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## Communicating through Visualizations: Service Designers on Visualizing User Research

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### Summary

Visualizations are commonly seen as one of the distinguishing features of service design, yet little research has been done on the topic. Building on questions raised by recent research (Segelström & Holmlid, 2009) this paper analyses the results from 14 interviews with practicing service designers. The interviews focus on user research. The analysis is aimed at answering why service designers visualize their material. It is found that the various visualization tools all serve the purpose of communicating user data to different recipients. Additionally the results points towards that there is a set of basic techniques, such as customer journeys and personas, which are almost universally used, as well as a long tail of techniques only used by a few companies. Finally, it is found that service designers to a large extent let the nature of the user data decide the form of visualisation together with the intended audience of the visualization.

### Introduction

When talking or listening to service designers one quickly notices the importance various visualizations are given by the practicing community. Still, there has been little academic interest in how visualizations are used within service design this far. This paper reports on an interview study, aimed at exploring service designers' attitudes towards user research. The focus of the analysis was how and why visualization techniques are used, building on recent research (Segelström & Holmlid, 2009).

## Background

Although various visualization methods used by service designers, such as service blueprints (Shostack, 1982; 1984; Kingman-Brundage, 1991), have been known and adapted (Mager, 1997) since the early days of service design, visualizations have received little interest by the academic service design community. In early academic writings on service design, visualizations were mentioned in passing by (Erlhoff et al, 1997), if at all (Mager, 2004).

Instead it was the practicing community which took the leading role in highlighting the use of visualizations. Case studies by service designers prominently feature visualizations of various types and for different stages of the design process, from the current situation to a preferred future. Examples include personas in 'The Diabetes agenda' (Burns & Winhall, 2006), scenarios in 'Activmobs' (Vanstone & Winhall, 2006) and stakeholder mappings as well as future customer journeys in 'Dear architect' (Engine, 2007). The extensive use of visualizations has also transcended into projects in product-service systems, such as 'Transitioning Stigma' (Radarstation, 2008). As a final example, 8 out of the 21 research methods mentioned on Engine's website are visualization techniques (Engine, n.d.).

The community writing about service design has somewhat responded to this, and recent texts often include references to the widespread use of visualizations within service design (Mager, 2008; Mager & Gais, 2009; Saffer, 2007; Moritz, 2005, and several authors in Miettinen & Koivisto, 2009). Holmlid (2007) draws the conclusion that service design is a highly visual design discipline. In her work on service design tools, Tassi (2009) lists a number of visualizations under the heading of "Representations". A typical formulation on visualizations can be found in Maffei et al, (2005):

*'The main and distinctive focus of service design tools concerns the design, description and visualization of the user experience, including the potentials of different interaction modes, paths and choices (Flow Diagrams, Storyboarding, Use Cases, Customer Journey, Video Sketching, Video Prototyping, Dramaturgy, etc). Other tools try to support the representation of the complexity of service organization like Blueprint, Service ecology, Service system map, Social network mapping, etc.'* (p. 6)

However, most written ventures into visualizations within service design are still performed by practitioners, writing short chapters in books by academics, such as Samaliois (2009) and Winhall (2009) in Mager & Gais (2009), or being interviewed for books, such as the founders of live|work in Moggridge (2007). Visualizations are often mentioned as one of the main strengths of service designers in texts written to convince companies to invest in service design, such as 'Transformation Design' (Burns et al, 2006) and 'Journey to the Interface' (Parker & Heapy, 2006) – texts which are, once again, written by practitioners.

Few academics have done research on or involving visualizations in service design, among the little research which has been done, the focus has often been service blueprints, such as in Wreiner et al (2009) and Sparagen & Chan (2008). As a part of the documentation for the 'Designing for Services'-project Jennifer Whyte wrote a short section titled 'Visualization and the design of services' (Whyte, 2008). She focuses on potential future research on visualizations and how meaning is created, as well as its implications for design education. The [video documentation](#) (Kimbell, 2008) from the same project provides some insights on visualizations however, especially in the section 'Making the services tangible and visible' (starting at 4.13) in which the frequent use of visualizations is identified as one of the three characteristics which define service designers' work in comparison to other design disciplines. Lucy Kimbell (2009) later elaborated on her findings, stating that one of the main goals behind visualizing is to make the services tangible. She also noted that different companies used different techniques.

Froukje Sleeswijk Visser (2009) uses visualizations frequently in developing a framework for transferring user knowledge from researchers to designers. She developed her framework in relation to products as well as services, and uses visualizations as a tool to communicate the three aims in the knowledge transfer; enhancing empathy, providing inspiration and support engagement. She focuses her research on which mechanisms drive the knowledge transfer rather than how the tools (such as visualizations) should be formed.

However, Sleeswijk Visser (2009) does explore some issues on visualizations, in regard to the look and feel of the visualizations and its effect on the knowledge transfer. The case study ('I prefer real photos over cartoons') which deals the most with visualizations is directed towards the two aims of creating empathy and inspiration in regard to the morning rituals of families. Creating empathy with users is often held forward as one of the key goals of user research in service design (Segelström et al, 2009; Voss & Zomerdijk, 2007; Parker & Heapy, 2006). Sleeswijk Visser (2009) found that designers prefer 'real' material over sketched and that the visualization tools storylines and personas support a quick immersion, where storyboards serve as inspiration.

Segelström & Holmlid (2009) explored the uses of visualizations as tools for research for service design. The focus of the study was uses of visualization in the research stages of the design process. In Segelström & Holmlid (2009) the Analysis-Synthesis Bridge Model (Dubberly et al, 2008) is used to position the findings. Due to the focus of the study, the visualizations that interviewees in the study mention are primarily used in the design phase where research is interpreted. A categorization of the found visualization types placed in the Analysis-Synthesis Bridge Model, gave the image shown in Figure 1 (where the size of the bubble indicates the amount of interviewees who mentioned a technique of the category). The full list of methods mentioned throughout the interviews is available in the appendix of Segelström & Holmlid (2009).

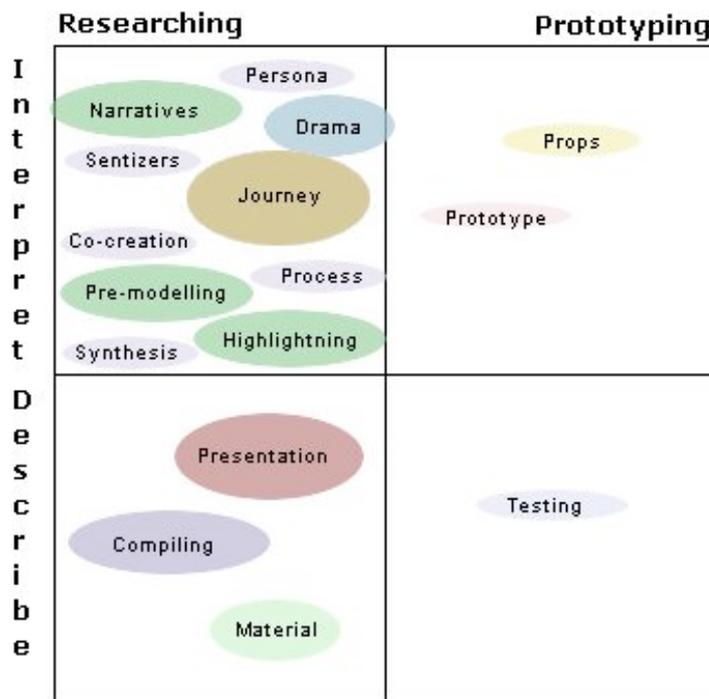


Figure 1 - Categories of visualizations found by Segelström & Holmlid (2009), when focusing on visualizations for user research. The size of the bubble indicates the number of mentioned techniques included in it.

Segelström & Holmlid (2009) point to the different characteristics of the various categories for visualizing the input from the user research; some serve to highlight the time-based nature of services (such as journeys), the co-creation of value between people (such as personas) and yet others highlight the relationship between various stakeholders (such as co-creation). Furthermore it is suggested that the nature of services lead to the frequent use of visualizations in the research stage (an opinion echoed by Kimbell (2008; 2009)). Segelström & Holmlid suggest that “the visualization techniques suggested by the designers are not used as simple tools to map and describe what is, but rather serve the purpose of interpretation and understanding” (2009, p. 6). For future research, studies into the underlying goals of the visualizations are suggested.

## Method

The data used in Segelström & Holmlid (2009) was re-analysed, focusing on the reasoning service designers provide regarding to why they visualize and on which grounds they build their visualizations. The method section is divided into two parts; the first one describes the data collection whereas the second one describes the analysis which was performed.

### Data collection

The data used for this study has been collected by interviewing practicing service designers. All agree that they are doing service design, although a few prefer other professional titles such as “user experience designer”. A total of 14 interviews were conducted. Ten interviews were face-to-face and four were performed over telephone/Skype. 13 of the interviews were conducted by the author and one by a second interviewer. Most of the interviews were conducted with a single interviewee, but in four interviews two persons were interviewed.

The interviews were conducted between October 2008 and January 2009, with a majority done during the Service Design Network conference week in Amsterdam in late November 2008. The primary workplaces of the interviewees were in seven different countries at the time of the interviews.

The companies in which the interviewees worked ranged from world-leading to newly started companies; from large design firms to small service design firms; from commercial and public to social innovation firms; some were multi-national and others were national. All interviewees but one worked as consultants.

The overall focus of the interviews was to collect data about service designers’ attitudes and opinions towards the user research phase of the design process. The interviews were semi-structured and focused on four main themes, with each theme consisting of a number of related questions. Notes were taken during the interviews and 13 of the interviews were recorded. The interviews lasted for a total of 13h:42 min, with a median of 55 min:56 sec.

The data used as a basis for this paper concerns what the designers say about methods and techniques for visualizations. This information was gathered primarily from questions regarding visualization, but also from their comments on ways of visualising the data in answers to other questions. The more explicit questions were:

- » How do you present the results of your data collection? Internally as well as externally?
- » Do you visualize the data you have collected? How?
- » Do you choose type of visualization depending on the data you have collected or do you look for certain types of data to be able to fit it in to a preferred way of visualizing?

## Data analysis

The collected material was analysed to try to find answers to the research questions suggested as future research in Segelström & Holmlid (2009). The questions for the analysis were articulated as follows:

1. For which reasons are visualizations used in service design?
2. Which factors influence the choice of visualization type?
3. Are there any patterns in choices of visualization type based on the underlying reason for visualizing?

The first two research questions were answered through analyzing and mapping the reasoning by the interviewees in regard to aspects of all three questions. The third research question was answered by comparing the results from Segelström & Holmlid (2009) with the findings from the first two questions.

## Results

The results from the research are presented below, in connection to the research questions which helped answer them.

### Motivations for visualizations in service design

To find the main reasons for professional service designers to use visualizations, the reasons stated throughout the interviews were analyzed and placed in groups depending on their line of argument. A total of 20 different lines of arguments were found in the interview material. Figure 2 below list these arguments, sorted in three categories of reasoning.

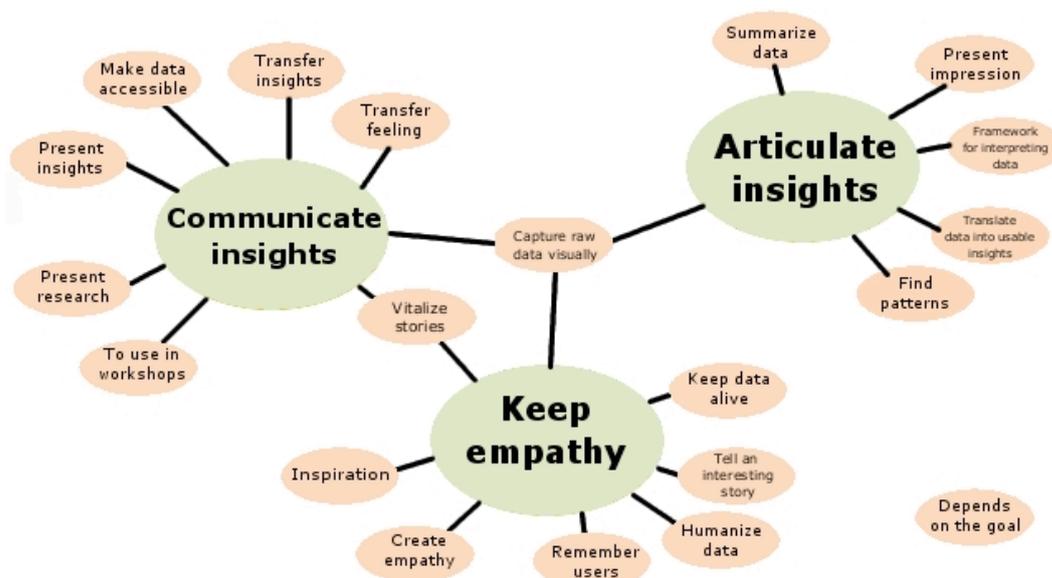


Figure 2 - List of arguments for using visualizations sorted in categories according to type of reasoning. A tabulation of the results is available in Appendix 1.

As the figure shows, three main reasons emerged from the data: to help the service designers formulate insights from the user material collected, to communicate these insights to their clients and as a way of keeping the data 'alive'. Out of the 20 reasons to visualize, 17 could be mapped directly to one group; two were connected to more than one group. These two were 'Vitalize stories', which relates to both keeping empathy and communicating insights and 'Capture raw data visually' which relates to all three groups. The final argument can be seen as a summarization of the other 19: 'It depends on the goal'.

### **Influences on the choice of visualization type**

When it comes to what influences the choice of visualization type, the interviewees give two main reasons; the nature of the data collected and the goal of the visualization. The goals vary in various ways as can be seen in Figure 2 above. The two reasons may be broken down even further as the communication of insights might be to the client organization just as well as to participants in co-creation workshops. Interviewees also stress the difference in nature of the visualization in regard to whether they are meant to be viewed by external persons or to facilitate the process within the design team. Visualizations directed towards external persons are usually made simpler and more aesthetically appealing, than internal visualizations which are often left complex and crude in their style – it may be as simple as a wall of post-its.

The nature of the data influences in multiple ways as well – different projects leads to different ways of collecting user input. Some projects may support recording of video material, whereas others not – something which naturally has a major impact on how the data later is visualized. The other way is related to the content, rather than the shape, of the data. When improving on an existing service, making a service blueprint of the current situation might help understanding the context as well as identifying design opportunities, whereas creating a new service requires other approaches, such as future scenarios.

### **Patterns in choice of visualization type**

When investigating the visualization techniques used, it was found that the interviewees universally claimed to let the data and the goal of the visualization influence how user input was visualized, rather than falling back on preferred way of doing things.

However, a look back at the tabulation of visualization techniques listed in Segelström & Holmlid (2009), gives the impression of there being a basic set of visualization techniques for service designers. A renewed and expanded look at the categories of techniques further strengthens this impression.

If the number of companies who mentioned a techniques within a category is added one can see that there seems to exist a few basic techniques which most companies use, such as customer journeys and personas. Additionally a long tail of types of visualizations which are only used by a small number of companies exists.

An adaptation of the appendix from Segelström & Holmlid (2009), with the tools used for prototyping removed, is presented in Table 1 below. The table is also extended by information on the number of companies who mentioned a technique within each category.

Category	Total	Comp.	Category	Total	Comp.	Category	Total	Comp.
Journeys	17	11	Highlighting	5	5	Co-creation	2	2
Narratives	12	8	Compiling	4	3	Pre-modelling	2	2
Personas	10	9	Synthesis	4	3	Sensitizing	2	2
Media	10	6	Drama	3	3	Process	2	2
Presentation	6	4	Material	3	2	Props	2	1

Table 1 - Visualization techniques for research interpretation, total number of times they were mentioned and the number of companies mentioning them. Adapted and expanded from Segelström & Holmlid (2009).

## Discussion

The interviews conducted reveal that there are two main influences which affect the choice of how to design a visualization of service design research; intended audience of the visualization and the nature and content of the research data. That the audience of the visualization is very important for how it will look can also be noted in the fact that ‘communicate insights’ to clients is one of the three main reasons for creating visualizations, whereas the two other reasons are mainly direct at the design team.

Looking at which kind of visualization types are used by the service designers, one can see that there are a few types which are used by most interviewees, whereas most types are only used by a few. Journeys, narratives, personas and the use of data collected through visual and/or audio media seem to be the basic visualization techniques of service design. Visualizations outside these groups are usually developed and used by solitary firms. A key difference between the basic visualization techniques and the proprietary ones is that the basic techniques can be used to achieve more than one of the goals, for which visualizations are created whereas the proprietary usually only achieve one of these goals. Personas, for example, is a technique which can be used to achieve all three goals behind visualization and thus becomes an effective technique (in light of this it is not surprising that persona was the single most cited technique in the interviews).

If one reflects on the role the three reasons to visualize have in the design process, one sees that they have distinct places in various parts of the design process. Creating visualizations to articulate insights helps members of the design team to externalize the results of their sensemaking (see Krippendorff, 1989) of the design process, and thus creating a common ground (see Clark, 1996) on the insights from the research within the design team. This helps the team to define the design space available for the particular project at hand. In other words, the ‘articulating insights’-reason for visualizing can be seen as *communication within the design team*.

Service designers also create visualizations with the aim of keeping empathy. This is a way of making sure that the user input is not forgotten throughout the design process. That knowledge collected is forgotten over time has been known for a long time, just like the fact that people tend to remember information which fits their world view better (a classic example is Bartlett’s (1932 [1995]) experiment with the tale of Native American ghosts). If designers do not keep in touch with user input, there is a risk of ending up with self-centered rather than user-centered design (Pruitt & Adlin, 2006). Thus, being able to remember user

data the way it was initially understood is important so that the designs created always suit the users' needs and wishes. In other words, the 'keep empathy'-reason for visualizing can be seen as *communication with one's memory*.

As noted in regard to the influences on the choice of visualization type, there may be various different types of receivers of information outside the design team (such as clients, workshop participants and authorities). The information directed towards these different groups may also have various aims (aims which can or cannot be met in a single visualization) – creating, and showing, visualization for clients might be a way of showing progress just as well as a way of grounding the design suggestions that are made at a later stage. In other words, the 'communicate insights'-reason for visualizing can be seen as *communication with stakeholders outside the design team*.

Put together, this means that the different visualizations of user research all serve the purpose of communicating the information collected, but with different recipients. In fact, Clark (1996, p. 153) states that: "To communicate is, according to its Latin roots, 'to make common', to make known within a group of people". And that is just what visualizations do in translating user research insights into new service designs.

### **Implications for service design education**

The findings from this paper and Segelström & Holmlid (2009) together imply suggestions for how service designers should be trained at universities around the world. It is crucial that students are thought how to translate the intangible nature of services into tangibles which can be used as a basis for discussions with colleagues, clients and the end-users of the service. Students should learn about the basic techniques, such as customer journeys and blueprinting, as well as learning how to find new solutions to visualizing a service offering when needed. The ability to communicate research findings and, in later stages, new service suggestions are necessary for a successful service design project and thus should be treated as one of the basic foundations which need to be thought to new service design students. Students also need to be thought to reflect on the nature and qualities which visualizations they create have and what they communicate to whom.

### **Implications for service design research & future research**

This study has made the implicit knowledge about visualizations for user research which exists in the service design community explicit, and analyzed the nature and underlying motivations for visualizing user research. This gives the academic service design community a basis to build further research on visualizations on.

The results herein describe how service designers talk about using visualizations in their work. For future research, an analysis of actual visualizations from service design projects would be of much interest, to further describe how visualizations are used within service design.

The paper also highlights the need for more research on visualizations in general. Very little research has been done on specific visualization techniques from a service design perspective. The research which exists on the visualization techniques is usually done within a different domain, such as service marketing or interaction design. Studies which focus on visualizations as a part of delivering new service design suggestions, as well as comparisons to whether there are any differences in the nature of visualizations in different stages of the design process.

## Conclusion

The interviews reported on in this paper all point towards the fact that visualization techniques serve as tools for communication within service design. The difference between different types of visualizations depends of the nature of the data they are based on as well as the intended recipients. Many interviewees state that visualizations directed towards external stakeholders are simplified and made with more concern to aesthetical aspects, whereas internal visualizations may be as simple as a wall full of post-its. The research also points out a group of basic visualization techniques within service design, as well as revealing that there is a long tail of different techniques used by a small amount of companies.

Overall, the paper presented here answers some of the questions raised by Segelström & Holmlid (2009). Put together the two papers give a description of how service designers use visualization techniques to make sense of user research and communicate this to the stakeholders in their design projects.

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## Appendix 1

Appendix 1 consists of a tabulation of Figure 1. The reasons for visualizing user research which connect to more than one group are placed at the lower end of the table.

Table 2 - List of arguments for using visualizations sorted in categories according to type of reasoning.

Articulate insights	Keep empathy	Communicate insights
Summarize data	Inspiration	Transfer feeling
Present general impression	Create empathy	Transfer insights
Framework for interpreting data	Remember users	Make data accessible
Find patterns	Tell an interesting story	Present insights
Translate data into usable insights	Humanize data	Present research
	Keep data alive	To use in workshops
		Vitalize stories
	Capture raw data visually	
Depends on the goal		