

DESIGNING FOR SOCIAL SYSTEMS: EXPERIENTIAL APPROACHES

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ABSTRACT:

Today's design challenges are more geared towards the creation of social systems. While systems design is not new the *social* systems design challenges of today ask for novel and designerly approaches. We set up a workshop to investigate these approaches employing three techniques as input: co-reflection, lo-fi prototyping and value-flow modeling. Reflecting on the six social system concepts we present insights that can act as a first framework to design for social systems: (1) Finding a balance between taking a first or third person perspective; (2) A tension-field between designing for and experimenting within the chosen contexts exists; (3) Design constraints were either perceived as inspiring or limiting.

1. INTRODUCTION

Designers today are being asked to address complex situations and expected to deliver considerably more than a single product. Designers operationalize the transformative power of design and look for opportunities rather than problems (Hummels and Frens, 2008). Increasingly designers are tasked with creating or augmenting a social system as the true outcome of their design intervention. For example, a design team faced with building a mobile application that crowdsources real-time information on the ambiance of all the nightclubs in town must design more than a mobile app. They need to envision a sustainable social ecology of information providers and seekers, and they must craft a plan for initiating and growing this social system. Current product design processes do not provide the right perspective for engaging with and innovating social systems.

To investigate how we might advance current design practices, we carried out a design workshop where small student teams spent one week to design

novel social systems. Our challenge was to shift students away from the product design process they were familiar with and to get them to both see the social systems around them and to consider these systems part of the material of their design. To prime the students for this task, we offered them three techniques: value-flow modeling, as a way of abstractly viewing the system at a high level; co-reflection, as a way to see a social system from both the inside and the outside; and lo-fi prototyping, as a way rapidly begin to reflect in action (Schön, 1983) and generate design ideas. Results of the workshop show that the techniques help to advance students towards a more systemic approach. However, we observed that students found it difficult to make the step from products to social systems nonetheless.

In this paper we first provide a brief overview of social systems design. We describe the workshop and the three techniques, and we describe three cases. Finally, we reflect on what we learned and on the challenges to designing social systems as an opportunity for the design research community to generate new tools and new approaches to social system design.

2. BACKGROUND

2.1. SYSTEMS

There is a long history of using a systemic perspective to both understand the natural world and to construct the artificial world. These ideas come from systems science and engineering (Ackoff, 1971; von Bertalanffy, 1972; Nelson and Stolterman, 2003). Thinking about and working with systems became increasingly important in design following World War II as designers and engineers were increasingly asked to create more and more complex things, such as rockets for space exploration. Systems thinking helped designers to both see the whole and to focus on making a small part that could be integrated into a whole.

The Design Methods Movement emerged at this time, motivated to advance design by making it more systematic, rationale, and scientific. However, this movement faltered as it became too focused on methods, on doing design right (Alexander, 1971). Lost was the creative spark and intuition that makes

design different from science and engineering (Margolin, 2002). Members that these more systematic approaches failed to produce better designs (Margolin, 2002).

Today the idea of systems remains in both industrial and interaction design, but generally in a non-social form. Systems today are mainly used as ordered assemblies that work to unite multiple product. Industrial designers work with systems to make collections of products that work together functionally, mechanically, electronically, and aesthetically. Interaction designers employ systems to make products more extensible; easier to grow from one version to the next. These often take the form of GUI guidelines other designers can follow.

2.2. DESIGNING SOCIAL SYSTEMS

Increasingly designers are being asked to design products that work within complex social systems and products that shape and form these systems. This demand arises from two trends. First, the rise of communication technology has led a huge increase in socio-technical systems. Designers are asked to design for groups, examples range from collaboration tools like basecamp to social media services like YouTube to crowdwork services like Mechanical Turk. Second, design thinking is increasingly being employed to address societal level issues such as sustainability and empowering people in third-world countries through the appropriate use of technology. In working in these spaces, designers need to take a systemic view of the situation in order to conceive of an effective ecology that supports many stakeholders and many technical systems.

In both cases, designers must work with social systems; distributed collections of artificial nodes (both physical and digital) and human nodes that interconnect via social, economic, and informational ties. These systems have both technological and a social constructs that must follow many different rules and social mores.

Design within and for social systems increases the design challenge (Frens and Overbeeke, 2009). Design teams still need to give form and meaning to

physical things (industrial design) and they must still envision and specify the behaviors of interactive devices and applications (interaction design). However, they must also work to understand how these design choices impact a social system and they must consider mechanisms for gaining continuous feedback on the impact their design choices have. In addition, they must often consider designing several things that work together to achieve and maintain the social system instead of focusing on the design of one thing.

Industrial design has always had clear demarcations of what to include and what to exclude in a given product design process. This is less clear in interaction design as it often includes both physical form, information hierarchy, and computational behavior. Social systems design makes design demarcations even blurrier; it requires the integrations of more disciplines, each bringing their own valid perspective on what the system is. The challenge is to define an appropriate scope and work to integrate the most valuable and meaningful within a social system design process.

3. WORKSHOP SETUP

Our goal was to advance design by improving our understanding of the current challenges of moving from a product design perspective to a social system design perspective. As an initial step, we chose to run a week-long design workshop where we would offer student teams three different techniques on systems design and then observe how they work and what they make.

The workshop was held at the Technical University in Eindhoven, with eighteen Masters students in the industrial design program. Students were randomly divided into six teams. The teams were asked to design a system that helps people helping. We first exposed them to the three techniques through a lecture and an in-class activity. Then the teams were set loose to discover a problem or situation they wanted to tackle. We refer to this as an experiential approach: students go out into the world, they select a context to explore and design for and conduct as much of the design work as possible while emerged in the context.

In order to gain insight into their design process, students were asked to keep a 'self-ethnography' report in which they tracked their activities, impressions, and reflections for each day. This provided both documentation of the process and also insight into the state of their thinking. In addition, they were asked to document how they worked to adopt a first person and third person perspective, a critical part of the co-reflection perspective (Tomico et al., 2012).

3.1. TECHNIQUES

Our selection of the three different techniques emerged prior to the workshop through our on-going discussions of how to engage students in more systemic thinking. Each author had their own hunch developed from previous experience in designing social systems. Through these discussions we began to see a way of linking these three techniques together. Below we provide a brief overview of the three techniques.

3.1.1 CO-REFLECTION

Co-reflection (Tomico et al., 2012) involves the stakeholders during the design process to foster cooperation and reflective practices so as to frame the design space, collaboration space and reformulate the design opportunity. It brings about a constructive confrontation between the designer's rationale and societal motivations and values. Co-reflection exhibits three interactional characteristics: it supports sharing experience, information, and feelings; the achievement of inter-subjective understanding through collaborative meaning making; and relationship building. These three interactional characteristics (sharing, inter-subjective understanding and relationship building) make co-reflection especially interesting for the involvement of stakeholders during the design process. Figure 1 shows a role-playing activity done during a presentation where the students communicated the results from a co-reflection session that was carried out in context during the project. Roleplaying was used to keep the findings of the co-reflection session experiential and personal, from a first person perspective.



Figure 1, role-playing activity

3.1.2. LO-FI PROTOTYPING - THE MAKING APPROACH

This technique promotes 'making' and 'doing' as the mechanism for obtaining insight into the design challenge at hand. This follows Schön's (1983) idea of reflection in action, the process by which a designer engages a material in a reflective dialog in order to imagine what might be rather than as a way of implementing a fully formed idea. The thought process is externalized and operationalizes first and third person experience as an instrument for the assessment of the value of solution. Any technique that delivers experienceable results can be used to sketch and to prototype.

The making approach was introduced by means of a time-constrained lo-fi prototyping exercise, see figure 2. Students were asked to create a small system: a personal communication device. Here an additional aspect is highlighted: the process of forcing students to rapidly make design judgments, which favors design intuition over argumentation, thus catalyzing the conceptual process by thinking with the hands.



Figure 2, lo-fi prototypes during the presentation

3.1.3. VALUE FLOW MODELING

Value flow models come from service design, a design discipline that is explicitly systemic. These models are a type of stakeholder map that details the flow of intrinsic and extrinsic value between all of the stakeholders within a system. Design teams use these to visualize the current state of a service ecology and then modify the diagram as an early form of prototyping, of assessing new services or innovations. The challenge in envisioning a new ecology is to imagine a flow of value in which each stakeholder perceives they are gaining more value than they are returning in terms of labor, effort, or revenue.

Figure 3 provides an example of value flow for Internet search. This simplified model shows four stakeholders: the search service, companies that advertise, searchers, and web content creators. The search service has two customers, the companies that advertise and the searchers. The searchers are also customers of the advertising companies, but, to some extent, also a service provider to the search service. Their input and the items they select are valuable data used to improve the search quality. In value flow models, each stakeholder that provides value must also receive value. Note that in this example, the web content creators are an exception. They provide an

implicit value in that they are blind to the fact that their labor is being used by the search service to create value for others.

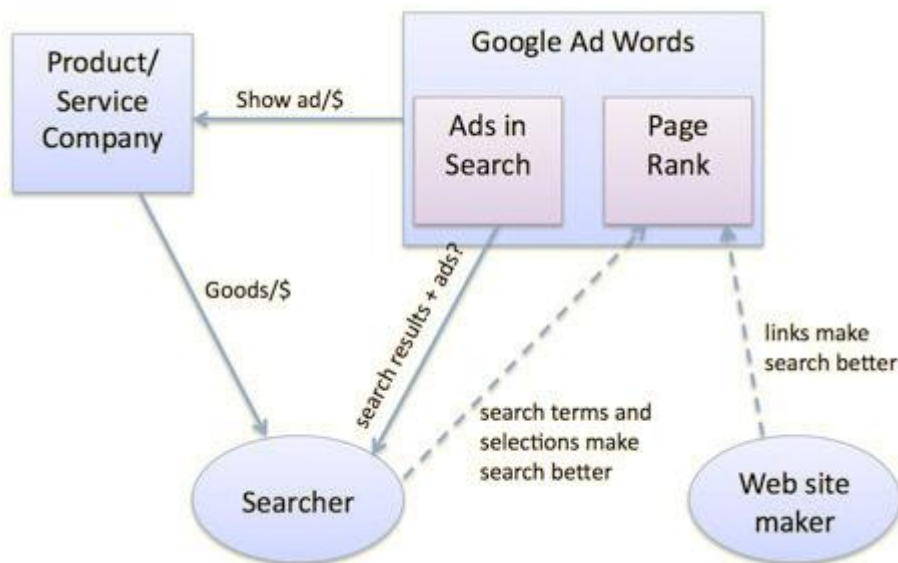


Figure 3, a value flow model

Value flow models provide an abstract and decontextualized overview of a social system. It allows designers to see all of the entities at play and some of the streams connecting them. Co-reflection provides a contextualized perspective that includes the first-person and third-person lenses. Value flows and third-person together provide a top-down way of seeing and acting on the social system. The first-person provides a bottom up, giving designers the opportunity to design from within the system. Lo-fi prototyping works to heighten the importance of design thinking, of getting designers to think with their hands. It allows designers to connect with their tacit understanding of the social system they wish to transform by moving the abstraction out of their field of vision.

4. DESIGN CASES

The student teams produced six very interesting design cases. Here we provide a brief overview of three of them to help reveal how these perspectives influenced the design activities.

4.1. CASE 1 - "PEER"



Figure 4, PEER

One team chose to focus on interactions between the homeless and non-homeless citizens of Eindhoven. The team's resulting design, PEER, is a system where citizens can share food and other material goods with the homeless by placing these items in containers located across the city. The design was intended to lower the social barriers to giving by removing the need for direct interaction. Citizens could more easily leave food, cigarettes or other items so the homeless would be less inclined to bother them.

The team started with the goal of increasing social interaction between the homeless and non-homeless as a way to support a better transfer of material goods. The team took a first-person perspective, playing the role of non-homeless. Interestingly, this made them realize how difficult it is to deal with the homeless and raised the core issue of distrust between these two groups: the team experienced how difficult it is to get the homeless' trust, and by not being trusted they ended up not trusting the homeless either. The team shifted from facilitating social contact to avoiding it.

The team was frustrated and never viewed the lack of trust as a design opportunity. While students gained real insight into the context, they let

negative aspects of this experience become too personal. Switching from a first-person to a third-person more often might have helped them see the bigger picture and to re-understand the role the homeless play in the social system within the city. They needed more distance and only at the final presentation they realized what happened.

4.2. CASE 2 - "LIBRARY"



Figure 5, Library

One team focused on the library as a social context. They created a recommender system to help patrons find books to read. Their service allowed patrons to share reviews when returning books. Using this information, their service used color to guide searches based on recommendation. The semantic web applied to book lending was intended to make the library a more social place, where knowledge, insight, and opinion could be collectively shared.

This team appeared to advance towards an "easy" solution, focusing on a familiar technical form of a content recommender. We felt that they could have pushed into new territory, especially after seeing their first interventions in the space of the library. Their reflections on the project showed they valued the experiential approach of spending time at the library

as a way of designing from within this system. What we observed, however, was this team had the tendency to rationalize their choices rather than trusting in their designerly intuition. They seemed to approach the project as a series of experiments from a scientific tradition rather than as a series of design iterations. This gave a rather pragmatic tone to the work. It forced them into a loop of hypothesis testing instead of a series of constructive iterations that would have allowed them to engage the social system of the library as a material with which to have a conversation. The team identified a functional value of a recommender, but they did not get the much out of context as they did not trust their designerly skills as a way of understanding and of re-understanding it.

4.3. CASE 3 - "SEATS"



Figure 6, Seats

One team selected a co-working space, Seats to Meet (S2M), as the context for their social system. Their design generated several new reasons for people working in this space to interact as well as new reasons for people to come to this space outside the task of work. Their explorations included creating an event, thematic screenings, making profiles, and displaying personal expertise and expectations, and their final design integrated all of these ideas.

This team took a different approach than others. They focused on person-to-person interaction in physical space as the only acceptable goal, working in support of the very idea of co-working spaces. However, their unwillingness to engage with technology as possible opportunities seemed to limit their design ideas to what is already known and familiar. We selected this design case because we were a bit conflicted with the goal that the group chose. They added to an existing infrastructure and this can be seen as either smart or opportunistic. However they never attempted to redefine what S2M might be; how it could be more than just co-working or more than social interaction in physical space. This forced us to ask if our three techniques were functioning to shrink instead of expand the space for opportunity.

5. DISCUSSION

Looking across all six design cases, we can see points at which the three techniques successfully slotted into one another. Value flow modeling provided a holistic view to see the underlying system within the selected context. This supported efforts to design from a third-person perspective in co-reflection; specifically it provide a map of all of the parties at play within the context. Teams also were very successful at operationalizing and even re-understanding insights from co-reflection through the rapid construction of lo-fi prototypes. Lo-fi prototyping strongly supported teams in taking a first person perspective and imagining what could and should be.

While the techniques provided a reasonable starting place to support teams across the social system design activity, we feel that there is much room to further optimize the techniques and their integration into a design process. Design teams worked to reveal and envision situations using very conventional materials (paper, cardboard, etc), and these materials quickly showed their limitations. Students suggested that wireless and location aware prototyping tools could help. From this suggestion and our own observations, we suspect that lo-fi solutions like location aware, distributed role-playing games could be repurposed to work as basic tools to rapidly embody and investigate early stage ideas. It is this that we will bring to our next workshop.

Apart from a reflection on the tools, an analysis of the designs revealed a series of 'dichotomies' that characterized the different teams' approaches to social system design that can act as a first framework for connecting systems to ID and IxD practice.

5.1. USING FIRST AND THIRD PERSON

We intended for students to shift between first and third person perspectives; however, not all students managed this. Some exclusively used a first person perspective, resulting in rather introspective and even self-indulgent designs. This could be seen in "PEER," where the team let the discomfort with the homeless become too personal. They lost their grasp on the holistic view of the situation. Others more exclusively employed a third person perspective. This provided a false sense of control because of the disconnect it creates from the richness and complexity of the context. For example, the "Library" team continually rationalized their ideas to the abstraction of the social system without acknowledging the complexity of the library as a context. We suspect they may have not trusted themselves enough to release the sense of control that the third person perspective offers. The first person perspective seem to better allow design teams to engage in a reflective conversation with the social system as a design material; it allows designers to draw on their experiential knowledge gained from being in this place and to operationalize this in new ideas. The lesson is that when designing for social systems there is a need for methods and processes that drive teams to effectively take both perspectives and to iterate between them.

5.2. TENSION FIELD BETWEEN DESIGNING AND EXPERIMENTING

The teams had different approaches for exploring in context. We intended teams to design for and within a selected context. However, some interpreted this as to experiment with the context. For example the "Library" group would set up 'experiments' to see what would happen if..., but this did not lead them to a cohesive and innovative design. While this might be a coincidental artifact of our workshop, we suspect this points to a more general issue. The experimental framing kept them very focused on the current social system; it seemed to make it much more difficult to step well

beyond the current conventional relationships and behaviors. The team had no means to deal with the openness of the systems design challenge and were not prepared to leave their product design instincts in favor of a new approach. Teams that made larger conceptual leaps were more successful in creating valuable social system design proposals, which reinforces our thinking that systems design is indeed a different than current approaches to product design and interaction design.

5.3. DESIGN CONSTRAINTS

While exploring contexts, teams encountered numerous design constraints, such as the silence in the library or the social unease within S2M. Teams had remarkably different reactions. Some found the constraints a source of inspiration. Others experienced them as limiting. Several teams struggled to find harmony between challenging the status quo and addressing actual constraints. While this has been always a challenge in design we feel that the push towards taking a first person perspective, trusting one's own experience, might have had the effect on some students of changing the situation to their preferences. As we are elaborating our understanding of how to design for social systems, how to deal with constraints is something that needs further attention.

5.4. CONCLUDING

In sum, we have outlined a new challenge for design, presented the results of a workshop on social system design and showed a series of dichotomies that act as a preliminary framework. This work indicates that the challenges faced when designing for social systems are different challenge than those currently faced in product design or interaction design and that by taking a designerly approach the solutions are of a different character.

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