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# Perspectives on Systemic Design: examining heterogeneous relevant literature to provide a historical and ‘systemically inspired’ review

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**Abstract** This paper lays out a plan of action for literature review on Systemic Design. It argues that despite the newness of systemic design, there is scope for such work, especially if it departs from the typical styles of literature review, and a) takes a historical perspective, b) pulls in a range of heterogeneous literature, and c) if, in doing this, it takes its cue from systems itself, and uses systems thinking based methodologies to establish the interrelationships between systemic design and its influences and directions. Thus the goal of this paper is to explain the rationale for this review style and to call for it to become a strand of research that offers interested scholars a place to stand to examine the antecedents of the turn to systems by designers, to learn about the rich heritage of the systemic design and to help develop further themes within this design paradigm that are newly emerging.

**Keywords:** Literature review, systemic design, heterogeneous resources, historical perspective, emergent themes,

## 1. Introduction

As the ideas of systemic thinking become more familiar and found in many disciplinary discourses, so there is an increase in work reviewing systemic thought. Existing literature reviews are often conducted from a particular disciplinary standpoint, for instance, management (Mele, Pels and Polese, 2010); engineering (Monat and Gannon, 2015). It is as yet too early to carry out a literature review on systemic design. Therefore, although this paper is in the tradition of a literature review, it differs in two respects. The first difference is in the emphasis on giving a sense of a historical perspective (Peruccio, 2017). This allows us to move from the type of literature review whose primary purpose is to draw out key concepts. Rather, we wish to add to the 'key concepts' review, a narrative that builds on timelines and contemporary reactions to relevant discourse in the period under study. The second difference is to use a review methodology based on a systems-inspired literature review (Sylvester, Tate and Johnstone, 2013). This encourages drawing in a range of literature and lends support to narrative inferences by making explicit the interrelationships between ideas, timelines and contemporary discourse. The rationale for making these departures from traditional review methodologies is that, since systemic design is relatively new, grounding it within a historical perspective is an important contribution to establishing a background. Also, systemic design's 'newness' means that resources are not discoverable using traditional literature review search techniques which rely on pre-defining search terms. However, we believe that a review based on 'sweeping in' (Nelson, 2003) heterogeneous relevant research literature will offer a richer set of materials. In short, this review would seek to map the trajectory of ideas that have been influential in systemic design and related themes 'entangled' with systemic design, and by doing this, generate fresh insights into the philosophy, theory and praxis of systemic design.

## 2. From a traditional to a 'systemically inspired' review'

Typically, a descriptive literature review will use a number of search terms, and choose a number of publication outlets, to seek and obtain a good coverage of source material. When a collection of resources is made, they are studied, and the reviewers synthesize previous research and conceptualise the research themes. From this, reviewers will build a picture of what is happening in that particular discipline with regard to a particular topic. The main purpose of this type of review is to draw out the key concepts. Our claim is that for Systemic Design it is too early to have such a review, and that a narrative literature review based on historical perspective will be more conducive to offering useful insights. Also, it will not be possible to be neutral, but the interpretative approach will be open and thus available for inspection and debate.

We propose to use a systems thinking inspired approach (following Sylvester, Tate and Johnstone, 2013) who look for the narratives and uses soft systems methodology to better understand those narratives and frame them, giving interpretations that do not need to follow the positivist style with the emphasis on progression common to most typical literature reviews. Although this approach was adopted for studying concepts in Information Systems, it can be adapted to be used with systemic design. This is because it is primarily a narrative, as opposed to a descriptive, approach. The narrative

approach in this case, makes use of a historical perspective, which is helpful for grounding a new emergent design paradigm such as that of systemic design. It does this by placing it in context, showing how it relates with the various schools of systems-based work, where different groups of researchers are working with the 'same' theory, but in different ways for different purposes.

Such an approach was taken by Greenhalgh, Robert, Macfarlane et al., (2005). They proposed that a 'meta-narrative' review can help make sense of heterogeneous bodies of literature, in which different groups of scientists have conceptualised and investigated the 'same' problem in different ways, in their case the theory of the diffusion of information. Although this is not the kind of question we are dealing with here, still there is value in the idea of a meta-narrative that may offer explanations for various phenomena we observe and help us to interpret them. We agree with Sylvester et al. in challenging the assumption that scholarly knowledge accumulates in a linear fashion over time. They present evidence that sometimes, because of the popularity of some schools of thought, they seem to create more and more studies following established models and methodologies, such that research, rather than building up, is 'piling up', and not creating new insights or advances. When literature reviews of such schools of thought are carried out, they are necessarily inward looking, even though a traditional descriptive review may point to a continuous progression. By combining thematic and historical context to the literature, it is possible to "identify turning points, changes and disconnects [...] distinguishing advocacy from enquiry [...] provide a nuanced and heterogeneous understanding of a complex real-world phenomenon." (Sylvester, Tate and Johnstone, 2013, p.1213).

Finally, our approach also draws from Cameron and Mengler (2009), who worked on a problem that we see as similar ours, although with a starting point that is based on heterogeneity of meaning. Working in the context of museums, they noted that many museums share the problem that their objects in their collection are too many to be displayed at any one time. However, with the advent of the internet, it is possible for interested parties to experience virtual objects. The problem then becomes that both "digitization and networked access enable [...] gathering a broader range of associations around collections, intimately connected to cultural, social and political formations, debates and events." (Cameron and Mengler, 2009, p. 190) and the question arises of how to catalogue the objects to take account of these associations. The classification systems previously established are no longer relevant, as they are too closed to be of wider use. Yet online databases provide access to those objects that cannot be displayed, so the information about them needs to be as rich as possible.

In addition, as part of the modern conceptualization of museums, they are no longer to be conceived as 'mausoleums' but as collections enhancing public education and awareness, meaning that they should be as open, but also as relevant, as possible for the public. The dichotomy between the expert museum curator and the casual visitor is also breaking down, as the meanings assigned to objects move into the realm of the 'networked' object. This refers to the object, whether virtual or real, that is the subject of debate over the internet. Such network objects can be artefacts that have not been seen in the museum setting, in real life, but are the main protagonist in online debates. Thus, the researchers sought to understand how the museum might moves from a closed system to one that

attempts to match its lived environment with all its incumbent contradictions, uncertainties and variabilities. Their response was to use the metaphor of complexity and acknowledge that on the one hand the heritage of classifications are valued, but that in addition, meanings are fluid. Of course, this is well known internally within the museum curators and cataloguers, but the custom has been to 'force' objects into classification, as a means to foster clarity and rationality, and to maintain the authority of the museum. This is in spite of much research demonstrating that the way the museum cataloguers understand the objects differs greatly from the way members of the general public do.

Accepting that there is room for alternatives, and that this should be a source of richness, and an opportunity to authorise more meanings, without compromising the authority of the museum, is akin to what we propose in our literature review approach. We propose that the heterogenous literature can contain different narratives that can foster different meanings, meanings that are not available if practices such as selection processes or pre-assigned meanings predominate.

Thus, Sylvester et al. see the problem of the traditional literature review as pre-imposing a selection process that narrows down the collection of documents to be studied, and also assumes positivist progression, and Cameron and Mengler see the objects in the museum collection as being forced into a rigid classification system that denies their existence as 'networked' objects. Sylvester et al. suggest a historical perspective and derives narratives in which to foster new interpretations. Cameron and Mengler suggest the notion of "knowledgescapes" and of using complexity as a metaphor that rejects dualistic, hierarchical and linear approaches. Such an approach will incur 'uncomfortable' but real-world aspects that we all operate under, such as interlinkages, unpredictability, ambiguity and heterodoxy. In both the traditional literature review, and the traditional documenting systems of libraries, real life is being confined to conform to well delineated 'systems' which ignores complexity and with it the richness of stories that do not conform to the accounts that fit within the norms of those systems.

A systems thinking based approach can provide a more holistic picture of the topic under study because it is conducted within the context of surrounding environments. It includes the researcher as an active part of the research setting, facilitating dynamic dialogue among different perspectives of the things and participants (Jung, 2017). Such an approach searches for the influences and looks for the meaning, as illustrated in the two photos below:



Figure 1. Illustrating “Documenting the influences and searching for the meaning”

The review work seeks to both to map the trajectory of ideas that have been influential in systemic design as well as to follow back related themes that are ‘entangled’ with systemic design, e.g. healthcare or eco-sustainability, etc.



Figure 2. Illustrating both “trajectory of ideas” and “themes entangled with systemic design”

### **3. Entanglement**



Figure 3. Illustrating “Engtanglement”

Since both systems thinking and design have highly inter-disciplinary traditions, it is natural that both should be bound up with many types of work, and that sometimes valuable pieces of research are located in publication outlets that would not normally be directly associated with design or systems, such as with a collection of resources about sustainability (Systemic learning for Sustainability, n.d.) or healthcare (Clarkson et al., 2017). Moreover, it may be that the perspective, which may be for example, the collection in which the resource is located conceals viewpoints relevant to systemic design. For instance, we know that participatory approaches are a bedrock of systemic design, yet foundational research on the notion of co-design as collective creativity, leading possible “transformation toward more sustainable ways of living in the future” (Sanders and Stappers, 2008) does not mention systems, although it might be argued that it appears to have absorbed it. Another example is when systems thinking is applied to an area contingent to design, such as creativity: Csikszentmihalyi, a psychologist, claims systemic implications on creativity (Csikszentmihalyi,1999).

Therefore, following relevant themes and topics and also research groups (e.g. Barbero, 2017) is important. This is not done with a primary aim of discovering search terms, - although this can be useful at a later stage for seeking out more resources, - rather, it is mapping themes to an overall emerging picture, so that interrelationships can be reflected upon. This, in turn, leads to more discoveries until a ‘saturation’ point is reached, sufficient for a well-grounded narrative accounting for how certain themes are related and how developments have emerged. This narrative can then give some basis to make assumptions about how they might continue to develop.

Furthermore, by laying open to scrutiny the ways by which the observer (in this case the authors of this paper) ‘interpret’ what they see, other observers are able to follow the reasoning and draw their own conclusions, for as Midgley (2003) emphasises, it is not possible to present a neutral account.

### 3.1. As an example...

The trajectory of systems thinking and systems oriented design offered by Peruccio (2017) shows how a historical perspective can be illuminating. Between the 1972 publication of the *Limits to Growth* (Meadows et al., 1972) and the Buchanan's 1992 paper noting an area of design "concerned with complex systems or environments" (Buchanan, 1992, p.10) there is a gap of two decades. Previous to this, we know that systems thinking was taught in the now famous design education establishment that was the Ulm school, (1953-68). Also, we know that in this period Design was pre-occupied with self-reflection on the nature of design e.g. 'designing designing' (Jones, 1979); with debates about intuition versus positivism, with 'designerly ways of knowing' (Cross, 1982). It is strange that systems thinking does not seem to have infiltrated to produce 'systemic design' earlier.

We might speculate, that perhaps it was because of an association between positivism and system dynamics (Coyne and Snodgrass 1991; Cross, 1993)? On a parallel note, in a different discipline, Collopy notes that systems thinking did not implant itself in management (Collopy, 2009) although he attributes this to need to acquire literacy in systems. The question of systems literacy is also part of other discourses around systems thinking, with claims that systems literacy is essential to all research endeavours (Bosch, King, Herbohn et al., 2007; Dubberly, 2014).

Figure 4 below represents an attempt to show how a visualization of this speculation can lead to more thoughts. Of course, visualizing has been shown to be a good tool for exploring 'data' as Tufte (1990) advocates, based on examples from the past.

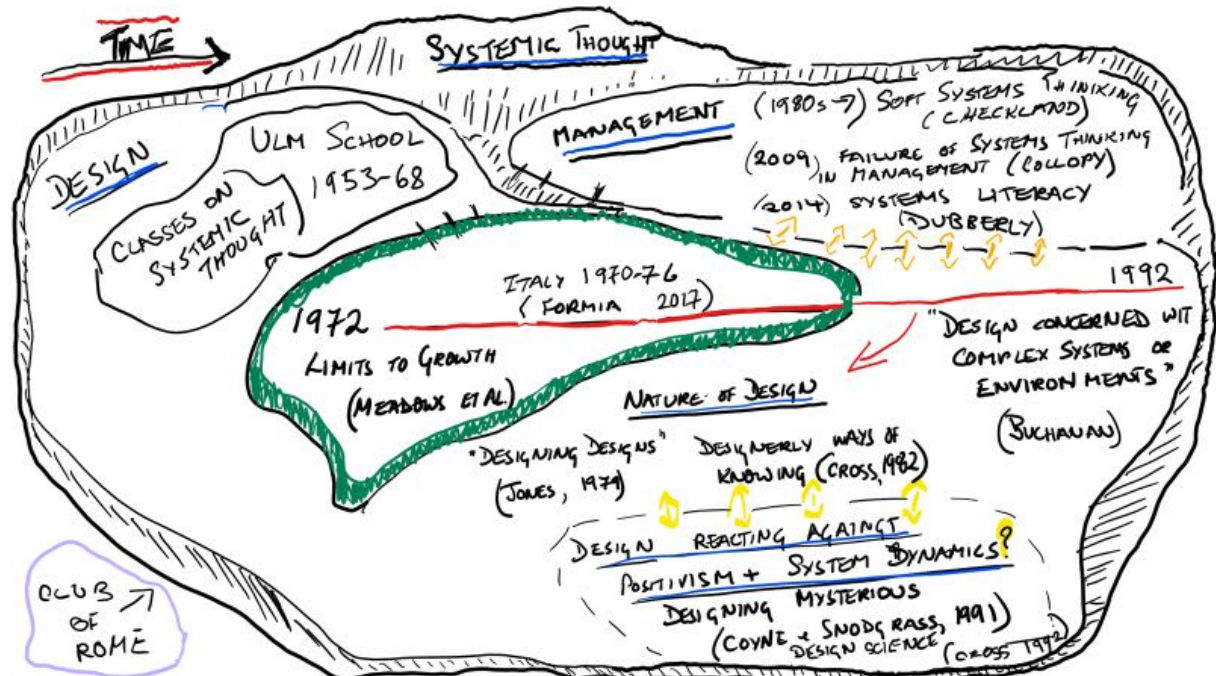


Figure 4. Systemic thought and how it did not take root in Design despite antecedents -rich picture

## 4. The contributions of Design History and Literature Reviews



Design historians are the acknowledged experts in answering these kinds of questions posed above (Formia, 2017). However, we maintain that literature reviews, especially those framed as we have described, could also be helpful. For instance, within design oriented academic journals, there is an emergence of concern with incorporating wider issues into design. Examples are papers on ‘whole system design’ integrating social, economic and environmental phenomena (Blizzard and Klotz, 2012; Charnley, Lemon and Evans, 2011) and the linking of ‘design for sustainability’ (DfS) as design for ‘system innovations and transitions’ (Ceschin and Gaziulusoy, 2016). Many of these papers evolve their systems thinking discourse from exposure to interests in sustainability (stewardship of the planet), or to ‘bumping up against’ complexity in their design work. This correlates the claim that, “design studies today tend to follow an ambiguous version of complexity theory, rendered without citations or methodological influence” (Jones, 2014, p.123). If this is the case, is design simply responding to the pervasiveness of calls for the need for systems thinking, apparent in all kinds of settings from agriculture to 3<sup>rd</sup> sector work (Bland and Bell, 2007; Vexler, 2017)? In order to try to answer these questions, we need a blend of both a historical perspective, literature reviews that follow the narrative method, and heterogenous literature encompassing various types of resources, coming from various disciplines, not to mention different regions of the world, and where literature may not ordinarily be available to researchers because of language or other barriers.

## 5. Current work and future directions

The plan for our work, is to continue to map out themes and timelines, with the aim of also creating a set of resources that can be added to, interpreted (and re-interpreted) to explore the interrelationships of timelines with themes that are found both in and around systemic design. A number of such themes have already presented themselves in our work so far, such as the relationships between service design and systemic design which call for both more grounding and more exploration (Darzentas and Darzentas, 2014, 2016). Another theme is to examine the antecedents of recent work on systems thinking as a psychological construct (Davis, Leppanen, Mularczyk, et al., 2018, Randle and Stroink, 2018), and speculate what this might mean for designing with neurodiversity. More immediately, the suggested synthesis of Design Thinking and Systems Thinking (Pourdehnad, Wexler and Wilson, 2011; Ryan, 2014) is a fertile ground for more nuanced investigations as evidenced by (Jones, 2014; Sevaldson, 2017)

It is our hope that we can also engage with the emerging systemic design community, via the new Systemic Design Association, to create a special interest group of like-minded researchers, in order to, for instance, bring in impactful literature from sources that are unknown to the wider community, because of not being published outside of national boundaries, or inaccessible due to language barriers, or being published in non-indexed resources. In this way, we hope our review work will not only lead to publications, but also to the establishment of a background prompting fresh research questions.

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