



Faculty of Design

2015

Gigamaps: Their role as bridging artefacts and a new Sense Sharing Mode

Sevaldson, Birger

Suggested citation:

Sevaldson, Birger (2015) Gigamaps: Their role as bridging artefacts and a new Sense Sharing Mode. In: Relating Systems Thinking and Design (RSD4) 2015 Symposium, 1-3 Sep 2015, Banff, Canada. Available at <http://openresearch.ocadu.ca/id/eprint/2049/>

Open Research is a publicly accessible, curated repository for the preservation and dissemination of scholarly and creative output of the OCAD University community. Material in Open Research is open access and made available via the consent of the author and/or rights holder on a non-exclusive basis.

The OCAD University Library is committed to accessibility as outlined in the [Ontario Human Rights Code](#) and the [Accessibility for Ontarians with Disabilities Act \(AODA\)](#) and is working to improve accessibility of the Open Research Repository collection. If you require an accessible version of a repository item contact us at repository@ocadu.ca.

Birger Sevaldson

Gigamaps: Their role as bridging artefacts and a new Sense Sharing Model

Abstract

The role of the Gigamap is constantly developing. This process has not been an intentional process but a process of discovery. By looking at some obvious roles of the Gigamap closer new concepts crystallize. This working paper reports on the rethinking of the Gigamap as a tool to design a shared picture of complex systems for systemic design intervention. The role of the Gigamap as bridging device to detect and cover destructive ruptures in the design process is investigated closer. Investigating the ruptures leads to understanding better the qualitative features the maps depict and how these features can be shared. This leads in the end to a proposal for a Sense Sharing Model

Introduction

Gigamapping has been established as an important tool in Systems Oriented Design (SOD) throughout the last years, especially at the Oslo School of Architecture and Design, but also spreading elsewhere.

Through this period the role of Gigamapping has been discussed and developed. From the start the role of the Gigamap was to be an inclusive and un-dogmatic approach to large scale mapping. Its main purpose was to get at grips of big complexity for the designer. Any hard framing of the Gigamap and any imposed rule set was seen to be counterproductive and limiting. The map was seen as a device to integrate systems thinking with design. Through the map one could harness the design process and the practice of design to become a strong tool for understanding systems as well as designing them. The map was a tool for *design inquiry* as defined by Nelson and Stolterman who describe design as a separate form of knowledge production (Nelson & Stolterman, 2012). So we started to look at the Gigamaps as devices for design inquiries and hence the maps were looked upon as design artefacts. Developing the map through design iterations was a strong way of refining the insights into the complexity of the systems at hand and to cut across scales from myriads of details to large scale patterns.

In this development Gigamaps have been regarded by us as soft systems approaches closely related to the SSM “Rich Picture” (Checkland P. & Poulter, 2006) and other visual techniques. At the same time we were aware of the limitations and advantages of harder systems models and therefore adopted a pragmatic view on systems approaches rooted in Critical Systems Thinking (Flood & Romm, 1996). This implied in some cases the inclusion and integration of various systems models into the Gigamaps.

Revisiting the role of the designer and the role of the Gigamap and Systems Oriented Design has led to a shift in the view on the role of the Gigamap.

In design we most often are looking at composed perspectives. This means that we are navigating complexities that are crossing technological, biological and social realms. We deal with both deterministic and unpredictable systems, framed and tamed ones as well as wild and wicked ones. This implies that we might find ourselves at both soft and hard ends of the systems approaches. Design culture indicates that we are more on the soft, fuzzy and wicked side of that landscape but reality tells us that we more than often work with e.g. technology. Technological

systems at large are “hard” and deterministic. Our lack of grips at the hard side we compensate with interdisciplinary collaborations with e.g. systems engineers and other experts. This is not limited to the hard end of the scale but it also expands throughout the field involving in any experts and stakeholders.

In addition we find our self working in interdisciplinary networks of stakeholders representing different cultures and different fields. These might be sortable according to the above mentioned scales of hard and soft but might as well fall outside. There might be an enormous gaps and variations in a network of stakeholders. These gaps need to be bridged.

Gigamapping has been a central tool for co-inquiry where experts, users and other stakeholders are brought together and immerse in a dialogue across their specialized cultures and terminologies.

It is hence not of any importance if the Gigamap neither submits to any systemic model nor creates its own modelling of systems. The Gigamap is instead the in-between, the infill and the multiple bridging system between expertises, knowledges, models and fields.

This working paper will discuss further the nature of Gigamaps and refine the view on how they are part of design inquiries and how this connects to their role as design artefacts. Further on I will discuss the role and limitations of some particular systems models and argue that they only cover limited aspects. Moving on to talk about how to turn the tension between particular models as well as other world views expertices and stakeholder perspectives into a productive richness imperative and how Systems Oriented Design takes on a role of the in-between where the Gigamap is the arena of co-existence. A discussion on what we actually share leads to the “Sense Sharing Model”. Finally I will draw the lines back to the idea of a conglomerate research design first proposed in 2002.

Background

This working paper is taking as its main framework the idea of praxiology. The term Praxiology is first used by Cross (Cross, 1999) in the field of design as a systematized accumulation of practice generated skills experiences and knowledge. Though Cross does not define Praxiology exactly it is implicit that it is this way he uses the term. Despite that the term is used differently in other fields the way Cross used it is identical to the way I am using it.

The paper is not about theory development nor methods development. It is about developing the understanding of practice. For this the term and concept of Praxiology seems adequate. Methodology is the systematic analyses of methods and strategies in doing scientific studies. Methodology deepest seen is not very well applicable to practice. Its failure in the realm of design exposes this inherent problem. Praxiology is the systematic study, analyses and pragmatic development of skills, explicit and tacit knowledge, approaches, libraries of concepts, technical methods, conventions, rules and strategies, in advanced practice.

In Systems Oriented Design (SOD) over the last ten years a substantial praxiology has been developed. (B. Sevaldson, 2009). This working paper is situated in this work and it brings the work another step forward. As an example of one of the more substantial developments we could point at the development of the *Library of Systemic Relations* (B. R. Sevaldson, n.d.). This is a practice based systematisation of the characteristics found in relations when working

with Gigamaps. When turning the attention from the object to their relations, working with real world systems and without the restraints from orthodox systems models it became clear that the common use of systems relations in those models was insufficient. The format of the Gigamap, allowing and encouraging the mix of differing categories, graphic expressions, media, and mixed methods approach, resulted in a very robust mapping model. This robustness allowed for unlimited types of information to be mapped out and networked within the same image. Turning attention from objects to relations is a central feature of systems thinking. Describing the relations in detail was a natural consequence and from that the library of types of systemic relations was built. I emphasise it is a library and not a typology. The library is open and to be developed infinitely. It is also not prescribed as a way of working but as a repertoire of abilities. This library is part of the growing Praxiology of Systems oriented Design.

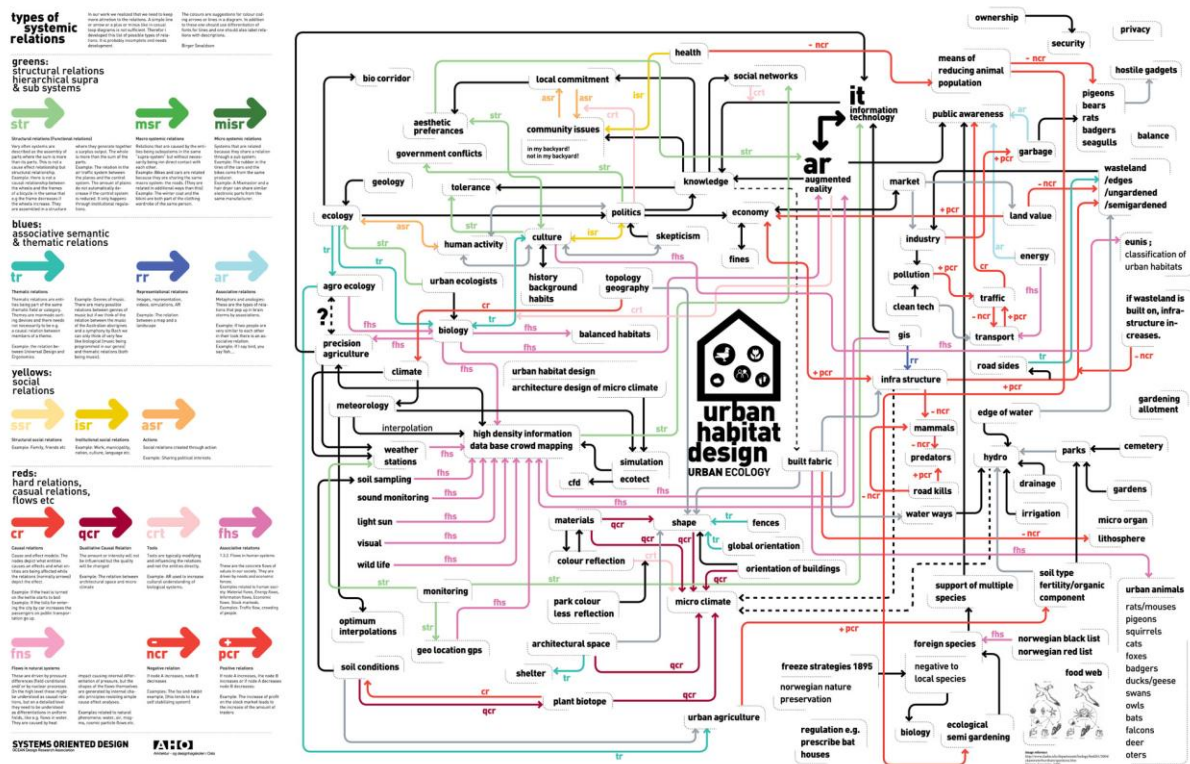


Figure 1. A Gigamap with heavy emphasis on the relations. The relations are color coded according to the suggestions from the “Types of Systemic Relations” web page. Each type is described in an extensive legend. (Sevaldson et. al. 2013)

Gigamapping is extensively described by the author and others (Aguirre & Paulsen, n.d.; Davidová, n.d.; Hensel & Sørensen, 2014; Romm, Paulsen, & Sevaldson, 2014; B. R. Sevaldson, 2013; B. Sevaldson, 2011; Singh, 2013). Shortly it is a multi-purpose and multi-layered device with multiple uses and intentionalities. Amongst them we find:

- To grasp complexity: the system, its sub and supra systems, its environment and its landscape
- To design, share, align and criticize an image of a complex situation
- To understand and share problem fields, (problematiques)
- To modulate relevance

- To critique boundaries
- To seamlessly move from descriptive to generative
- And more.....

The Gigamap draws on many other concepts, approaches and methods to depict and describe and design within complex issues and it draws all those perspectives and approaches together into one powerful device.

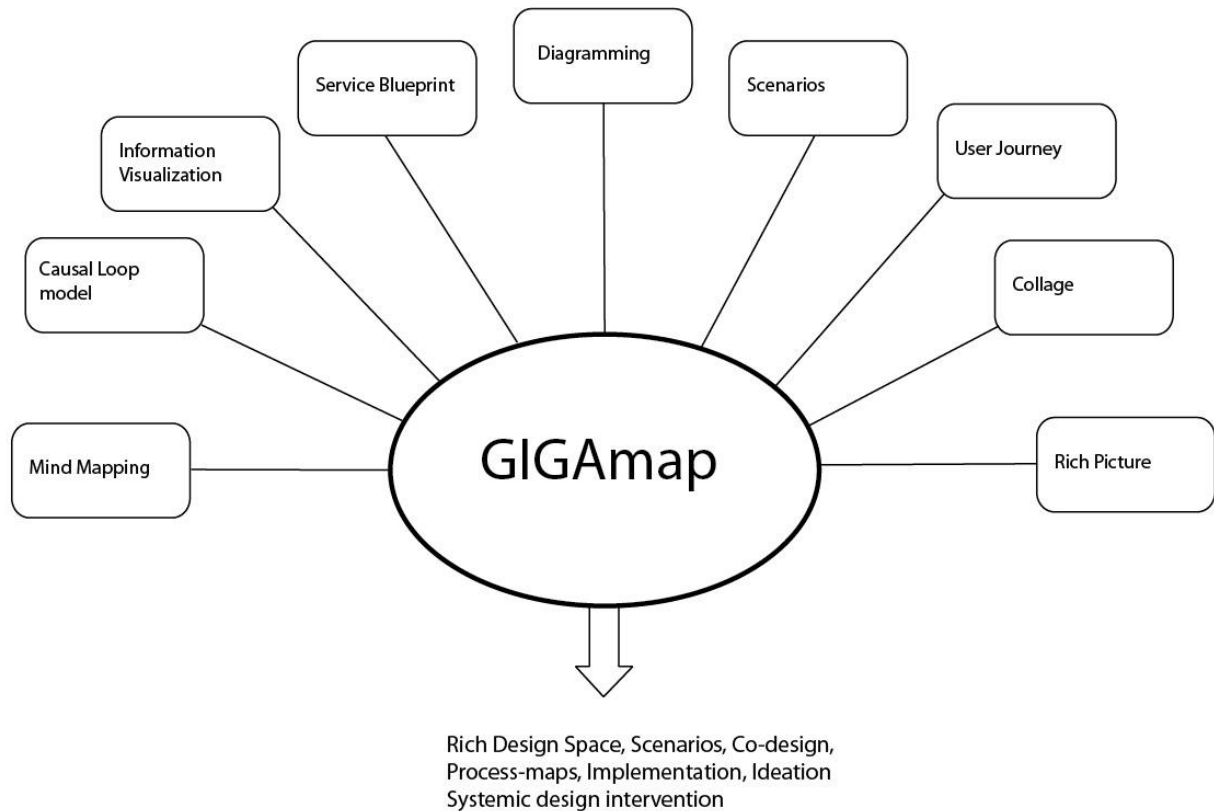


Figure 2. The Gigamap draws together many different ways of diagramming and representing information. (Diagram by B. Sevaldson, 2013)

While mapping in general is a way of ordering and simplifying issues, so to say “tame” the problems, Gigamapping intends not to tame any problems. Gigamaps try to grasp, embrace and mirror the complexity and wickedness of real life problems. Hence they are not resolved logically nor is the designerly urge for order allowed to take over too much and hence bias the interpretation of reality.

Gigamaps are intentionally vague and unresolved.

- They are an inclusive and un-dogmatic approach to large scale mapping
- Hard framing and imposed rules are counterproductive and limiting
- They are a tool for *design inquiry*
- The maps are design artefacts developed through design iterations
- They span from myriads of details to large scale patterns

They are representing composite perspectives. This means that the co-designers do not necessarily settle on a shared perspective but they share an understanding of the multiple perspectives that are constantly and dynamically at play in the process. In design we are navigating complexities that are crossing technological, biological and social realms. We deal with both deterministic and unpredictable systems, framed and tamed ones as well as wild and wicked ones. We are at both the soft and hard ends of the systems approaches

Ruptures

A general phenomenon that produces problems in projects dealing with high degrees of complexity are any kind of information or communication breakdowns as well as misaligned perspectives. These issues I call ruptures. Ruptures can appear because of structural reasons (the systems information structure is insufficient) or over time (things get lost in the process) or by general misconception of the implications. Typically implementation challenges are underestimated to a degree that is epidemic. This is due to a rupture between the models one operates accordingly and the reality these models represent. This erroneous models could be caused by ignorance or by biases, e.g. to get a sale and cope with the problems later. Ruptures can be:

- Information overload causes decisions based on short memory
- Client not understood well enough
- Dis-alignment within the organizations (own and client)
- Implementation problems
- Too narrow or wrongly framed horizon
- Different conceptions of systems shape, extend, connectivity, structure
- Different sensitivity towards the system

Actors

Ruptures always appear between actors in the project. The list of actors can be very long but here we have limited it to consist of the individual designers, the design team, the client, experts, users, society and agency (stakeholders who cannot represent themselves)

	Designer	Design team	client	experts	users	Society	Agency
Designer	?						?
Design team		?					
client	?				?	?	
experts							
users					?		
Society							
Agency							?

Figure 3. A matrix with the simplified stakeholder and actor list can be used to search down potential ruptures before they appear. Interestingly one can with such a matrix speculate if also individuals are coordinated with themselves. Ruptures and hidden contradictions within one person's picture of the system are normal when it comes to working according to multiple perspectives. (B. Sevaldson)

A central intention in SOD is to act proactively on complexity. Shying away from potential difficulties and solving them when they eventually emerge is a bad strategy. It is both expensive and delaying and the space for responding in a good way is already closing. Imagining possible problems in advance is a better strategy. Even quick and short reviews would help to avoid gaps in information flow and to maintain ownership.

The Gigamap. The ultimate bridging device

The Gigamap has proven to be an ultimate bridging device. It is easy learned and easy to apply. Especially within groups of collaborators the bridging and synchronizing effect is remarkable. We have run a number of workshops with business leaders and other groups where they report on this effect. Even for people who have worked together for years and who should be fairly synchronized hidden ruptures are unearthed and addressed.



Figure 4. Example of Gigamapping process involving a large number of participants from a public service in Oslo. They were in the middle of an organizational reforming process that had run into problems because of large amounts of ruptures. The Gigamapping together with the development of new bespoke collaborative tools helped them to get back on track. (From "On the same page" L. LeBlanc et. Al. AHO, Oslo, 2014)

New developments in bridging

Until recently our conception of what the Gigamaps role might be in a collaborative setting was restricted to providing a shared picture of a complex field that is up for a design project. We have realized that these are constructed pictures, that we co-design a co-understanding of the complexity. Also it was clear that the sharing of hard facts and data as well as reporting from stakeholders etc was formed or weighted and calibrated in the process of sharing them to form a coordinated understanding of the issues. Interpretation is central.

In this paper I will present additional layers or additional detail to what this sharing is and what it addresses. All these progresses are found on the soft end of the scale. So besides sharing hard data, quantitative and qualitative information and how they are related, sorting and designing them into a shared picture of the complexity a Gigamap does much more.

The true value of the Gigamap is that it produces aligned and shared sensitivities for the task at hand.

The Sense Sharing Model

The Sense Sharing Model is nothing more than a perspective that describes the shared sensitivities above. Co-designers can share as much information they want and co-design the Gigamap and create a shared picture, but they can still have a different view on the issue.

Since the start of the research with Gigamaps it was clear that there was more to it than the facts only. This has led to a long process of developing the insight about this form of mapping. This has developed through two steps of concept development. The first step was the realization and clarification of the Gigamap as a design artefact. This had implications on how the mapping process was seen, and on the relation between the map and the reality it first depicts and later redesigns. This realization did solve some of the qualitative questions the mapping raised. But there were still more tacitly sensed issues to it. Intuitively we were drawn towards certain types of maps that depicted richness and depth on the cost of clarity. I needed to clarify this attraction to the wicked.

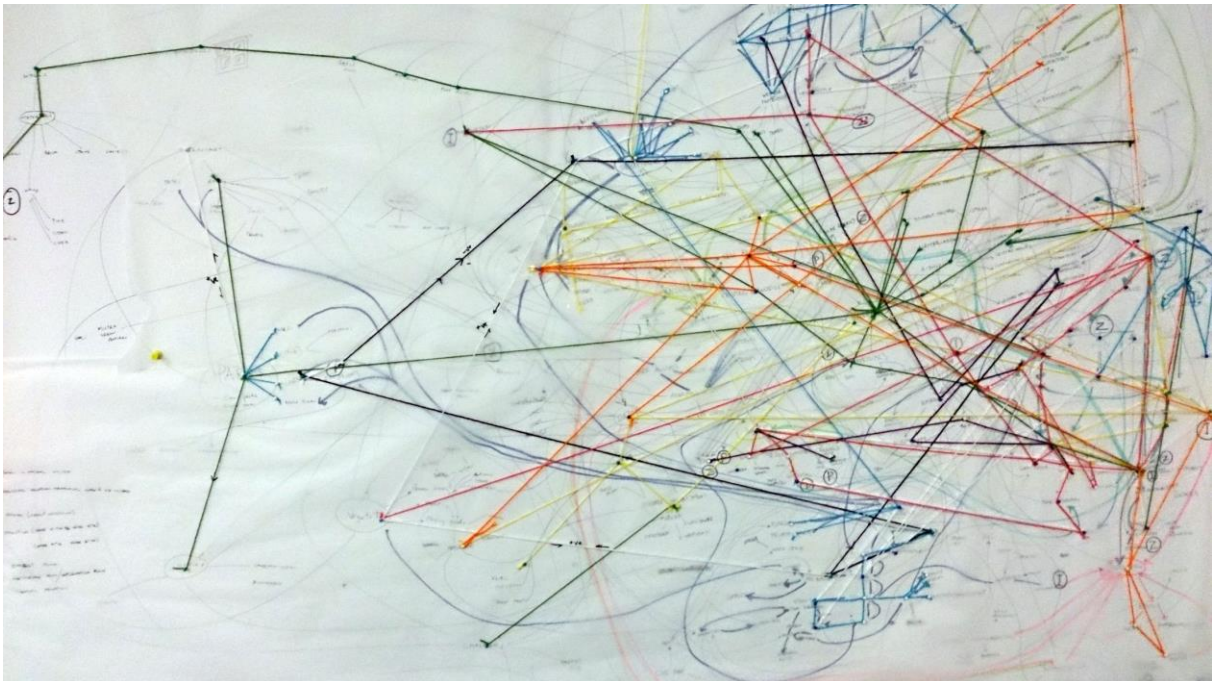


Figure 5. Richness and depth on the cost of clarity. Such maps were intuitively attractive but what they depicted and emphasised was not immediately clear.

By studying exemplars of such maps the realization emerged that what these maps mainly communicated and shared were soft but never the less very important and central issues when bridging ruptures. Instead of dominantly communicating information these maps communicated and depicted a sense of the qualitative features of the system. These features are the components of the Sense Sharing Model.

These were pinpointed to include the following features:

- Sense of the field
- Sense of Gestalt
- Sense of degree of complexity
- Sense of timing and dynamics

- Sense of needed effort
- Sense of resistance

This is far from finalized work and more features might be added in the full paper following this working paper.

We will in the rest of the working paper shortly go through these features.

Sense of field

This sense sharing feature generates a shared sense of the field in which the client organization or the project is situated. How extensive is it? How solid or blurry is its boundaries? How enclosed or fragmented is the field? How vast does it stretch? How diverse is it? Failing to share this sense of the field can result in fragmented project work.

Sense of Gestalt

This sense sharing feature generates a shared sense of the main figure of the system at hand. Is there a clear head? Is it a top down or bottom up organization? Is it old and grown over time. Is it worn and fragile. What shape depicts it best? Failing to share this sense of Gestalt might result in hidden ruptures in the process.

Sense of degree of complexity

This sense sharing feature generates a shared sense of how complex the challenges ahead are. If the team has very differing views on how challenging the task is there is a serious rupture. It is not needed to understand the system in all its detail to generate a sense of degree of complexity.

Sense of timing and dynamics

This sense sharing feature generates a shared sense of how dynamic the system is. Is it changing quickly or slowly? Is it able to absorb change within a reasonable span of time or will change take longer time. How is the timing for suggested interventions. Failing to share the sense of the dynamics of a system can result in serious ruptures and desynchronized and erroneous planning.

Sense of required effort

This sense sharing feature generates a shared sense of the effort needed to successfully implement a suggested systemic design intervention. Is it expensive, are there technical difficulties? Failing to share this sense leads to serious implementation problems. Such failures are too normal in e.g. IT.

Sense of resistance

This sense sharing feature generates a shared sense of the inherent resistance to change that affects the systemic design intervention. Resistance can be found on all levels in the system, its environment, the landscape it lives in and globally.

How to practice the Sense Sharing Model

This model is very new and we do not have yet a lot of experience leading to developed praxiologies for the model. But the steps forward would include creating sessions for each of the features where they are discussed through over and with the Gigamaps developed.

Simple tools will probably be developed for this, similar to the ZIP analyses, the threshold analyses and others developed within the praxiology of SOD.

Concluding remarks

This is a working paper in the midst of a development process that has quite central implications on how we look at the role of the Gigamap in SOD. As mentioned we need now to test the Sense Sharing Model and develop simple to use tools and guidelines for it. This will be hopefully developed and presented in the fully developed version of this paper.

References

- Aguirre, M., & Paulsen, A. (n.d.). Using material properties to understand and shape relationships in public and social services.
- Checkland P., & Poulter, J. (2006). *Learning for Action: A Short Definitive Account of Soft Systems Methodology and its use for Practitioners, Teachers and Students*. Chichester: John Wiley & Sons, Ltd.
- Cross, N. (1999). Design Research: A Disciplined Conversation. *Design Issues*, 15(2), 5–10.
- Davidová, M. (n.d.). Generating the Design Process with GIGA-map: The Development of the Loop Pavilion.
- Flood, R. L., & Romm, N. R. A. (1996). *Critical Systems Thinking: Current Research and Practice*. New York: Plenum Press.
- Hensel, M. U., & Sørensen, S. S. (2014). Intersecting Knowledge Fields and Integrating Data-Driven Computational Design en Route to Performance-Oriented and Intensely Local Architectures. *FOOTPRINT*, 8(2), 59–74.
- Nelson, H. G., & Stolterman, E. (2012). *The design way: intentional change in an unpredictable world: foundations and fundamentals of design competence*. Englewood Cliffs: 1st ed. Educational Technology, 2nd ed. MIT press. Retrieved from <http://www.google.com/books?hl=no&lr=&id=ymDUJvWlCmEC&oi=fnd&pg=PR9&dq=related:yfYfvzkLUJcJ:scholar.google.com/&ots=ZcUEa4K859&sig=Sq-BI-rrnMlufacVyXstsxVsN0#v=onepage&q=&f=false>
- Romm, J., Paulsen, A., & Sevaldson, B. (2014). *Practicing Systems Oriented Design; A guide for business and organisations that want to make real changes*. Oslo: Oslo School of Architecture and Design.
- Sevaldson, B. (2009). Systems Oriented Design. Retrieved from <http://www.systemsorienteddesign.net>
- Sevaldson, B. (2011). GIGA-Mapping: Visualisation for complexity and systems thinking in design. In *Nordic Design Research Conferences, Making Design Matter*. Helsinki: NORDES. Retrieved from <http://ocs.sfu.ca/nordes/index.php/nordes/2011/paper/view/409>
- Sevaldson, B. R. (n.d.). Library of Systemic Relations. *Systems Oriented Design* (www.systemsorienteddesign.net). Retrieved December 4, 2015, from <http://www.systemsorienteddesign.net/index.php/giga-mapping/types-of-systemic-relations>
- Sevaldson, B. R. (2013). Systems Oriented Design: The emergence and development of a designerly approach to address complexity more. In *DRS Cumulus 2013*. Oslo: HIOA. doi:ISBN 978-82-93298-00-7
- Singh, J. (2013). Towards a sustainable resource management: A broader systems approach to product design and waste management. Retrieved from <http://www.diva-portal.org/smash/get/diva2:694766/FULLTEXT01.pdf>