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Perspectives on systemic design: Examining heterogeneous relevant literature to provide a historical and 'systemically inspired' review

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Previous work on reviewing Systemic Design

- Existing reviews on systemic thought bounded by disciplinary perspective : e.g.
  - management (Mele et al, 2010)
  - engineering (Monat et al, 2015)

- Only one on design and systemic thought (Peruccio, 2017)

1. Mele, C., Pels, J. & Polese, F. (2010). A Brief Review of Systems Theories and Their Managerial Applications. *Service Science*, *2*(1–2), 126–135

2. Monat, J. P. & Gannon, T. F. (2015). What is Systems Thinking? A Review of Selected Literature Plus Recommendations. *American Journal of Systems Science*, *4*(1), 11–26.

3.Peruccio, P. P. (2017). Systemic Design: A Historical Perspective. in Barbero, S. (Ed.) Systemic Design Method Guide for Policymaking: a Circular Europe on the Way, Allemandi, pp 68-74 (output of the EU funded Interreg RETRACE project)

This review work does 2 things:

1. takes a historical perspective (drawing on Peruccio, 2017) rather than the "key concepts" type of review
   - i.e. conceptualise research areas and survey and synthesise prior research
   - because we believe that :
     - it is too early to have a key concepts type of review,
     - a narrative 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.

2. uses a systems thinking inspired approach (following Sylvester 2013)
   - looks for the narratives
   - uses soft systems methods to better understand those narratives and frame them, giving interpretations that move from the positivist line of progression that is typically adopted in literature reviews.

Sylvester, A., Tate, M., & Johnstone, D. (2013). Beyond synthesis: re-presenting heterogeneous research literature. Behaviour & Information Technology, 32(12), 1199–1215

Establishing the influences…
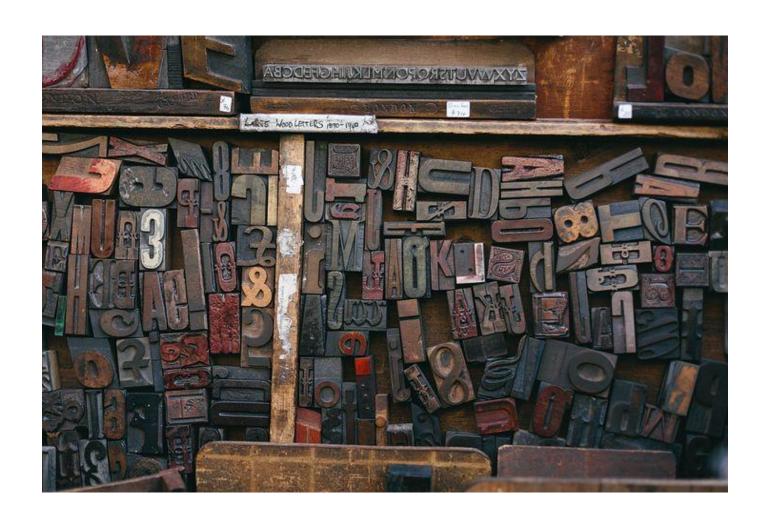
…and looking for the meaning

Table 1. Comparisons of assumptions between traditional and SSM versions of a literature review.

Assumptions of a traditional literature review	Assumptions of an SSM literature review	Comparison based on Cooper's (1988) taxonomy
A literature review presents a rational summary of the current state of knowledge about an external reality	A literature review represents selected data to which meaning is applied in a context	Perspective that the researcher presenting a literature review makes neutral and rational selections versus acknowledging that the coverage of papers included in a literature review is necessarily limited and selective
Academic research occurs in a neutral context	Academic research occurs in a social and political context. Academic studies have 'owners' who may advocate for the study for reasons of promotion or reputation, and may be engaged with other actors from the academic research community	Perspective of neutral representation of previous knowledge versus perspective of espousal of multiple, competing, and possibly self-interested positions
Reviews of academic literature are used to build a cumulative research tradition	Reviews of academic research are subjective and used to serve the purposes of individuals, and of the wider academic and practitioner communities (including political purposes)	Goal of integration of previous studies versus goal of criticism and elucidation of the multiple perspectives presented in previous studies
Academic research should be conceptualised as a summary of findings independent of the social and political context of the researchers themselves	Academic research can be conceptualised using SSM and CATWOE analysis and presented as a rich picture	Organisation is conceptual versus organisation is historical and structured around CATWOE elements

The review work seeks to both:

map the **trajectory of ideas** that have been influential in systemic design

follow back related themes that are **'entangled'** with systemic design, e.g. healthcare or eco-sustainability, etc.

Entanglement =

- "when information about one thing improves our knowledge of the other"

Examples of entanglement in design processes

- **participatory approaches** are a bedrock of systemic design, yet 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.

- Systems and creativity:, the psychologist, Csikszentmihalyi,(1999) claimed systemic implications on **creativity**

- Sanders E. B.-N. & Stappers P. J.(2008) Co-creation and the new landscapes of design, CoDesign, 4:1, 5-18

- Csikszentmihalyi, M (1999). Implications of a Systems Perspective for the Study of Creativity. In Sternberg, R. (ed.) Handbook of Creativity. New York: Cambridge University Press, 313-338

The aim of this research

- To help us understand and situate influences
- To help us move forward
- To see systemic design where it is assumed to be
- To see systemic design where it lives – but is not acknowledged as such
- To help us answer questions that arise...

As an example..
Why has Systemic Design not emerged before 21st century????

- Between the 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"(p.10) there is a gap of two decades.

- Previous to this, we know that systems thinking was taught in 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.

- Perhaps it was because of an association between positivism and system dynamics (Coyne and Snodgrass, 1991, Cross, 1993)?

- In a different discipline, Collopy (2009) notes that systems thinking did not implant itself in management although he attributes this to need to acquire literacy in systems.

- (Interestingly, others see systems literacy as essential to all research endeavours (Bosch 2007, Dubberly, 2014)

TIME →

SYSTEMIC THOUGHT

MANAGEMENT

(1980s →) SOFT SYSTEMS THINKING (CHECKLAND)

(2009) FAILURE OF SYSTEMS THINKING IN MANAGEMENT (COLLOPY)

(2014) SYSTEMS LITERACY (DUBBERLY)

1992

DESIGN

ULM SCHOOL 1953-68

CLASSES ON SYSTEMIC THOUGHT

1972 LIMITS TO GROWTH (MEADOWS ET AL.)

ITALY 1970-76 (FORMIA 2017)

"DESIGN CONCERNED WIT COMPLEX SYSTEMS OR ENVIRONMENTS" (BUCHANAN)

NATURE OF DESIGN

"DESIGNING DESIGNS" (JONES, 1974)

DESIGNERLY WAYS OF KNOWING (CROSS, 1982)

DESIGN REACTING AGAINST POSITIVISM + SYSTEM DYNAMICS?

DESIGNING MYSTERIOUS (COYNE + SNODGRASS, 1991)

DESIGN SCIENCE (CROSS 1993)

CLUB OF ROME

Interpreting what we see….

- Within design oriented academic journals, there is an emergence of concern with incorporating wider issues into design.
  - 'whole system design' integrating social, economic and environmental phenomena (Blizzard & Klotz, 2012, Charnley et al, 2011)
  - the linking of 'design for sustainability' (DfS) as design for 'system innovations and transitions' (Ceschin & Gaziulusoy, 2016).
- Such papers link their systems thinking discourse from
  - sustainability (stewardship of the planet)
  - or to 'bumping up against' complexity in their design work
  - etc.
- This correlates the claim that, "*design studies today tend to follow an ambiguous version of complexity theory, rendered without citations or methodological influence*" (p123) (Jones, 2014).
- 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 (Bland & Bell, 2007, Vexler, 2017)?

Looking to the future
Mapping out themes and timelines

- Several avenues of research immediately present themselves
  - merging of disciplinary boundaries e.g. service design and systemic design (Darzentas & Darzentas, 2014, 2015)
  - to examine the antecedents of recent work on systems thinking as a psychological construct (Davis et al, 2017, Randle & Stroink, 2018) and speculate what this might mean for designing, e.g. designing with neurodiversity.
  - the suggested synthesis of Design Thinking and Systems Thinking (Pourdehnad et al, 2011 & Ryan, 2014) is a fertile ground for more nuanced investigations as evidenced by Jones (2014) and Sevaldson, (2017)
  - And many others….

Our last words from Sylvester et al. (2013)

- "By challenging the assumption that scholarly knowledge accumulates in a linear fashion over time, we are able to identify turning points, changes and disconnects."

- "We can distinguish advocacy from enquiry".

- "We can provide a nuanced and heterogeneous understanding of a complex real-world phenomenon."

In conclusion...

Thank you!

- We would be grateful for any interesting "lines of enquiry" you may like to contribute
- We envisage this work as beginning a dialogue with the Systemic Design and RSD community...
- the possible formation of a working group? (Special Interest Group, etc.)

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