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Tangible Research as Inspiration for Business Innovation

The amount of social, environmental and economic problems facing the world have increased, and the global awareness of these issues has grown through the interactively engaging world wide web and the transparency of online debate. Dealing with complex challenges requires a more systemic approach, positioning networked collaboration paramount, as individual stakeholders alone cannot provide solutions as multifaceted as the problems themselves. For industries to participate in online dialogue with an unprecedented level of transparency and critique, there is a need for new tools, talent and thinking. "It actually requires a different company culture to thrive in a knowledge economy." (Brand, Rocchi, 2011). With this in mind, how can designers contribute to the complex restructuring of business innovation?

Within the Readership in Strategic Creativity at Design Academy Eindhoven, as a part of CRISP (The Creative Industry Scientific Programme), we strongly believe that designers can play a more vital role to society and business innovation if their skills and ways of thinking are applied in the very first stages of an innovation process. CRISP is a Dutch national research programme spanning eight research projects, in which Design Academy Eindhoven collaborates with three Technical Universities, two Universities in Amsterdam and over 50 industry partners, design companies and service providers. The PSS 101 and Incubator 2.5, are two such projects that investigate how designers can support complex networks and business innovation.

Looking beyond the idea of products as just products and services as only services, the focus of these projects go beyond the traditional paradigms of product design and service design and works towards a combination of the two: Product Service Systems (PSS). Through a 'Thinking through making' approach, research associate Karianne Rygh has contributed two years research to the Crisp programme, investigating how the use of tangible tools can foster a better understanding of networks producing PSS for all stakeholders operating within them, while building and maintaining trust to encouraging collaboration.

Networks are the new teams, but we do not yet understand particularly well how these networks operate and thrive. We do know, however, that they are important for innovation. There is a specific form of creating networked collaborations in most CRISP projects, which includes both users of the services and the systems we are designing. We call this 'Orchestration', which includes the arrangement, coordination, and management of design projects, in particular those addressing so-called 'wicked problems' (Buchanan, 1992). These design situations are so complex that they often require a network rather than a team to create, implement and deliver results. Such networks can be forged but also have to emerge from the relationships that are built between people, rather than between organizations.

They cannot simply be designed top down because hierarchical relations between the different stakeholders are, by definition, lacking in a network. A deep anthropological and empathic understanding of the networks and their dynamics is required as part of the orchestration, to create successful collaboration (Raijmakers et al, 2009).

There is a need for a paradigm shift in relation to approaching the 'wicked' problems (Buchanan 1992) facing society, but also in regards to the economy and how large organizations respond to today's challenges. This calls upon designers to take on more strategic roles in order to find new means to address complexity and to build bridges between previously separate disciplines.

Together with researchers (from the Technical University of Delft and Design Academy Eindhoven) and partner companies (Océ, ZuidZorg, Exact, Connect to Innovate and STBY) the research projects PSS 101 and Incubator 2.5, have aimed to develop a framework and tools for improving networked collaboration across industries. This research has been made tangible in the form of the two design concepts: Value Pursuit, a tool for structuring conversation and aligning expectations and goals amongst stakeholders and the Super-Maker – a workshop methodology bridging the innovation gap between new technology and client or end user operating it.

Designers as key stakeholders

Operating in networks comes with many challenges, such as difficulties finding a common language, common goals or an understanding of other stakeholders' needs, but even when these struggles are overcome, businesses are not always mature for adopting innovative outcomes.

"In large organizations (…) collaboration between departments is often based on tried and tested procedures (…) documented in manuals and templates. However, when trying to develop something that is new to the organization that requires new ways of working – the existing ways of working efficiently may actually hinder evolution."(Wierda, 2014).

Through knowing where to intervene and which elements to make concrete, it is possible for designers to assist companies in adopting new approaches that don't immediately fit into their pre-defined models, as is often the case with new services. The delivery of services may differ per encounter between each individual customer and individual provider. It is in these encounters that the service acquires its final form, which, as a consequence, is slightly different every time (Vargo & Lusch, 2008).

However, knowing where to intervene requires knowledge and a deep understanding of the structure and inner workings of a specific company. By involving designers in the beginning phases of an innovation process, they have the opportunity to learn these key aspects of the business along the way, making it possible for them to gain an overview of where their design skills can be of value. Where designers' skills can be of contribution is not always clear to the designer, nor the client or company, it is therefore important to define possible more strategic roles that designers can take on.

Together with the industry partners in CRISP we have defined three more strategic roles that designers can adopt in networks collaborating to create PSS: making ideas tangible and understandable (visualizer); facilitating the connections between people or parties

(connector); and instigating change (instigator). Through the role of a visualizer, making ideas tangible and more understandable often includes some kind of visualization where the making of these visualizations is also part of the conversation between the stakeholders. "The role of a visualizer moves beyond only visualizing information or making appealing aesthetics; designers have the ability to design tools that enable *others* to visualize what they are saying, encouraging understanding across 'silos'. (Lindquister, 2014).

Taking on the role of 'connector', designers can enable people to connect beyond their own disciplines and then broker collaborations between them. Rapid co-creation in the form of quick visualisations of ideas, brings relevant stakeholders, such as designers, researchers, and business specialists for instance, together to focus all their insights and experience on one area of value to participate in a decision-making process. This cross-disciplinary approach also helps to map out what the next steps need to be in their collaboration (Gardien, et al. 2014).

Once new connections are established, designers have the ability to instigate change by making new insights, opportunities and ideas tangible, and in doing so, creatively disrupting traditional forms of communication. "For getting people on one track, creating something that you can place on the table can be very important. It gives people the impression that forward movement can be achieved, and thus provides an impetus. Something tangible can be really valuable, especially when all those present can relate to and interact with it." (Stappers, 2014)

In order to connect with the company and its stakeholders, build a relationship of trust, and to know where disruptive innovations might be beneficial, designers in the previously mentioned roles need to become key stakeholders taking part in the conversation from the start.

Making a network successful

In the PSS 101 project, Rygh has had the opportunity to become such a key stakeholder as a designer, being involved in the conversations concerning PSS networks from the beginning. As a result, she has been able to learn about key success factors from the industry partners, as they were being identified. A partner from Canon Océ pointed out during a PSS 101 workshop that in their experience, when creating PSS in networks, whether inside or between organizations, success crucially depends on three factors:

1. Each stakeholder involved must have an understanding of the value to be gained from the networked.
2. They must be able to express their needs clearly.
3. They must understand the other stakeholders' expectations.

As organizations are building bridges between previously separate disciplines, their networks expand to include professionals from fields that are different from their own. The more complex a service is, the more multidisciplinary the network becomes, which increases the challenges for those who must necessarily collaborate in order to deliver these services. To build a thriving network and to develop more innovative PSS it is necessary for organizations to work together and incorporate other network-partners' expertise during the early, developmental stages of their independent solutions.

In PSS networks, every stakeholder adds value in the form of experience and knowledge with regard to the development and roll-out of new service concepts. In theory, these networks can be a reservoir of expertise from different professional disciplines available to all network partners, but due to a lack of common language and an understanding of each other's goals and interests, this reservoir is rarely tapped into.

As relations of value within PSS networks are created by individual people as extensions of the companies they represent, trust affects how resources are shared within a network as it affects a person's ability to convey experience and communicate how this expertise can be used. One approach to building trust in networks is by expanding the stakeholders' overview of how their individual efforts contribute to the success of a PSS. Stakeholder maps (e.g. Stickdorn and Schneider, 2010) relate to these factors and give an overview of network relations. They do not, however, convey which relations are of actual value nor where new connections can be made.

Value Pursuit – a tool for fostering conversation and encouraging collaboration

To give stakeholders a better overview and understanding of the fact that value and common goals can have a different meaning for different stakeholders, the workshop tool Value Pursuit was designed as a hands-on intervention based on a deep understanding of the dynamics at play in networks. The tool consists of two 'game boards'. The first is designed to collect information about how participants in a network can benefit from and support each other. The second game board visualizes these gains and contributions on a real-time 'radar', indicating the balance of contributions and gains in order to trigger further discussion.

Moving inwards from the outside on the first Value Pursuit board (Figure 1), participants are asked to write down on post-it notes what their expectations, contributions (experience, expertise, solutions) and struggles (challenges or obstacles) are, in developing a specific PSS, or in reaching the defined common goal. After placing their answers on the board, participants are encouraged to take a sticker of their color and place it on other participants' struggles, indicating where they can be of benefit to that specific stakeholder.

Figure 1

By matching contributions to other stakeholders' struggles, new relations of value are established. In order to gain an overview of these potential exchanges in the network, these connections are counted and indicated on the 'radar' (Figure 2&3).
Each participant has a large playing piece, representing the number of potential contributions they can gain from other participants, and a small piece representing the contributions they have offered to others. For a network to thrive and for trust to be maintained between network partners, these playing pieces should be aligned as much as possible. However, this visualization is not an accurate measurement, but rather a trigger for conversation. How much a person gains from a network should be balanced against his/her contributions.
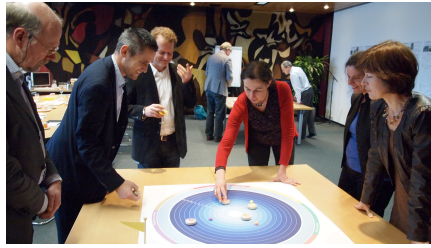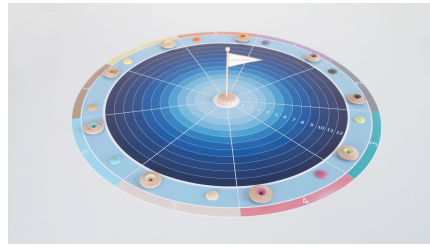
Figure 2

Figure 3

The Value Pursuit has been tested in several case-study workshops, both in regards to networks internally within a large organization, and external networks of stakeholders, in different sectors such as health care, education and business. One case study workshop instigated by the province of North Brabant, exploring networked collaboration regarding water management policy making, used the Value Pursuit tool to introduce new stakeholders to their network. The aim of the workshop was to explore how existing stakeholders could collaborate to share the current responsibility of policy making onto a larger number of new stakeholders, with the goal being to develop a new Provincial Water Plan for 2016-2020. The regional government of North Brabant, responsible for developing the plan, and new stakeholders, used the Value Pursuit in a round-table discussion investigating what new relations could be made between them. For the new stakeholders, the Value Pursuit tool provided a very beneficial overview of the network, the issues to be debated, and the expectations and agendas of everyone involved.

A key insight from the workshop was that the Value Pursuit tool assumes that propagating openness and transparency is good, which is not necessarily true in policy-making. In networks such as these, the stakeholders have to negotiate certain elements of the policy that are familiar to all, but in negotiations, transparency and openness can work against you and can be wise to keep your cards close to your chest. Stakeholders who know each other very well, give and take in a controlled way during negotiations, and they don't want to say something that can work against them later.

As identified by the CRISP partner and service design agency, STBY, Value Pursuit is well suited for the future development of networks – particularly where design thinking is needed in order to address an unfamiliar topic or theme; when dealing with a larger complex problem that requires the aspects that urgently need change to be identified; when innovation is greatly needed; or when new stakeholders come into the network. The Value Pursuit approach works very well in these situations because openness and transparency are valued and required. The tool gets new stakeholders up to speed on the current situation of the network they have entered. Furthermore,

A prototype of an online Value Pursuit Platform has been developed together with STBY. This platform makes the information and connections gained through the VP workshop accessible in an interactive, visual way, to all participating stakeholders. In this way, the designer (facilitator) has designed him/herself out of the activity, so that the participants can continue their collaboration independently through the use of this online value map.

The Super-Maker - Facilitating co-creation and business innovation

In order to research how networked collaboration can lead to new innovative opportunities, the Readership Strategic Creativity at Design Academy Eindhoven has collaborated with the

printing company Canon Océ in the research project Incubator 2.5. Together with researchers from Delft University of Technology and experts from Canon Océ, the Incubator 2.5D was set up to explore how Océ's new 2.5D printing technology could be applied in the field of architecture, and how the creative industries in general could contribute to determining new opportunities for this innovative technology.

2.5D printing is high resolution printing on elevated surfaces and thereby a 3D fabrication technology. The starting point of the research was to master and explore the 2.5D printing design process and thereafter design a 'minimum viable product' (Ries, 2011), (which was a 'minimum viable 2.5D sample' in our case), to present to architecture studios in order to collect the as much 'validated learning' about potential customers and possible applications of 2.5D, as possible.

Figure 4

As a designer, Rygh designed an archive of such explorations in 2.5D as a sample book to show possible clients, interviewing architecture and design studios such as Marcel Wanders Studio (Figure 4), CC Studios and Next architects. The first samples were developed according to the designers' assumption of what samples architects would be inspired by seeing. However, the multiple interviews often produced journalistic responses that on a general level didn't generate the new knowledge the researchers or Océ was looking for. By using the research gained through design experience, Rygh tested how the discussion could be brought to a new level, less generalized and more of specific interest to each creative professional through the design of the Super-Maker workshop. The Super-Maker is structured to gather all relevant stakeholders, (architects, designers, researchers and Océ printing and business experts in this case), in a co-creation session producing tangible representations of the discussions and ideas that are triggered through workshop activities.

Figure 5

Figure 5

Instead of attempting to identify possible applications of 2.5D printing through interviews

with experts, Rygh broadened the scope of gaining insights by inviting the various architects to several Super-Maker workshops (Figure 5), asking them to contribute their expertise in regards to what role 3D fabrication can play in architecture. Through the workshop, the architects were taught the 2.5D design process and introduced to the archive of 2.5D samples already created, representing the various tracks of research Rygh had conducted. This combined served as tangible triggers for conversation, initiating co-creation and ideation. As a result, new 2.5D samples were designed and produced, serving as tangible triggers for discussion in the following Super-Maker workshops. The participants (Figure 6), thereby became extensions of the previously mentioned designers' more strategic roles, by the fact that they were visualizing their own discoveries and using these to communicate with their individual co-workers or clients.
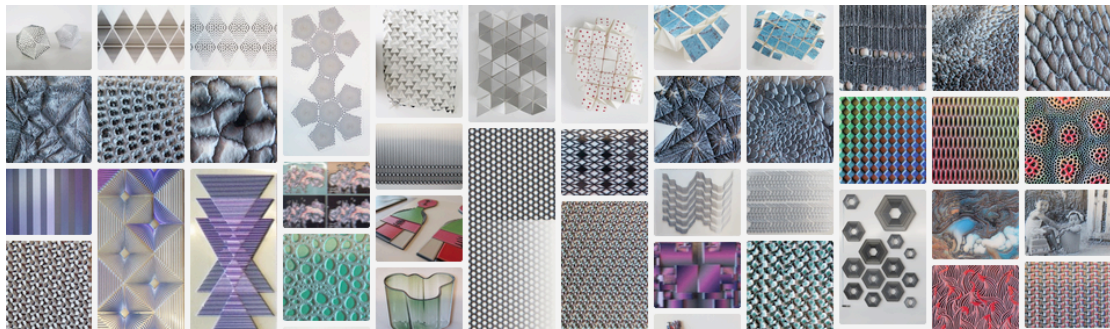

Figure 7

Utilizing a 'thinking through making' approach for understanding stakeholders' needs and 'dropping something on the table' (Stappers, 2014) in order to get them to imagine and see the potential in their own and each others innovations, contributes to guiding new ideas through an organization. It is often difficult to get people on board when they are not fully informed, nor do not have a proper understanding of the concept in question. Embodying the explorations and research in tangible objects (Figure 7) have contributed to triggering discussion and dialogue with relevant stakeholders within Canon Océ, allowing them to communicate with one another in new ways.

In collaboration with external designers, architects and students from the Design Academy Eindhoven, the Super-Maker has been tested through several phases, which has added to the 2.5D printing archive of exploration. The archive of tangible research was exhibited during the Dutch Design Week 2014 (Figure 8&9), with the aim of attracting attention from creative professionals in their own arena. The research was displayed as a non-linear time line, showcasing the intertwined process of design research following a thinking through making approach.

(Figure 8)   (Figure 9)   (Figure 10)

A series of radio conversations were initiated during the Dutch Design Week to accompany the 2.5D exhibition (Figure 10). Relevant stakeholders within the network of the research project were invited and challenged to reflect upon the research processes as well as to share the findings and outcomes with a wider audience. This contributed to creating a better

understanding of the value the research had created both within the network and for the printing company.. By accompanying these talks with a curated exhibition, it was possible to properly communicate a very in depth design research, something which can often prove to be difficult since exhibition formats rarely allow you to give multiple layers of information. In addition, the attention gained through the exhibition contributed to Canon Océ's understanding of the general interest for the technology, and where the technology can be positioned in the creative practice. The radio conversations were therefore a very helpful tool in communicating the deeper meaning of the exhibited research outcomes.

Conclusion

What both the Value Pursuit and the Super-Maker have shown is that design interventions not only help us to visualize the often complex network we are in, but the designed tools, products or services are also very beneficial in aligning the various stakeholders within the network and offering ways to find common ground. By bringing stakeholders into co-creation 'making' workshops, their interactions bring out a certain transparency, or indication of what they would like to gain and what they could contribute to a network. By designing and coordinating the workshop's activities and directing the choice of participants in a strategic manner, designers through making their research tangible, can build relations between stakeholders that would otherwise be difficult to forge.

Operating as a designer in a complex network also means that the research and design concepts need to be communicated properly to all stakeholders involved, but more importantly, they need to be thoroughly understood. When proposing new methodologies such as the Super-Maker to large companies the concepts need to be translated into the correct business language for them to be understood by departments that determine whether or not a concept will be approved and accepted. This can often prove to be a challenge for designers as abstract ideas rarely fit into business models.

Its often thought that getting new ideas is the difficult part, but in fact, large companies are often spilling over with ideas (Ries, 2014), the difficult part is rather turning those ideas into profitable ventures. "A common misconception about Design Thinking, is that when you´ve built a prototype, people think you´re done, but you´re actually only one percent along the journey. There's a lot of design in a good idea, but there´s a lot more design, and more craft, in getting the idea *right*." (Brown, 2014).

Getting the idea *right* involves iteration and can account for the last 90% of the process. However, very often it is perceived as only being the last 10%, and this is an example of how the creative industries and other professional fields misunderstand each other in the creative process. It's therefore important that designers gain an awareness of how the communication of their process (such as in the Super-Maker exhibition) and not only the final outcome, can be a determining factor as to whether or not a concept is supported, and in addition, it can be used as a tool to inspire and trigger stakeholders to stay onboard.

Designers move beyond mere facilitation in networks when they intervene with something they have specifically designed for a certain context, something that is a result of their analysis of the collaboration between stakeholders they have observed and learned from. Orchestration can be seen as a special form of facilitation that is still supportive and responsive, but also intervenes and provokes. These interventions can lead to new relationships and new stakeholder networks.

Following a 'thinking through making' approach to understanding stakeholders' needs and 'dropping something on the table' (Stappers, 2014) in order to get stakeholders to imagine and see the potential in their own innovations, the Readership in Strategic Creativity at the Design Academy Eindhoven, aim to better equip designers with the necessary skills to pioneer and guide new ideas through the collaborative models that are still emerging

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