

Investigating Prototyping Practices of Service Designers from a Service Logic Perspective

Johan Blomkvist, Fabian Segelström & Stefan Holmlid

Linköping University

Abstract

The view of the nature of services has changed with the introduction of the service dominant logic. An important part of the logic is that services create value-in-use for customers. Customer-focused disciplines such as many design disciplines have a history of working with prototyping to understand the value-in-use. The service design discipline has a similar approach to the development of services. Based on previous research a framework of perspectives on service prototyping is presented which can be used to understand the prototyping approach utilised by designers. Then, using four of the suggested foundational premises of the service dominant logic this paper examines some of the ways prototyping can support the understanding and development of value propositions. The analysis shows that prototypes and the development and testing of them with customers and users can be seen as a tool for making sure that the value propositions offered by the companies are right, as well as exploring the customer's role as a co-creator of value. The prototyping framework can be used to practically manifest the service-dominant logic in the development of service prototypes.

1 Introduction

With the introduction of the service (dominant) logic (Vargo & Lusch, 2004; 2008) the value which services provide for the customers has become the focus of much of the service management discourse. This changed view of services was summarised well by Edvardsson, Gustafsson & Roos (2005, p. 107); "it is suggested that service is a perspective on value creation and that value creation is best understood from the lens of the customer based on value in use".

If we see value creation for the customer as the main criteria for creating a successful service, the question quickly becomes: How can we make sure our service offers the possibility for our customers to create value in use? As foundational premise 10 in Vargo & Lusch (2008) states that "[v]alue is always uniquely and phenomenologically determined by the beneficiary" we suggest that the prototyping practices of disciplines which have a strong customer-focus is a good starting point.

Within product and software development the concept of prototyping is well known. The word prototype comes from the Greek language and roughly translates as *first or primitive form* (Harper, n.d; Svenska Akademien, 1954). To prototype has been described as "expressing the concept in three dimensions to enable discussion, understanding and exploration of different possibilities" (von Stamm, 2008, p. 22).

Several authors have suggested that the prototyping approach also can be applied to services (Hollins & Hollins, 1991; von Stamm, 2008) and the field of service prototyping is highlighted as a field which needs more research in the overview on research priorities for service by a large group of Arizona State University scholars (Ostrom, et al., 2010).

One discipline, promoting the use of prototypes, is user-centred design (see Segelström (2010) for a short introduction), which serves as an umbrella for a number of different design areas such as service design, product design and interaction design. What these design areas have in common is a general approach which focuses on developing new artifacts through the involvement of the end-users of the artifact (design talks about users where management talks about customers). The general approach of user-centred design to designing new artifacts fits well with the eighth foundational premise in Vargo & Lusch (2008); “[a] service-centred view is inherently customer oriented and relational”.

Taking the focus of service logic on creating value in use for the customers as a starting point we thus set out to explore what can be learned from the praxis of user-centred design in general and service design in specific, if we want to make sure that our service offers as great a potential for value as possible for our customers.

2 Prototypes as described in design literature

The idea that prototyping can benefit the result of design activities is commonly accepted in design. The benefits can be described at a very general level as facilitating collaboration and generating feedback. Collaboration is supported by prototypes that externalise and represent ideas and possible concepts. These externalisations facilitate communication and support collaboration both within and between stakeholder groups. By externalising ideas, prototypes also allow stakeholders to take part in the progression of projects. This helps provide proof of concept which increases the feeling of security among stakeholders by showing that ideas are realisable and feasible throughout the project lifecycle. Externalising concepts also allow stakeholders to generate feedback. This in turn allows companies to save money by preventing bad ideas from reaching the market and making the mistakes earlier on in the process when the cost of going in another direction or adjusting the concept is not as high. Early prototyping helps identify problems and by using parallel prototypes simultaneously the process can suggest fruitful directions of a project. “In short, having some external representation provides a common reference point that allows stakeholders to collaborate and evaluate design suggestions.” (Blomkvist, 2011, p. 26).

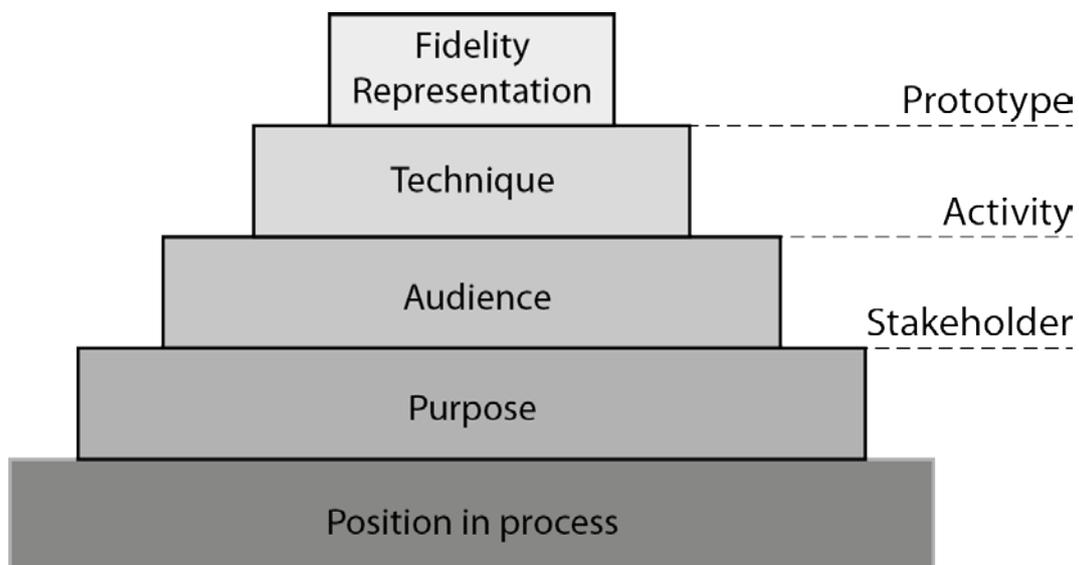


Figure 1: a framework of prototyping perspectives

To nuance the term slightly, prototypes can be divided into categories based on their purposes. This has led to a number of different categorisations. For instance, prototyping can be used on a general level to elicit requirements, using explorative prototypes, to try out solutions with experimental prototypes, and to “continually adapt a system to a rapidly changing environment” with the use of evolutionary prototypes (Schneider, 1996, p. 524). Looking at the various perspectives from which prototyping have been described in previous literature, the purposes of prototyping is a recurring theme. Breaking prototyping approaches down into explorative, experimental, and evolutionary is one way to approach the more specific purposes for having a prototyping phase in a project. A literature study by (Blomkvist & Holmlid, 2011b) found a number of perspectives on prototyping in design literature. The perspectives can be summarised as, Fidelity, Representation, Technique, Audience, Purpose, and Position in process.

The perspectives on prototyping can be seen in the prototyping pyramid representation (see Figure 1). Here, perspectives found in design literature are summarised and generalised and presented. The levels of the pyramid are prototype, activity, and stakeholder. On the prototype level we find the actual prototype, consisting of a representation of an idea or concept. The representation is of certain fidelity, showing in more or less detail the suggested solution. The concept of fidelity in prototyping has been discussed at length and the term fidelity has gradually been broken up in sub-categories. One of the more comprehensive lists has been suggested by (McCurdy, et al., 2006). They suggested that fidelity be “conceive[ed] of [in] prototypes along five orthogonal axes:

- level of visual refinement,
- depth of functionality,
- breadth of functionality,
- level of interactivity, and
- depth of data model.” (p. 1240)

The prototype in the framework is situated in a context where some type of activity makes the prototype useful and relevant. The activity is most often some kind of technique used for prototyping. Today there are numerous ways of prototyping, using everything from cardboard models (Ehn & Kyng, 1991) and scenarios (Carroll, 1999) to video (Young & Greenlee, 1992), and prototyping has also reached the realm of social interactions (Kurvinen, Koskinen, & Battarbee, 2008), and of course experiences (Oulasvirta, Kurvinen, & Kankainen, 2003; Buchenau & Fulton Suri, 2000).

The activity and prototype need to be designed to fit the intended audience on the stakeholder level according to the perspectives framework. The audience can be passive or active – i.e. aware that it is taking part in the prototyping activity or not - the important thing is that the fidelity, representation, and activity are adjusted to generate feedback, or spark discussions, that are relevant and useful. The feedback should be useful in relation to the purpose of prototyping. All this happens at a specific point in the overall design process which will affect the other perspectives and the cost, possibilities, and constraints that make up the prototyping context.

3 Prototypes as described by service designers

Service prototyping is one of the least studied aspects of service design academically. Many of the examples of service design come from the design consultancies themselves. Prototyping is

nevertheless recognised as an important part of most design disciplines. Service design is no exception, as revealed by an interview study with service design practitioners (Blomkvist & Holmlid, 2010). The study revealed that service prototyping is considered to be an important part of the interviewed service designers' work. The study also revealed a number of areas that the designers find particularly challenging with service prototyping. The first area was *inconsistency* in regard to the people, events, and behaviours in a service. The inconsistency of services makes findings identified during prototyping more difficult to generalise and no matter how rigorously the prototype is tested the actual service will always look a little different because both front-line, back-office, customers and other stakeholders change. This change takes place both across and within individuals. The designers also mentioned *authenticity* as a challenge for service prototyping. Using real people in real situations helps to counter this potentially problematic challenge which has its origin in the inconsistency challenge. Techniques such as roleplaying and personas that are not based on actual people might be less useful for service design as a consequence.

A related area was *validity*. This concerned the activity level of prototyping and what the actual context of the prototype is. How much of the prototyping activity can be transferred to the intended context of implementation is especially important in service design since so many factors can influence the service experience. This problem is not as salient in many other design fields, where only one product or interface for example is prototyped. But services take place in the world and are many times highly dependent on contextual information, cues, signifiers, and so on. Another challenge was *time*, and the fact that services can sometimes stretch over long periods of time making the borders of the service blurry and limiting the power to control or understand the whole experience of the service. The last challenge that the informants mentioned had to do with the *intangible* aspects of services. These aspects were conceived as more challenging to prototype using existing knowledge since most knowledge about prototyping has been generated within fields with tangible design objects.

Many of these challenges can be recognised from the IHIP perspective where services were mainly thought of as what products are not. The challenges have however grown out of actual perceived problems or possible problems as seen by service designers. These challenges also illustrate why prototyping might be even more important in service design than in many other design disciplines. The scope of services in terms of time and complexity makes them hard to grasp and without prototypes they can potentially remain as a cluster of different ideas and thoughts, distributed over a group of designers and other stakeholders. Service designers visualise services to deal with the intangible aspects (Kimbell, 2008) and to provide overview of the whole service. This also allows them to understand the whole service experience.

Another study based on the same interview material has been conducted (Blomkvist & Holmlid, 2011b). This study revolved around the questions of who is involved in service prototyping and in what way. The study showed that the client of the service design agency mainly is involved in service prototyping. This was found both for the creation and evaluation of prototypes. The client was in that sense both part of authoring the prototype, and as an audience of the prototype. The interpretation is that service designers work closely with their clients in developing value propositions, and then test their ideas with future and existing customers. The study also resulted in the insight that almost all prototyping carried out by the informants included external stakeholders.

The designers said that prototyping without inclusion is useless and most never do a prototype just for themselves.

Based on the interviews, the framework of perspectives on prototyping was expanded and adjusted. The new framework can be seen in Figure 2. The top level is the same as in the old framework. The prototype is still a representation with the two main perspectives being representation and fidelity. The representation has some kind of materiality to it; people, interfaces, things, and so on. This allows stakeholders to understand and take part in the prototyping process but from the design point, the representation needs to be thought through from many different aspects. People need to be dressed a certain way to elicit the right kind of feedback, they might need costumes, certain behaviour, and knowledge about the service and the specific area that is being prototyped. Customers might need specific goals or desires. Products need to be considered from many different aspects as well. Their weight, colour, size and so on, their role in the service and how this is communicated. The suggested types of *fidelity* in the previous chapter are potentially applicable also when it comes to services, but additional types of fidelity might also be relevant. This aspect of service prototyping needs to be further researched. Since the context of services is important, and service designers call for more *validity*, that perspective is added to the framework on the activity level. Here, also social and environmental fidelity (or validity) should be relevant (Wellings, 2009). So in addition to using some kind of *technique* to represent and make the prototype relevant, also the context of where the prototyping happens is considered on the activity level.

On the stakeholder level, the perspective of who *authors* prototypes is added based on the interviews. The author needs to be familiar with the techniques used on the activity level, and at the same time be able to represent the service, at suitable levels of fidelity and in the right context for the *audience* to be able to provide useful feedback. For any prototype, from the point of the audience, there might be both a perceived and an actual author. What is important here is that the relation between author and audience, in terms of power and associated values do not interfere with the audience's perception of the prototype. The author, which may be a single person or a group of people from one or more stakeholder groups, will also prototype for a specific *purpose*.

The purposes for prototyping services were said to be; explore, evaluate, communicate. These are three strategies or approaches to prototyping services. The first type happens earlier on in design projects when designers and possible collaborators do not yet have a clear idea of what the solution might look like. Instead they use prototypes to develop new ideas by searching for possible solutions that appear during the prototyping phase. The second type, evaluation, is more structured as an activity and involves mainly testing of ideas. The hypothesis about what behaviour will occur in the prototypical service is well defined, as a consequence of a carefully carried out design research study. For the last type of prototyping activity, communication, the idea is fully or partially defined and represented in a way suited for a specific audience. The purpose here can be to convince a stakeholder to invest more in the project or it can be part of the delivery from a project. Communication prototypes generally offer no or very little opportunities for interaction – the prototype is linear, while the others many times allow the user or customer to interact and manipulate the behaviour, of or in, the prototype.

A communication prototype can be a movie, a story or something else showing the main features of the suggested service. This kind of prototype is many times a little more polished to make the idea

look as appealing as possible. What is communicated by the prototypes are values for different stakeholders. Most commonly it is the customer who is in the centre of attention in these representations, and focuses it put on showing the value experienced by the customer. This value can be of many different kinds, both emotional and physical, such as healthcare, guidance, advice, transportation, community, status, and so on. Communication prototypes many times also describe the situation before, to be able to make a dramaturgical point of the resulting situation based on the prototype. Both evaluative and explorative prototypes can be anything from a conversation to a full scale service including buildings, people, artefacts, support processes and so on. The neat thing with prototyping of course, is that service concepts are developed incrementally and by starting small, problematic issues can be revealed and resolved before the cost is too high.

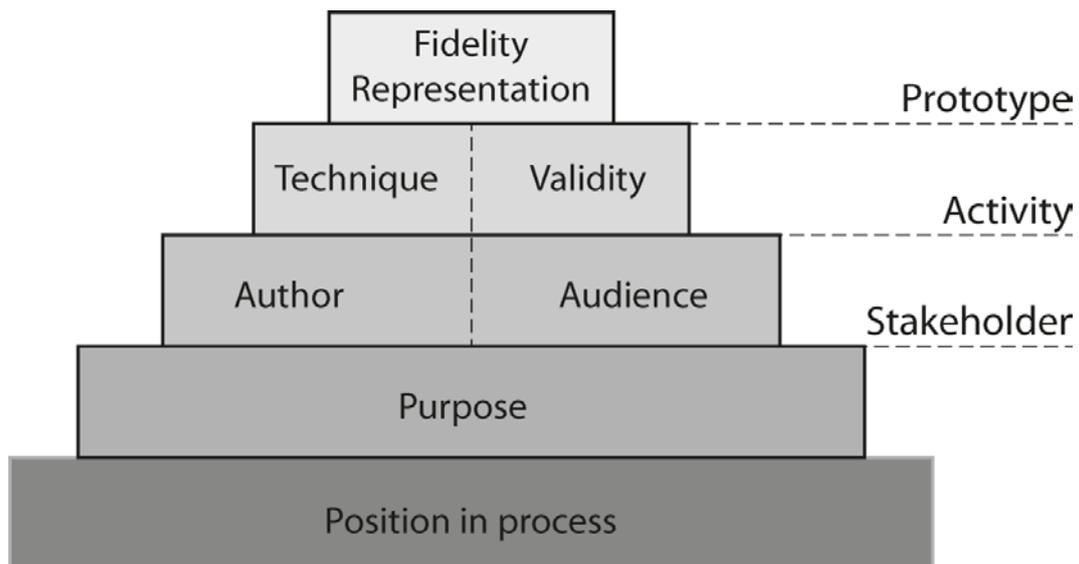


Figure 2: a framework of service prototyping perspectives

To summarise, prototypes are manifestations of ideas that visualise and make service experiences tangible. This allows designers to communicate within and across stakeholder groups that take part in the development of new services and improvements of existing ones. The main purposes for prototyping are to explore, evaluate, and communicate. Prototyping activities always involve outside stakeholders, i.e. people that are not from the design agencies. Prototyping of services is more focused on the clients than the customers. A number of perspectives on prototyping have been identified and presented as a framework that is directed at service prototyping specifically (Blomkvist & Holmlid, 2011a).

4 Service design and service logic

Having established how prototypes are used within user-centred design in general, and service design in particular, it is time to add the analysis layer; a service logic perspective. This chapter will frame our understanding of service logic and highlight the relationship between service logic and service design.

Key differences between service design and service logic

Service design and service logic (as described in marketing and management) share similar goals, but diverge greatly on tools and methods. Service logic mostly uses traditional marketing approaches

such as focus groups and surveys, although new approaches are being investigated (Witell, et al., 2011). Service design relies on ethnographic approaches to customer understanding (Segelström, Raijmakers, & Holmlid, 2009) and make use of visualisations of the service as a basis for discussions about the (re-)design of it (Segelström, 2010). A recent textbook on service design describes service design as resting on five core principles: User-centeredness, co-creation, visualisation of service sequences, making services tangible and a holistic view (Stickdorn, 2010).

Co-creation is a good example of how service design and service logic use same or similar terms but mean different things. The two related terms co-creation and co-production are used within both fields but with different meaning. As noted by several authors (Segelström, 2010; Blomkvist, 2011) the terms co-creation and co-production are used in the opposite cases in service design and service logic; when a service designer refers to co-creation he/she refers to the process of planning a service structure in collaboration with customers whereas someone using the service logic terminology would mean the joint efforts in making the service delivery when she/he says co-creation. These joint efforts would however be called co-production by a service designer, just like the service logic-minded person would call the joint planning of the service structure co-production.

Looking at the visualisation-practice of service designers we find another aspect which is relevant to highlight in this context; Segelström (2010) found that the visualisations of service design practitioners represent the IHIP-notion better than important service (dominant) logic traits. In the continued discussion Segelström (ibid.) draws the conclusion that the discipline of service design seems to see service in line with the IHIP-notion rather than service (dominant) logic-notion.

Analysis framework

Looking at the scope of service design and service logic thinking we find that service design has a narrower focus; service design focuses on developing new and improving existing services, whereas this is just a part of the scope of service management.

Taking the narrower scope of service design into account a framework for analysis was developed based on the foundational premises presented by Vargo & Lusch (2004; 2008) which apply to the development of new services. We see four of the foundational premises as important in this context;

FP4. Goods are a distribution mechanism for service provision

FP6. The customer is always a co-creator of value

FP7. The enterprise cannot deliver value, but only offer value propositions

FP8. A service-centred view is inherently customer oriented and relational (Vargo & Lusch, 2008)

The continued discussion on how the prototyping practices of service designers can influence service logic – and vice versa –will be centred around these four statements.

5 Service prototypes seen from a service logic perspective

FP4. Goods are a distribution mechanism for service provision

Based on what the designers say about prototyping, we find support for FP4 insofar that they regard goods and products as integral parts of a service. From the perspective of FP4 it is important that the mediating function of goods are seen as an integrated part of the service system as a whole, and not as a single isolated entity. Prototyping approaches should thus aspire to include as much as possible in the service prototype representation. Design and prototyping is relying on making a possible future tangible, through embodiments and visualisations. In service design there is a tendency to focus on the perception of the service as a whole, which leads to a focus of prototyping activities on evaluating concepts rather than specific parts – be they goods, interactions or actions. In this process, goods are treated like all the other distribution mechanisms of the prototyped service by service designers. Looking at the framework we see that the prototype level (fidelity and representation) is the part which has most to do with the goods in the service provision. Designers represent and design products, people, interfaces, and so on. The products are however seen as different from the intangible aspects of the service, and considered less problematic to prototype. The physical aspects are seen as mediators of value and can act as touchpoints and service evidence. Given this, in prototyping, fidelity and representation of these distribution mechanisms in the prototype need to be considered.

FP5. The customer is always a co-creator of value¹

A service prototype is a low fidelity service proposition. By creating a prototype of a service and observing the performance it is possible to understand how the stakeholders, such as the customers, will co-create value in the service. This is a process of designing a service proposition that is represented at a fidelity that generates useful feedback from the involved stakeholders. Prototypes help reveal what the customers perceive as their role in the service and by offering alternatives, a prototype can suggest cheap and quick improvements to the service proposition.

One of the features of prototyping in design is that one stakeholder is the primary audience of prototyping activities. This means that service prototypes – as performed within service design – are very helpful tools to make sure that all the needed prerequisites are in place for the customers of the launched service to do their part in the service delivery without experiencing any unclarities as to what they are expected to do next. However, service prototyping is a process that involves many stakeholders where not only the customer is an important collaborator. Most representation techniques in service design, and most approaches within user-centred design, rely heavily on inclusion of the presumptive customer.

The interviewed designers state that *validity* is important, and even though not stated directly we understand FP5 as one of the underlying reasons for this. Services are co-created and thus prototypes should be tested with real people that could actually be interested in the service.

Prototyping is an iterative activity and while taking part in the service and co-creating the value the customer redefines and changes the service, thus affecting the next iteration. In that sense a service prototype in the light of FP5 introduces the customer as an *author* as well as *audience* in the prototyping framework. In user-centred design in general, customers are viewed as *audience*. In product design you wouldn't say that the user is part of the prototype, they are testing the prototype and not taking active part in the process of defining the prototype.

¹ In this section we use co-creation as it is understood within service management rather than service design, see chapter 4.

FP6. The enterprise cannot deliver value, but only offer value propositions

Prototypes can express the potential value of propositions. Communication prototypes are prototypes that “specialise” in showing the value for selected audiences. The interviewed designers would argue that the intangible aspects of a service is more difficult to prototype than the tangible, given e.g. the large amount of knowledge already generated within product and interaction design about how this should be done. Different techniques for prototyping express and emphasise these propositions in different ways. When prototypes are done right they can reveal what the customer experiences as the value or values of services. Prototyping can many times reveal also unexpected values by how customers use or interact with service prototypes. In this way prototyping helps the service provider arrive at desirable value propositions.

It is important how the prototype is represented and what technique is being used. If the audience can understand what the prototype intends to do they can provide invaluable information about how the service will do if it is implemented. Prototypes allow designers to understand what a good solution is and perhaps more importantly, what a good solution is not. If a proposition is somehow wrong this can be noticed early before too much money is spent on the idea, and a different direction of the project can then be suggested instead. Later in the design process, the prototype authors and other stakeholders gain confidence in their idea through iterations of prototyping the proposition. The fidelity of the prototype can then be improved and a version more like the finished proposition can be developed and tested.

FP7. A service-centred view is inherently customer oriented and relational

This FP is from a service design perspective the most fundamental one; being a user-centred design discipline, service design puts the customers in the centre of all activities. Services are developed for customers, and in such a way that users want to use them repeatedly over time. Taking a service design approach to the service development leads to customer orientation and relationships between service provider and customer become a guiding star for the service development.

Designers in general and service designers traditionally focus on designing for the customer (or user). Service designers focus on the customer’s journey through the service and how it can be improved from the customer’s point of view. The techniques used by service designers investigate relations between service provider and customers. Values expressed by the service provider and the customers understanding thereof are common topics of service design projects which is one indication that the relations are important to understand. The relation with other stakeholders is not always made explicit today, but in a holistic service prototyping approach different stakeholders should be included and collectively take part in the activities.

6 Conclusion

Design and prototyping rely on making possible futures tangible which is why knowledge about prototyping can be so useful for expressing the potential value of propositions. This paper has shown how service prototyping can be understood from a service-dominant logic perspective. It has explained how prototypes are tools to assess the quality of services in an early and inexpensive way. One common assumption has been that this is not possible in the case of services – that only product quality can be understood before being used (as noted by Gummesson, Lusch, & Vargo, 2010). Depending on how the different aspects of the prototyping framework is understood and used the

precision of the predictions about how customers will perceive the quality will vary, but without prototyping there will be no way of predicting how a service will be received. The earlier prototyping happens, the cheaper it is to fail and the easier it is to address problems or change direction of the project. Without external representations and good prototyping techniques there is no reliable way to assess service propositions before they are implemented and used.

More explorative prototyping techniques can also be used that are not meant to evaluate as much as generate ideas. Some of these techniques offer ways to create new service propositions in a collaborative manner, while also increasing the understanding of the experience from the design team's (or authors) point of view (Buchenau & Fulton Suri, 2000). Different techniques for prototyping can also be used to explore the roles of customers as co-creators of value.

The analysis also raised some issues for prototyping services. For instance, considering the challenges for prototyping mentioned by the interviewed service designers it would seem that they still have much of an IHIP understanding of services. Fully understanding services from a SD logic perspective could potentially benefit service design approaches in prototyping as well as in more general terms.

(Heinonen, et al., 2010) have called for a more customer-centric view of services. It is evident in the use of customer journeys that service designers focus on describing services from the point of view of the customer. Traditional user-centred approaches also focus to a large extent on the presumptive user, for understandable reasons. In service design however, the role of the service provider is important also since they both take part in the service. This dependence of two or more actors for prototyping services makes it a good tool to highlight the needs and perspectives of both the service provider and the customer.

To summarise, service prototyping fits well with the service-dominant logic and can even be used to practically manifest the logic in the development of services. The service design framework can be used in this process to understand prototypes from different perspectives and enhance the performance and usefulness of service prototypes.

7 Bibliography

Blomkvist, J. (2011). *Conceptualising Prototypes in Service Design*. Linköping, Sweden: Linköping University.

Blomkvist, J., & Holmlid, S. (2010). Service prototyping according to service design practitioners. *ServDes.2010*. Linköping, Sweden: Linköping university electronic press.

Blomkvist, J., & Holmlid, S. (2011a). Existing Prototyping Perspectives: Considerations for Service Design. *Nordic Design Research Conference, NORDES*. Helsinki, Finland.

Blomkvist, J., & Holmlid, S. (2011b). Service designers on including stakeholders in service prototyping. *Proceedings of Include 2011*. London, UK.

Buchenau, M., & Fulton Suri, J. (2000). Experience Prototyping. *Proceedings of the 3rd conference on Designing interactive systems: processes, practices, methods, and techniques* (pp. 424-433). New York: ACM.

- Carroll, J. M. (1999). *Scenario-Based Design: Envisioning Work and Technology in System Development*. New York: John Wiley & Sons.
- Dow, S. P., Glassco, A., Kass, J., Schwarz, M., & Klemmer, S. R. (2009, September). The Effect of Parallel Prototyping on Design Performance, Learning, and Self-Efficacy. *Stanford Tech Report*, 10. Stanford, CA, USA.
- Ehn, P., & Kyng, M. (1991). Cardboard Computers: Mocking-it up or Hands-on the Future. In J. Greenbaum, & M. Kyng, *Design at Work: Cooperative Design of Computer System*. Lawrence Erlbaum Associates.
- Gummesson, E., Lusch, R. F., & Vargo, S. L. (2010). Transitioning from Service Management to Service-Dominant Logic. *International Journal of Quality and Service Sciences*, 2(1), 8-22.
- Harper, D. (n.d.). Retrieved 01 09, 2011, from Online Etymology Dictionary:
<http://www.etymonline.com/index.php?search=prototype&searchmode=none>
- Heinonen, K., Strandvik, T., Mickelsson, K.-J., Edvardsson, B., Sundström, E., & Andersson, P. (2010). A Customer-Dominant Logic of Service. *Journal of Service Management*, 21(4), 531-548.
- Hollins, G., & Hollins, B. (1991). *Total Design: Managing the Design Process in the Service Sector*. London, UK: Pitman.
- Kimbell, L. (2008). *What do service designers do?* Retrieved 07 01, 2009, from Designing for Services:
<http://www.sbs.ox.ac.uk/D4S/videoArchive/index.html>
- Kurvinen, E., Koskinen, I., & Battarbee, K. (2008). Prototyping Social Interactions. *Design Issues*, 24(3), 46-57.
- Lusch, R. F., & Vargo, S. (2006). Service-dominant logic: reactions, reflections and refinements. *Marketing Theory*, 6(3), 281-288.
- McCurdy, M., Connors, C., Pyrzak, G., Kanefsky, B., & Vera, A. (2006). Breaking the Fidelity Barrier: An Examination of our Current Characterization of Prototypes and an Examples of a Mixed-Fidelity Success. *CHI 2006 Proceedings* (pp. 1233-1242). Montréal, Canada: ACM.
- Ostrom, A. L., Bitner, M. J., Brown, S. W., Burkhard, K. A., Goul, M., Smith-Daniels, V., et al. (2010). Moving Forward and Making a Difference: Research Priorities for the Science of Service. *Journal of Service Research*, 13(1), 4-36.
- Oulasvirta, A., Kurvinen, E., & Kankainen, T. (2003). Understanding contexts by being there: case studies in bodystorming. *Personal and Ubiquitous Computing*, 7, 125-134.
- Schneider, K. (1996). Prototypes as Assets, not Toys: Why and How to Extract Knowledge from Prototypes. *Proceedings of the 18th international conference on Software engineering* (pp. 522-531). Berlin, Germany: IEEE Computer Society.
- Segelström, F. (2010). *Visualisations in Service Design*. Linköping, Sweden: Linköping University.

- Segelström, F., Raijmakers, B., & Holmlid, S. (2009). Thinking and Doing Ethnography in Service Design. *Proceedings of the International Association of Societies of Design Research, IASDR 2009*. Seoul.
- Stickdorn, M. (2010). 5 Principles of Service Design Thinking. In M. Stickdorn, & J. Schneider (Eds.), *This is Service Design Thinking* (pp. 34-45). Amsterdam, Netherlands: BIS publishers.
- Svenska Akademien. (1954). *Prototyp*. Retrieved 04 14, 2011, from Svenska Akademiens Ordbok: <http://g3.spraakdata.gu.se/saob/show.phtml?filenr=1/197/206.html>
- Vargo, S., & Lusch, R. (2004). Evolving to a new dominant logic for marketing. *Journal of Marketing*, 68, 1-17.
- Vargo, S., & Lusch, R. (2008). Service-dominant logic: Continuing the evolution. *Journal of the Academy of Marketing Science*(36), 1-10.
- von Stamm, B. (2008). *Managing Innovation, Design and Creativity* (2nd Edition ed.). Chichester, United Kingdom: John Wiley & Spns, Ltd.
- Wellings, P. (2009, February 19). *Adaptive Path Blog*. Retrieved January 18, 2010, from Adaptive Path: <http://www.adaptivepath.com/blog/2009/02/19/beyond-prototype-fidelity-environmental-and-social-fidelity/>
- Witell, L., Kristensson, P., Gustafsson, A., & Löfgren, M. (2011). Idea Generation: Customer Co-creation versus Traditional Market Research Techniques. *Journal of Service Management*, 22(2).
- Young, E., & Greenlee, R. (1992). Participatory video prototyping. *SIGCHI conference on Human factors in computing systems* (p. 28). New York, New York, USA: ACM.