthermore a recent aggregate in design discipline. Design thinking plus business and marketing perspectives become Design Management. Corporate Social Responsibility and Corporate Social Innovation are endeavours from companies and communities to achieve common visions of possible futures. Aesthetics experiences are a prominent foundation that can be tracked to each of the backgrounds of the respective fields called forth.

The article revised briefly reflections in regards the self-construction of the fields with emergent paradoxes from drifting points, and argued that such paradoxes constitute a directional bridge for a philosophy-in-action and furthermore constitute a design wisdom.

Firstly, the article revised the importance of perception and construction of aesthetics experience in respect of its implications on design. Summarizing this point, design of behaviour is a promising direction in developing product and process architectures (commodities, goods, services and experiences). Secondly, the article exposed the evolution of design discipline in respect of design thinking and design management. Synthesizing this point, design discipline and its specialized knowledge can contribute with pertinency to cause value generation in societal changes and meeting socio-technical needs by engaging firms into action with communities. Thirdly, social innovation can leverage sustainable societal changes by addressing social needs with cross-disciplinary insights. Summarizing this section, universal and inclusive design with its convergence with neuroscience present better insights for addressing root causes while at the same time can offer companies, firms and organizations formalization of CSR and CSI programs with its positive benefits.

Nevertheless, because of the recent unification of these fields, there is need of empirical methods and evaluative tools derived from experiences, good practices and case studies that account for validated societal advances on social problems and the unifications hereby employed. The literature and reflections presented offer a directional bridge for: a) CSR and CSI programs, in respect of business innovation with opening to policy and strategy making; and b) design philosophy and wisdom, in respect of relevant and meaningful pathways towards research strategies that support the construction of empirical tools and holistic methodologies of action in the contemporary societal scenario.

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HONG KONG DESIGN MANAGEMENT ACADEMY CONFERENCE 2017

RESEARCH PERSPECTIVES ON CREATIVE INTERSECTIONS

Designing Good(s)? Exploring the Politics of Social Design Processes

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doi: 10.21606/dma.2017.131

As design shifts from designing objects to designing for social transformation, there is an increasing need to address political dimensions within the design process. This paper explores those dimensions by drawing insights from the field of Science and Technology Studies. In doing so, we bring forward issues of ontological politics within social design processes, including: the recognition of situated knowledges, the multiplicity of reality, and the performative nature of methods. The implications of these issues are investigated through the examination of two practice examples in which different methods were used to support reflection on politics in social design processes. This research highlights the need to be more critical of the "good" that social design processes are working towards and the methods used to support political awareness. It also opens-up a host of new questions about how to address political issues amid the complexity and multiplicity of reality.

keywords: social design; politics; science and technology studies; social good

Introduction

All design is, arguably, a socially significant activity, ordering and forming the world through its process (Dilnot, 1982). Although issues of politics have been discussed within design research for several decades (e.g. Ehn & Badham, 2002; Nygaard, 1979; Papanek, 1973), there is increasing recognition of the need to better address these issues as the design process becomes more explicitly motivated by social causes within the emerging area of social design (Koskinen, 2016; Tonkinwise, 2016). As design shifts from a focus on

objects to cultivating societal transformation, the role of non-designers in the co-design process becomes prominent (Manzini & Coad, 2015; Sangiorgi, 2011). Thus, it is not only important to discuss the influential role of designers and designed objects, but also how issues of politics can be thoughtfully addressed within complex, participatory design processes working to realize social good.

As design processes are seen as a means of creating preferred futures, there is a pressing need to think critically about the political implications of these futures (Buwert, 2015; Willis, 2013) and establish a foundation for debate that is currently lacking (Manzini, 2016). To position politics within design, many design researchers have borrowed from Rancière's conceptualization of politics (Keshavarz, 2015; Kimbell, 2011; Markussen, 2013). For Rancière, politics is fundamentally a question of inequality - forming society by distributing, partitioning, assigning and attributing parts, roles, identities, and so on (Keshavarz, 2015). With implications for discussions of inequity, the focus of this paper is on ontological politics, or how reality is enacted through practices, drawing from the field of Science and Technology Studies (STS).

The purpose of this paper is to explore some of the political dimensions in social design processes and reflect on how these might be addressed within the design process. To achieve this, we draw on the writings of three prominent scholars in the area of STS - Haraway (1988), Mol (2002), and Law (2004). Insights from these authors are used to guide the critique of two practice examples in which methods were used to catalyze conversation and reflection on political issues within social design processes. In doing so, this research opens up a host of new questions regarding how researchers and practitioners should respond to ontological politics within social design processes, without becoming paralyzed and unable to act.

This paper begins by reviewing the entangled issues of politics in social design brought to light by design researchers. Then we look to research done in STS to strengthen the dialogue within social design in relation to ontological politics. Armed with new insights from STS, we describe and critique two empirical examples of how methods were used to address political issues within the social design process. We finish by summarizing our reflections on how we might move the issues of politics in social design forward by highlighting questions for future research.

A Crisis of Conscience?

We open up the discussion by reviewing some of the extant literature on politics in design. Here we highlight the desire to do good through design, touch on the added political complexities in social design processes, and discuss existing responses.

Doing Good through Design

Design has a long and ambitious tradition of wanting to do good - of having the best of intentions - in projects ranging in scales from city planning projects to creating tableware (Fallan, 2013). At the same time notions of good and bad abound. In philosophy, it is suggested that the term 'good' serves to assess the way in which certain behaviors enable the realization of goals (MacIntyre, 1981). To that end, there are many varieties of goodness, including: instrumental, technical, medical, utilitarian, hedonic and the good of man (von Wright, 1963). Ylirisku and Arvola (forthcoming) relate these varieties of

goodness to six different design traditions and argue that designers and design researchers would benefit from a more explicit perception of the good that underpins different design processes.

The desire to do good through design is especially evident in recent projects focused on social transformation, such as projects by the British Design Council (Burns, Cottam, Vanstone, & Winhall, 2006). As design moves into the space of social innovation, design researchers have highlighted the fact that power and politics are significant blind spots in the design process that need to be addressed (Keshavarz, 2015; Kiem, 2011; Sangiorgi, 2011; Tonkinwise, 2016). It has been suggested that there is a recurrent pattern of periodic concern for society within the design field that has been dubbed a "crisis of conscience" (Soar, 2002 p. 34). Recent calls within design research and evolutions of design practice suggest that we are again amid such a crisis of conscience as social design continues to gain traction (Keshavarz, 2015; Tonkinwise, 2016).

These more recent calls are part of an ongoing dialogue about doing good within the design discipline more generally. Early on, industrial designers were called out as being among the most dangerous professions in the world - enabling overproduction and overconsumption (Papanek, 1973). Some researchers suggest that design is a servile activity with the purpose of improving things for others (Buchanan, 2001; Nelson & Stolterman, 2003). For many years, the design profession has also acted in this way, adding value at the end of a production process to an idea ultimately produced by someone else for their economic benefit (Heskett, 2017). However, it is argued that design must not be analyzed based on its intentions to serve, but rather what it does and does not do to people and the environment (Keshavarz, 2015). Furthermore, it is suggested that we must not only focus our political analysis on the results of a design process, but we must also consider the process itself, as this already manipulates the environment (Keshavarz, 2015).

Koskinen (2016) proposes that social design sees social forces and processes as its material, making design processes an explicit means of cultural production. It has also been noted that design brings with it its own culture, which tends to focus discussions narrowly on solutions - that is, the techniques used and the effectiveness of the results (Manzini, 2016). Design activities are infused in the social and economic structures within and for which design functions, and its relationship to existing power dynamics and capital are often taken for granted (Julier, 2013). Design carries with it legacies of colonization and imperialism, often ignoring alternative ways of thinking and knowing (Tunstall, 2013). Issues of cultural production, design culture, relationship to capital, and colonization, become central in the discussion of politics when designing with societal ambitions. If social design wishes to do good in society, this inevitably requires careful consideration of these political issues.

Responding to Political Complexity

While social design carries with it many of the same political issues as other areas of design, it also must address added political complexities. Seeking to do good amid socio-cultural systems, social design is faced with the extreme political complexity that is inherent in wicked problems (Norman & Stappers, 2016). Rittel and Webber (1973) suggest that it is "morally objectionable for the planner to treat a wicked problem as

though it were a tame one, or to tame a wicked problem prematurely, or to refuse to recognize the inherent wickedness of social problems" (p. 160-161). Wicked problems create a challenge when designing as practitioners within the design process are faced with conflicting priorities that emerge from multiple root causes becoming interconnected over time (Jones, 2014).

Amid such complexity, it is difficult to make judgments on what is good both within a social design process and the results thereof. How can you navigate appropriately amid such landscapes where it is likely impossible to sort out the political implications of one's actions? One common path to dealing with this complexity and acknowledging design's own limitations is to open up the design process for participation by a variety of stakeholders as partners in the process. In fact, co-design processes seem to be taking an increasingly central role within social design (Manzini & Coad, 2015). Accordingly, the need to grapple with politics and further complexity within these participatory processes comes to the fore, raising questions of identification, representation and subjectification (Keshavarz & Maze, 2013).

In the literature, it is acknowledged that participatory design is a political process with conflicts (Greenbaum & Kyng, 1991; Simonsen & Robertson, 2012) and power imbalances (Nygaard, 1979). Still, while politics is a central issue in participatory design (Kensing & Blomberg, 1998), the political aspects within the discourse have become subtler in recent years (Halskov & Hansen, 2015). However, it is recognized that politics in the interaction between stakeholders and personal agendas influence the decision-making processes. Akama (2009) suggests that "whether agendas are disguised, mystified or openly shared" (p. 4) has a significant impact on the design process. Especially as participatory social processes often engage with marginalized populations in a variety of settings, an equal playing field cannot be assumed (Hussain, Sanders, & Steinert, 2012). This political complexity certainly demands attention within social design processes.

Much of the existing design literature calls for increased reflexivity and reflection among practitioners (Keshavarz & Maze, 2013; Sangiorgi, 2011). There have been a variety of explicit attempts in the area of social design to engage directly with politics through aesthetics, such as through design activism (Fuad-Luke, 2009; Markussen, 2013), adversarial design (DiSalvo, 2012), and critical design (Dunne, 2005). In participatory design processes, the emphasis has been on integrating methods and tools for prompting change from within the design process (Lenskjold, Olander, & Halse, 2015). A number of methods of have been discussed within design literature that range in scale and scope, including: scaffolds for dialogue (Akama, 2009), anecdotes (Whitcomb, 2016), minor design activism (Whitcomb, 2016), and dialogic design (Manzini, 2016).

Still, the conversation about how we can prompt such reflection on politics within co-design processes aimed at creating social good is only just beginning. Do methods such as those mentioned above support the desired level of reflection and cultivate the political wisdom necessary to navigate amid the complexities of societal transformation? Does the integration of methods for opening up political discussions aid practitioners in realizing social good? We explore these questions by drawing on discussions in the field of Science and Technology Studies.

Drawing from STS

As the design discipline seeks to advance a more critical debate, but lacks the language for discussing the political dimensions of design processes (Keshavarz, 2015; Manzini, 2016), it seems pertinent to look to more established dialogues in related fields. To help unpack the approaches to politics within design processes, we turn to the field of Science and Technology Studies. The origins of STS can be traced to the mid-60s, when discussions in research on science and its relationship to technology, economic development and society ensued. One thread of the discussion that emerged was the critical sociology of scientific knowledge (SSK). SSK research held a radical, relativistic view, with a humanistic aim of developing an empirically informed understanding of the social nature of scientific knowledge (Edge, 1995). In parallel, the rise in civil rights, environmental and feminist movements as well the influence of the Vietnam war, spawned research interests in these subjects and justified their study in academia (Kaplan, 1991 as quoted in Edge, 1995), leading to a political sociology of science.

The field of STS has evolved significantly since then. According to Hackett and colleagues (2008), STS "may be characterized by its engagement with various publics and decision makers, its influence on intellectual directions in cognate fields, its ambivalence about conceptual categories and dichotomies, and its attention to places, practices, and things" (p. 1). STS scholars engage a multitude of stakeholders in issues concerning equity, policy, politics, social change, national development, and economic transformation. von Wright (1963) highlights how the distinction between norms and values on one hand and fact on the other has led to the idea of science being value-free. However, the critical reflexivity that SSK research spawned acknowledges the inseparability of value and fact, and continues to drive scholarly STS debate (Edge, 1995).

Given the economic, social, political and environmental crises we are mired in today, insights from STS are more relevant than ever. In particular, we highlight discussions on ontological politics (Law, 2002) within STS. We see ontological politics as fundamental to the discussion in social design as assumptions about the nature of reality underpin how we choose to conduct a political analysis. From the writings of Haraway (1988), Mol (2002), and Law (2004), we focus on three key issues: situated knowledges, the multiplicity of reality, and the performative nature of methods.

Situated Knowledges

In early STS discussions, Haraway (1988) brought forward the insight that there is no objective knowledge, there are only highly-specific, partial ways of organizing the world. She argues that all knowledge is situated - tied to a particular human body and a particular circumstance. Haraway suggests that people must be accountable for their positions, which significantly contributes to how they form meaning and their own partial knowledge. In this light, claiming that there is a universal knowledge which is not located is irresponsible. She also highlights the politics of location and situation - calling out that no position is innocent, as everyone builds their knowledge within a web of power-differentiated relationships.

Additionally, in her discussions, Haraway stresses that the positions of the oppressed are not exempt from critical re-examination and deconstruction. These positions are not neutral, but rather they are preferred because they are least likely to deny the interpretive

nature of knowledge. Haraway advocates for the split and contradictory self that can interrogate positioning and be accountable, while constructing and participating in dialogues and imaginings of the future. In relation to social design approaches, this poses questions about how practitioners can seek to gain knowledge from different perspectives, while maintaining accountability for their own positionality and partiality.

The Multiplicity of Reality

Further to Haraway's understanding that all knowledges are situated and embodied, research in ontological politics reveals that reality itself is multiple and that realities do not pre-exist, but are continually shaped through our practices (Mol, 2002). Mol (2002) suggests that, "reality is done and enacted rather than observed" (p. 77). In her research, Mol followed a disease through the hospital, attending to the ways this disease was enacted, or put into practice. Her research suggests that an object, like a disease, is singular in theory, but multiple or fractional in practice. Mol calls out the coexistence of multiple entities that go by the same name as an object is understood and approached in various ways, but at the end it is one. Amid this multiplicity in singularity, Mol suggests that any certainty about reality is manufactured as reality is in fact varied.

Mol suggests that when considering multiple ontologies, the question about "what to do" will forever come with tension and doubt. A particular notion of good, for example, will always be contested. Understanding multiplicity opens up and keeps open the possibility that things might be done differently. Thus, when designing, Mol's work seems to uplift the value of confusion and uncertainty. While reinforcing the necessary persistence of doubt about what is good, we must still act. Mol (2002) concludes that, "doing good does not follow on finding out about it, but is a matter of, indeed, doing. Of trying, tinkering, struggling, failing, and trying again" (p. 175). Thus, perhaps addressing politics in social design should be reimagined as a constant sense of doubt and humility while acting on one enactment of good, among multiple.

The Performative Nature of Methods

Law (2004) echoes Mol's emphasis on the importance of uncertainty suggesting that methods are not sufficient for dealing with the complexity of the world. Law argues that methods focus on clarity and represses the possibility of mess. Further, he suggests that while methods are traditionally used for observing what happens in the world, they are actually a means of "world-making". Methods are indeed performative, constructing realities through the representation of realities. Law (2004) states that a method "unavoidably produces not only truths and non-truths, realities and non-realities, presences and absences, but also arrangements with political implications" (p. 143). Thus, methods in themselves are not neutral, but rather make certain political arrangements stronger or more real, while eroding others.

While Law's main focus is on research methods, much of his thinking can apply to methods for cultivating reflection on politics within the design process as well. As methods bring forward incomplete representations of the world, they leave behind the complexity of the world itself, "othering" aspects which are inconsistent with the chosen method (Law, 2004). As such, this raises questions about what design methods are silencing or refusing to enact and how these methods might be reshaped. Similar to Mol, Law

suggests that we need to imagine and practice "world-making" as flows and spirals, where partially connected "goods" are made and remade.

Insights from STS extend the understanding of the multiplicity and complexity of reality that social design is grappling with and embedded within. Amid such a mess, practitioners and researchers in social design can only have a partial understanding of these realities, a perspective which is intrinsically linked to their own position and power within a network of relationships. Furthermore, as social design seeks to enhance dialogue and reflection amid design processes, it is important to remember the methods of doing so in and of themselves have significant political implications.

Examining Examples from Practice

To help make the implications of STS discussions about ontological politics more tangible for the area of social design, we present and critique two promising examples of efforts to aid practitioners in integrating critical perspectives into the social design process. For each of these examples, we briefly highlight the foundations of the methods used, then describe how they were put into practice, and proceed to unpack the approach using insights from STS.

Cultivating Critical Reflection

The first example of a response to engaging with politics in social design processes involves the use of methods of critical reflection in Peer Positive, a co-design project in Toronto, Canada. Critical reflection involves a set of methods that support practitioners to examine assumptions and power dynamics within situations to improve one's practice (Fook, 1999, 2007). It has roots in pragmatist writings on the careful consideration of beliefs (Dewey, 1997) and reflective practice (Schön, 1983). It also links to critical theory - encouraging social and political analysis to enable transformative changes (Fook, White, & Gardner, 2006). Research and practice relating to critical reflection is increasingly common in the fields of social work and education (Nguyen, Fernandez, Karsenti, & Charlin, 2014). Here, we describe, and then later critique, how critical reflection was cultivated within the co-design process of the Peer Positive project.

The Peer Positive project (see peerpositive.ca) brought together a diverse range of stakeholders in Northwest Toronto to design and implement a systems-level intervention to improve the experience of individuals with mental health and addictions issues. Participants included service providers from health care, housing, education, social services, justice, immigration, and so on, along with individuals with lived experience of mental health and addictions issues, and their families. The project was facilitated by a multi-disciplinary team (including one designer and the first author of this paper) from the Center for Addiction and Mental Health (CAMH) with funding from the Ministry of Health and Long-Term Care in Ontario as part of the Systems Improvement through Service Collaboratives initiative (see servicecollaboratives.ca).

Stakeholders, generally 30-50 people, met monthly for co-design sessions in which they sought to better understand the system, develop appropriate interventions, and guide the implementation of desired changes. The intervention the community designed was focused on enhancing the engagement of people with lived experience in the review, design and delivery of services. Amid the co-design process, both at the community-level

and within individual organizations, there were acknowledged power dynamics and inequities. As such, it was recognized that critical reflection was needed to be integrated as part of the co-design process to support meaningful and safe involvement. Two main tools were developed based on approaches used in other sectors: the Critical Reflective Practice Workbook and the 4A Cards.

The Critical Reflective Practice Workbook encouraged people to unpack and write down the stories they heard about service providers and service users, and their own related identities. For example, one part of the workbook asks participants to deconstruct the myth of the helper - the binary perception that service providers are strong and independent and service users are in need and vulnerable (shown in Figure 1). The workbook asks individuals to reflect on the divisions created between service providers and service users. The workbook became a tool for training and catalyzing discussion within organizations.

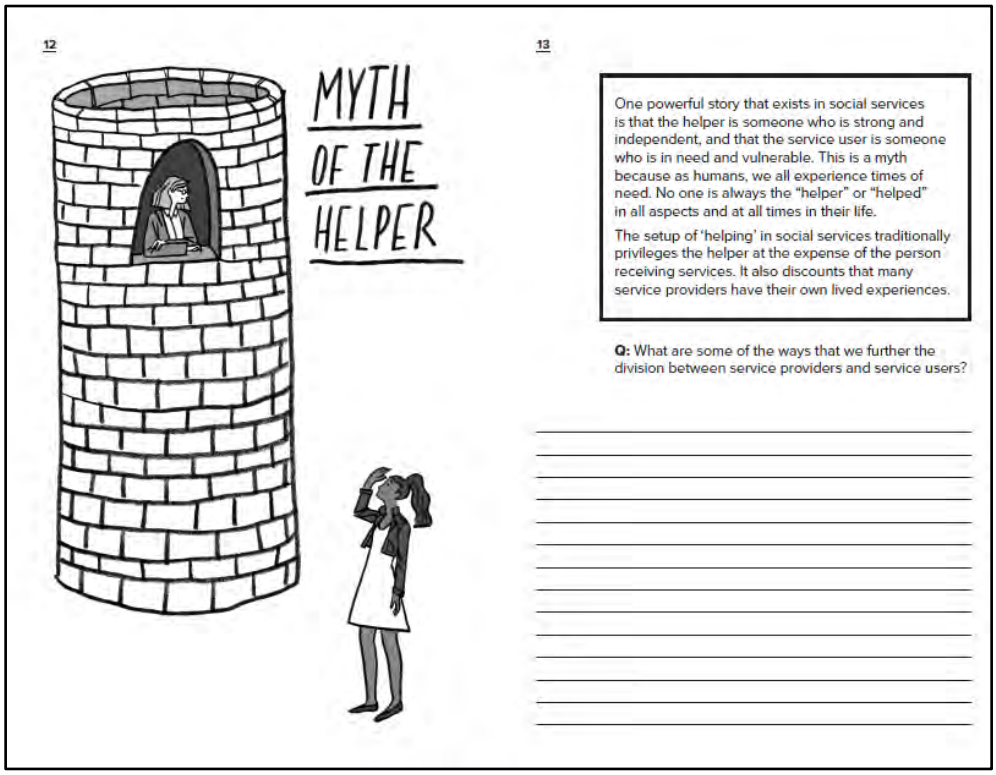

Figure 1 One page of the Critical Reflective Practice Workbook for the Peer Positive project

The 4A Cards were developed and used as a guide for the process of individual and group reflection. The cards outlined four steps in the critical reflection process (the 4As) - awareness, analysis, action and agency - highlighting key questions for each step. The analysis card is shown in Figure 2 as an example. These tools were used by the Peer Positive project facilitators and project participants in their own organizations to guide

critical reflection as they worked to strengthening the involvement of people with lived experience in services.

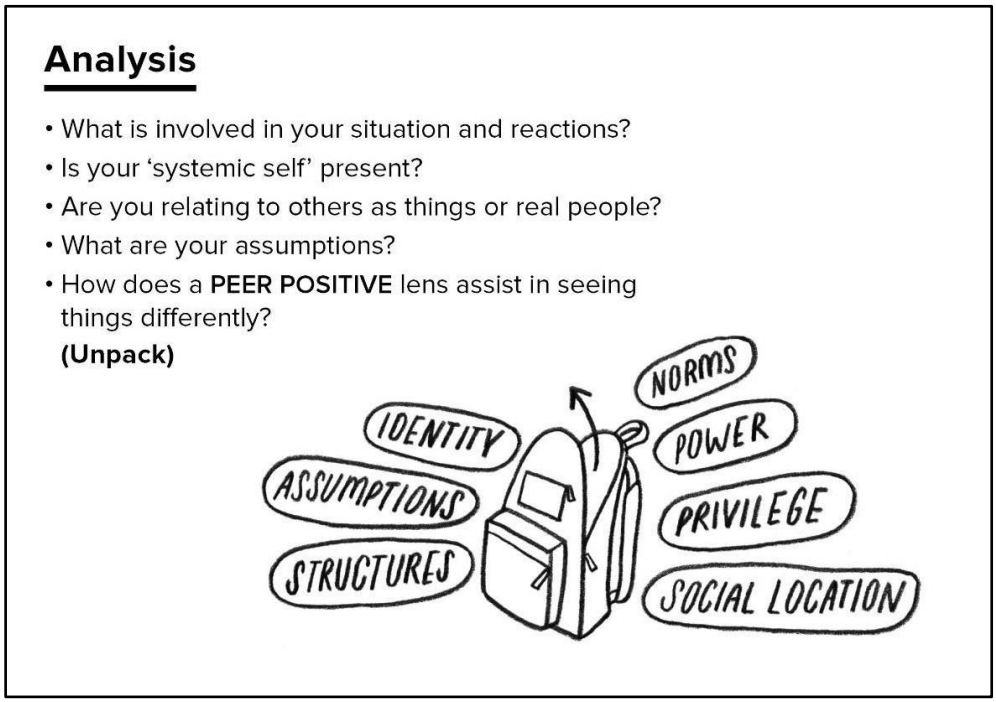

Figure 2 One card from the 4A Cards for the Peer Positive project

With insights from STS, we can examine this approach to cultivating reflection on political issues within the Peer Positive project. Considering Haraway's findings about situated knowledges, did the approach recognize the partiality and situated nature of knowledge? Did the methods used help practitioners recognize the politics of their own location? Certainly these methods and tools were aimed at such goals, but perhaps it is difficult to cultivate complete reflexivity. For example, in the Peer Positive project, the 4A cards sought to guide practitioners through questions related to recognizing others' positions, but still reinforced the importance of a "Peer Positive perspective" as almost an objective reality.

Furthermore, both the 4A cards and the critical reflection workbook aimed to support practitioners in "taking on the perspective" of peers, or people with lived experience, but, as Haraway (1988) explains, the position of people with less power is not neutral either. These methods do not explicitly encourage practitioners to unpack the politics of the underlying assumption that services are better when peers are more involved. Haraway further suggests that one cannot simply relocate to a different vantage point without accountability for that movement. For example, in the case of Peer Positive, one cannot be a service provider and move freely into the position of a person with lived experience without recognizing how being a service provider might influence what one sees.

Additionally, if we look again at the Peer Positive example, we can see a tension between the singular notion of good and its multiplicity as suggested by Mol. The methods encourage practitioners to think about a variety of perspectives on a situation, but they also seem to suggest that doing good is synonymous with one sort of intervention, e.g. engaging people with lived experience. Furthermore, through her research Mol (1999) reveals that the question of "what to do?" is more important than the question of "who should decide?". Suggesting that the focus on profession versus peer in Peer Positive, may be masking the political discussion about what should be done, for example, to change services.

Furthermore, if we look directly upon the use of the methods of critical reflection in Peer Positive with regard to their performative nature, we can see how this approach supports and enacts presence and absence related to the realities of the mental health service system. For example, in focusing reflection on the positional power relationship between service providers and service users, did these methods perhaps erode the realities of other intersecting legacies of oppression at play such as racism, ableism, classism, sexism, heteronormativism and cissexism?

While critical reflection was the intended outcome, perhaps the implementation of these methods carry with them political agendas and a construction from which individuals infer what might be good and bad. For example, were issues related to whiteness, such as positional power, made more real through the construction and use of these methods? Certainly, the literature on critical reflection acknowledges that reflection can be used to serve different interests and that the frameworks used influence the process and content of reflection (Fook et al., 2006). There are also lingering concerns that methods of reflection can simply function to reinforce current beliefs or practices (Brockbank & McGill, 2007).

While the approach to cultivating critical reflection in this co-design process supported practitioners engaged in the project to discuss and reflect on issue of power and politics, the methods themselves carried with them certain political agendas that worked to enact a particular reality. Similar issues can be seen in the approach to addressing political issues within the design processes in the example below.

Encouraging Norm-Creative Innovation

Another response to addressing politics in social design can be seen in the development and use of norm-creative innovation methods in Sweden. The concept of norm-creativity was coined by Vinthagen and Zavalia (2014), with roots in norm-critical discussions in gender studies and education. Over time it was recognized that feminist and queer pedagogy needed to be opened up to more intersectional perspectives; the norm-critical concept emerged in Sweden to signal a movement this direction (Bromseth & Sörensdotter, 2014). Norm-criticism recognizes that what is "normal", or socially acceptable, gives advantages to those that comply to norms and discriminates against those that do not comply. Furthermore, a norm critical perspective recognizes that artifacts are political; for example, in the sense that they are designed and used in gendered contexts (Berg & Lie, 1995).

Building on this foundation, design researchers worked with VINNOVA, Sweden´s innovation agency, to develop hands-on methods for helping practitioners create

solutions that are inclusive and accessible by working through a norm-creative lens (see Vinnova.se). These adapted design methods were packaged into a card deck called NOVA. They were developed with the assumption that practitioners often create solutions based on a too narrow understanding of user's needs, excluding those who do not comply with existing norms.

This set of methods has been used in a variety of practice settings, including in a waste management project and a hospital context. In the waste management project, the cards were used to help practitioners designing a new waste management service in Sweden to better consider the needs of those who do not conform to certain mobility or age norms, such as those who do not have a car or the elderly. Within a hospital setting, these methods were used to help health service providers reflect on the normative nature of the services they were providing. For example, using the "body swap" method (shown in Figure 3 in Swedish), staff did role reversals to try and see situations in new ways from the perspective of different patients. The process sparked discussions about normative activities within the hospital, such as gendered prescription practices.

Figure 3 NOVA, the norm-creative innovation card deck by VINNOVA

The methods within the norm-creative innovation card deck encouraged practitioners to look beyond themselves and empathize with others. In doing so, it is possible that these methods could be seen as a means of becoming more objective and all knowing, rather than simply extending one's partial and embodied knowledge. Helping practitioners to recognize the limitations of their own understanding, despite attempts to broaden their considerations, becomes a pressing issue. As practitioners are engaging in dialogues about

norms, it can be easy to forget that there are no independent actors standing outside of reality and thus, what is brought forward and decisions about "what to do" are inherently political.

Furthermore, as Haraway suggests, one must be accountable for their own positionality. For example, one cannot move from being someone who conforms to a particular social norm to fully understanding what it means to be discriminated against by simply acting out a role reversal in the "body swap" method. People and bodies carry with them situated knowledges and location that cannot be erased by "taking on another perspective" as is often encouraged within design processes.

One can also see in the NOVA example, that the methods used amplify certain realities and partial knowledges, while excluding others. The norm-creative innovation methods focus on how to design tangible objects and services with a greater awareness of norms. This amplifies a focus on the design of things, perhaps silencing discussions related to the larger systemic issues of inequality, and issues related to the culture of design itself. By systematizing a process of reflection and action, methods such as these cannot fully succeed in recognizing the complexity and messiness of the world. While a promising beginning, a look at these examples suggests there is a need to further develop our approaches to addressing political issues in social design processes.

Re-Muddling the Mess

In this paper, we have highlighted the pressing need to attend to issues of politics in social design. While all design participates the construction of realities and these concerns are relevant for all design disciplines, we focus here on social design because of its explicit intentions to do "good" in society. Like all design, social design must attend to the politics of design and its culture, but within social design there is the added political complexity of dealing with wicked problems and of engaging stakeholders within a co-design process.

In response to such issues, there have been attempts to integrate methods of critical reflection and dialogue to open-up inherent political issues within the social design process. However, as we have shown in this paper, these responses also have political implications that deserve further analysis and discussion. To aid in moving this line of thought forward, we have examined two examples of specific efforts to address political issues within social design processes. Through the lens of STS with a focus on ontological politics, we have critiqued these practice examples adding complexity to existing considerations within social design processes. This analysis has shed light on a variety of issues including: recognition of situated knowledges, the multiplicity of reality, and the performative nature of methods. In Figure 4, we bring related questions inspired by authors from STS together into a tentative framework for reflecting on the politics of social design processes.

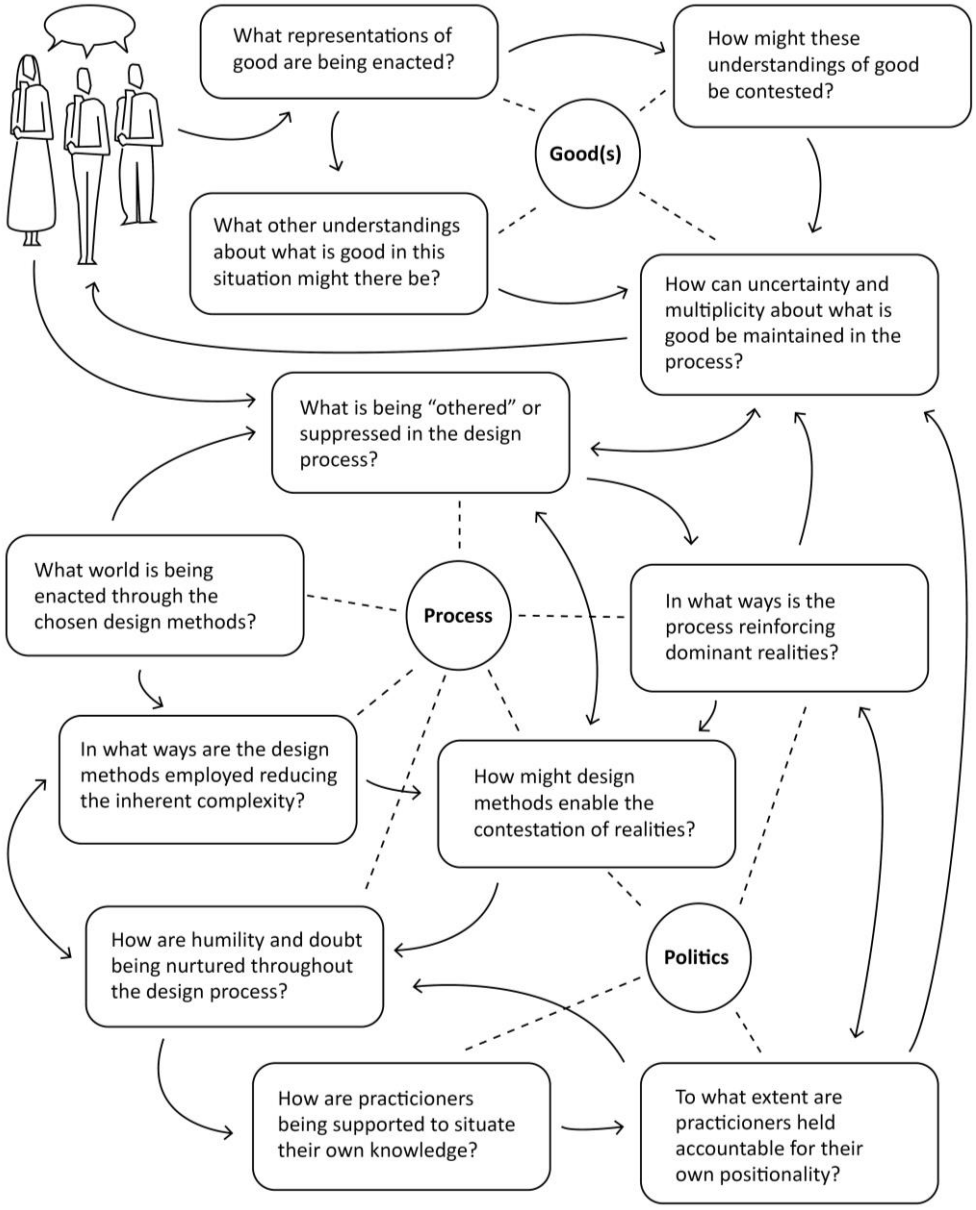

Figure 4 Tentative framework for reflecting on the politics of social design processes

Firstly, the work of Haraway (1988) helps us recognize that all knowledges are particular and influenced by one's location within a network of relationships. Moving forward, it is pertinent for social design to continue to explore ways of helping practitioners to increase their accountability for their own position, and support a more situated reflection amid the design process. Perhaps, as it has been previously mentioned in design research, aesthetic interventions can support practitioners in more intentionally embodied forms of

contemplation (Buwert, 2015). It is worth considering how social design processes might better tap into aesthetics to cultivate new knowledge that not only helps practitioners to understand things "from others' perspective", but simultaneously aids practitioners in recognizing their own positionality.

Secondly, Mol (2002) brings forward the understanding that reality is itself multiple and, as such, all objects and situations are multiple, although one. As social design seeks to realize social good, it must acknowledge that the notion of good is indeed multiple and intertwined in ontological politics. This leaves lingering questions about who should determine what counts as good within social design processes and more importantly what should be done? Social design wants to do 'good', to improve situations; but it rarely questions the political back-end context that qualifies what is 'good'. Still, Mol emphasizes the need to not get paralyzed, but hold on to doubt and to start the process of tinkering.

Thirdly, Law (2004) contributes to this discussion by suggesting that methods amplify certain realities, while suppressing others. As the world is indeed messy and unknowable, Law proposes that it is perhaps a disciplined lack of clarity and finding ways of enacting non-coherence that may be needed. Reviewing these practice examples suggests that social design may need to do more than simply integrating new methods of dialogue and critical reflection that risk reinforcing dominant realities.

This research inquiry has helped to re-muddle the mess of politics in social design processes and in doing so, opened up more questions than answers. These questions have been brought together in a tentative framework for reflecting on the politics of social design processes. In doing so, this paper contributes to the evolving discussion on social design by illuminating the need for meta-level reflection by both practitioners and researchers as well as offering a collection of relevant questions to support this dialogue.

Furthermore, this research highlights important opportunities for future research including addressing questions such as: what notions of good are being enacted through social design processes? How can social design processes support embodied, situated knowledges? How might design methods be adapted to recognize the multiplicity and complexity of reality? How can reflexivity in social design processes be cultivated in a way that fully acknowledges the messiness of reality? We acknowledge the subtle paradox of putting forth these questions and therein enacting our version of reality. The aim of doing so, however, is to avoid political blindness to one's position and partial knowledge, and be critical towards issues we have raised in this paper.

Social design processes tend to focus on how to do something without necessarily thinking about the politics of the what. Perhaps social design needs to be more critical of the politics of the goods they are working towards, acknowledging that these goods themselves are contested. Furthermore, as social design looks to cultivate political wisdom among practitioners, it must take time to thoughtfully refine its methods, acknowledging their politics and the politics that design brings with it. Amid the multiplicity and complexity of social design processes, perhaps what is most evident from this research is that dealing appropriately with politics involves maintaining humility and uncertainty in the midst of an iterative process of learning.

Acknowledgements

This project has received funding from the European Union's Horizon 2020 research and innovation programme under the Marie Skłodowska-Curie grant agreement No. 642116. In addition, this research has been conducted with funding from Torsten Söderberg foundation project No. E22 – Making sense of design work and Riksbankens Jubileumsfond project No. RMP16-1159.

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Theme 5: Methods

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Section 5.a

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HONG KONG DESIGN MANAGEMENT ACADEMY CONFERENCE 2017

RESEARCH PERSPECTIVES ON CREATIVE INTERSECTIONS

Introduction: Design practices for effective strategic design

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doi: 10.21606/dma.2017.232

An increasing number of organizations use design practices not solely for implementing strategy but also to formulate it (De Bont, 2016; Calabretta, Gemser and Karpen, 2016). Related, an increasing number of design consultancies are adding 'strategic design' to their list of activities. Since this is an emerging professional field, consensus as regards to what 'strategic design' entails is as yet lacking. We propose the following definition: "*Strategic design refers to a professional field in which designers use their design practices to co-determine strategy formulation and implementation toward innovative outcomes that benefit people and organizations alike*." We propose, first, that what distinguishes strategic design from 'traditional' design, is having a critical influence on *strategy formulation* in addition to *strategy implementation*. When design activities only relate to the implementation of strategy defined by others, for example by executing a design brief or innovation project, design is not strategic. Strategic decisions that tend to be influenced by strategic designers include, for example, the definition of the corporate innovation strategy or the corporate branding and communication strategy. In terms of activities, *design practices* constitute the focal point of our definition of strategic design. Design practices represent routinized 'designerly' ways of working, which can be enacted by individuals or, more often, in teams of individuals. The enactment of design practices is facilitated by means of specific design tools, techniques and abilities. In our definition of strategic design, we furthermore suggest that outcomes should benefit both *organizations* and *people*. Designers are traditionally concerned with fulfilling customers' desires. Strategic designers, however, must also be explicitly concerned with organizational desires and explicitly need to take into account feasibility and viability as well. However, strategic design is not simply about creating or fulfilling the wishes or needs of individual people or organizations; it is also about creating a better society. It is about the pursuit of long-term (non-financial, social, public) interests and ensuring the long-term well-being of all

stakeholders. Finally, we would like to emphasize that we do not argue that designers should replace business professionals with regards to strategy making. In our definition on strategic design provided above, we explicitly use the word *co-determine* to indicate that strategic designers should contribute to strategy formulation together with other professionals.

With design becoming more strategic, design professionals need to master a new set of design practices – routinized ways of working – to address complex managerial challenges. For example, as suggested above, acting on a strategic level requires a strategic designer to co-decide not only on desirability but also, concurrently, on feasibility and viability. Research on strategic design as practiced is, however, relatively light. There is some research on design practices in the context of strategic decision-making (e.g., Liedtka, 2014; Calabretta, Gemser, and Wijnberg, 2016); there are case studies on effective tools and methods (see e.g., Calabretta, Gemser and Karpen, 2016); and there is some research on needed abilities and potential roles for strategic designers (e.g., Miller and Moultrie, 2013; Seidel, 2000). However, more knowledge is needed so that professional designers can effectively operate on a more strategic level.

In this track, we contribute to developing this knowledge by focusing on effective practices for strategic design. The track includes seven papers that each provide insights into the how and why of strategic design. Below, we provide for a more specific introduction of the different papers.

The first paper is entitled: 'Designers as innovators in organizational contexts: A proposal for a typology' and is written by Lisbeth Svengren Holm, Antti Ainamo and Christina Vildinge. Based on a multiple case study approach, the authors propose a typology for the different roles present-day designers may fulfill in innovation and suggest this may depend on the kind of organizational context (profit versus not-for profit), the type of innovation (product, process, or service; radical versus incremental) and the stage of the innovation process (discover & define versus develop & deliver).

Our next contribution is from Nico Klenner, Gerda Gemser and Ingo Karpen. Their conceptual paper is entitled: 'How design practices assist new venture teams in creating entrepreneurial opportunities'. Klenner and colleagues explore the under researched topic of design for entrepreneurship and suggest there are similarities between how designers and entrepreneurs operate. Based on a study of design, innovation and entrepreneurship literature, the authors provide for a conceptual framework and six propositions on how design practices can assist new venture teams by helping to generate ideas, change beliefs and take action.

The third paper is by Fulden Topaloğlu and Özlem Er and is entitled 'From design management to strategic design: Triggers, enablers and challenges in building design management capabilities'. The paper is focused on how to guide designers and organizations in building capabilities in the field of design management and strategic design management in particular. Building on prior design management frameworks, it proposes a 'Design Management Audit Framework (DMAF) that intends to identify and accommodate new capabilities needed to support the changing and broadening context and roles of design. In addition, the paper discusses triggers, enablers and challenges in

moving from design management to strategic design management based on three in-depth case studies of manufacturers of sanitary ware ceramics.

Niya Stoimenova and Christine de Lille provide a paper entitled: 'Building design-led ambidexterity in big companies'. The authors explore how design can assist in achieving organizational ambidexterity (i.e., an organization's ability to simultaneously engage in exploration and exploitation). They gathered data by means of action research performed at two large international companies that attempt to accelerate innovation projects by combining design and agile practices. The authors discuss the innovation approaches of these two large innovation companies in-depth, focusing on the methods, mindsets and infrastructure used, and then propose a new type of organizational ambidexterity, namely 'design-led' ambidexterity.

The final paper of our track is of Giulia Calabretta, Christine de Lille and Caroline Beck and is entitled: 'The role of service design practices in enabling and embedding the servitization transition'. In this paper, Calabretta and colleagues propose that service design practices can help companies to overcome the challenge of transitioning from a product focus to a service focus (i.e., *servitization*). Using data from expert interviews, ethnography and multiple case studies, the authors describe and exemplify practices through which service design professionals establish a service-oriented mindset, introduce a service-specific development process, and a create widespread commitment to the servitization transition.

In sum, the above-discussed papers provide useful insights into design practices, capabilities, and frameworks that are particularly helpful for designers operating on a strategic level. However, as the field of strategic design is emerging, the field still offers plenty of opportunities for future research. Promising future research directions would, for example be, an in-depth study into practices (and related tools and abilities) that help strategic designers to combine the often-conflicting goals of desirability, viability and feasibility. In addition, it would be interesting to examine by means of what practices designers can gain and sustain a more strategic role in organizational settings.

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HONG KONG DESIGN MANAGEMENT ACADEMY CONFERENCE 2017

RESEARCH PERSPECTIVES ON CREATIVE INTERSECTIONS

Designers as Innovators in Organizational Contexts: A Proposal for a Typology

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doi: 10.21606/dma.2017.73

This paper proposes a typology for the different roles and drivers present-day designers may fulfil, which may depend on the kind of organisational context involved and the type of innovation. The interest in the potential of designers contributing to business and management innovation and the economy as a whole has grown, with the premise being that companies modelling innovation processes on the design process are more innovative and more successful than others. Design has become represented almost as a synonym to innovation and a legitimate response to criticisms of management training for being too scientific and detached from real-world complexities and problems. This raises a need to understand and clarify the roles designers can have or take, in companies but also in the public sector, where design is increasingly commissions contribute to innovation. Based on a multi-case study approach we propose a typology based on three different types related to the outcome of designers acting as innovators: product, process and service innovation. With these types of innovations we propose a typology for the different roles designers can have and take based on a hierarchical model related to the Double Diamond model for the design process. Radical innovations are related to strategic level and benefit from the potential of designers with an artistic and aesthetic approach.

keywords: business management innovation; designers as innovators; organisational context

Introduction

Design has become known almost as a synonym to innovation (e.g. Boland & Collopy 2004; von Stamm, 2008, 2013; Dunne and Martin, 2006; Verganti, 2009). This paper proposes a typology of the different roles present-day designers may fulfil in innovation, which may depend on the kind of organisational context involved and the type of innovation. The interest in the potential of designers contributing to business and management innovation and innovation in the economy as a whole has grown, with the premise being that companies modelling innovation processes on the design process are more innovative and more successful than others (e.g. Roy & Riedel, 1997; Gemser & Leenders, 2001; Irish Centre for Design Innovation 2007; SVID 2008; Bason, 2014; DeEP, 2015).

> *"We need to capitalise on Europe's creative potential. This increases dramatically the role of designers, because, if we have a broader understanding of innovation, we need more power for design and design thinking in companies as much as in the public sector", as expressed in a public presentation in 2011 by the Head of EU Innovation Policy development, Peter Dröll.*

Despite this we know there are still tensions between designers' and managers' perspectives, objectives, and ways of approaching problems and challenges (e.g Beverland, 2005; Johansson & Svengren Holm, 2008; Micheli et al, 2012). Design has thus become represented as a legitimate response to criticisms of management training for being too scientific and detached from real-world complexities and problems (Mintzberg, 2004; Boland & Collopy, 2004; Bennis & O'Toole, 2005; Augier & March, 2007; Holland, 2009; Glen, Suciu & Baugn 2014). The need to give evidence that design, as an aesthetic based process, indeed contributes to successful new product development (NPD) has moved on to a need of understanding what kind of roles designers have in NPD (Perks, et al, 2005; Dong, 2014; Roper et al, 2016), and what impact the involvement of design can have on the organization (Oke et al, 2009; Martin, 2010; Micheli et al., 2012).

In this paper we argue why and how it matters that few managers and policy makers truly understand that design has its roots in artistic and aesthetic practices. One consequence of these roots is a necessity to embrace ambiguity and the trying out of new methods – instead of imagining a world where designers have good competence that just needs to be discovered and then success can be repeated. The desire to repeat successful practice in terms of "best practice" is often a disappointment as most markets, not the least consumer markets, are complex, which means that it is mostly in hindsight one can see cause and effect, if at all (Kurtz & Snowden, 2003). Designers are comfortable with such conditions, embracing ambivalence and insecurity, and accept this, or even encourage this as a learning process (Cross, 2007; Brown, 2008; Liedtka, 2010).

Designers are hence not the ones to operate in a steady-state oriented environment and quantitative, efficient and optimization-oriented thinking; they belong to dynamic environments and qualitative, adaptive and satisficing oriented thinking. Problems addressed by designers, just like those addressed by artists, tend to be wicked, so complex that with any design solution it is impossible to know the effect a new product or service will have (Buchanan, 1992; Cross, 2007; Soila Wadman & Svengren Holm, 2016). In turn,

that is precisely why some designers resort to problem-solving very small steps: trial and error contributes to acquiring more knowledge that can give experience for future decisions (Perks et al, 2005).

The purpose of this paper is to specify and develop a typology for the diversity roles of designers can have in innovation in companies and organizational contexts, based on the expansive roles designers as in-house innovators, external consultants have received when working on product or service design or on organizational processes in commercial or public contexts. Designers – traditionally working with commercial organizations and material based projects – now frequently also work within the public sector (Bason, 2014; Emilson et al., 2011; Pacenti & Sangiorgi, 2010). Designers increasingly work in multi-disciplinary teams within the organization (e.g. Ainamo, 2007; Johansson & Svengren Holm, 2008). More recently, more than one kind of roles for designers has emerged in, for example, the dynamic process of the four phases of innovation: "discover, define, develop, deliver" as illustrated by the so called Double Diamond model developed by Design Council (2005/2017 – Figure 1 below). We have used this model to identify the phases where designers have entered the processes also in our case studies on which we base our analysis.

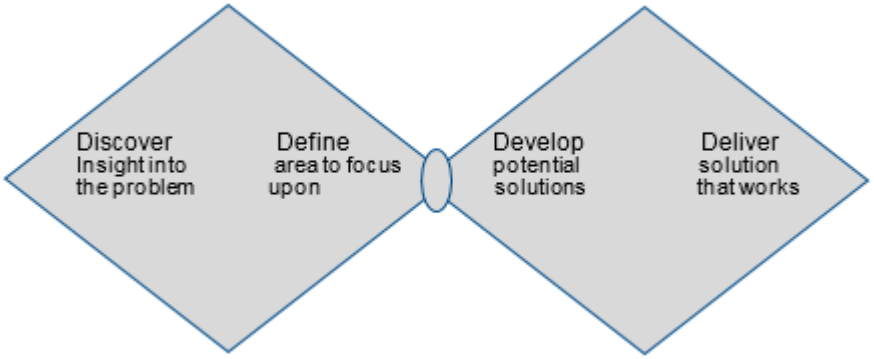

Figure 1 The Double Diamond developed by Design Council to illustrate the design process

What designers do: Designers as innovators

Every profession and competence changes over time according to the changes and demands of its context, and tools/technologies to work with (Perks et al., 2005; Valtonen, 2007). The emergence of designers as a profession is in large a result of industrialization (Heskett, 1980). Logically the design profession and the roles change when industries change. But even if service became a large – and dominant – sector already in the 1980s, this did not affect industrial design in NPD to any great extent. It was not until well into the 2000s as service design emerged as a specific expertise among designers (Brown, 2008; Kimbell, 2011). Furthermore, Ropert et al. (2016) find that the roles of designers have not changed the last decades. However, we believe that the emergence of service design has led to a larger focus on the design process as such, even if the physical outcome is still important, and this has been one reason for expanding the roles of

designers also to that of process innovation. That was also one argument for initiating this project.

Reflecting the above first layer of what designers do, designers are in design literature traditionally described as problem-solvers (e.g. Rittel & Webber, 1973). More recently, the past ten to fifteen years have been marked by a shift in the view of their contribution to innovation. Adding layers, designers have emerged as professionals who solve problems in ways where they are capable of thinking out of the box (e.g. Buchanan, 1992; Kelley, 2001). Buchanan (2001) defines the expansion of designers' roles as four orders of design practice; i.e. from working with 1) signs and symbols that are artistic or aesthetic, for example, to working on 2) industrial goods, 3) on services/experiences/interactions (e.g. Holmlid, 2009; Kimbell, 2011) and, finally, on 4) systems and organizations (see e.g. Emilson, 2015). The fourth order of practice is relevant to discuss today. However, as seen previously, designers won't leave the other orders of practice. Designers have remained specialists in creativity and problem solving. At the same time, they have been lumped together with other creative practitioners, in the meaning of them being representatives of the creative class, in the widest possible sense.

Many studies have tried to identify various roles designers on the basis of the type of innovation, production and contextual factors (Perks, et al., 2005; Valtonen, 2007; Tan, 2009; Dong, 2014; Wilson & Zamberlan, 2015). In her research Valtonen (2007) illustrated how the roles of Finnish industrial designers developed and changed from 1950s – where Finish industrial designers had an important national role of building a new national identity after the war – until 2005, when the designers took – or at least aspired for – more strategic roles, not the least encouraged by the success of Nokia. Perks et al. (2005) differentiated the roles of design as functional specialism, as part of multifunctional team, and as NPD process leader. This taxonomy was based on an analysis of the actions, skills and contextual factors within which the designers acted. The study focuses on NPD with companies in different industries but still designing physical products. In the UK, Tan (2009), focusing on the roles of designers in the public sector, proposes that designers have a role as communicators who enable conversations around difficult issues, and being capability builders who enable non-designers to use design tools. In the study of Wilson and Zamberlan (2015) designers, acting as co-creators, concluded that designers are new-knowledge creators, facilitators, and participants in cultures of creative collaboration and inter-disciplinary teamwork. Based on a recent study Ropert et al. (2016) claim that the roles of the designers, at least in Irish manufacturing industries, have not changed during the last decades, and to some degree it is probably correct, especially when looking at NPD and product design. But the scope of what designers do have expanded, not the least due to the digitalization of products, and with service and the public sector as new markets for designers with a stronger emphasis on design as a process.

The roles identified in these studies range from being collaborators and creative actors in product or process development projects, where the designers create concepts and fine-tuning it in team-work, to acting as mediators converting and using cultural traits and language, transforming cultural realities into forms and shapes and colours to make the product appealing for the consumers or the processes and organization more innovative.

Methodology: a Case Study approach

This study aims to explore and identify a typology for the character of the current roles designers have, or receive, in organizations as drivers for innovation. We decided upon a multi case study approach and collected 20 case studies with different kinds of organizational contexts. Case study research is considered a suitable method when searching for qualitative data of phenomenon and events (Tsang, 20014), as case studies are rich of empirical evidence (Yin, 1994). Eleven of these cases were conducted in 2015 to have a larger and up-dated database. These eleven case studies were conducted by researchers from University of Gothenburg and Corvinius University of Budapest in a EU-financed project on the subject of design as driver for innovation[111]. For the new case studies we therefore got access to companies in Finland, Hungary, Ireland, Italy and Sweden. The other nine cases were done in previous research projects by researchers at University of Gothenburg and also authors of this paper or part of the Cre8tv.EU project.

Choice of cases

We sought to have cases where designers worked on innovations of products, services, and processes in different contexts, in commercial and public organizations, in large and small companies. The designers were in-house as well as external, often working with clients in multi-disciplinary teams. In some cases the designers have been the entrepreneur, or have been part of the start-up teams. We were not looking in particular for success stories but rather for companies where design was used at least as a process according to the design ladder developed by Danish Design Council (Danish Design Council, 2001/2017).

Table 1 Overview of the case studies

Type of context	Small	Large	External	In-house
High-tech products	2	1	X	X
Digital services	2	2	X	X
Furniture and interior	2	3	X	X
Packaging	2	-	X	-
Consumer goods	2	2	X	X
Public sector	-	2	X	
Summary	10	10		

High-tech and digital service companies: We selected nine companies from high tech companies in different sectors: medical technology (1); subcontractor to the transportation industry (1); mobile sector (2); games (1), and Internet based digitally based services (4). The companies are large and small, and the designers are external and in-house.

[111] These case studies were conducted within the Creative EU project: Cr8tv.EU

Consumer goods contexts: We choose nine companies in more traditional design related industries, like interior, furniture and home appliances (6); apparel (workwear and sportswear) (2); and packaging (1). The designers were both external and in-house. Some of the companies are large and global; others are smaller but exporting. Two of the furniture companies cater mainly for public sector, the others mainly for consumer markets.

Public-sector contexts: We wanted to investigate design in the public sector where designers have begun to find new customers, and where designers have worked with a new approach for meeting and learning; a trade union (1), and a city council (1).

Methods for collecting and analysing data

The methods for collecting primary data in all of the cases have been interviews of designers, product developers, owners and managers in the companies; secondary data from different sources, for instance newspaper articles about the companies, and web pages of the companies. The interviews were transcribed, and together with the other data we wrote a case stories for each company/organization, describing facts about the company/organization, the history of its development, position of the designers, and activities designers had for a certain outcome: a new product or process or organization.

We did a content analysis of the cases, within and cross the cases, according to what type of actions the designers were conducting in the cases. This is similar to Perks et al. (2005) but we also categorized the outcome in terms of degree and type of innovation, i.e. incremental, radical, product, new market or segments, new process, or organization. We noted how the different functions and the designers themselves defined their roles in the company or in the organizations and compared this with activities and the process of innovation. We have a fair number of cases but very few in each industry, especially the public sector. It would require a larger number in each industry and sector to make generalized conclusions possible. Hence, we can only propose a typology that indeed needs to be further investigated.

Findings and discussion

In many of the companies design was described as being equal to innovation and hence designers as innovators. Based on the analysis we found it therefore useful to start the discussion of the roles based on three main types of designers as innovators: product innovators, process innovators and socially driven innovators. The roles within all types differ between being strategically and tactically oriented, which to some degree is related to the taxonomy formulated by Perks et al (2005). However, we could not find the pure functional roles, i.e. sticking to the traditional design skills, aesthetics, visualization and technical skills, which was one of the roles defined by Perks et al (2005). It could of course be a result of the selection of companies with certain maturity on the design ladder, but we could also relate this to a general claim that in the last decade design has received more strategic roles. This claim was for instance made by the Swedish Industrial Design Foundation who commissioned a study of Swedish companies' use of design; one in 2004 and then repeated in 2008 (SVID 2008). The study in 2008 showed that the number of companies having a higher maturity regarding the strategic use of design had indeed increased (SVID 2008).

However we could also see that the roles designers have for innovation is not so different based on country specific factors. We saw no difference between the roles of the designers in our cases in the different countries and therefore we disregard from discussing this as any contextual factor.

Designers as product Innovators

> *"In the beginning you are Sherlock Holmes, in the middle Picasso and in the end you are some kind of an engineer. The designer has many different caps and roles, depending on the different phases of the design process" (the external designer at the large, global furniture company)*

A core industry for industrial and product designers is interior and furniture, a mature industry, which spans between being conservative and radical. Designers have a traditional role as creator of new aesthetic expressions, new forms and mostly work according to a brief. Technical development can lead to radical new forms. However, in several of the cases requirements for sustainable solutions in material and inclusiveness were part of the discussions between the designers and the client besides the requirements for high quality regarding aesthetics and brand related issues. The initiative for sustainable solutions in some of the cases came from the designer, in some cases from the client, especially in those cases where the mission of the company was strongly related to sustainability, including its social aspects. Some of the cases were thus strongly purpose driven to contribute to a better and more including society.

This interest for sustainability encouraged the designers to take an active role in searching for instance for result of research of new materials, to consider longer usage and also engaging in the development of circular business models. In this sense the designers got a new strategic and research oriented role added to the old ones as functional designer and form giver when researching for sustainable solutions and is illustrating a purpose driven role for the designer in the discovery phase of the design process.

The technically based companies are highly technical driven in the first place and also needs to integrate new technologies at a high speed to keep up with the market development. We saw a difference between high tech companies manufacturing technical devices compared to those in the digital service context. In the digital companies designers were more integrated with the engineers for innovation and with leadership for the creation of creative cultures. We therefore come back to this when discussing designers as process innovators.

As Valtonen (2007) and Perks et al. (2005) noted, throughout the years designers have added new roles, like for instance that of being strategists and working with multi-disciplinary teams, consisting of engineering and marketing functions. The fundamental role for this kind of a designer is indeed that of giving form to a concept, but beyond that is the aesthetic notion of gestalt or embodiment or the brand. The designer's role can on one hand be to create a design language that communicate the product in line with the communication of the brand, on the other hand to challenge the prevailing understanding of the business. The role in the first case is to interpret and visualize the intention of the company's vision and mission, the other to challenge it based on both current content, context and also future.

When giving space for more radical approach the designer uses its artistic, aesthetic and design knowledge. It is the designer's artistic and aesthetic knowledge and methods that leads to radical innovations, either for the company or for both the company and the market, which we could see in the cases in the technical contexts. Here the designers' sense of critical mode of current states, fantasy and imagination of different futures, is what distinguish them from the conventional modes in innovation processes. The role is to be the provocateur, to challenge the obvious, common knowledge and expand what is thought of as possible. When the provocation leads to reflection and inspires also the others involved in the process it can lead to transformation, which can be a radical innovation for the market and/or the company.

The artistic driven process use the aesthetic tools for visualizing but is also imaginative of the future needs going beyond the user needs that are expressed and observed on current markets. It is using the role of being a strategic visionary without being locked by the current products or services or way of working at the company or organization. The artistic driven process will have consequences for the company and organization, probably requiring a re-thinking of how they operate at present state, which we could see in two of the cases, one in the public sector.

As this artistic and aesthetic driven role has an impact on the positioning of the company and the brand on the market, it is of strategic importance for the company. The role is further strengthened by designers' knowledge of trends on the market, social cultural tendencies and sub cultures in society at large. Designers, through education, design history, relation to the material world of design icons, are closely linked to the cultural aspects of society. Designers are more or less consciously contributing to the material world – and thereby also the taste cultures (Bourdieu, 1984). Designers become brokers of knowledge as interpreter but also mediator, what also could be discussed as the taste of the design community (Bourdieu, 1984; Christoforidou, 2013). The form giver develops business on an incremental level of innovation and the aesthetic driver challenges how we understand the material symbols, which in turn brings opportunities for new interpretation and radical innovation (Verganti, 2008).

The role as technology knowledge broker for radical innovations has been recognized in earlier studies (Hargadon & Sutton, 1997). The contribution of designers in this perspective has been highlighted by for instance Leonard and Rayport (1997), Kelley & Littman (2001) and Brown (2008). The role of being a broker for new technology and market trends is an argument for commissioning consultancies in general. Balsamo (2011) means that technology and culture are inseparable, as those who are involved in technological innovation are also designing the cultures of the future, which emphasize the close relation between designers and engineers (Johansson & Svengren Holm, 2008).

In several of the cases, especially in furniture and home products, the commission for the designer was business motivated and expectations were incremental innovations. These innovations occur on a tactical level and the designer's role is then partly as what we would refer to as aesthetic developer. The interesting finding in some of these cases is that the designers were given space, or created the space, to challenge the brief which in turn lead to more radical innovations for the company in particular but to some extent also for the market.

In summary: The design knowledge of trends and social cultural tendencies in society at large, of technologies and solutions from different industries enables designers to take a strategic position in product innovation. The design knowledge on strategic level of innovation is connecting to the aesthetic and artistic educated knowledge or mind-set driven by the search for new understandings that challenge prevailing ways of perceiving the world, including the interest for sustainability. The designer ask artistic-driven questions to find the common denominator and then abstract the understanding to recreate new ways of seeing what is happening in the on-going conversations and people's visions of the future. The roles we identified in the context of designers as product innovators are therefore ranging between being strategic communicator and purpose driven researcher where artistic methods, knowledge brokering and traditional design skills are crucial for the development.

Designers as process innovators

Once a radical innovation has been introduced and become a success on the market, various incremental innovations occur, based on this once radical innovation (Rothwell, 1992). This is seen as the normal development, but the speed of radical innovations, especially in the digital context has increased. Digital companies are hence trying to shrink the periods of incremental innovations, which leads to an expectation for companies in the digital context to remain creative and innovative. Google has become well known for its creative environment and is to some extent a role model for other companies in the digital context (Economist, 2009; Schmidt & Rosenberg, 2014). We can also see in our digital case studies that these companies are trying to foster a culture not only with constant incremental innovations but also with more radical innovations.

The innovations are often technical and engineering driven, but there is a tendency that engineers, and designers – e.g. graphic designers, interaction designers, and web designers – are working very closely together and seeing themselves as designers! Design in these companies has become part of the culture: "everything we do is design". In some cases the roles of designers were rather to create a broader spectrum of developing a creative and innovative environment and culture than the products per se. When more radical innovations were sought for, the tools of design, referred to as design thinking, were seen as fruitful to achieve this. Designers then have the role to educate others to learn design tools and to "think" like designers. Without doubt the value of the designers' competence is highly respected as the driver for innovation, but it is more the role of a pedagogue that is increasingly of interest as part of the technical innovation.

The designers in these cases were almost all in-house and hence had a continuous and regular collaboration with other functions in the company. Many of the new digital companies have invested in active based office solutions, with areas for play and social interactions. But also some of the companies in more traditional industries, interior, apparel (sportswear and workwear) we identified that the designers were contributing to process innovations alongside the traditional task of new product development. One of the interior companies invested in a design studio, which enabled a different relationship between the engineers and the designers, and way of collaborating. Both the workwear company and the union used the designer and artist to intervene and disrupt the way they used to work. For the workwear company this led to a change of rooms for product

development to enable more creative and innovative processes and for the union it led to a new way of recruiting members. This latter case we noticed was more artistically driven. With artistic we here mean that it includes aesthetic dimensions and visualizations, but also interventions, inspirations, and performances.

> *"It was insanely amusing to do the graffiti, something I'd never done before. You feel the uncertainty when you stand in front of a wall and do something semi-permanent. The you have three people behind you who are shouting, "come on!" and who want to push you further. That's a feeling I've taken with me into other new and demanding situations later on." From the union case.*

The roles we identified in the context of designers as process innovators are therefore from being creative culture curators to artistic driven interventionists.

Designers as social innovators

A last aspect that we want to highlight is a trend that the designer acts as social entrepreneur and driver for social innovation. Designers are challenging the traditional way of understanding the role of designers, how to act and why and where. Whereas already Simon (1969/1996) defined that design is about creating something better, the recent challenges in society has led designers to questioning how they can contribute to a better and sustainable society with a focus on the social aspect of sustainability. The role of the designers is then not only to create an aesthetic experience but also a humanistic experience in relation to society. To contribute to a better society, designers engage in different kinds of contexts and work with different actors.

Designers, as social innovators, are visionaries of what goes on in extra-organizational social contexts. When exploring the role of design for innovation it is also necessary to bring up the social contexts in which the designers have taken an increasing and larger role the last decade. It started to take off when service design was highlighted as a concept by for instance IDEO (Brown, 2008) and hospitals were one of the first areas where the skills and ways of thinking proofed to be valuable for innovation in the health care sector. This was, however, just the start for new segments in which designers could work. In this research project about the roles of designers for innovation we therefore could not disregard this trend and wanted to learn more about what role the designers indeed have for innovation in the social oriented contexts, not only public organizations but also private driven non-profit organization. We wanted to explore some not so traditional service design contexts and therefore include two social enterprise cases in this study. The cases were initiated in one case by a designer working at an architectural firm, in the other case by architects at an architectural firm. They organized collaboration between different partners and government bodies, who could have an interest of a project with the purpose of children's learning but also for the purpose of doing socially good. These projects were in both cases intended to be temporary projects and events. For the first architectural firm the project was however carried out once more in a social deprived area now in collaboration with the City Council and the schools in the area. The other architectural firm repeated the event for some years when seeing the value of the learning outcome.

"Design is at the service of local and social needs, while also serving as a community building and educative tool. Furthermore, it provides floor for multicultural, multidisciplinary experimentation bridging perspectives, knowledge and co-creative efforts."

In both projects the artistic methods and process of the designers played a crucial role to engage the participants. The outcome was in both cases learning in the first place, although expressed and articulated with different design objects that were displayed at the end of the events. The objective was not to create any commercial objects but to illustrate what the participants had learnt and could achieve. The roles we identified in the context of designers as social innovators we define as social driven artistic curators and pedagogues.

Summary of the roles

We summarize the different roles we identified in the context of product, process and social innovation in the figure 1 below. Here we highlight the designers' roles as linking the artistic method and process to the strategic level of the firm and the discovery phase of the Double Diamond model.

Designers integrate imagination – seemingly not totally realistically but still within the realm of what ought to be actually possible – in their visions. With such a synthetic schema of what ought to be possible, they are at odds with traditionally more scientific based practice. Therefore, involving designers in early phases of innovation processes, in the discovery phase, allowing them to be integrated into or even drive the strategic aspects of innovation work can therefore have significant impact on the organisation of innovation work as well as on the organization itself. This is stressed by earlier studies, but here we want also to stress the role that the artistic, aesthetic driven process has for strategic outcomes, regardless if it is a product or a process.

Tactical level is related to incremental innovations where designers are part of business development, which is also related to the early phases of innovation, discovery but especially the defining phase. The roles are similar to the roles on strategic level, but docking into the organizational planning and ways of doing business, not necessarily as provocateur. The role of the designer can be understood as the intrapreneur connecting the inner organizational functions and outer market challenges. The importance of being a listener, both to the market, users and the producers are equally important.

We therefore propose a simple typology based on the degree of innovation, radical or incremental – see Figure 2 below. Relating this typology to the design process as described in the Double Diamond model, we propose to look at this model from a hierarchical perspective rather than a linear one. In this perspective the discovery phase is related to the strategies of the company and radical innovation as these have strategic implications. Incremental innovation is about defining the task and is more on a tactical level. The latter phase of the design process is about the delivery and here the role of the designer is to produce visual documentations (see Figure 2 below).

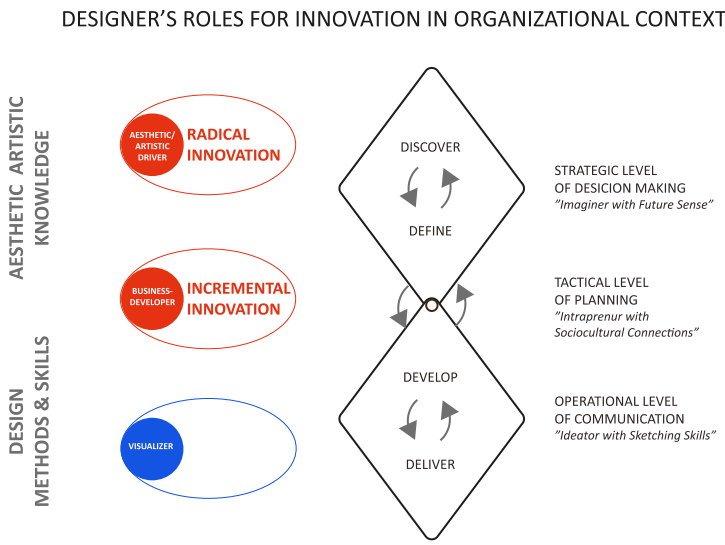

Figure 2 Designers' roles in relation to innovations on strategic and tactical level. There can be said to be three streams of research on design as innovation in organizational con¬texts, focusing: (1) on decision making, (2) on planning, or on (3) communication. The three streams of research can each be said to adhere to a specific focus of interest and not only a level of analysis. The levels of analysis with respect to the research streams can be said to be the strategic level of decision-making, the tactical level of planning, and the operational level of communication, respectively.

Conclusion

We have analysed twenty cases to illustrate the roles designers and designers' competence can have and can take in innovations, both in product and service innovations as well as in process innovations. The latter context is a growing field for design but also the traditional role in product and service innovation is essential for the growth of an economy as it strengthen companies' competitiveness globally. A radical brief to designers call out to the traditional imprint of designer as artist and an aesthetic. We therefore conclude:

Radical innovations are related to strategic level where designers are artistic and aesthetic drivers. The condition for designer with an artistic approach is to give space for designer in the early phases of development, i.e. the discovery phase. The potential of design is here understood also in the sense of performance, in addition to styling, form and appearance, also adding researching for the purpose of achieving sustainable solutions, i.e. that design is also purpose driven.

A designer turns the questions given and argues, "why" thinking in additional abstract dimensions departing from the aesthetic experience. Here the roles of being imaginers with future sense or provocateurs, challenging existing systems and prevailing knowledge are most importantly creating space for new fresh understandings of being. But also the capability to listen to the market, the users as well as the producer in order to understand what trends and socio-cultural tendencies are relevant and possible to utilize. The designer is not first Sherlock Holmes and then Picasso, but both at the same time. … The

pedagogical and communicative skills become important to make people understand the raison d'etre behind the innovation.

Future research

The last decade, with the development and expansion of new technologies in a speed not seen before, industries, public sector and society are changing. Klaus Schwab (2016) means that the changes are historic in terms of their size, speed and scope. This has an impact on the demands of design, alongside with designers' skills and competences. The roles of designers have expanded and the boarders of what is design are increasingly blurred. An interesting question for future research is not only more research of the roles of educated designers in different contexts, but also the consequences this has on the education of designers, not the least those with roots in product and industrial design. The cores of the designers' skills and competences, visualization, aesthetics, forms etc., will these still be part of the education or is digitalization taking over the traditional way of learning through prototypes and models by the hand? What impact will this have on our visual, aesthetic understanding of three-dimensional products that indeed still exist?

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HONG KONG DESIGN MANAGEMENT ACADEMY CONFERENCE 2017

RESEARCH PERSPECTIVES ON CREATIVE INTERSECTIONS

How design practices assist new venture teams in creating entrepreneurial opportunities

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doi: 10.21606/dma.2017.82

Research at the intersection of business and design has focused extensively on examining the importance of design for innovation. In this conceptual article, we explore the less considered topic of design for entrepreneurship. We start from the premise that there are similarities in the context in which designers solve problems and entrepreneurs create opportunities and that designers enact certain routinized ways of working that may enable the creation of entrepreneurial opportunities. The main contribution of this article is that we propose a conceptual framework and formulate six propositions depicting the ways in which design practices can enable three antecedents of successful opportunity creation: the ability to generate ideas, the ability to change opportunity beliefs, and the ability to take action.

keywords: design practices; opportunity creation; design; entrepreneurship

Introduction

In entrepreneurship practice, we have observed the rise of an interesting and important phenomenon: designer co-founded new ventures. The emergence of this phenomenon is evidenced by numerous examples of designer co-founded ventures that achieved exceptional business success. One of the most prominent examples of a company exhibiting success under the reign of a designer co-founded team is AirBnB, which was co-founded by two design graduates who met at Rhode Island School of Design: Joe Gebbia and Brian Chesky; and Nathan Blecharczyk, a technical co-founder with a degree in Computer Science. Through building an online peer-to-peer accommodation marketplace to connect hosts and travelers, AirBnB's founding team created an entrepreneurial opportunity that resulted in outstanding commercial success and a valuation of USD 30 billion (Newcomer & Huet, 2016).

The effectiveness of designer co-founded ventures is evidenced by a recent report which states, that 21% of startups across all sectors with a valuation exceeding one billion US dollars have co-founders who have embraced design or come from a design, arts, or human-centred background including architecture, design, music, visualisation, fine arts or media arts (Maeda, 2016). These developments have been recognized by actors in the startup ecosystem, and various support initiatives were established, such as specialized incubators and accelerators, educational programs for entrepreneurial designers and venture capital funds appointing designers to their management teams. Notable examples are Designer Fund, a venture fund specializing in startups co-founded by designers and 30 weeks, an incubator helping designers to transform into founders. But also more traditional actors in the venture capital sector have entered the space and appointed partners with design expertise: for example, John Maeda, former President of the Rhode Island School of Design with Kleiner, Perkins, Caufield and Byers and Irene Au, formerly heading design teams at Google and Yahoo, with Khosla Ventures.

Paralleling practitioner interest in exploring the intersection of design and business, interdisciplinary research involving the two fields has been embraced by academia. Especially innovation literature increasingly acknowledges that design can be an effective approach for innovating (e.g., Brown, 2008, Brown, 2009; Calabretta & Gemser, 2015; Brown & Martin, 2015; Kolko, 2015; Yoo & Kim, 2015; Verganti, 2013). Although there are many parallels between innovation and entrepreneurship (Bessant & Tidd, 2007) and even though the likely contribution of design for entrepreneurship has been suggested in the design literature (e.g., Gunes, 2012; Hirsch, 2012; Matthews, 2009; Matthews, Bucolo & Wrigley, 2011; O'Grady, 2012), research at the intersection of design and entrepreneurship remains underdeveloped, and insight on designers' contribution to entrepreneurship is lacking.

While there is prior practical and academic evidence that suggests that design and entrepreneurs' design expertise might play an essential role in entrepreneurship, there remain a wealth of unexplored aspects of the phenomenon offering an opportunity to study the processes enabling the phenomenon's emergence. This study takes a first step at discerning the possible contribution of design to entrepreneurship by examining how design practices can facilitate the successful creation of entrepreneurial opportunities.

Prior research suggests that designers engage in certain design practices ('ways of doing') for problem-solving that are distinct from more traditional problem-solving approaches (e.g., Calabretta & Gemser, 2015; Karpen, Gemser & Calabretta, 2017). Solving design problems and creating entrepreneurial opportunities both require individuals to navigate in situations characterized by uncertainty, ambiguity, and isotropy (Buchanan, 1992; Sarasvathy, 2001, 2008). These parallels suggest that routinized design practices not only aid designers in solving design problems but may also assist new venture teams in creating entrepreneurial opportunities. As a consequence, applying design practices might impact entrepreneurs' efficacy in developing entrepreneurial capability, which is defined as 'the ability to identify a new opportunity and develop the resource base needed to pursue the opportunity' (Arthurs & Busenitz, 2006, p. 199).

In this conceptual paper, we examine more in-depth how design practices might inform the successful creation of entrepreneurial opportunities. To do so, we build on extant

literature in the field of innovation and design (e.g., Calabretta & Gemser, 2015; Karpen, Gemser & Calabretta, 2017) and in the field of entrepreneurship (e.g., Alvarez & Barney, 2007; Gaglio & Katz, 2001; Sarasvathy, 2001; Sarasvathy, 2008; Sarasvathy et al. 2003). Following Alvarez and Barney (2007), we make a conceptual distinction between opportunity discovery and opportunity creation and propose that the enactment of design practices will be particularly useful for opportunity creation.

In what follows, we present the findings of our literature review and develop a conceptual framework depicting how design practices may be applied in opportunity creation. We propose several ways how the enactment of design practices might inform the ability to create opportunities and explain under which circumstances these design practices will be most effective. Finally, we discuss how our framework might be tested and explore its implications for future empirical studies on design in entrepreneurship.

Literature review

Perspectives on entrepreneurial opportunity

In the entrepreneurship literature, the ability to identify entrepreneurial opportunities is regarded as one of the most important abilities of entrepreneurs (Ardichvili, Cardozo & Ray, 2003) and in the past significant scholarly attention has been placed on the study of opportunity identification (e.g., Ardichvili, Cardozo & Ray, 2003; Gaglio & Katz, 2001; Eckhardt & Shane, 2003; Shane & Venkataraman, 2000). Some authors even argue that opportunity identification represents the most distinctive and fundamental of entrepreneurial behaviour (Gaglio, 1997; Kirzner, 1979; Stevenson & Jarillo, 1986; Venkataraman, 1997) and suggest that a better understanding of the ways in which individuals identify opportunities and exploit opportunities might distinguish the domain of entrepreneurship research from the domains of strategic management, economics, and other social science disciplines (Venkataraman, 1997). One of the fundamental questions in this line of research has been "why, when and how some people, and not others, discover and exploit opportunities" (Shane & Venkataraman, 2000, p. 218).

There is an ongoing debate among entrepreneurship scholars about classifying different ways in which opportunities are identified. For example, DeTienne and Chandler (2004) distinguish four ways in which opportunities are identified; active search, passive search, fortuitous discovery and opportunity creation. Another classification comes from Sarasvathy and colleagues (2003), who make a distinction between opportunity recognition, opportunity discovery, and opportunity creation. A simpler, yet popular distinction comes from Alvarez and Barney (2007), who distinguish between two opposing theoretical streams: opportunity discovery and opportunity creation.

According to Alvarez and Barney (2007), the opportunity discovery perspective and the opportunity creation perspective differ along three central assumptions. Firstly, both perspectives follow different theoretical assumptions concerning the nature of opportunities. While the opportunity discovery perspective assumes that opportunities exist independent of entrepreneurs, the opportunity creation perspective assumes that opportunities do not exist independent of entrepreneurs. Hence, there is a conceptual distinction between ‘discovering’ objectively existing opportunities; for example through offering new products and services to an existing market, and ‘creating’ opportunities, for

example through establishing entirely new markets by anticipating changing customer needs. Secondly, both perspectives follow different assumptions concerning the nature of entrepreneurs. While the opportunity discovery perspective assumes that entrepreneurs differ in some important ways from non-entrepreneurs and these differences exist ex-ante, the opportunity creation perspective assumes that entrepreneurs may or may not differ from non-entrepreneurs ex-ante, and that differences may emerge ex-post. This distinction has a fundamental impact on research design. While research following the opportunity discovery perspective often examines the individual entrepreneur as the unit of analysis, research following the opportunity creation perspective is rather interested in the processes entrepreneurs follow. Thirdly, each perspective follows different assumptions concerning the nature of the decision-making context. While the opportunity discovery perspective assumes that entrepreneurs make decisions in a decision-making context characterized by risk, the opportunity creation perspective assumes that entrepreneurs make decisions in a decision-making context characterized by uncertainty. While 'true uncertainty' presents itself as a phenomenon that is unmeasurable and is experienced in situations in which one lacks the necessary information to predict odds accurately, 'risk' has been defined as a type of uncertainty that is susceptible to measurement and is experienced in situations in which we can convert given information into an effective certainty (Knight, 1921).

Given the ontological assumptions of the two perspectives, we propose that the application of design practices can be effectively studied when assuming an opportunity creation context. Thereby, we will focus our theorizing on the opportunity creation perspective. In the opportunity creation perspective, entrepreneurial opportunities are defined as: (1) New ideas or inventions that may or may not lead to the achievement of one or more economic ends that become possible through those ideas or inventions; (2) Beliefs about things favourable to the achievement of possible valuable ends; and, (3) Actions that generate and implement those ends through specific (imagined) new economic artifacts (the artifacts may be goods such as products and services, and/or entities such as firms and markets, and/or institutions such as standards and norms) (Sarasvathy et al., 2003, p. 143). Given this definition of entrepreneurial opportunity, the application of design practices should help new venture teams to achieve three outcomes; (a) generate ideas or inventions; (b) change beliefs favourable to the achievement of possible valuable ends, and (c) take action to generate and implement these ends through (imagined) new economic artifacts.

In what follows, we will introduce the concept of design practices and discuss how certain design practices might be applied to the opportunity creation process and aid new venture teams to generate ideas, change beliefs, and take action.

Design and design practices

While design's growing contribution to business has been recognised (Liedtka & Ogilvie, 2011) and design thinking has become a 'hot topic' in the management literature (Brown & Martin, 2015; Kolko, 2015; Yoo & Kim, 2015), research exploring the potential synergies between design and entrepreneurship is relatively light and the specific contribution of the design process and designers role in entrepreneurship remain largely unknown. This is rather surprising, as design science has been influential on entrepreneurship theory

through the emergence of the opportunity creation perspective (Sarasvathy, 2003) and effectuation theory (Sarasvathy, 2001, 2008), which consider effectuation theory to be 'at heart a theory of design' (Sarasvathy, 2004, p.522). Opposed to other theories in the field, in effectuation theory firms are seen as artifacts (Simon, 1996), and thereby entrepreneurship can be studied as a science of the artificial (Sarasvathy, 2004). Sarasvathy (2004) further suggests 'the existence of a maker' (p. 529) who creates firms in a context of uncertainty where neither means nor ends are predetermined. Entrepreneurship, as seen from the perspective of effectuation and entrepreneurial opportunity creation, has many similarities to the context designers often navigate in when solving problems. Entrepreneurs often deal with situations closely related to a concept resembling a distinct sort of problems often addressed by designers and thereby well-grounded in the design literature: wicked problems (e.g., Buchanan, 1992). Wicked problems are a "class of social system problems which are ill formulated, where the information is confusing, where there are many clients and decision makers with conflicting values, and where the ramifications in the whole system are thoroughly confusing" (Churchman, 1967, p. B-141). In the opportunity creation perspective, entrepreneurial opportunities are created through abductive reasoning processes (Sarasvathy et al., 2003). Abductive reasoning has also been identified as a fundamental characteristic of design and design thinking (Dorst, 2011). Dorst (2011) refers to abductive reasoning as the answer to design challenges that require a reasoning mode aimed at creating value through identifying relevant means and working principles, neither of which are given at the start of the process. These concepts relate back to philosopher Peirce (1934) who distinguished between three reasoning modes: "Deduction proves that something must be; induction shows that something actually is operative; abduction merely suggests that something may be" (p. 171).

While research on the outcomes of design and design as a process or method for problem-solving in an organizational context has been around for a relatively long time, research on design practices and how these designerly ways of doing affect outcomes, is relatively recent (e.g., Calabretta, Gemser & Karpen, 2016; Karpen, Gemser & Calabretta, 2017). Karpen and colleagues (2017) studied how service design can be leveraged in organizations, and they proposed a capability-practice-ability portfolio, delineating firm-level capabilities, individual abilities and six interactive design practices that contribute to the strategic use of service design in organizations. According to Karpen and colleagues (2017), the application of design practices (i.e. actions) is enabled by individual's design abilities, which can be seen as conditions for such action. Further, designers' abilities and design practices are the foundations of firm-level design capacity.

We will use the design practices as identified by Karpen and colleagues (2017) to form the theoretical frame for this study as these design practices seem to cover a broad spectrum of designerly ways of doing. This list of design practices supporting our theorizing is illustrative, rather than exhaustive and allows us to illustrate how design practices can impact each of the three antecedents of opportunity creation.

The six design practices identified by Karpen and colleagues (2017) are the *practice of envisioning*, the *practice of representing*, the *practice of condensing*, the *practice of reframing,* the *practice of aligning with brand values* and the *practice of bonding*. The *practice of envisioning* (Karpen, Gemser & Calabretta, 2017) describes designers' efforts in

creating future scenarios and using these as departure points for developing design solutions and future experience settings. The *practice of representing* (Karpen, Gemser & Calabretta, 2017) describes designers' efforts in identifying and prioritizing the needs of relevant stakeholders, especially customers, giving primacy to human desirability over feasibility and viability considerations. The *practice of condensing* (Karpen, Gemser & Calabretta, 2017) describes designers' efforts in structuring, summarizing, and synthesizing information and thereby connecting the dots between important design elements. The *practice of reframing* (Calabretta & Gemser, 2015; Karpen, Gemser & Calabretta, 2017) describes designers' efforts to frame a problematic situation in new and interesting ways, by the adoption of new frames for interpreting the situation. The *practice of aligning with brand values* (Karpen, Gemser & Calabretta, 2017) refers to designers' efforts to align their design with brand values. The *practice of bonding* (Karpen, Gemser & Calabretta, 2017) describes designers' efforts in establishing a comfortable and relational psychosocial context for constructive interaction and ideation.

In what follows, we suggest that all six design practices may be applied by new venture teams and we make several propositions on how specific design practices might aid entrepreneurs to generate ideas, change opportunity beliefs and take action on an opportunity.

Conceptual model

The main contribution of this paper is that we propose six ways in which design practices can assist new venture teams to generate ideas, change opportunity beliefs, and take action. These three process steps originate from the opportunity creation literature (Sarasvathy et al., 2003) and can be seen as the antecedents of successful opportunity creation. We will theorize how exactly specific design practices can aid new venture teams in achieving these outcomes and successfully create entrepreneurial opportunities. As a result of our theorizing, we derive six propositions, which embody major points of departure for further empirical investigation. Figure 1 depicts a visual representation of our framework, and it summarizes how specific design practices are related to ideas, beliefs, and actions. Each of the design practices and their contribution to enable the ability to generate ideas, change beliefs, and take action will be discussed in detail in the following subsections.

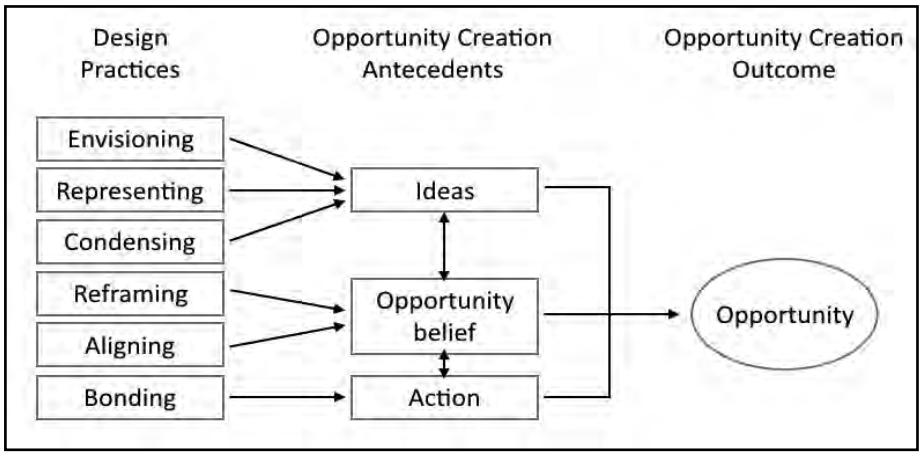

Figure 1 The impact of design practices on opportunity creation

Envisioning future scenarios

The *practice of envisioning* (Karpen, Gemser & Calabretta, 2017) describes designers' efforts in creating future scenarios and using these as departure points for developing design solutions and future experience settings. This practice relies on designers' ability to handle the unknown and complex; the ability to execute projects that are explorative in nature and contain much ambiguity, and uncertainty as regards to context factors and potential outcomes. Enacting this practice enables new venture teams to envision future scenarios, through which they can systematically generate a large number of ideas for new economic artifacts that feed into the opportunity creation process. Thereby, new venture teams will enlarge the volume of ideas that might be turned into entrepreneurial opportunities. These 'idea sets' have previously been described as the complete stock of entrepreneurial ideas – ranging from the 'spark' of an idea to fully commercialized ideas – a person has accessible in memory at any given time (Hill & Birkinshaw, 2009). Davidsson (2015) defines new venture ideas as imagined future ventures; i.e., an imaginary combinations of product/service offering, markets, and means of bringing the offering into existence.

By continuously broadening the volume and quality of their idea sets and new venture ideas, new venture teams actively lay the foundation to be able to identify potential future opportunities. Prior research has shown that individuals who can brainstorm many solutions to problems have a higher tendency to find the most innovative solution (Osborn, 1957; Proctor, 1995; Shepherd & DeTienne, 2005). Hence, we suggest that the *practice of envisioning* might not only serve new venture teams to generate a large number and variety of ideas, but it might also increase the innovativeness of these ideas and subsequently create more innovative entrepreneurial opportunities.

- **Proposition 1:** The *practice of envisioning* assists new venture teams to systematically generate a large number and variety of ideas, which aids in increasing the innovativeness of the resulting opportunities.

Representing customers and other stakeholders

The *practice of representing* (Karpen, Gemser & Calabretta, 2017) describes designers' efforts in identifying and prioritizing the needs of relevant stakeholders, especially potential users and customers, giving primacy to human desirability over feasibility and viability considerations. This practice relies on designers' ability to polysensorize; the ability to stimulate stakeholders engagement by providing different types of experiences. Enacting this practice enables new venture teams to identify and prioritize the needs of relevant stakeholders and thereby generate ideas for new economic artifacts. Changing one's viewpoint and seeing an idea from the perspective of customers or other stakeholders enables new venture teams to detect previously ignored aspects. Taking the perspective of a customer or other stakeholder groups can change the beliefs about things favorable to the achievement of possible valuable ends based on customer or stakeholder insights. For example, by taking the perspective of an extreme user of a product or service the *practice of representing* will aid new venture teams to take the perspective of this particular customer group to achieve deep customer insight and translate the specific requirements of this customer group into products and services that will satisfy the extreme needs of this customer group. According to Ardichvili and colleagues (2003) specific knowledge about customers, for example, knowledge of customer problems and knowledge how to serve customers, are important factors that influence the opportunity identification process.

- **Proposition 2:** The *practice of representing* assists new venture teams to see an opportunity from various stakeholder perspectives, which aids in generating ideas for new economic artifacts to satisfy stakeholder needs.

Structuring, summarizing and synthesizing information

The *practice of condensing* (Karpen, Gemser & Calabretta, 2017) describes designers' efforts in structuring, summarizing, and synthesizing information and thereby connecting the dots between important design elements. This practice relies on designers' ability to think through systems; the ability to focus on optimizing whole systems, including all relevant stakeholders and resources, rather than seemingly disparate parts thereof. Enacting this practice enables new venture teams to adjust their beliefs about a given idea based on newly accessible information and effectively communicate the information to key stakeholders. Enacting this practice enables new venture teams to navigate in situations of information overload. Prior research suggests that entrepreneurs often face situations that tend to overload individual's information-processing capacity and are characterized by high levels of uncertainty, novelty, emotion, and time pressure (Baron, 1998). Enacting this practice enables new venture teams to comprehend information better, which might lead to insight that would otherwise remain incomprehensible to the entrepreneur. Prior research has shown that comprehending information and making new associations between information is a central process underlying business opportunity identification (Mitchell et al., 2007; Shane 2000) and the *practice of condensing* might aid comprehension and trigger such new associations.

- **Proposition 3:** The *practice of condensing* enables new venture teams to structure, summarize and synthesize information, which aids in generating new

ideas by being able to comprehend information better and by making new associations.

Reframing problems into opportunities

The *practice of reframing* (Calabretta & Gemser, 2015; Karpen, Gemser & Calabretta, 2017) describes designers' efforts to frame a problematic situation in new and interesting ways, by the adoption of new frames for interpreting the situation. This practice relies on designers' ability to experiment; the ability to continuously learn and adjust from testing and playing with solutions toward desired scenarios, unhindered by fear of failure. Enacting this practice enables new venture teams to change their beliefs about a given idea through several ways and build opportunity confidence. Opportunity confidence is the result of an actor's evaluation of a stimulus, such as an external enabler or a new venture Idea, and the basis for the creation of new economic activity (Davidsson, 2015). Firstly, it enables new venture teams to run mental simulations and activates counterfactual thinking, which aids new venture teams to break existing means-ends frameworks and thereby impact on the opportunity identification process (Gaglio, 2004). Running mental simulations involves contrasting reality (what is or what was) with a mental image of what might have been or what could be (Sanna, 2000). Counterfactual thinking aids individuals in challenging assumptions, uncovering potential underlying causes, generating useful questions, or raising provocative hypotheses about causality and intervening antecedents (McGuire, 1997). Secondly, we suggest that enacting this practice can enable new venture teams to avoid the framing effect, a cognitive bias that leads individuals to rely on an initial frame of reference, even though this frame of reference might be inadequate (Tversky & Kahneman, 1986). Thirdly, we suggest that enacting this practice can enable new venture teams to develop veridical perception (Gunderson, 1990), which has previously been described as the willingness to challenge assumptions. Gaglio and Katz (2001) proposed that alert individuals who are impervious to framing effects might be more successful at identifying entrepreneurial opportunities. Finally, we suggest that the *practice of reframing* might lead new venture teams to reframe problems into opportunities by perceiving new patterns in the available information (Baron, 2006).

- **Proposition 4**: The practice of reframing assists new venture teams in reassessing problematic situations, which enables them to change their beliefs about an idea and reframe problems as opportunities.

Aligning with brand values

The *practice of aligning with brand values* (Karpen, Gemser & Calabretta, 2017) refers to designers' efforts to align the design of a product or service with deeper brand values. This practice relies on designers' ability to stimulate, facilitate, consolidate and reconcile existing as well as new brand stories across various contexts and stakeholder perspectives. Enacting this practice enables new venture teams to shape the belief that an opportunity aligns with the values of the brand, and most importantly reflects the values of customers and key stakeholders. Insofar, this practice informs the development of opportunity beliefs, which are known to be shaped by information, experience, and deeper values (McMullen & Shepherd, 2006). The more entrepreneurs perceive an idea as generally feasible and generally desirable, the more certain their belief that an idea constitutes an opportunity (Grégoire, Shepherd & Lambert, 2010). Creating alignment between the

deeper brand values and the values of customers in the target market will enable new venture teams to perceive an idea as feasible for the brand and desirable for customers and key stakeholders. Strong alignment will strengthen individuals' belief that an idea can develop into an opportunity that promises market success. On the other hand, enacting the *practice of aligning with brand values* offers new venture teams a screening mechanism by which potential opportunities that do not align with the deeper values connected to the brand can be abandoned and instead alternatives can be pursued.

- **Proposition 5:** The *practice of aligning with brand values* enables new venture teams to ensure that there is sufficient alignment between brand values and stakeholder values, which is necessary to create ideas that will resonate with the market and promise market success.

Bonding with stakeholders

The *practice of bonding* (Karpen, Gemser & Calabretta, 2017) describes designers' efforts in establishing a comfortable and relational psychosocial context for constructive interaction and ideation. This practice relies on designers' ability to empathize; the ability to sense and share another's thoughts, feelings, and experiences, and to react to and embed these into design processes or outcomes. Enacting this practices enables new venture teams to bond with key stakeholders and lay the ground to achieve the commitment of these key stakeholders to provide the resources necessary to take action on a specific opportunity and be able to create new economic artifacts. Enacting the practice of bonding can influence entrepreneur's ability to expand their social network by creating new ties and tapping into network members' social networks. Doing so will aid new venture teams to acquire new resources in the form of knowledge and stakeholder commitments (Sarasvathy, 2001). Individuals were previously found to be more likely to pursue entrepreneurial opportunities when they possess nonspecific human capital, general skills, and qualities, and an extensive social network (Lee & Venkataraman, 2006). As the opportunity creation perspective posits that an opportunity does not exist before an entrepreneur takes action on it, this step is crucial for opportunity creation.

- **Proposition 6**: The practice of bonding enables new venture teams to connect with stakeholders, which aids new venture teams to add new means to the venture and develop the necessary resources to take action on an opportunity.

Effectiveness and interaction between practices

Practices are by their very definition interactive and socio-culturally embedded, and they often stretch into a meso-organizational level, such as teams or departments (Karpen, Calabretta & Gemser, 2017). Also, practices can be individually performed, but they are collectively framed, shaped and manifested in contextual interdependencies (Warde, 2005). Thereby, when assessing the effectiveness of design practices for opportunity creation, it is crucial to relate the effectiveness of a given practice to the context (for example, individual or department/team) and take into account alternative practices that might effectively contribute to the opportunity creation process. For example, while a certain design practice might be effective when applied by an individual entrepreneur with a professional design background, other practices might be more effective when jointly performed in a multi-disciplinary team context. Such alternative practices might stem from team members' diverse professional backgrounds, they may vary drastically

between various founding teams and the degree of routinization may change over time, as "practices are skilful behaviours, dependent (as the term suggests) on practice until they become automatic" (Scheer, 2012, p. 202). Furthermore, to determine the effectiveness of specific practices for generating ideas, forming opportunity belief and inducing action, entrepreneurs will need to assess the relative effectiveness of each practice throughout the opportunity creation process. Thus, while we have previously discussed how each of the six design practices might inform the antecedents necessary to create entrepreneurial opportunity effectively, it is important to highlight that their effectiveness will likely be dependent on the context, the interaction between the six design practices and the interaction between design practices and alternative professional practices.

Discussion

In this article, we have delineated six design practices that enable new venture teams to influence three antecedents of successful opportunity creation; entrepreneurs' ability to generate ideas, change beliefs and take action. We have further proposed the mechanisms of how design practices inform these outcomes. The resulting conceptual model should be further explored through empirical research, for example through a qualitative study exploring if and how new venture teams apply the six design practices when they create entrepreneurial opportunities. It might be, that qualitative research might uncover additional design practices and mechanisms, which have not been part of our propositions. Furthermore, the conceptual framework could be further explored by studying new venture teams and allow for a comparison of the effectiveness of design practices, when applied by entrepreneurs with a design background, as compared to entrepreneurs with another professional background. Further promising research avenues are to explore the interplay between design practices and the interplay between design practices and non-design practices.

Previously, we suggested that design practices are particularly effective when departing from the assumption that opportunities are created rather than discovered. We are aware that this fragmented view on the opportunity literature has received some criticism and we support recent attempts to synthesize the various theory streams, most notably by Davidsson (2015). However, to shed light on the appropriateness of our assumption, we deem it necessary that scholars examine this assumption empirically, for example by investigating if new venture teams describe their experience of the opportunity identification process as a process of discovery or creation. One could then enquire about the perceived effectiveness of design practices and discern if the effectiveness of design practices might be linked to either mode of opportunity identification. In practice, we might find entrepreneurs who apply design practices for opportunity discovery. It requires empirical research to discern if applying design practices to the task of opportunity discovery indeed is less effective, or if it even might have a negative effect through accruing the opportunity cost of foregone benefits of applying alternative and potentially more effective practices to discover opportunities.

In the greater context of studying design's contribution to entrepreneurship, we suggest exploring the topic on a team or project level and study the agents who might apply design practices for the benefit of entrepreneurship. To do so, we suggest studying case studies of designer co-founded new venture teams as a research subject. Studying

designer co-founded new venture teams might give revealing insights into the professional use of design practices to create entrepreneurial outcomes. For example, it would be interesting to study more in-depth under which circumstances founders with and without a professional design background use specific design practices and how the application of these design practices results in entrepreneurship outcomes.

Conclusion

Our intention in this article was to take the first step in the pursuit of advancing knowledge on the contribution of design to entrepreneurship by proposing new relationships between concepts originating in the design and entrepreneurship literature. We did so by theorizing on the application and impact of design practices to the opportunity creation process of new venture teams. We have made two major contributions that might lead to better understanding how designerly ways of working can inform entrepreneurship scholarship. Firstly, we have integrated literature on design and entrepreneurship, and by doing so, we have uncovered some similarities and shared assumptions in the two literature streams. We have found that the opportunity creation perspective lends itself well to study design concepts in an entrepreneurship context. Acting in the face of uncertainty, ambiguity, and isotropy and employing an abductive reasoning mode for problem-solving are shared properties of creating entrepreneurial opportunities and solving complex design problems. Secondly, we have proposed six design practices that can be applied to the opportunity creation process. We have accordingly formulated six propositions how enacting design practices might influence entrepreneurs' ability to generate ideas, change held beliefs and take action. All of these are necessary antecedents of opportunity creation, and we suggest that applying design practices might aid new venture teams in creating entrepreneurial opportunities.

From a practical point of view, our research offers insights for design professionals who consider to 'take the plunge' and venture out on their own or as part of a team. Firstly, our theorizing can aid both, design and entrepreneurship practitioners, to better understand the similarities between the context of professional designers and the context of entrepreneurs. And secondly, our propositions give design practitioners an indication on how their professional practices may inform the opportunity creation process and consequently, how their ways of working may be useful when starting a new venture.

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HONG KONG DESIGN MANAGEMENT ACADEMY CONFERENCE 2017

RESEARCH PERSPECTIVES ON CREATIVE INTERSECTIONS

From Design Management to Strategic Design Management: Triggers, Enablers and Challenges in Building Strategic Design Management Capabilities

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doi: 10.21606/dma.2017.102

Conflicting with heightened awareness about design's strategic role for businesses, research is lacking about methods and tools to guide designers and organizations in building strategic design management capabilities, as well as about the development of these capabilities in organizational contexts. This paper aims to provide important perspectives concerning these issues in two major ways. First, it presents the development of a new Design Management Audit Framework (DMAF) that aspires to identify and accommodate new capabilities and responsibilities that are necessary to support the changing and broadening context and roles of design. Then, the paper discusses the triggers, enablers and challenges in moving from design management to strategic design management practices in organizational contexts, based on the results of 3 in-depth case studies, which have utilized the new Design Management Audit Framework to carry out a comprehensive design management audit process inside these organizations.

keywords: strategic design management; design management audit; case study; capabilities

Introduction

As indicated by academic researchers, design practitioners, as well as commentators and authors at the intersection of design and business, there is an increasing integration of

design into business strategies and innovation processes of businesses from various scales and industries (Brown, 2009; Brunner, Emery & Hall, 2009; Danish Design Centre, 2003; Gemser & Leenders, 2001; Martin, 2009). However, it is also acknowledged that solely investing in design or engaging in design activities is not sufficient to ensure that design contributes to organizational goals and generates the desired business outcomes. Theoretical and empirical studies reveal design management to be the mediating factor that determines the effectiveness of design projects and how design plays a role in improving business performance (Bruce & Bessant, 2002; Chiva & Alegre, 2007, 2009; Dumas & Mintzberg, 1989; Gorb & Dumas, 1987). Consequently, the development of design management capabilities is a critical organizational learning and capability building process, for firms that aim to turn design into a strategic resource for their organization.

On the other hand, a review regarding recent literature in the design management field reveals that design is undergoing a transition in the ways it is used and managed inside organizations. While the more traditional roles for design inside businesses have been largely limited to the design and development of products and services, especially over the last decade, the roles for design have broadened towards more upstream activities and responsibilities concerning the overall business context, strategy and organization. Designers and designerly methods are now increasingly being called on to contribute in restructuring and shaping company strategy, brand strategy and communications; formulating new or improved business models and visions; as well as in driving organizational change and strategic renewal (Deserti & Rizzo, 2013; 2014; Lee & Evans, 2012; Lockwood, 2011; Buchanan, 2008; Junginger, 2008; Smith, 2008; Ravasi & Lojacono, 2005; Borja de Mozota, 2003; Turner, 2013). On the design practice side, we see that an increasing number of design consultancies around the world (e.g. Frog, IDEO and Continuum) have extended their services to strategic services such as brand strategy, technology strategy, innovation strategy, and business design, in order to strengthen the connection between business needs and user needs (Sanchez, 2006; Weiss, 2002). These developments provide significant indications regarding how design capabilities can also participate in the discovery and decision making processes in connection to the business context (Weiss, 2002).

As a result, the contemporary outlook calls for more participative and interactive roles and widened responsibilities for designers and design managers, particularly in the context of strategic decision making processes in organizations. This also points to the growing need to handle design efforts, corporate goals and strategies in a more unified manner, which has long been highlighted by the design management literature under the concepts of *strategic design* and *strategic design management* (Borja de Mozota 1998; 2003; Er, Er & Özcan, 2005; Hertenstein & Platt, 1997; Lorenz, 1994; Holland & Lam, 2014; Calabretta, Gemser & Karpen, 2016).

Consequently, as organizations focus on acquiring or improving their design management capabilities, they often recognize that they have to build more strategic skills in managing design. In order to transform design into a strategic resource, they feel the need to expand their design management processes from project level and functional level tasks to strategic level design management activities, that is, "using design management to drive and implement corporate strategic goals" (Holland & Lam, p.3). Yet this is not an easy task, with little research and guidance regarding how to develop and establish these

skills. Despite the mounting literature highlighting the significance of strategic design management, there are important gaps in our body of knowledge concerning these practices. Research is lacking on many important issues such as: strategic level design management capabilities residing inside organizations, how companies make the transition from carrying out project level design management to building strategic level design management capabilities, how these capabilities are developed over time, as well as the enablers and barriers businesses encounter throughout their development.

This paper aims to provide important perspectives regarding these issues, based on 3 in-depth case studies, which utilized a new *Design Management Audit Framework* to carry out a comprehensive design management audit process inside the organizations. Different than existing tools, the new *Design Management Audit Framework* allows for a detailed examination of not only project or organizational level design management capabilities, but also the strategic level capabilities in managing design and how design efforts are linked to business strategies. The case studies also put considerable emphasis on the development of these skills over time, in order to understand triggers, enablers and barriers in the building of these capabilities.

The paper begins by presenting the theoretical review undertaken to assist the development of the new audit tool and continues by introducing the Design Management Audit Framework. Later, the paper explains the details of the case study research, the rationale for the selection of cases and methods utilized in data collection and analysis. Then, major results of the case studies are presented regarding triggers, enablers and barriers in the development of strategic design management capabilities. Finally, the paper ends with the study's conclusions.

Theoretical Review for the Development of the New Design Management Audit Framework

An initial review of existing tools and frameworks for assessing design management capabilities revealed that they fall short in catching up with the transition that has been undergoing in the ways design is utilized and managed inside organizations. Therefore the major question in the development of a new design management audit tool was: How can design management capabilities be assessed with an up to date consideration, particularly incorporating design management capabilities at the strategic level? With this research question, it was intended to come up with a comprehensive design management assessment framework that incorporated design management capabilities that are integral to the linking of design activities with strategy, business context, and organizational goals, as well as to update existing tools to include capabilities that are becoming increasingly critical to support the emerging contexts and needs for design.

The following sub-sections briefly present the review and synthesis of existing literature in design, design management and strategic management, in addition to a comparative analysis of existing design management frameworks and audit tools[112].

[112] A more detailed account of the theoretical basis of the Design Management Audit Framework can be found in the Ph.D. thesis of the author (Topaloğlu, 2016) and the paper presented in another conference (Topaloğlu & Er, 2017).

Evolving Design and Design Management Literature

A review of the evolving design and design management literature informed the development of the new audit tool by providing a comprehensive understanding about how the discourse in design and design management literature advanced with respect to the roles and contributions of design inside organizations. Additionally, it helped to delineate the breadth of activities, processes and notions that require a consideration in managing design.

The earlier literature predominantly specified the roles of design with respect to areas of actual design practice, depicting design's direct role in the creation of products and services, organizational environments, communications and corporate identity (Blaich & Blaich, 1993; Cooper & Press, 1995; Kotler & Rath, 1984; Lorenz, 1986; Walsh et al., 1992). Accordingly, in this context, design management was largely confined to the management of specific design projects with the objective of ensuring their successful execution.

Yet, over time, scholars began to center more and more on the role of design in the context of critical organizational processes, such as production, new product development (NPD) and innovation. They revealed other significant roles of design for the organization such as: speeding up product development and providing efficiency in production processes (Walsh et al. 1992; Trueman & Jobber, 1988); understanding user needs and making new connections between technology and these needs (Borja de Mozota, 2003; Veryzer & Borja de Mozota; 2005); integrating, coordinating and communicating between different departments and functional specialists (Borja de Mozota, 2003; Cooper & Press, 1995; Lorenz, 1986; Trueman & Jobber, 1998; Walsh, 1996; Walsh et al. 1992); and design's leading roles in major organizational processes like NPD and innovation (Perks et al., 2005; Utterback et al., 2006; Verganti, 2008, 2009; Veryzer, 2002; Von Stamm, 2003). For the design management field, these perspectives demanded a focus on developing new methods and capabilities to guide the design and development process, to improve the collaboration between different functional groups, and to assist the generation of a supportive environment for design and innovation to flourish. These expanded the focus of design management scholars from project level to organizational level tasks and responsibilities.

On the other hand more recent research depicts design's increasing roles in the context of defining company strategies, supporting strategic decision making inside businesses and guiding organizational change and strategic renewal. Studies reveal that designers and design methods are being invited to contribute to strategy formation and decision making, in order to provide ideas about business possibilities, new directions and opportunities that can inspire and shape strategy (Chung & Kim, 2011; Francis, 2002; Sanchez, 2006; Weiss, 2002). Even a quick glance at the latest articles in major design and design management journals especially since the 2000s, reveals the increasing discussion of design with respect to its role in tackling with wider business and management challenges that are beyond the traditional boundaries of design. These considerations under the notions of *design thinking* (Brown, 2005, 2008, 2009; Liedtka & Ogilvie, 2011; Martin, 2009) *design attitude* and *managing as designing* (Boland & Collopy, 2004) suggest that the introduction of design approaches, methods and *designerly ways of thinking* (Cross, 2007) to management thinking and routines can significantly improve the current shortcomings of management practice; boost innovation in business models, processes

and outcomes; and guide change and transformation. Accordingly, design management literature is increasingly placing emphasis on the role of design in informing, influencing, shaping strategies, visions and business models, as well as its role in leading organizational change and renewal (Buchanan, 2008; Borja de Mozota, 2003b; Deserti & Rizzo, 2013; Junginger, 2008; Lee & Evans, 2012; Lockwood, 2011; Muratovski, 2015; Ravasi & Lojacono, 2005; Smith, 2008).

Therefore, recent perspectives depict a significant shift taking place in the way design is utilized inside organizations and how this requires new roles and capabilities for designers and design managers in terms of strategy and decision-making processes. As a result, it can be concluded that beyond the management of design projects, new roles regarding taking part in informing and shaping corporate strategy, in addition to establishing the connection between design activities & resources and corporate objectives & strategy, emerge among the primary and fundamental responsibilities under design management (Best, 2006; Cooper & Press, 1995; Cooper et al., 2011; Er, 2005; Turner 2013). Therefore an updated tool for auditing design management capabilities need to integrate these important capabilities inside its array of skills.

An Analysis of Strategic Management Literature and Implications for Design Management

As highlighted in the previous section, as the role of design in strategy becomes more emphasized, it becomes more critical to understand strategy and strategic management concepts and perspectives and analyze their implications for design management.

In essence, strategy is concerned with the "long term prosperity" of the organization (Pearson, 1990, p. 21). It aims to answer major questions about the ends an organization seeks and what it should do to attain these results. Despite the multiplicity of distinct schools and perspectives, the literature in strategic management revolves around two main groups of thought: the Market Based View (MBV) (Caves & Porter, 1977; Porter, 1980, 1985), also referred to as the outside-in view, and the Resource Based View (RBV) (Barney, 1991; Penrose, 1959; Peteraf, 1993; Wernerfelt, 1984) or the inside-out view. These two theoretical perspectives provide alternative approaches to explaining the source of competitive advantage, and therefore strategy making for firms.

Emerging in the 1980s, the MBV puts weight on external conditions that characterize the industry, as the major sources of competitive advantage for firms. Scholars of the MBV argue that strategy starts with a thorough analysis of industry conditions and based on this analysis, it involves determining a profitable product-market position - cost leadership, differentiation or focus (Porter, 1980; 1985) -, and then, directing all organizational efforts to attaining and sustaining that position. Especially the early literature in design management has considered the relationship between design and strategy largely through the lens of the MBV. In this context, scholars mostly elaborated on how design can be used in terms of key generic strategies suggested by Porter (1980, 1985) and discussed the role of design in reference to the specific requirements of differentiation, cost leadership and focus strategies (Bruce & Bessant, 2002; Cooper & Press, 1995; Kotler & Rath, 1984, Lorenz, 1986, 1994; Walsh 1996; Walsh et al., 1992). As a result, from this perspective, design management focuses largely on the direct and tangible contributions of design with respect to products, communications, identities and

environments, and how these processes and projects can be executed in the light of the chosen product market position. Consequently, MBV brings the emphasis more on the project level tasks in managing design.

On the other hand, scholars of the RBV take an inward looking stance, and consider firm-specific, unique, hard to imitate and hard to substitute resources and capabilities as the main sources of competitive advantage for firms. The enterprise is viewed as a bundle of tangible and intangible resources and capabilities, among which some can constitute the firm's distinctive or core competencies (Amit & Schoemaker, 1993; Barney, 1991; Grant, 1991; Prahalad & Hamel 1990; Wernerfelt, 1984). These capabilities are developed over long periods of time through firm specific learning processes. Therefore, they are not easily traded or imitated, presenting a more lasting competitive advantage for the enterprise. Since the 1990s, RBV has gained increasing popularity and diffused rapidly throughout the strategic management literature (Mahoney & Pandian, 1992; Priem & Butler, 2001).

Other important concepts and perspectives originated in relation to the RBV, such as: dynamic capabilities (Helfat et al., 2007; Teece et al., 1997), organizational learning (Crossan & Berdrow, 2003; Nelson & Winter, 1982), the learning organization (Senge, 1990), knowledge creation (Nonaka & Takeuchi, 1995) and the knowledge based perspective (Grant, 1996a, 1996b; Kogut & Zander, 1992). By turning the focus of strategy, from planning of responses to external market conditions, towards identifying and building valuable internal resources and capabilities, the RBV aligns itself with a more dynamic approach to strategy making. It encourages strategic management to focus on developing distinctive competences (such as, fast product development cycles, superior process and product design, or advanced customer service) in order to create long-lasting sources of competitive advantage.

The influences of the RBV can be observed especially inside the more recent design management literature. Particularly since the late 1990s, design and design management capabilities are increasingly linked to the core notions of the RBV, and explored as strategic resources (Borja de Mozota, 2003; Svengren-Holm, 2011), core competencies (Borja de Mozota, 2003; Svengren-Holm, 2011), and dynamic capabilities (Jevnaker, 1998). Jevnaker (1998) relates design and design management capabilities to the RBV, and specifically elaborates on design management capabilities inside the dynamic capability perspective (Teece et al., 1997). Similarly, rooting her discussion in the RBV, Borja de Mozota (2003) analyzes design as a resource; as knowledge, as a source of organizational change and as a core competency. In this discussion, the management and integration capabilities for design emerge as essential capabilities, in order to turn design into a core competency. Therefore, when considered from this perspective, design management emerges as the administration of design as a learning process; a fundamental capability for organizational knowledge creation (Nonaka & Takeuchi, 1995); and a dynamic capability (Teece et al., 1997) that renews and reconfigures design capabilities, "regenerating both the products and the company" (Borja de Mozota, 2003, p. 160).

Additionally, this approach recognizes design's role not only in the creation of more direct and tangible outcomes, but also in the coordination and development of other significant organizational processes, capabilities and core competencies, such as those related to

rapid NPD, design-driven innovation, unique service provision, the creation and development of a creative organizational culture, as well as design's role in strategy formulation, organizational learning and organizational change.

Through this analysis, it is concluded that some important implications of the RBV in terms of design management tasks and responsibilities can be inferred as:

- focusing on the integration of design with other business processes and capabilities to generate core competencies,
- continual nurturing of design skills and resources,
- ensuring design's participation in strategic management processes,
- focusing on the integration of outside knowledge through design research capabilities to feed into innovation processes,
- and the generation of a culture and environment supportive of learning as well as design.

A Review of Existing Design Management Audit Tools and Frameworks and Identification of Major Gaps

Assessment of design and design management capabilities possessed by businesses is a significant subject, valuable for both academic research and business practice. In the most basic sense, the assessment of these capabilities enables businesses to review and discuss how the organization handles design activities and decisions, and to evaluate design processes and outcomes, as well as their effectiveness (Best, 2006; Cooper & Press, 1995). The audit process establishes awareness about existing routines and shortcomings, and opens up a path for improvement and change. Moreover, these tools and frameworks are also used for research purposes, to explore existing capabilities in organizational, industrial and national contexts, and to understand problems, as well as conditions facilitating good practices in design and design management (See Dickson et al., 1995; Heskett & Liu, 2012; Moultrie et al., 2006; Koostra, 2009; Storvang et al., 2014). Scholars commonly refer to these tools and frameworks under the term *design audit* (Best, 2006; Cooper & Press, 1995), as a broad heading to cover audits regarding every possible area related to design and its management inside an organization.

In essence, audits are formed of a list of questions that provide the foundations for "an in-depth analysis of a particular area of importance to the corporation" (Cooper & Press, 1995, p. 190). Inns (2002) explains that the audit process is similar regardless of the subject area; it begins with the identification of areas and activities to be examined; continues with the determination of relevant stakeholders; and using questioning, observation and research methods, assesses the quality and performance of the activity under focus. This is followed by analysis of the results in order to offer recommendations and directions for change (Inns, 2002).

Table 1 indicates existing design audit tools and design evaluation frameworks that were reviewed and analyzed to inform the development of the new design management audit framework.

Table 1 Existing design and design management audit tools and evaluation frameworks.

Tools	Author

Corporate design sensitivity and design management effectiveness audit	Kotler & Rath (1984)
Self-assessment of design management skills	Dickson et al. (1995)
The Design Atlas	Design Council (1999)
The Design Ladder	Danish Design Center (2001)
Design audit tool for evaluating design performance in SMEs	Moultrie et al. (2006)
Design Management Staircase	Kootstra (2009)
A model for design capacity	Heskett & Liu (2012)
Design Capacity Model	Storvang et al. (2014)

Among these, except for the Design Ladder by the Danish Design Center (2001), which is suggested only "as a tool for rating a company's use of design", all the other tools either completely target design management capabilities, as in the case of Design Management Effectiveness Audit by Kotler and Rath (1984), Design Management Staircase by Kootstra (2009) and Design Capacity models by Heskett and Liu (2012) and Storvang et al. (2014); or encompass important dimensions regarding design management, as in the case of Design Atlas (Design Council, 1999). Some of these tools are in the form of short self-assessment questionnaires, such as Design Management Effectiveness Audit (Kotler & Rath, 1984), and design skills assessment tool (Dickson et al., 1995). Some are more visual and aim to provide an instant characterization of design management without much concern for a detailed evaluation, such as Design Capacity models by Heskett and Liu (2012) and Storvang et al. (2014). Yet others are more structured and comprehensive, such as the Design Atlas (Design Council, 1999) and Design Management Staircase (Kootstra, 2009), allowing for an extensive and systematic review of design and design management capabilities. However, taking into consideration the inferences and arguments put forward in the previous sections, existing tools are found missing in several respects.

As revealed in the previous sections, design management field has evolved from being concerned solely with the organization and management of design projects and corporate wide design activities, to include more upstream activities, skills and responsibilities that emphasize the integration of design strategies and processes with organizational goals and business strategy. Yet existing tools and frameworks are somewhat lacking to provide a satisfactory approach to frame and evaluate design management capabilities that specifically focus on establishing the link between the business context, organizational goals, and company strategies, and the way design is organized, managed and utilized inside organizations.

Secondly, although the literature highlights attaining a higher level of design integration inside the organization among the most critical conditions for effective design management (Borja de Mozota, 2003; Bruce & Bessant, 2001; Dumas & Mintzberg, 1989; Stevens et al., 2009; Topalian, 1990; Turner, 2013), existing tools and frameworks do not provide a way to evaluate design integration inside organizations, such as: design's level of coordination and communication with other business functions and processes; the extent

of design activities carried out in different fields, or the level of coordination and coherence between design activities in different domains.

Another critical point is that in the current business context the significance of creativity and knowledge has long been established. This in turn underlines knowledge creation, integration of outside knowledge and organizational learning as extremely critical capabilities for businesses in the generation of competitive advantages. Yet existing tools and frameworks do not provide any dimension concerning how outside knowledge is acquired and integrated in the context of design, for example through processes such as design research, or the establishment of idea and information networks (except for some focus to this issue in Moultrie et al. (2006) in the context of requirements capture through user and competitive research). Neither do they provide a way to review how design and design management capabilities are advanced and renewed inside the organizations, which are highly significant capabilities in connection to organizational learning.

A New Design Management Audit Framework

In order to fill the gaps that were identified and summarized in the previous section and to update existing tools based on new research and perspectives provided by the evolving literature, a new *Design Management Audit Framework (DMAF)* is developed, which is presented in Table 2 in its brief form.

Design Management Audit Framework consists of 9 major dimensions, in other words capability categories, which altogether define a company's design management capability. These are:

1. Design in Strategy
2. Planning for Design
3. Investments for Design
4. Design Processes
5. Design Organization
6. Research for Design
7. Training and Development for Design
8. Design Integration
9. Culture and Climate for Design

Each capability category further comprises of 2 to 6 items that represent the most significant activities or skills under each category, generating a total of 31 items for reviewing design and design management capabilities inside an organization.

Although with some differences, the 5 categories of Planning for Design, Investments for Design, Design Processes, Design Organization, and Culture for Design, largely overlap with the dimensions included in the Design Atlas (Design Council, 1999) and the Design Management Staircase (Kootstra, 2009) frameworks and constitute the more typical and acknowledged dimensions under design management. Yet the other 4 categories, Design in Strategy, Research for Design, Training and Development for Design and Design Integration, and the respective items under each, are devised to address the aforementioned gaps and are proposed as significant skills and activities that must be included inside an up to date and comprehensive design management system.

Additionally, as part of the Design Management Audit Framework, an assessment scale is developed based on the process maturity principle, in the form of a 4 level maturity grid, similar to the approach utilized by the Design Atlas (Design Council, 1999), Design Management Staircase (Kootstra, 2009) and the design audit developed by Moultrie et al. (2006). Table 3 presents the assessment scale for the capability category Design in Strategy.

Table 2 Design Management Audit Framework (DMAF).

Key Capability Categories	Major Questions
1. Design in Strategy	
Strategy Formulation Process	How effective is the business in strategy formulation? How are strategies formulated in the organization?
Strategic Planning Process	How effective is the business in planning its activities? Are strategies turned into business plans? How is the planning process carried out?
Strategy and Planning Communication	Are business strategies, goals and plans communicated effectively within the organization?
Design in Strategy	Is design included in strategy formulation? How is design positioned inside business strategy and objectives? Is there a defined design strategy?
Design's Input to Strategy Formulation	Is there any form of design/designer/design thinking input in the strategy formulation process? Do design managers or designers contribute to the shaping of business strategy and design objectives?
2. Planning for Design	
Design Planning	Does the business carry out design planning? If yes, how is this done; what types of evaluation and objectives guide the design planning process?
Design Planning Horizons	How far into the future does the organization think when planning for design?
Design Policy and Principles	Is there a formal/established corporate design policy or major notions that guide design? Are there defined design principles?
3. Investments for Design	
General Budget Allocation	Does the business carry out its budget allocation in a structured manner?
Design Budget Allocation	Does the business allocate budgets to design activity? If yes how are decisions regarding design budgets made? Does the business utilize any methods to guide design budget allocation decisions?
4. Design Processes	
General Process Awareness	Does the business identify its activities as processes?
Design Process Awareness	Are design processes recognized and defined inside the organization and in connection with other processes? (ex: design in NPD, marketing, corporate communications)
Design Process Management	Does the business have structured processes for design project management and monitoring? (Time plans, review meetings, documentation, brief formats, cost monitoring)
Design Process Thinking, Methods & Tools	How do design projects/activities proceed? Are structured methods, techniques and tools utilized during design processes? (Research, Concept generation, Design development, decision making tools, evaluation of concepts)

Legal Processes for Design	Does the business ensure the legal protection of design based intellectual rights? How is this process managed?
Design Evaluation Processes	Are there structured procedures for evaluating design? (both pre-launch and post-launch, the success of design projects, the contribution of design to profitability, ROI, effectiveness in market?
5. Design Organization	
Design Management Responsibility	Does the business have an assigned management responsibility for design?
Design Skills	Does the business have the necessary skills to carry out design activities? Does the business have a design function? Does it utilize outsourced design capabilities?
Organizing for Design	Does the business effectively organize its (in house and/or outsourced) design activities?
6. Research for Design	
Design Research Programs and Resources	Does the organization carry out design research activities or utilize resources to inform design? (user needs and requirements, market research, user research, demographic and social trends, future trends, lifestyle research, technology, competitors)
Information and Idea Networks	Are there established information and idea networks for design?
7. Training and Development for Design	
General Training and Development	Does the organization carry out training and development programs for its employees?
Nurturing Skills and Creativity of Design Related Personnel	How does the organization nurture the skills, knowledge and creativity of design related personnel/in-house design staff?
8. Design Integration	
Coordination and Communication with Other Business Functions, Strategies and Processes	Are there effective structures and processes for communication and coordination between design and other business functions?
Role and Place of Design	Which processes does design contribute throughout the organization? When does design get involved in these processes? When do design processes start?
Breadth of Design (Design Activities Undertaken in Different Areas)	What are different design activities undertaken throughout the organization?
Coherence and Coordination Between Different Areas of Design	If design is undertaken in different design fields, is there coordination and coherence between design activities undertaken in different areas?
9. Culture and Climate for Design	
Design Awareness & Understanding of Senior Management	Do senior managers have a broad understanding and awareness about how design contributes to the organization?
Design Commitment of Senior Management	How committed are senior managers to design?
Design Attitudes of Employees	How positive are the attitudes to design among the employees?
Environment for Creativity	Is there an environment supporting creativity? Do managers encourage creative experimentation and design?

Table 3 Assessment scale of the Design Management Audit Framework for the capability category Design in Strategy.

	Level 1	Level 2	Level 3	Level 4
Strategy Formulation Process	There is no strategy formulation process.	Strategy understood as setting a few conventional performance targets without the formulation and evaluation of strategic options, no clear, guiding strategic visions.	Business strategies are developed, however with a limited analysis of internal & external factors and strategic options, and the process is not regular and structured.	Business strategies are developed through a structured process, and a detailed analysis of internal and external factors (trends, technology) and promising strategic options.
Strategic Planning Process	There is no business planning process.	Planning is carried out in a limited and unstructured way in a few business areas/functional departments.	Business strategies are turned into detailed business plans in several business areas/functional departments.	Business strategies are turned into business plans through a detailed and structured planning process in all business areas/functional departments, planning is an organization-wide approach that drives the business.
Strategy and Planning Communication	Strategy and business goals and plans are known only by few key individuals.	Business strategies, goals and plans are communicated in an unstructured way to senior management.	Business strategies, goals and plans are communicated in a structured way to senior management but there are problems in their communication to lower levels.	Business strategies, goals and plans are communicated in a structured way, with all company staff receiving relevant information and being updated.
Design in Strategy	Design is not part of strategy formulation or business plans.	Design is sometimes articulated as part of strategies and business plans of other areas like marketing and new product development but as individual projects.	Design is integrated into company strategy and business plans, but under marketing or new product development strategy.	Design is part of company strategy and business plans with a clear design vision, objectives and planning for design, design strategy is linked to other business processes and corporate objectives in various areas.
Design's Input to Strategy Formulation	There is no input from design to strategy formulation or business planning.	Designers and design managers indirectly contribute to strategy and plans through their interaction with key individuals and senior managers.	Designers and/or design managers contribute to strategy and plans however in the lower levels of marketing strategy or design strategy formulation.	Design managers and/or design staff contribute to strategy formulation by taking part in the company's strategy formulation process through structured meetings and processes.

Details of the Case Study Research

Using the DMAF presented in the previous section, the case studies aimed to explore the scope and nature of design management capabilities in organizational contexts, with a

specific focus on design management capabilities at the strategic level. Other major objectives were to understand the triggers that stimulate businesses to develop strategic design management capabilities, and the barriers and enablers encountered throughout their development.

Selection of Cases

In the light of abovementioned objectives, the fundamental concern in the selection of cases was to choose cases that offered the greatest possibility for learning. This condition meant that the companies did not simply use design, but that they showed a discernible and consistent emphasis on design use in connection to their business strategies.

The empirical context was decided to be specified as the Turkish ceramic sanitary ware industry based on two major factors. The first is that this industry is one of the first industries in Turkey to begin the acquisition of design and design management capabilities. Secondly, beginning with the mid 2000s, several firms from the industry have been observed to initiate major strategic renewal processes that involved the integration of design into their corporate strategies, an increasing focus on the development of design management skills and a noticeable intensification in design activities carried out in different areas ranging from product development to corporate communications (Topaloğlu & Er, 2010; 2011). This trend towards taking a more strategic perspective to the management of design is noticed to be followed in differing degrees by the major players in the industry. Therefore, it was discerned that ceramic sanitary ware sector provides a unique and significant ground to explore design management capabilities at the strategic level. Additionally, the criteria for the selection of companies followed from the research objectives and were identified as:

- Utilizing in-house designers and/or working with external designers,
- Being a large scale company[113],
- Giving a clear focus on design as part of business strategy (as demonstrated by their web sites, corporate communications, and participation & awards earned in design competitions).

As a result, 3 large scale ceramic sanitary ware manufacturers were identified as offering information rich cases for studying strategic design management capabilities. In the later stages of the study, these organizations (Eczacıbaşı VitrA, Kale Seramik and Serel Seramik) were found out to be the top 3 players in the industry in terms of market share.

Data Collection and Analysis

In order to attain a rich understanding about design management capabilities and to cover the phenomenon of interest inside its context, data was collected at 3 major levels of analysis: the business organization, the development of design and design management capabilities throughout the years, and present design management capabilities possessed

[113] The results of a survey conducted by the Danish Design Council (2003) reveals that "large companies have a greater capacity to engage in design compared to small companies" (p. 29), and that company's focus on design in relation to company strategy, business visions and future role in the value chain increases together with the company size. This indicates that large scale companies are more likely to possess design management capabilities pertaining to the strategic level.

by the organizations. Additionally, the case study design pursued a literal replication (Yin, 2009) approach.

With the objective of triangulating (Yin, 2009) the evidence, data was collected through 4 major sources: interviews with key informants; documents, including company documents, books, reports and articles covering the cases under study; direct observations regarding work environments; and physical artifacts, which included the outputs of different design activities carried out by these organizations, such as product designs, retail environments, websites, product catalogues and other marketing and communication materials. Yet, interviews constituted the principal method of data collection, which were carried out with key informants such as design managers/directors, marketing managers/directors, designers, and general managers. DMAF established the interview guide, where the list of topics and questions structured under this framework were utilized as the basis of semi-structured interviews, comprising questions of an open ended nature. In order to collect data regarding the development of design and design management capabilities throughout the years, company documents and prior research were complemented by additional interview questions. A total of 13 interviews were carried out with details presented in Table 4. All interviews were recorded as audio files and were fully transcribed. A total of 21 hours and 51 minutes of interview data were collected.

Table 4 Interview Details.

Case	Interview Code	Job Title	Interview Duration
Case Study 1	CS1-1	Design Director	2 hours 48 min.
	CS1-2	Marketing Services Manager	55 min.
Case Study 2	CS2-1	Design Management Office Supervisor for Bathroom	Part 1: 1 hour 18 min. Part 2: 1 hour 17 min.
	CS2-2	Vice President of Marketing	45 min.
	CS2-3	Marketing Manager	1 hour 56 min.
	CS2-4	Design Management Office Supervisor for Tiles	1 hour 24 min.
	CS2-5	Designer	1 hour 11 min.
	CS2-6	Business Group Vice President of Organizational Development	1 hour 4 min.
	CS2-7	Business Group Vice President	60 min.
Case Study 3	CS3-1	Design and Application Manager	2 hours 59 min.
	CS3-2	Design Chief	2 hours 59 min.
	CS3-3	General Manager	52 min.
	CS3-4	Sales and Marketing Manager	1 hour 23 min.

Data analysis was carried out in two phases. Level 1 analysis focused on analyzing case study data by describing and evaluating how the studied organizations managed design, based on the capability categories and themes provided by the audit framework. Whereas, Level 2 analysis focused on analyzing how design and strategy are linked

through design management practices and routines in the current situation; the triggers for the development of strategic design management capabilities; and key enablers and barriers that influence this process.

This secondary level of analysis was carried out, initially in the context of individual cases, by identifying emergent themes and recurring patterns; and later, by exploring them by means of a cross-case analysis. The themes were then integrated through their comparison across the cases, eventually to come up with the study's final conclusions.

Results

Triggers for the Development of Strategic Level Design Management Capabilities

The case studies revealed that the triggers for an increased integration of design into business strategy and subsequently the development of strategic level design management capabilities were all initiated in the context of major strategic renewal and organizational transformation processes.

For a long time, the companies had managed design under the direction of marketing, product development or production departments and utilized design to provide product differentiation inside a market environment, which was becoming increasingly more competitive. However, in all three cases, starting after the mid 2000s, the companies began to develop a more strategic perspective regarding design and initiated a new period in the development of their design management capabilities. The factors that triggered the development of design management capabilities at the strategic level were all strongly linked to major organizational change and strategic renewal processes, which were planned to be executed by the top management teams.

In every individual case, design was positioned by these organizations as the most important tool for the intended organizational transformation efforts that involved premeditated changes in several dimensions, such as organizational structure, resources and capabilities, market focus and business growth mindset. The organizations felt the necessity to make a leap in their design management capabilities in order to achieve the new long-term goals of their renewed strategy.

More specifically, for Eczacıbaşı VitrA, design was identified as the key instrument in the company's transfer to a brand development strategy with the long term objective of becoming a global brand. For Kaleseramik, the development of strategic level design management capabilities was a major route inside the strategic renewal and organizational restructuring processes regarding several group companies and to develop a unified approach to all product design and development activities. For Serel Seramik, design management capabilities at the strategic level began to be advanced following company's merger with another group company after which design was identified as the driving tool of its new business strategy, which involved a major change in market focus and significant organizational transformation and brand repositioning efforts.

Systems and Routines Utilized For Linking Design with Company Strategies

The companies were seen to utilize 3 main routes to connect design strategies and activities with their business strategy:

- Assignment of management responsibility for design at the senior level

- Inclusion of design managers in strategy formulation and business planning processes
- Establishment of an independent design function

The assignment of management responsibility for design at the senior level contributes to the coordination of design with overall business strategy and content by clearly granting executive responsibility for design to a manager who has direct information and understanding about the long-term outlook, business context and priorities of the organization. In other words it moves design management from “the assignment of the normal administrative chores to a manager” to “identifying and communicating ways that design can contribute strategic value to a company” (Blaich & Blaich, 1993, p. 13).

The inclusion of design managers in strategy formulation and business planning processes ensures design's contribution to strategy making, as well as allowing the design manager to have detailed knowledge and understanding about business strategies, as well as policies and plans of major business functions. This in turn facilitates the identification of different roles for design throughout the organization. On the other hand, the establishment of an independent design function ensures that design is considered in strategy formulation and business planning processes in a distinct manner and treated in the same status with other major business departments such as marketing, production or sales.

Overall these findings confirm the previous work in design management literature, underlining: the importance of assigning design management responsibilities to a senior level manager (Topalian, 1990), the increasing role of design and design managers inside strategy formulation processes (Chung & Kim, 2011; Francis, 2002; Hertenstein & Platt, 1997; Jerrard & Hands, 2008) and the direct relationship between desing’s influence and strategic role with its degree of independence in the corporate structure (Borja de Mozota, 2003).

Key Enablers for the Integration of Design with Strategy and the Development of Strategic Level Design Management Capabilities

The major factors that have supported the development of strategic level design management capabilities and the establishment of an increased level of integration between design activities and strategy show substantial similarity in the studied organizations. These are:

- Design's recognition as a strategic tool
- Top management awareness, support and commitment
- A deliberate focus on attaining strategy alignment, coordination and communication between design and major departmental functions
- Cultivation of a supportive organizational culture for design

Design's recognition as a strategic tool in the wider context of significant organizational transformation and strategic renewal processes acted as the initial trigger and major enabler for all companies. Another important facilitator was the awareness, support and commitment coming from top management, which has long been pointed out by design management literature among the most essential factors concerning the effectiveness of design integration efforts (Topalian, 1990).

Additionally, beginning with the development of a more strategic approach towards managing design these organizations began to place a deliberate focus on attaining strategy alignment between major business functions and on increasing communication and coordination among departmental managers through different systems such as: organization of design platforms and special meetings among these groups, restructuring the strategic planning process and inclusion of design managers in strategic planning processes. It was seen that this purposeful focus on the improvement of communication and coordination among departmental managers was also instrumental in helping them to take increasing ownership of design and design's renewed place in the overall company strategy.

Another major enabler was observed to be increased efforts towards the cultivation of design awareness and understanding throughout these organizations. This was undertaken by establishing new systems and routines, such as: initiating important training and development programs for design, organization of regular design talks and presentations inside the company given by in-house and external design specialists; annual meetings and awards directed at increasing awareness, recognition and encouragement regarding design, creativity and innovation; and internal communication systems broadcasting news and events regarding design and creativity.

Key Barriers and Challenges in Linking Design with Company Strategy and the Development of Strategic Level Design Management Capabilities

Although the triggers, current systems and routines utilized, as well as the major enablers in the development of strategic design management capabilities were substantially similar, major barriers and challenges faced by the organizations showed greater variance from one organization to the other. Among these, 3 themes could be identified that showed a fair degree of similarity:

- Finding the organizational place for the design function
- Assignment of strategic level design management responsibilities
- Characteristics of organizational culture that are antagonistic to design such as: institutional inertia, corporate pragmatism, management routines based on efficiency and problems regarding power sharing

It was observed that throughout the development of strategic level capabilities in managing design, these businesses undertook numerous changes regarding their design and design management organization. Design department was structured under different departments such as production, product development or marketing until it gained its independence as a separate functional department. In one of the cases design department was restructured back under marketing after functioning as an independent department for one and a half years. Additionally, the assignment of design management responsibilities changed frequently together with changes regarding design organization. Although to different degrees, these organizational changes indicate that throughout the development of a more strategic stance towards design, finding the most favourable organizational structure for managing design activities was a major challenge for the companies.

Another significant challenge for the organizations was identifying how to carry out and who to assign design management responsibilities at the strategic level. As the

organizations began integrating design into their business strategy, they had to begin carrying out strategic level responsibilities such as defining design's expanding roles, formulating design strategies and standards, or planning and allocating budgets for growing design investments. They tried out different systems such as forming design boards, assigning strategic level design management and project and organizational level design management responsibilities to different managers inside the organization. It was seen that design management responsibilities were mostly carried out in a dispersed manner by different parties based on different design disciplines and their level of responsibilities, where strategic level design management tasks were carried out for a long time by managers with other priorities than design, such as marketing managers.

Other significant barriers and challenges were related to the prevailing organizational culture inside these companies. Although for each company these characteristics varied to different degrees they can be listed as: institutional inertia, corporate pragmatism, tradition-bound behavior, short-term management routines based on efficiency, cost-cutting, and seeing fast results, and problems with respect to company politics and power sharing. It was seen that these factors slowed down necessary organizational change processes, increased their time to take effect, and made it hard to instill new approaches, more creative and strategic stances to the management of design activities. These are in line with previous literature which has focused on identifying major barriers to successful design integration (Bruce & Bessant, 2002; Cooper & Press, 1995; Jenkins, 2010; Jerrard & Hands, 2008).

Conclusions

The paper provides new knowledge in the context of strategic design management in two main ways. Firstly, the paper presents the development of a new Design Management Audit Framework (DMAF), which aspires to update existing tools. Despite design management's broadened roles and responsibilities, existing tools and frameworks are lacking to frame and evaluate design management capabilities that enable the essential connection to be made between an organization's goals, its business strategy and its design practices. Additionally, a more detailed review of literature suggests that it is necessary to expand and update current frameworks in the light of new perspectives and research that have emerged over the last decade. As an answer to this need, DMAF is suggested as a comprehensive design management audit tool that allows not only the examination of more traditional capabilities and responsibilities under design management, but also the appraisal of strategic level design management capabilities. Additionally the framework suggests new capability dimensions to accommodate key responsibilities and skills that are increasingly underlined by the recent design management literature.

Secondly, the paper presents the results of 3in-depth case studies, which made use of the DMAF to explore strategic design management capabilities in organizational contexts, as well as their development through the years. The case studies increase our knowledge on the interface between design management and strategic management, as well as about the enablers and challenges encountered by businesses in the process of becoming a more design-oriented organization. The case studies revealed that although the organizations had long been utilizing design, the main factor that triggered these

businesses to initiate the development of more strategic capabilities in managing design was the start of major organizational change and strategic renewal processes. Additionally, the case studies indicated that the major enablers in the development of strategic design management capabilities were: support and commitment coming from top management; specific efforts on attaining alignment, coordination and communication between design and major departmental functions and their strategies; and focus on the cultivation of an organizational culture supportive for design. Whereas the major barriers and challenges were faced in the context of assigning strategic level design management responsibilities; finding the most effective place for the design function inside the organizational structure and certain characteristics of the organizational culture that are hostile for design, such as corporate pragmatism, desire for seeing fast results, routines based on efficiency and problems with respect to power sharing.

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RESEARCH PERSPECTIVES ON CREATIVE INTERSECTIONS

Building Design-led Ambidexterity in Big Companies

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doi: 10.21606/dma.2017.133

Organisational ambidexterity is considered a crucial capability for long term firm survival and development. However, adopting and successfully implementing it presents multiple challenges. Furthermore, despite being increasingly popular in the last two decades, the role design can play in achieving it is notably missing from the discussion. This paper analyses the attempts to accelerate the innovation pace of two large international companies in the consumer electronics and healthcare and airline industries. Both attempt to combine design and agile elements in fast-paced environments, while working in multidisciplinary teams early in the NPD process. However, one is guided by designers, the other by people with a background in operational functions. As such, they provide a good foundation to study design's role and its implications in achieving ambidexterity in two large international companies. The collected insights helped us to define a new form of ambidexterity and devise a model for building ambidextrous organisations through design.

keywords: design-led ambidexterity, capabilities, Lighthouse Model

Introduction

In today's turbulent business environment, organisational ambidexterity is considered a crucial capability for long term firm survival and development (Oehmichen et al., 2016). Defined as "the ability to simultaneously pursue both incremental and discontinuous innovation… hosting multiple contradictory structures, processes, and cultures within the same firm" (Tushman & O'Reilly, 1996), organisational ambidexterity allows companies to be aligned and efficient in order to manage current business demands and adapt to environmental changes (Mom et al., 2015). As such, the construct has become increasingly

popular in the last two decades. Since its introduction in 1996, it has been addressed in hundreds of empirical studies, theory papers, special issues of journals devoted to the topic (Academy of Management, August, 2006; Organization Science, July-August, 2009), review articles and a large number of symposia at professional meetings (O'Reilly & Tushman, 2013). In fact, the articles addressing "organizational ambidexterity" in Google Scholar for 2016 only are 894, which implies it has a significant presence in the academic context.

Early studies on ambidexterity focus on its outcomes. More recent ones have shifted to its antecedents at industries, business units and senior manager level and its implementation in companies (Oehmichen et al., 2016). However, to our knowledge, notably absent from this discussion is the role of design and its influence on the construct. Therefore, the purpose of this paper is to advance the understanding in this field and to discern how design can help in building ambidextrous organisations. To do so, we discuss the innovation efforts of two big international companies. The first is one of the largest manufacturing firms in the world in the area of consumer electronics, lighting and healthcare. Their new innovation approach, X1, is created and led by the design department of the firm and has three main pillars: co-creation, multidisciplinary teams and reflection. The approach was established as an attempt to accelerate the innovation pace of the company. It ensures, through fast iterations, that ideas are feasible, viable and desirable early in the New Product Development (NPD) process. In addition, the firm has both a long-standing tradition with design and a large presence of designers in-house. The second is one of the oldest commercial airlines in the world. Their new innovation effort, X2, was created to check ideas' feasibility and desirability early in the NPD and thus accelerate the firm's pace of innovation. Based on principles of Lean Startup (LS) (Ries, 2011), Scrum (Schwaber & Beedle, 2002) and Design Thinking (Brown, 2008), the department was established together with the local airport a year ago. The basic premise of X2 is to conjure up ideas, prototype them in a matter of days and test as soon as possible with real passengers and employees either at the Departure hall, one of the three dedicated gates at the airport or during flights. However, unlike X1, neither the company nor the team has affinity with design (yet) and design skills were brought in by the first author of the paper.

This paper is structured as follows: first, the existing literature on different types of ambidexterity is reviewed. In addition, design's possible role is briefly reviewed, as well as three factors challenging its implementation. Then, the methodology of the research and the collected results are described. This is followed by a discussion of the results, concluded in a new model for achieving ambidextrous organisations through design. Last but not least, the article discusses possible limitations of the study and indications for future research.

Organisational Ambidexterity according to Literature

To achieve ambidexterity organisations have to undergo both exploration and exploitation activities (March, 1991). On the one hand, exploration is characterised by search, experimentation, play, flexibility and investigation, and can result in new knowledge (Tabeau et al., 2016). This new knowledge is essential for developing radically new solutions (Atuahene-Gima, 2005) and achieving [brand] relevance (Beverland et al., 2015).

However, its results are often distant in time, uncertain and ambiguously connected to the current context. As such, exploration is associated with looser controls and structures, more flexible processes and search behaviours (Duncan, 1976). Hence, the exploration subunits are organized to experiment and improvise. Exploitation, on the other hand, allows the firm to improve [brand] consistency (Beverland et al., 2015) and already present knowledge by performing "refinement, choice, production, efficiency, selection, implementation and execution" (Tabeau et al., 2016). Thus, it is associated with tight controls, structures and culture, and disciplined processes, carried out by units organized to be efficient (March, 1991). These activities improve present returns, which are relatively certain and closely related to the organisation's current actions (March, 1991). Thus, they are more likely to contribute to cost efficiency, profit gains and incremental innovation (O'Cass et al., 2014). Hence, there is an existing bias in companies favouring exploitation over exploration since it provides greater certainty of short-term success (O'Conor, 2008). Due to the different roles and influences on innovation outcomes (Tabeau et al., 2016) of the two activities, it's imperative that the tension between them is managed well (March, 1991) so balance can be achieved. Such balance is both feasible and beneficial to organizational performance (Jansen et al., 2009).

O'Reilly & Tushman, (2013) and Chebbi et al. (2015) define three types of organisational ambidexterity in regards to the interaction between exploration and exploitation. The first one, sequential, is a form of temporal separation. This type of ambidexterity is more useful in stable, slower moving environments. It occurs when companies shift from exploitation to exploration and vice versa by realigning their structures and processes to reflect the context they are in. Hence, the firm goes through periods of centralization to enhance cost efficiencies and decentralization to emphasize innovations (Raisch, 2008). Some scholars claim that overall decentralization followed by reintegration generates the highest organizational performance (O'Reilly & Tushman, 2013). Therefore, being able to develop process mechanisms and relationships that can enable the switch between exploration and exploitation is crucial with sequential ambidexterity (Wang & Rafiq, 2012).

The second is simultaneous or structural ambidexterity. Achieved either through spatial separation or parallel structures, it requires autonomous, structurally separated units for exploration and exploitation. Each unit has its own alignment of people, structure, processes and cultures managed in its unique way (Duncan, 1976). However, the spatial separation creates physical boundaries between the exploration and exploitation activities (Benner & Tushman, 2003). It also protects the former from the firm's existing inertia and thus allows to achieve both simultaneously (Jansen et al., 2009). Next to this, parallel structures can be used also by defining primary and secondary structures to carry out key tasks (Raisch & Birkinshaw, 2008). Primary structures are used for incremental innovation and for maintaining stability, while secondary structures such as project teams and networks are focused on exploratory activities (Raisch & Birkinshaw, 2008). Both mechanisms enable each unit to focus on its tasks more effectively (McDonough & Leifer, 1983). For this type of ambidexterity, integration and sharing knowledge and resources among the units is needed (Burgers et al., 2009) to ensure sustained growth (Durisin & Todorova, 2012). In order for the results of each activity to be well-integrated, they should be held together by a common strategic intent and dedicated leadership (O'Reilly & Tushman, 2013).

Both sequential and structural ambidexterity attempt to solve the exploration-exploitation tension through structural means. Contextual ambidexterity (Gibson & Birkinshaw, 2004), solves it on individual level. Such is achieved by creating a set of processes or systems, which allow and support each individual to make her own judgement in regards to dividing her time between conflicting demands for alignment and adaptability. The ability to balance exploration and exploitation depends on the organisational context, characterized by "an interaction of stretch, discipline, and trust" and requires a "supportive organizational context" that "encourages individuals to make their own judgments". Contextual ambidexterity can be clearly differentiated from the others in three ways. First, the emphasis is on individuals making the adjustment rather than on units. Second, ambidexterity is achieved when individuals agree that their unit is aligned and adaptable. Third, the organizational systems and processes are never concretely specified. According to O'Reilly & Tushman (2013), the most common example of such is workers being able to perform routine tasks (exploitation) but also continuously to optimise their jobs (exploration). This type, however, does not address the simultaneous and systematic conduct of exploration and exploitation (Kauppila, 2010).

As already mentioned, ambidexterity's implementation, regardless of the type, continues to be challenging (Oehmichen et al., 2016). This calls for a different approach to it. Design and its role in creating ambidextrous organisational structures has not been examined yet. Nevertheless, we believe it to be a perfect match to guide firms in both their explorative and exploitative activities due to its proficiency in dealing with uncertainty and wicked-problems (Tabeau et al., 2016) and its user-centredness respectively. Furthermore, despite the documented challenges of implementing it in big companies, the popularity of design-based approaches such as Design Thinking and Design Sprint (Knapp et al., 2016) continues to grow (Carlgren et al., 2016). Moreover, relatively little is known of the specific mechanisms through which the use of design might improve innovation outcomes (Liedtka, 2015).

We base our research on three organizational challenges of design's implementation we consider interconnected and amplifying each other: methods, mindset and infrastructure. First, due to their iterative nature and requirement of hands-on means (Sanders et al., 2010), design methods clash with the linear exploitation processes of a firm (Carlgren et al., 2016). Second, the existing mindset should be considered since radical innovation is only possible if the company is able to break out of the existing (old) mindsets and routines (Carlgren et al., 2016). Such mindsets and the inability to unlearn are some of the major barriers to design's adoption (Assink, 2006) as well as to that of change processes within organzations (Lorsch, 1986). Finally, an infrastructure that allows for such methods and mindset has to be built. Providing collaborative structures and processes and connecting innovations with existing businesses is crucial for sustained innovation (Dougherty & Hardy, 1996). Furthermore, large organizations struggle with a lack of appropriate processes and/or routines for radical innovation (Carlgren et al., 2016). Therefore, our research is focused on better understanding the role of design and these three factors in achieving ambidexterity.

Method

This paper reports the result of an action research study in the already discussed two firms. The first author was embedded in both studies and acted as a participant in developing X1 and an action researcher in X2. The duration of the research in each entity and the freedom the researcher had differ. On the one hand, the research on X1 lasted 5 months. The methods, mindset and infrastructure were already established and the researcher had no influence on their further development. The results of this are reported in Stoimenova et al. (2015). On the other hand, the research on X2 lasted for 10 months. The role of the researcher was to introduce and implement fundamental principles and values of design in their largely based on LS and Scrum way of working. As such she had the opportunity to influence the selection of methods, the formation of the desired mindset and the development of the infrastructure. The efforts on developing these are reported in Stoimenova, et al. (2016). In addition, interviews with the key stakeholders of both X1 and X2 were carried out and analysed in accordance with the Grounded Theory Method (Charmaz, 2008). The two studies will be discussed at the stage they were in while the researcher was embedded in them, not their further development, as there was no continued involvement.

Results

As already mentioned, the two companies are discussed on the basis of methods, mindset and infrastructure. The notion of ambidexterity is not used as none of the firms deliberately tried to achieve such. In Table 1 there is an overview on each of these factors paired with quotes, illustrating the findings.

Methods

Both X1 and X2 make use of participatory and traditional design methods. On the one hand, X1 uses design methods of discovery, ideation and rapid prototyping, carried out in quick iterations and in co-creation with other departments of the firm. To achieve that, they use tools such as sketches, models, demonstrators and videos to clearly visualize the idea and then test it with users. The approach is sped up with 3-to-5-day workshops resembling sprints. On the other, X2 uses ideation techniques and methods typical for co-design (with either their employees or passengers). However, their main emphasis and guidance comes from Scrum and LS and thus, they make use of methods typical for these approaches such as hypotheses testing, sprints and customer development (Blank, 2006).

Mindset

Both approaches receive executive support, but team members in X2 and participants in X1 and X2 face difficulties as the way of working of each approach is very different than the one in the rest of the company. Furthermore, the approaches' core teams are selected to have slightly different mindsets. On the one hand, the team members of X1 should be able to think on a more conceptual and abstract level and in the same time should "really master a certain aspect". On the other hand, the team members of X2 are "not people who like to keep talking or thinking about what can be but… think "let's do it"". In addition, stemming from the design methods they use, X1 and X2 have a different degree of exploratory mindset. Due to their background in design, the X1 team exhibits a mindset with an emphasis on search and exploration, while the X2 team's mindset is still shaping.

Regardless, in the course of this research, there was a clear shift in X2 towards mindset that allows a certain degree of exploration and inclusion of users' ideas. Last but not least, each team mainly relies either on qualitative (X1) or quantitative (X2) data, which also affects accordingly their (initial) mindsets.

Table 1 Results Overview

X1		X2	
Methods	Quotes	Methods	Quotes
Co-design methods; Rely on user research upfront; Rapid prototyping methods; Regular user testing; Design workshops from 3 to 5 days;	*"… we had the walls covered with brown paper and tried to externalize all the time, just draw continuously, write down everything they said continuously and it's completely trivial, but that really helped them to structure their thoughts."* *"Getting the context known and [establish] shared knowledge among [people] you've never met before…, so everybody knows what the context is, who are we dealing with, what the region is, what the issues are…"* *"…make people enthusiastic to create things, because a lot of people are just used to write mails, PowerPoints, Excels … and be sure that you've done some field research – consumers and internal stakeholders"* *"They have to understand what is the goal, you want to define valuable value proposition."*	Co-design methods; Following the principles of LS and using Scrum as a project management tool; Minimal viable product (MVP) building; User testing through qualitative and quantitative data; 5-day design sprints;	*"We give ourselves the room to really try to understand the problem… and not jumping to conclusions and we also involve others to do that…but the focus also lies on validating hypotheses."* *"We work with learning milestones, we really make our learnings explicit and every learning leads to adjustment or an ideation session or [quantitative] research. And eventually when the learning dries up… you probably have something that works and we validate it with data."* *"You have all those methods and ways of ideations and I don't know if this is design… but we definitely use the tools to come up with ideas…"* *"But if we already have an idea, maybe not involve the user [upfront], but just go and do it with the users and get some speed and learnings as soon as possible… but I believe you still need research upfront."*

Mindset	Quotes	Mindset	Quotes
Team: the team of designers has exploratory mindset; Presenting themselves as non-experts, not designers; Rely on user research; Doers who are able to think conceptually; *Company:* difficult to convince other departments; Requires paradigm shift; Executive support;	*"They [the team] have to be able to think on a … conceptual level, abstract level…. open-minded and … they should have clear opinion but not be forceful. They should not be such strong characters that they blow others away in a meeting… They should be able to listen to other people as well and be knowledgeable – they should really master a certain aspect."* *"So what I try to do is not playing the designer in the beginning. Then I'm neutral … and I'm not protecting the design community or any other program. It's just – you have some room to facilitate this process. And this works quite disarming."* *"But for some rational people… who think about step by step, A to B or A to D via B and C and not M or L and we are actually telling: I can define B but I cannot define C, we will find out – that's not comfortable."* *"… for some people feels uncomfortable, even annoying that you do it again and again and again."* *"It's against some people's paradigm that you cannot make prototypes if*	*Team:* Development in their mindset from *"we already have the idea, why waste time"* to mindset favouring a certain degree of exploration; Rely on quantitative data; Doers; *Company:* difficult to convince other departments; Requires paradigm shift; Executive support;	*"I'm looking for people who are emotionally very strong, who dare, who really want to get results… not people who like to keep talking or thinking about what can be but really people who think let's do it, combined also with that you can kill your darlings very quickly … we don't have the people who dare to dream like that and who dare to do it."* *"… we don't know what the right solutions are, so we need to give ourselves the room to explore and it's pretty difficult because if we tend to just explore without a focus or a reason why, we tend to stay there too long."* *"So basically, it's [convincing other departments] about trust and about politics, but the trust is the most important thing."* *"The biggest change we've made in the past 2 months, we got [executive] support and now we have the confidence we're allowed to explore. And because we have that, we have more room to think and use [design] methods…"* *"What you see right now every department has their own goal, and*

	you have just started; it's impossible: it's like doing the interior design of the house before you have even built the house." *"It's quite a struggle to get people to use it and to overcome their unwillingness to sort of start playing with materials: sometimes they feel it's childish; they feel they are not qualified or capable."* *"They can think: why is this building doing it when this belongs to our sector and he is just a designer.... And then we say: we are not doing it, we are collaborating."*		*this is strange as we as a company should have 1 goal or the same goals, at least and we don't have those. That's tricky."* *"… I always made the comparison between Star Trek and Indiana Jones. They both do exploration. Star Trek – it never ends. They always keep on exploring, it's all about the exploration itself. Indiana Jones – it's not about the exploration itself. The exploration is a tool, it's a way to eventually get to the goal, that's still unknown at the moment."*
Infrastructure	Quotes	Infrastructure	Quotes
Led by designers in the role of project lead and/or facilitators; Strong emphasis on exploration; Each project lasts up to 3 months and makes use of regular workshops; The project lead coordinates the team, which meets meets only when enough input is generated; Different teams for each project Using multidisciplinary teams (from all relevant departments of the firm);	*"To sum up the approach: learn fast, make iterations, be sure that every discipline that is present has learnt the same… and also be realistic on stopping with the exploration once you together concluded that it doesn't make sense or at least turn the proposition to 180 degrees."* *"… and sometimes it's the conflict with fitting into the system when we actually want to get out of it and form a team, make a few iterations and then if we are lucky, we have a solid value propositions, then it's*	Led by people with operational background in the role of product owners (PO); No designers; Trying to find the balance between exploration and exploitation; Working in 2-week sprints, no time limit per project; POs dedicated to a certain problem, supported by a team of part-time employees with operational background;	*"I want to create a space where people [customers and employees] together with smart people can co-create the next thing themselves and also as an infrastructure where startups can be innovative with having as less meetings as possible with as much freedom."* *"… you build the infrastructure, but you're not the one who per se comes up with all the new ideas, you give other people the opportunity to be innovative in your environment, but they can only be as successful as they*

Emphasis on reflection and learning; Act as the bridge among the different disciplines; Introduce the approach to the rest of the firm through workshops; Focus on continuous user research; Difficult to manage the collaboration; Difficult to have the right people on board (lack of resources); Problems handing-over a project to the company;	*getting serious and then we can fit into the organization."* *"… but then again, my comment was that the [project] was really well, but the hand-over to the business afterwards… was more difficult, because we were so quick and solid in the [project] and the business couldn't keep up."*	The same team; Involvement of employees through interviews and ideation sessions; Reflection carried out during Sprint Reviews; Introduce the approach to the rest of the firm through 5-day design sprints; 5-day design sprints to kick-off a project or overcome obstacles together with users (employees); Focus on incremental changes; Difficult to manage the collaboration; Difficult to have the right people on board (lack of resources); Problems handing-over a project to the company;	*are, because you have the environment."* *"… I don't think it will change top down, it also won't change bottom-up in the sense that if we ask the employees, then suddenly will become very innovative. We have to give people the room to just do what the hell they think is the next step and take the leap of faith."* *"We incorporate that [handing over] in the ideation phase, where we do the roast to involve the main stakeholders."* *"So it [the solution] has to be linked to a division… and you need a multidisciplinary team. If you have both those things, it will radically shorten the time between ideation and implementation."*

Infrastructure

As seen from Table 1, there are both similarities and differences between the two. First of all, the duration of X1 project varies from 3 days to 3 months, while X2 works in sprints of 2 weeks without a set duration for a project. The projects of X2 are in accordance with strategic ambitions defined by the company's CEO and thus present a strong fit with the company. In comparison, although X1 works on strategic projects for the company, it takes time to explore topics and then seeks the fit with the company's roadmap.

Second, they follow similar phases in their way of working. On the one hand, X1 goes through a (qualitative) research phase, followed by framing and reframing activities in multiple iterations, concluded by prototypes and demonstrators and user testing. Reflection is an integral part of this approach. Designers facilitate the process, but never present themselves as such. Nevertheless, the stages in their approach have design jargon names. X2, on the other hand, carries mainly quantitative research to better understand the problem upfront. Once this is done, the team goes through an ideation phase in several iterations and regularly involves users (employees). After the ideation phase is done, the team employs both LS and (participatory) design methods to build Minimal Viable Product (MVP), test and reflect on it. In addition, each stage is named after a cartoon or book character that best reflects the nature of the respective activity. For instance, the ideation phase is called "Mickey Mouse" and the testing phase – "Dummy".

Third, both approaches involve parties external to the company. X1 involves design agencies and software companies, while X2 only recently started working with a software startup. Both use design-led workshops as interventions. However, the workshops in X1 are carried out regularly when enough new insights are generated. X2 carries out such workshops (5-day design sprints) in the beginning of a project or when stuck. Both interventions serve as a great conversation starter on what the respective approach can achieve. As such, they are also used to convince the company in the power of each approach since the threshold for performing it is lower and results are achieved in 3 to 5 days.

Forth, the principles, on which they build the teams for each project also differs. For instance, in X1 designers play the role of facilitators and project leaders. Each team is constructed by interested parties from the company and evolves over the course of a project. There is a core team of four to five people who continue to work on the project between the workshops. There is also a business owner, who provides financial support. On the other hand, X2's team consists of four product owners and several part-time team members with operational background that work together on different topics each sprint. Other company employees are involved directly only during the design sprints. Design was brought to them by the first author, another designer and the tools they created for the team. In addition, both approaches make use of multidisciplinary teams, however the emphasis on multidisciplinarity is much stronger in X1.

Fifth, in their efforts to scale up, X1 is carrying out company-wide facilitation trainings and using their workshops as a means for people to get acquainted with the approach. X2 carries out the design sprint for this purpose, but also to implement the way of working in other parts of the company. To do so they use metaphors and easily understandable and

relatable names for the phases of their way of working. They also spend time to create awareness among the company's staff by using them as participants in their tests.

Last but not least, the way they deal with the handing-over of a validated idea (project) to the organisation is different. X1 involves business owners early on. Sometimes, at the end of a project, they also involve people from the departments that will work on its further development. X2 turns to company stakeholders to critique the developed ideas during or after the ideation phase. Here the stakeholders "should also give the support that… they're available for the hand-over". Regardless of their differences, both X1 and X2 experience difficulties to successfully hand over validated ideas.

Discussion

In this paper we discussed the innovation approaches of two large companies. Neither X1 nor X2 was created to achieve organisational ambidexterity. Their intended emphasis was on accelerating the initial stages of NPD and thus the overall pace of innovation in their respective company. As such, they mainly carry out exploratory (design) or accelerated exploitative (Agile/LS) activities, followed by the exploitation activities of the firm. Despite the many differences and similarities, however, the main distinction between them is that X1 carries out exploration with very few elements of accelerated exploitation, while X2 carries out accelerated exploitation with a few elements of exploration. Hence, they do provide a solid foundation to achieve ambidexterity since most of the ambidexterity elements are present.

However, none of them clearly fits into the ambidexterity types described in the literature review section of the paper. On the one hand, they can be categorised as secondary parallel structures, since their teams are (mainly) tasked either with exploration or accelerated exploitation. On the other, they regularly shift from exploration to (accelerated) exploitation, and thus also fall into the contextual ambidexterity category. Such is especially visible in X2 where the team carries out both exploration (e.g. gathering user insights) and applies the methods of LS and Scrum. However, unlike the contextual ambidexterity, the teams do not decide whether to switch between the two activities entirely on their own. They are guided by a specified way of working. Thus, to fill this gap, we propose a new type of ambidexterity we call design-led, since both approaches use design methods throughout their processes. In addition, while design is an obvious fit for the exploration phase, it can also contribute to exploitation activities such as building prototypes and user testing. Therefore, it can play the role of the common denominator across different types of activities.

Using the theory of ambidexterity as a prism, the design-led ambidexterity consists of five main elements, combined in what we call the Lighthouse Model (Figure 1). First, there's the wheel of Exploration, in which X1 excells and X2 has only elements of. Second, the Exploitation wheel, as in the other categorisations, represents the activities big companies usually carry out. Both companies are very good at that. However, when two wheels are put together, they turn in opposite directions. Thus, the results achieved during exploration will be counteracted by the exploitation structures. This is what happens when both approaches try to hand over Exploration projects to the Exploitation phase. Therefore, just like in a gear train, a wheel combining elements of both activities can ensure rotation in the same direction. We call it the Catalyst, as it not only ensures such

rotation, but also increases the rate of collaboration between the two. Methods, which play this role well are LS, as it is based on the Lean and customer development methodologies, which accelerate exploitation, but also shares similar mindset with Design Thinking (Mueller & Thoring, 2012) or the Design Sprint, combining elements of Design Thinking and Scrum. These three wheels will not work unless a strong Executive Support is present. The last crucial element is Users (both employees and customers), who will trigger Exploration. Once all these elements are present, we believe the Lighthouse will work.

DESIGN-LED AMBIDEXTERITY

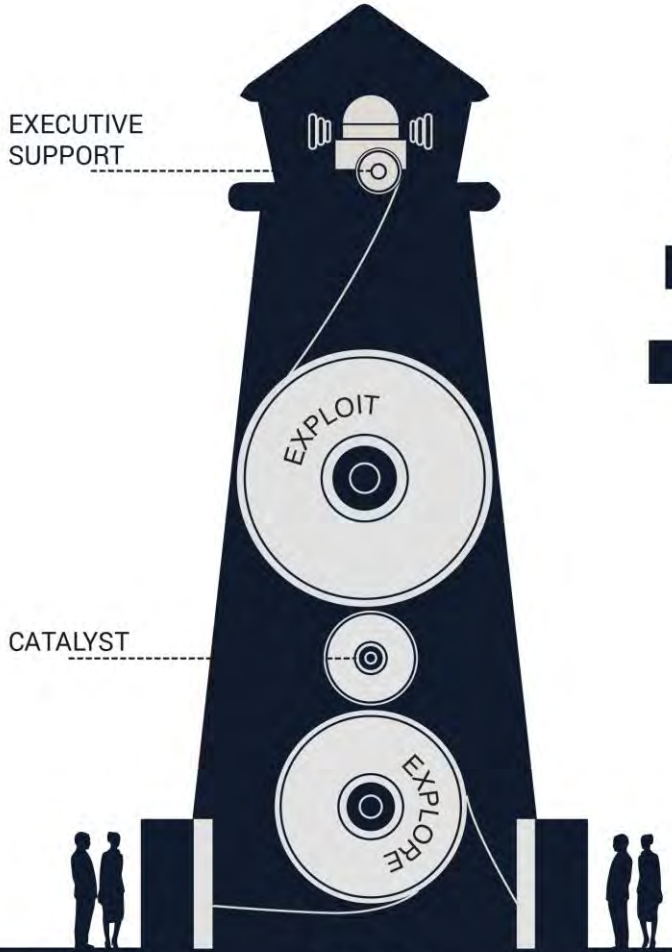

Figure 1: Lighthouse Model

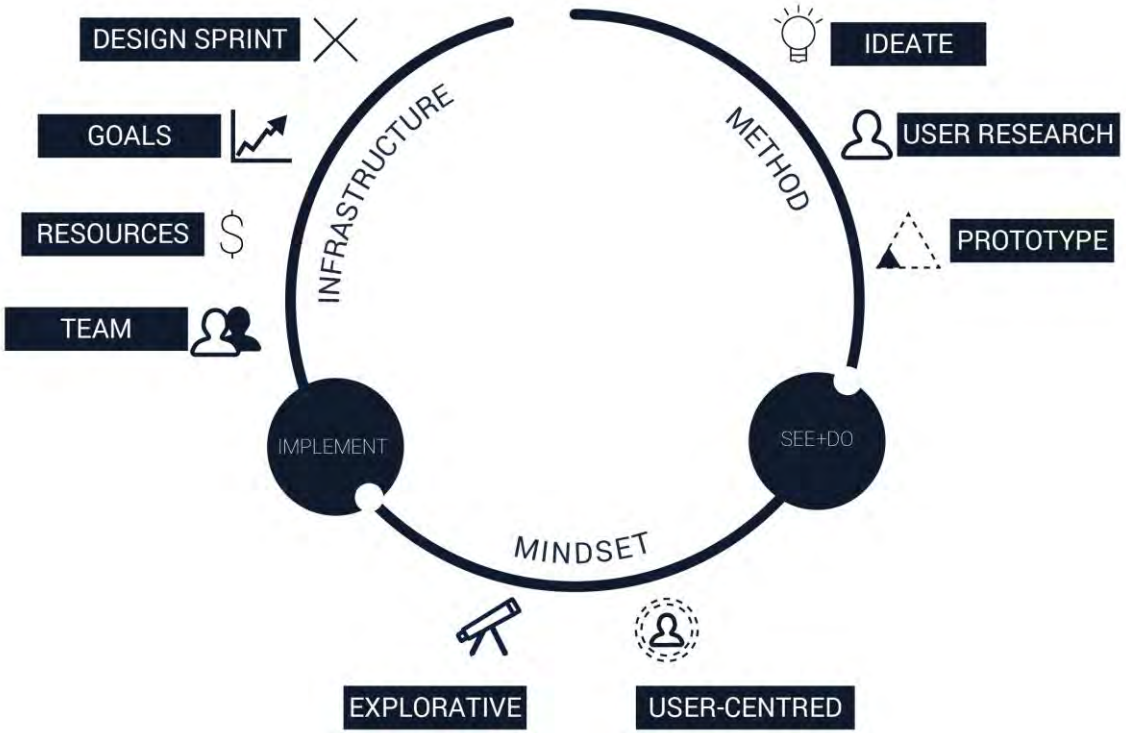

Figure 2: Design implementation and impact

Although the model is still in its inception phase, we believe it gives an initial indication and explanation of the main obstacles these two approaches face to achieve ambidexterity. For instance, the problem X1 has with hand-over: they have mastered the exploration phase and the company has well-developed exploitation structures. Although they implement Agile elements in their way of working and have a dedicated business owner, they're missing many of the exploitative elements of the Catalyst. On the other hand, X2 has the Catalyst figured out, but lacks a dedicated business owner and involves company stakeholders only at the end of the ideation phase. Furthermore, they lack truly multidisciplinary teams and miss some exploration elements and full involvement of their users.

Last but not least, initially X2's way of working was predominantly based on Scrum and LS principles. Therefore, we started by slowly introducing design methods by combining them with the ones they already used. After a few months of seeing and doing the methods on their own, we noticed a shift in their mindset. While at first they had an exploitative one due to their background, they adopted a mindset typical for co-design (Sanders & Stappers, 2008). Once the mindset was implemented in their day-to-day activities, the infrastructure also started changing – above all, the way they involve employees in their teams and a new element to their way of working (the 5-day design sprint). As such, both the infrastructure and the methods have to be flexible and open in order to react to the ever-changing environment (Figure 2). The only constant is the desired mindset that supports such development and the notion of design and design-led ambidexterity. Similar development was observed with participants in X1 workshops. However, the effect was less significant, possibly due to the little exposure time. The lack of influence of the researcher on X1's development and its later stage of development make it difficult to discern whether similar process occurred in X1. Regardless, these observations suggest the influence the three factors can have on establishing an optimal foundation for ambidexterity.

Conclusion

None of the reviewed approaches was developed to achieve organisational ambidexterity. Nevertheless, they do provide a solid foundation and a starting point for implementing such in their respective companies since most elements of ambidexterity are present. However, the way they approach it does not fit into any existing categorisations of the construct. Based on our insights, we created the Lighthouse Model and proposed a new type of ambidexterity – design-led – giving an initial indication on how to build such in mature companies. The diverse backgrounds and contexts of the two described situations give a solid foundation of the model. However, the aim of the model is to move from describing organisational ambidexterity towards prescribing design-led ambidexterity. As such, further research in other instances has to be carried out to validate it and make it applicable to a wider context.

To do so, despite the fact that this paper discusses mature companies, startups in a process of scaling up should be addressed, as they face fewer organisational constraints compared to established firms (Chen & Kannan-Narasimhan, 2015). Such companies deal with considerably less inhibitors to disruptive innovation such as excessive bureaucracy, unlearning the old processes, status quo and the risk-averse climate (Assink, 2006). In

addition, all startups start with an exploration or an idea of the founders. However, due to the adoption of Agile and LS methodologies, the focus quickly shifts to accelerated exploitation (Mueller & Thoring, 2012) to become a viable company. Therefore, in order to grow, sustainably scale up and create ambidextrous infrastructures, the balance between exploration and exploitation has to be found. The role of design in this is yet unexplored, too. Furthermore, since both X1 and X2 behave like startups within their organisational structures, we believe a better understanding of how such can be built in smaller scale could be later translated for mature companies as well.

In conclusion, although this paper reports two attempts to accelerate the pace of innovation early in NPD and lacks an insight on the longer term implications of such, it gives initial directions on how to achieve organisational ambidexterity. Further research on design-led ambidexterity and its implementation can yield interesting insights for startups and mature companies alike. Consequentially, it will improve our understanding of the role design can play in building organisational structures that can successfully carry out and balance both exploration and exploitation activities, expanding our body of knowledge on the strategic value of design.

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HONG KONG DESIGN MANAGEMENT ACADEMY CONFERENCE 2017

RESEARCH PERSPECTIVES ON CREATIVE INTERSECTIONS

The role of service design practices in enabling and embedding the servitization transition

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doi: 10.21606/dma.2017.140

An increasing number of companies are embracing the transition from a product focus to a service focus in their offering in order to face the challenges of the experience economy. However such transition (i.e., *servitization*) is challenging, since it requires companies to change both their processes and their mindset. In this paper we propose service design practices as an effective approach for overcoming the challenges of servitization and for achieving such a multi-layered transformation. By means of expert interviews, ethnography and multiple case studies, we empirically show how service design professionals guide companies towards a sustainable adoption of service orientation and successful implementation of service innovations. Specifically, we describe and exemplify a set of practices through which service design professionals establish a service-oriented mindset, introduce a service-specific development process, and a create widespread commitment to the servitization transition.

keywords: service design practices; servitization; organizational change

Introduction

Several manufacturing firms are currently focusing on servitization to differentiate themselves from competitors, to increase their revenues and to enhance customer experience (Josephson et al., 2016; Oliva & Kallenberg 2003). Servitization is defined as "the increased offering of fuller market packages or 'bundles' of customer focused combinations of goods, services, support, self-service and knowledge in order to add value to core product offerings" (Vandermerwe & Rada 1988, p. 314). Servitization is a key

strategic choice for organizations to adapt to a new kind of economy where services play a key role in value propositions (Ostrom et al., 2015).

While there has been considerable research advancements in identifying the resources and capabilities that enable manufacturing firms to successfully develop new services (e.g., Raddats et al., 2015; Ulaga & Reinartz 2011), transforming a product-led business (i.e., the organization and the culture) to service-led remains a challenge for many companies (Kowlakowski et al., 2015; Ostrom et al., 2015; Raddats et al., 2015; Ulaga & Loveland, 2014). More research is needed on enabling the process of organizational adaptation (i.e., the necessary changes in organizational structures and processes) and embedding a service-oriented mindset (Ostrom et al., 2015). Integrating and transforming the different (and sometimes conflicting) objectives and processes of product-led and service-led strategies are not easy. On the one hand, manufacturing companies must establish and reinforce a customer-centric mindset and service-led frame of reference for organizational activities; on the other hand, they must attempt to leverage on existing resources, capabilities and practices in order to contain the risks and sustain financial performance (Kowlakowski et al., 2015). Thus, adaptation must not come at the expense of performance (Eggert et al., 2014).

This article explores a possible new perspective for enabling and embedding the servitization transition and, in particular, the required mindset and process adaptation: service design and its strategic practices. Service design is a human-centred, co-creative, iterative approach to the creation of new services (Blomkvist, Holmlid & Segelström 2010). Researchers and practitioners are increasingly acknowledging service design as a strategic driver of service innovation (Kimbell, 2011; Patrício et al., 2011; Zomerdijk & Voss, 2009). Furthermore, as service design embraces holistic and system thinking (Brown, 2008; Patricio et al., 2011), it supports innovating organizations to not only focus on the development of a new service *per se*, but also to explore and understand cross-departmental implications and the relational and softer aspects of innovation (Sangiorgi 2012). Thus, service design can help companies reframe their businesses and processes around customer- and service-centric mindsets and practices, and become drivers of organizational transformation (Andreassen et al., 2016; Sangiorgi & Prendiville, 2014).

Despite its transformational potential, to our knowledge, no researcher has previously empirically investigated the role of service design in the servitization transition. We attempt to address this void—and simultaneously advance knowledge in the servitization literature—by addressing the follow research question: *how can service design support and embed the servitization transition in manufacturing companies*? To address the above research question, we combined different qualitative methodologies (in-depth interviews, ethnography, multiple case studies) to study how a service design consultancy uses its service design practices to support manufacturing clients in their servitization transition.

The remainder of the paper is organized as follows. First, we briefly review relevant literature on servitization and its challenges, and on the role of service design in service innovation. Then, we describe our empirical investigation by explaining our research design, its rationale and its execution. A presentation of our findings on the role of service design in servitization transition follows, with a subsequent discussion of the findings to draw conclusions on the role that service design can play in servitization and to position

our study within existing literature. Finally, we comment on the practical implications, limitations and directions for further research.

Literature review

Servitization: A Challenging Transition

The transition of manufacturing firms from a product-led to a service-led strategy and the progressive addition of service components to their product offerings have emerged as crucial managerial practices and, subsequently, research topics. According to Kowalkowski et al. (2015), the complexity of the servitization transition is due to transformation encompassing three dimensions: from a product focus to a service delivery focus; from standardization to customization; and from a transactional to a relational interaction with customers. Pursuing all three dimensions implies increased complexity, coordination costs and operational risk (Nordin et al., 2011).

According to Oliva and Kallenberg (2003), such complexity can stifle servitization efforts in different ways. First, companies might lose confidence in the economic potential of services, thus requiring significant additional effort to make the servitization transition credible across different departments. Second, even when companies realize the market potential of services, they might lack the necessary company capabilities and resources to develop them (e.g., coordinating skills, customer centricity, flexibility). Finally, a company might decide to undertake servitization but fail in implementing its servitization strategy successfully given cultural barriers and lack of commitment. A service-oriented culture is specific and profoundly different from a traditional product-centric culture in terms of stronger customer centricity, flexibility and openness to collaboration (Mathieu, 2001). Changing such a culture requires substantial time and resource investments (Vandermerwe & Rada 1988). Particularly, even if there is company commitment to the change, its implementation is likely to meet resistance from parts of the organisation not understanding the service strategy or simply fearing the implications of cultural change (Mathieu 2001). Creating a service-oriented environment and mindset throughout the company, and finding the right people for championing and implementing the servitization transition are key (Homburg et al., 2003). Manufacturing companies that neglect to invest resources in managing such transition risk long-term market competitiveness (Parida et al., 2014).

The importance of developing certain firm's capabilities, processes, and mindset, and of responding to their required cultural and corporate changes is well stated in the servitization literature (Vandermerwe & Rada, 1988; Oliva & Kallenberg, 2003; Brax, 2005; Slack, 2005). However, how to actually enable and embed the servitization transition (e.g., which tools and processes) has received limited attention (Ostrom et al., 2015; Ulaga & Reinartz, 2011).

In this paper, we argue that the principles and practices associated with service design (and described below) can potentially provide important resources for facilitating the organizational and cultural changes required by the servitization transition.

Service Design and Servitization Challenges

Service research has developed a substantial interest in service design, as proven by the increasing number of articles on the subject (e.g., Andreassen et al., 2016; Patrício et al., 2011; Zomerdijk & Voss, 2009). Service design is deeply rooted in design principles (Karpen, Gemser & Calabretta, 2017; Sangiorgi & Prendiville, 2014), and can be defined as a human-centred, co-creative and iterative approach to the development of new services (Blomkvist, Holmlid & Segelström 2010). These defining characteristics of service design make it potentially valuable for addressing some challenges of the servitization transition. First, a key feature of the service logic is a strong customer centricity. Service design professionals (and design professionals in general) have a strong background in deeply understanding human needs and behaviours, co-creating value with customers and generating solutions that are clear, meaningful and effective for users (Brown, 2008; Stickdorn & Schneider, 2010; Stigliani & Fayard, 2010). As manufacturing companies transitioning towards service-led strategies face the challenge to better understand the processes and context that affect the customer's experience, service design surges as a valuable approach to tackle this challenge of the servitization transition (Andreassen et al., 2016).

The development and implementation of new services is a very complex task and establishing the organizational resources, processes and capabilities for supporting service development and implementation is a major challenge in the servitization transition (Oliva & Kallenberg, 2003; Ostrom et al., 2015; Ulaga & Reinartz, 2011). Given service design's affinity with complexity (Sanders & Stappers, 2014; Stigliani & Fayard, 2010) and design professionals' intrinsic preference for holistic thinking (Michlewski, 2008), the service design approach appears adequate in dealing with the challenges of service implementation and also in the context of manufacturing companies experiencing service innovation for the first time (Andreassen et al., 2016; Patricio et al., 2011).

Finally, developing and managing new services require a co-creation effort between firms, different department employees, customers and other external stakeholders (Ordanini & Parasuraman, 2010). The concept of co-creation is central to service design (Lehrer et al. 2012), since collaborative efforts with customers or other actors are at the core of one fundamental design principle; namely, the co-design of ideas and concepts to better understand user needs and deliver value to them (Sanders & Stappers, 2014). By engaging different actors with the creation of user values and with a service mindset, service design can help companies in initiating and embedding the organizational and cultural changes that are required to support the servitization transition (Andreassen et al., 2016).

Despite the potential of service design, only limited research shows how integrating service design principles, tools and practices can support transformative processes like the servitization transition. We aim to generate knowledge on this topic by using empirical data from a service design consultancy and its practices in employing service design to support clients' servitization.

Methodology

We used an exploratory, qualitative methodology to investigate how service design supports manufacturing companies in their servitization transition. Exploratory

approaches are appropriate when there is limited theoretical knowledge on the phenomenon under study (Eisenhardt, 1989; Yin, 2003). Particularly, we derived our findings by combining data from preliminary in-depth interviews, one ethnographic study and four case studies.

Preliminary interviews

We started with 26 preliminary in-depth interviews with experts in service innovation, servitization and/or service design (design professionals, innovation managers, academics). These interviews helped us gain a general understanding of the role of service design in supporting the servitization transition. Each interview lasted approximately one hour, and was based on a semi-structured interview guide covering the interviewee's experience in service innovation, servitization and service design, and his/her perceptions on success factors and challenges for servitization.

Ethnography at ServiceDesign

The third author conducted the ethnographic study at ServiceDesign, a Dutch service design consultancy specializing in helping companies create and implement new services. At the time of the data collection, the third author had limited knowledge of servitization, service design and service innovation literature, which allowed her to approach the investigation with reduced observer bias (Eisenhardt, 1989). ServiceDesign's way of working aligns with the key service design practices for facilitating servitization. In line with the theoretical sampling strategy recommended for qualitative research (Eisenhardt, 1989), these features make our setting an "extreme case"—an ideal setting in which the phenomenon of interest is "transparently observable" (Pettigrew, 1990, p. 275). In order to improve its effectiveness in helping clients in the servitization transition, ServiceDesign recently started an internal project to redesign their consultancy service with a stronger focus on the implementation and the embedding of the service concept in the client organizations. The third author observed and participated in this project for six months, collecting data on ServiceDesign's strengths in supporting its clients' servitization and helping ServiceDesign develop a toolkit for servitization projects. Data collection followed the general recommendations of ethnographic research (van Maanen, 2011; Visconti, 2010), and included participatory observation, formal semi-structured interviews, informal conversations and analysis of archival data.

Multiple case studies of servitization projects

To further distil how service design contributes to servitization, we retrospectively investigated four projects committed to ServiceDesign by product-oriented companies wishing to develop service-oriented value propositions. We theoretically sampled the case studies with the aim of investigating different theoretical categories (Eisenhardt, 1989); that is, different servitization patterns according to Raddats and Easingwood (2010).

	Truck&Co	MedSupply	NetPower	QualyCare
Size	Large (>250 employees)	Medium-sized (50–250 employees)	Large (>250 employees)	Medium-sized (50–250 employees)
Industry	Automotive	Medical supplies	Power grid operator	Home healthcare provider
Current value proposition	Selling high quality commercial vehicles and providing maintenance	Selling medical supplies to public and private healthcare providers	Installing and maintaining the power grid	Providing healthcare at home or at nursing homes
Initial degree of servitization	Product-centric business adding services to its product value proposition	Product-centric business	Product-centric business	Product-centric business offering service value propositions
Project with ServiceDesign	Development of a new service for fuel-efficient driving behaviour	Development of a new service for the sales department to offer better customer support	Development of a value proposition for a service for domestic energy saving	Development of a digital service for home care
Respondents	Design professional, Project leader, Upper manager, ICT developer	Design professionals (3), Project leaders (2), Marketing managers (2), Sales director	Design professionals (2), Project leader, Upper manager	Design professional, Project leader, Upper manager, ICT developer

Table 1 - Case studies' description

For data collection, we used a dyadic approach and, for a total of 20 sessions, interviewed both design professionals from ServiceDesign and key informants from the servitizing companies (e.g., project leaders, business stakeholders, internal designers). The interviews were retrospective, semi-structured and focused on the following topics: (1) project's content (objectives, stakeholders and main implementation steps); (2) critical moments; and (3) the results and evaluations of the projects.

Data analysis

The analysis followed several steps, according to he guidelines of case study and qualitative data analysis methodology (Eisenhardt, 1989; Miles & Huberman, 1994). First, in line with our research questions, the first author analysed each case separately and selected quotes exemplifying key aspects of service implementation and critical moments in service implementation. Based on the selected quotes the first author completed an initial list of the main themes, constructs and insights for each case. This resulted in a first coding scheme for further refined. Subsequently, for increasing the reliability of within-case analysis and for conducting cross-case analysis, each author coded one case (using the provided coding scheme as a guideline), and the results were compared and combined during three collective sessions (Eisenhardt, 1989; Yin, 2003). The cross case-analysis refined the list of codes, by adding new entries or by collapsing existent entries into others. From the emerging codes we established tentative relationships between constructs. We then refined these initial relationships through replication logic, regularly re-examining each case to contrast and validate the occurrence of certain constructs. We also compared relationships and constructs with extant literature to emphasize similarities and differences, increase the internal validity of the results, and refine recurring themes and constructs. The iteration between data, literature and analysis was repeated several times. The results of this iterative process are presented and discussed in the following paragraphs.

Findings

According to our data analysis, ServiceDesign enacted the servitization transition of their clients by introducing a customer-centred mindset and a service-driven innovation process. This suggests that service design can support manufacturing companies in their servitization transitioning both at a cultural and process level. Furthermore, ServiceDesign embedded the new mindset and process by recurring to a set of design-driven practices that created organizational commitment to the servitization transition. In the following paragraphs, we first describe the customer-centred mindset and the service-driven innovation process introduced by ServiceDesign. Then, we illustrate the design-driven embedding practices.

Enacting the Servitization Transition

Introducing a customer-centred mindset. As indicated by the interviews, the manufacturing companies in our sample tended to rely on quality improvements and technological breakthroughs as main drivers of their decision making in service innovation projects, thus reflecting a product-driven mentality and simply transferring their product-driven approach to the service context. Design professionals in our sample actively introduced a customer-centred focus in the product-focused mindset of their clients, so

that the customer's needs, perspectives and behaviours become the unifying drivers of innovation decision making and practices. A top manager at Truck&Co uses the following words to recognize such an important role of ServiceDesign:

> *"I think in organizations such as ours, products important. But when we start developing services, keeping the product in the middle and everything else around it (…) will not reach the full potential of the service. You have to blend the product with everything else, and put the customer in the middle, listen to what he really wants, and find out their needs. And that is the reason why we hired [ServiceDesign]."*

Despite some clients already used to taking customer needs into account in their innovation practices, ServiceDesign helped them develop a deeper and more authentic understanding of customer needs and satisfiers by leveraging the human centeredness of their methods. As a manager from NetPower indicates:

> *"At a certain point, [the design professional] added an extra customer analysis step that was really based on discovering what is behind the things that people say, and how people experience the issue of energy. That was an important action, because it gave a building block in terms of not only quantitative market and technical research, but also in what are the customer's motives and how you can connect with him through your proposition, design and service."*

Some of the companies indicated that they missed the capability of translating a customer-centred vision (NetPower) or customer needs (Truck&Co) into concrete service value propositions. Relatedly, the design professionals in this study not only provided a deeper understanding of the customer perspective, but also supported their clients in translating the customer perspective into service value propositions fitting this perspective. As the project leader of Truck&Co recalls, the design professionals made the team so genuinely engaged with customer needs that it became very easy and straightforward to develop a driving service accordingly, with no disagreement on its feasibility and market potential.

Furthermore, in some cases, the customer-centred mindset became ingrained not only in the innovation teams directly involved with the design professionals, but also in the entire organization. For instance, in the MedSupply case, the customer perspective was progressively understood and embraced by the entire company for driving their overall innovation portfolio decision making (e.g., what are the next most appropriate innovation projects?). In the QualyCare case, the design professionals helped the client organization to embed the customer perspective in their company vision, as a starting point for shaping the organization and its core processes accordingly.

Introducing a service-oriented innovation process. In addition to instilling a customer-centred mindset, design professionals in our study supported the servitization transition at the process level by introducing a service-oriented innovation process that also revolves around customer centricity. The process involved two sequential phases ("Discover" and "Create") and two integrated, concurrent and iterative phases ("Develop" and "Implement"). For each phase, the design professionals in our study used a set of human-

centred design tools and methods to support the effective execution of the process. Our case studies show that the design professionals actively supported companies in adopting such service-oriented innovation process. As the project leader at NetPower indicates:

> *"[The design professionals] brought along a refined service design approach. Previously, our approach was defined in broad terms, there's a building-the-team phase, the analysis phase and then we'll think of developing things, and writing up a business case. But [the service design approach from ServiceDesign] clearly has further refined our approach towards a more user-centred one, and thus a more service-oriented one."*

All companies confirmed that the lack of a structured process for developing new services might have hindered the servitization transition. The service design process introduced by the design professionals appeared to be more structured than the clients' original way of developing new services for their servitization transition. For example, the marketing manager of MedSupply explains that one of the reasons why they hired the design professionals to support their servitization transition was the structured design-driven process that they proposed, and the detailed plan on "how we are going to come in a number of steps to a business case for the new service proposition". At the same time, the structure of the service design process is perceived as simple enough to be quickly implemented.

By introducing a clear, simple structure in their clients' service development process, the design professionals seemed able to blend the benefits of the customer-centred and iterative service design approaches with the benefits of the linear and rational approach commonly used in managerial problem solving. The design professionals in our study also achieved such balance through a clear specification of the tools to be used in each phase, of the tangible deliverables to be expected, and of the roles within the team. As the design professional in the NetPower project recalls, having tangible deliverables (like the customer journey) really helped the company not only to empathize with the customers, but also to get a feeling of moving to a goal and being on track in the development of the new service. According to the Marketing Manager of the MedSupply project, having such clear deliverables and a set of specific tools also created a common language across different stakeholders, with positive consequences for generating commitment and project ownership.

Embedding the Servitization Transition

Gaining and maintaining top management support. Our data shows that design professionals dedicated substantial effort in gaining and maintaining top management support, since this represents a fundamental condition for the servitization transition to occur and persists over time. Design professionals in our sample spent time in explaining and discussing their customer-driven service innovation process with top management to make them aware of what is expected from them in terms of participation and supporting resources, and ultimately to get their commitment. The Marketing Manager at MedSupply provides an example:

> *"Organizing a crash course in service design for the higher management to teach them more about the process and what to expect was a great way of*

providing them with the knowledge they needed to support this project, and later on enable its progressive implementation."

Providing clear knowledge about the service innovation process (and its outcomes) reduced managers' perceived uncertainty of transforming a manufacturing company into a service-oriented one, thus removing resistance towards the servitization transition. Design professionals in our sample also leveraged effective communication to achieve this objective; namely, by communicating in ways that fit top management language, interests and frames of reference. For instance, in the MedSupply project design, professionals combined their design tools (e.g., the customer journey map) with typical business tools (e.g., the service blueprint and the business model canvas) in order to translate the same information in different languages to engage top management and a broad array of stakeholders.

According to our interviews, top management support should not be limited to the initial commitment, but should be renewed and maintained throughout the entire project, especially in those critical moments in which organizational and structural changes emerge as necessary for service implementation. According to our data, the design professionals used frequent and clear communication and a co-creative way of working to maintain top management involvement, especially in critical decision-making moments. As a design professional explains with reference to the QualyCare project:

"We did it really together. We involved [the top management] in every step. Then it's also theirs. It's also their own baby. ... When we present several alternative solutions in a project we usually don't have our favourite. The client has to decide. We discuss with them and then we get to the favourite solution together."

Co-creation encouraged top management (and other stakeholders) to consciously devote cognitive effort to the co-creative tasks, thus ensuring that they developed ownership of the customer-centric process itself—and of its outcomes—and subsequent support for the servitization transition.

Creating bottom-up acceptance. Design professionals in our sample complemented top management support with a bottom-up approach for creating diffused acceptance of the servitization transition. A reasonable explanation could be that implementing a service development process and a service for the first time has so many organizational and structural implications that more operational parts within a manufacturing company could be involved from the early stages to prevent structural resistance to change. In line with that, design professionals in our sample first introduced the service-driven innovation process in innovation teams close to the market, and then progressively gained upstream organizational commitment. As the design professional working for MedSupply recalls:

"It became an escalating story. It started as a kick-start course on service design for a group of four people in a [business unit] ... and when they were doing that for a little while, [the company] decided we needed to scale this up to the entire organization. At that moment it became a really big project."

According to our empirical investigation, the bottom-up approach was also driven by the fact that innovation teams closer to the market can better capture the user perspective that is at the core of the design-driven service innovation process. Thus, ideas were generated from innovation teams close to the market, and then promoted through different company levels until reaching top management. For instance, in the QualyCare case, whilst servitization began as a top-management initiative, the design professionals introduced a more bottom-up approach for executing the process transition. Thus, the value proposition for developing the new service was not defined by top management and then passed down for its execution, but rather derived by the innovation teams through the combination of different ideas and user insights under the guidance of the designers. Subsequently, the proposition was improved and consolidated by integrating the creative inputs from different company levels till top management approval.

Training approach. The service design consultancy in our sample invested significant time at the beginning and during each project in training the client team in using service design tools so that they could execute the customer-centric service innovation process with the design professionals and develop ownership to it and its outcomes. These practices engaged the organizations with the transition on a deeper level by creating a profound, shared understanding of the servitization transition, and by letting the organization, especially the employees, experience the service design process. As a manager from MedSupply recalls, the training sessions on human-centred research and customer journey mapping helped in creating awareness about the different innovation approach, keeping the team committed to a paced and effective execution, and ultimately facilitating organizational learning.

The training approach also helped embed the customer-centred mindset described before. By training clients in using customer-centred methods for understanding the market(s) and developing fitting offerings, and by engaging them directly with such customer-centred activities (and with the customers themselves), ServiceDesign encouraged cognitive and emotional connections between clients and their users. As the NetPower case illustrates, using *contextmapping*[1] for gaining customer insights on what power energy really means for people helped the client organization experience the customer perspective, and subsequently embed it into their service offering and way of working.

Facilitating approach. In addition to and in parallel with training clients in the service-driven innovation process, the design professionals involved in this study facilitated its execution by helping clients go through all the steps and related methodologies. One design professional explained that in some cases, and given the novelty of the process and the required degree of change, training might be insufficient. The innovation team and involved stakeholders might regress to their previous practices as soon as the training was concluded. To prevent this rejection, the design professionals learnt to act as facilitators and sparring partners for client organizations throughout the project execution. The facilitator role was played by supporting both the management and the content of the

[1] Contextmapping is a qualitative design research method to uncover deep insights into how individuals experience a product or a service in their context of use. For a full description of the methodology, please look at Sleeswijk Visser, Stappers, Van der Lugt, and Sanders (2005).

project. In terms of project management, design professionals supported the manufacturing organizations in maintaining the project's pace and the focus on the servitization objectives. In the words of the Marketing Manager at MedSupply:

> *"The design professionals put quite some pressure on [project management], that you really have to do things to get results and deliver the new services. (...) For the first time in years the structure of the yearly business planning has not changed. So we kept the same structure and the same focus on developing new services. And that has absolutely been the designers' work by looking at it in a different manner."*

In terms of content facilitation, the design professionals acted as sparring partners in the enactment of design tools that allowed the execution of the projects. Particularly, they facilitated by asking the right questions, providing valuable inputs, helping summarizing and indicating core issues. As the project leaders at both MedSupply and QualyCare indicate, such roles went beyond the conclusion of the specific project they were involved with. The designers kept visiting the companies monthly to consult and spar on the implementation of the new service and its further embedding within the client organization.

Using visualizations and materializations. The design professionals in our cases used a variety of visualization tools for reducing the perceived intangibility of the service, and thus the perceive uncertainty of the servitization transition. The frequent use of visualizations and materializations of the emerging new service (or parts of it) (e.g., the blueprint, customer journey map, storyboards) made the service innovation outcomes more tangible and easier to communicate to different stakeholders. In the words of the Project Leader for the MedSupply project:

> *"For instance, [the design professionals] used the business canvas model. This is the translation of the service concept into strategic decisions and what needs to be done. That is needed, of course, to get [the service concept] into the business plan."*

The use of compelling images and a narrative style made the objective of communication stick in the minds of stakeholders for longer. According to the Project leader at QualyCare:

> *"In the beginning of the project, the service blueprint, but also to the personas, [...] bring a lot of information to you, and to a point that it stays in your head for a significant amount of time."*

By leveraging on their creative and emotionally engaging tools, design professionals in our sample helped organizations to think differently, thus creating the proper ground for departing from their traditional product perspective to adopt a service perspective (i.e., a customer-centred mindset). As the project leader at QualyCare observes:

> *"My first impression is that they were very creative. And I appreciate that, just to have a different way of thinking. And by means of their drawings, the customer journey and all the tools, they encouraged us to think different as well. That was actually my main reason to collaborate with ServiceDesign rather than with other kinds of consultancies."*

Additionally, clear, tangible visualizations were used for stimulating business stakeholders to incorporate the customer-centred mindset in their decision making, to act consistently with it, and to eventually embed the customer-driven process and its outcomes into the rest of the organization. As the design professional in the NetPower project indicates:

> *"There were documents, so we had a service blueprint, and we had a couple of personas, and we had insights, infographics of users, and we had done desk research. [The innovation team] presented all these tools in the shape they were, and consolidated everything in a business case on which the Board of Directors can make a decision. That was still quite a lot of work."*

Conclusive remarks

In this study, we have investigated service design as an important mechanism to trigger and maintain the servitization transition of different product-centric companies. In particular, our findings show how the principles and practices of service design can help override organizational resistance and embrace the mindset and process change required by the servitization transition.

Our findings suggest that service design helps manufacturing companies develop customer centricity, which is a key element of a service-focused mindset. While several studies have attempted to explain what customer centricity implies and requires in servitization (e.g., Kowalkowski et al., 2015; Ulaga & Reinartz 2011), there is limited research on how to develop and strengthen it. Service design consultants, whose practices and tools are by definition customer-centric, use a training and facilitating approach to let manufacturing organizations experience customer centeredness and to connect emotionally and rationally with customers and their needs. Thus, through repeated and extended exposure to customers, service design can embed its central role in the development and success of new services in the mindset of manufacturing companies. Furthermore, our data show that service designers not only create sensitivity for and understanding of customer needs, but also an ability to translate customer-driven insights into customer-driven value propositions. Thus, the customer-centricity enabled by service design resembles the more complex and relevant *service-related data processing and interpretation* capability identified by Ulaga and Reinartz (2011) as a more complicated conceptualization of customer centricity, but also more appropriate for product-service system offerings.

Similarly, service design enables manufacturing companies to transition to a service-oriented process, which is customer-centric, iterative and characterized by overlapping stages with an early start for the implementation. Such a process is comparable to the service development process for manufacturing firms proposed by Kindström and Kowalkowski (2014). The role of design lies in enabling the actual reconfiguration of manufacturing companies' activities through training at all levels of the company (from top management to front-end employees), and through structure and simplification. The choice of looking at service design consultants (external players) builds on the work of Agarwal and Selen (2009), who provide empirical evidence that the process of building service innovation capabilities is collaborative. According to our findings, service design helps in triggering, enabling and maintaining commitment to the actual reconfiguration of

manufacturing companies' activities through training at all levels of the company (from top management to front-end employees) and through structure and simplification.

This study has a few main limitations with implications for further research. First, the study is based on a small sample (one service design consultancy and four case studies from the same consultancy). Thus, despite this not being the aim of the method, the generalizability of our findings cannot be assessed. Future research could improve our findings through insights from additional case studies (for instance, involving different service design consultancies, or smaller companies embracing the servitization transition) and quantitative data corroborating the impact of service design practices on the servitization transition's performance measures. In addition, the study is limited by the Western European geographical focus (ServiceDesign is a Dutch consultancy and the clients from the case studies are companies operating prevalently in the European market). Applying our findings to other regions could further enhance the transferability and generalizability of our contribution. Furthermore, based on how ServiceDesign manages the servitization projects of its clients, we suggest certain service design practices that seem to be specific for enabling the servitization transition. However, given our limited sample, such specificity to the servitization context needs to be further validated—perhaps through a comparative research design where the practices and effects of service design in servitization cases is compared with non-servitization cases (e.g., service innovation in service companies).

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Volume 3

ISBN 978-1-912294-13-8

ISSN 2514-8419

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