Servitization of Products as an Approach for Design-Driven Innovation

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Abstract

In this paper we present how the meaning of a product can radically be innovated through add-on services and related service support products to the existing product instead of significantly redesigning it. We explore and investigate this assertion with an action-oriented case study using a research through design approach. Our research was done within the Dutch fashion industry together with a fashion label specialized in handmade knitwear. As a result two services, 'Meet Your Knitter' and 'Our Garment', were designed and added to an exclusive garment line. Early probing indicated an innovation in the meaning of the garments through servitization. In general, we conclude that servitization of products can be a promising approach for design-driven innovation. This is especially interesting for firms that would like to probe and experiment with service design for meaning innovations. However, more research is required to fully understand and utilize the suggested approach.

KEYWORDS: design-driven innovation, handmade fashion industry, servitization of products

Introduction

Background

Design is gaining a more prominent strategic role in today's economic environments. Companies like Artemide, Nintendo, Apple, Alessi, and so on, all have design at the core of their business. According to Verganti (2009) people do not buy products but meanings. The epistemology of design defines the word as 'making sense of things' or one can say that design is about creating meaning (Krippendorff, 1989; Heskett, 2002; Kazmierczak, 2003).

Design-driven innovation
Design-driven innovation (a.k.a. radical innovation of meaning(s)) is an innovation strategy introduced by Verganti in 2009. This strategy is relatively new compared to the two mainstream and dominant innovation strategies of user-driven innovation (a.k.a. market pull innovation) and technology-driven innovation (a.k.a. technology push innovation) (Verganti, 2009). While user-driven innovation usually departs from user/market studies and

technology-driven innovation departs from technological inventions, design-driven innovation departs from the innovator's culture. This strategy is about taking distance from the user/market and sometimes also about the integration of new or existing technology in a new market. This is to avoid incremental change and aims for change that is more radical. Verganti describes this idea well using his framework on which the different strategies are mapped together with a hybrid strategy what he calls 'Technology Epiphanies' (see Figure 1).

Since design-driven innovation primarily focuses on innovating the meaning of products, Verganti & Öberg (2013, 87) have provided the following definition for 'product meaning' in their more recent work: "To clarify, when we mention 'product meaning', we relate to the purpose of a product/service as perceived by the user. It is about the purpose for why a product is used, not how it is used (the user interface), nor what the product consists of (its features)". Although Verganti also proposes design-driven innovation for innovating the meaning of services, elaborate examples (in service design literature) remain limited.

We believe that in addition to innovating the meaning of products and services one could also innovate/influence the meaning of products through 'add-on services'. Our viewpoint is inspired from one of the current and more upcoming trends in innovation called 'servitization'.

Servitization of Products
The term 'servitization' was first introduced by Vandermerwe & Rada (1988) and referred to as the increased offering of more complete market packages of customer-focused combinations of products, services, support, self-service and knowledge in order to add value to core corporate offerings. However, according to Morelli (2003) 'servitization' also can be seen as the evolution of product identity based on material content, to a position where the material component is inseparable from the service system.

There are different forms of servitization. Tukker (2004 cited in Baines *et al.*, 2007) proposes categories rating from services with tangible products to products with services as 'add-ons'. Servitization often comes about as a reaction to financial challenges, strategic product differentiation, and (latent) customer demands (Mathieu, 2001; Oliva & Kallenberg, 2003; Gebauer *et al.*, 2006).

Objective

We are interested in the servitization stance of Morelli (2003), which is close to 'products with services as an add-on' category of Tukker (2004). Hence, we are interested in exploring how the meaning of an existing product can be innovated through servitization; i.e. through addition of one or more services and service support products designed around the existing product instead of significantly redesigning that product. In short, whether and how servitization of products can be used as an approach for design-driven innovation.
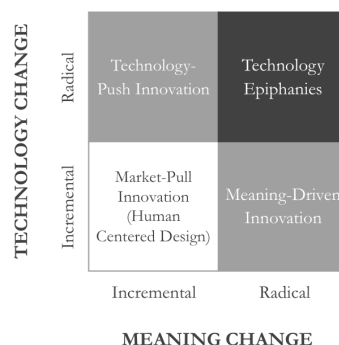

Figure 1. The two innovation dimensions and four related innovation types, adopted from Norman & Verganti (2014, 89).

This paper is structured in six sections. We started with an introduction in 'Section 1'. Next we continue by explaining our research methodology, context, and design in 'Section 2'. Then we present the results of our case study in 'Section 3'. From there we first reflect on the case study in 'Section 4' and later derive conclusions in 'Section 5'. Finally, in 'Section 6', we define our future work.

Research methodology, context, and design

Research approach

We have performed a case study (Yin, 1994) based on a 'research through design' approach (Frayling, 1993 cited in Koskinen *et al.*, 2011). In this approach, design action and reflection on action are considered creators of knowledge, and the design outcome is considered the physical proof of the knowledge generated (Schön, 1983).

Research context

The context for the research was a ten-month Master graduation project of the second author. With nine months in The Netherlands and one month in Ecuador, this project was a collaboration between the Industrial Design Department of Eindhoven University of Technology and Inti Knitwear (as client). Inti Knitwear is a Dutch fashion label established in 1993. This SME produces handmade knitwear in Ecuador and Peru for customers in west and East Asia. Nowadays Inti Knitwear has about one hundred and twenty five stores spread over The Netherlands, Belgium, Germany, France, Italy, Denmark, Japan, and Mongolia.

Case study setup

This Master graduation project started with a fascination for addressing the 'alienation of products' as a societal challenge (Eriksen, 2010; Walker, 2013). With this we mean the competition of the postmodern worldview in which a product has become another abstract hyper commodity in a global system with the traditional worldview, where products had deep and local meanings (Negus, 2002). In short, the design brief was to innovate the meaning of handmade knitwear as a product, in such a way to foster a (close) relationship between the producer and consumer. The case study was performed in three parts: (1) It started with semi-structured interviews with the founders of Inti Knitwear; (2) From there five Inti Knitwear garments (an exclusive line) were chosen for servitization where two services were designed; (3) In the end, two probes were designed and executed to sense and measure the meaning innovation based on servitization of the selected products, the exclusive line. In what follows, we explain each part in more detail:

(1) Semi-structured interviews
Early in the project, a set of questions was created and a semi-structured interview was performed to explore the meaning of Inti Knitwear garments. The following topics were embedded: mission statement, establishment, market size, demographic of employees, hierarchies, challenges, changes, and vision.

(2) Servitization of products
To address the societal challenge explained above, a design brief was created together with the client. The knitwear, currently an alienated product, was used as a starting point for design-driven innovation without product redesign. The intervention for addressing the societal challenge was framed as designing add-on services for handmade knitwear that could contribute to the awareness of deeper meanings of this product.

(3) Probing

Two probes were designed and executed in order to sense and measure whether any meaning innovation took place; if so, also to see if the meaning innovation was indeed a result of servitization of products. Probes are small packages that can include artifacts (like a postcard, map, camera, or diary) along with evocative tasks, which are given to people by designers to allow them to record specific events, feelings or interactions. The aim is to elicit responses from people, in order to understand their culture, thoughts, and values better (Gaver *et al.*, 1999; Matelmäki, 2006). The first probe was to sense the meaning of purchased Inti Knitwear garments before servitization. The second probe was to sense the meaning of the selected Inti Knitwear garments after their servitization. More information on how we used probing is to be found in 'Results - Probing outcomes'.

Results

Inti Knitwear and the meaning of its garments

The semi-structured interviews were performed with the two founders of Inti Knitwear. Inti Knitwear's headquarters was visited in the Dutch city 's-Hertogenbosch. The interviews were conducted in Dutch, audiotaped, and varied in length from 30-45 minutes. Later the recordings were transcribed verbatim and analysed starting with coding words and collapsing them into conceptual categories. From the semi-structured interviews we learned that the meaning of garments depend upon the organization structure of Inti Knitwear. What follows next is a summary of the results starting with Inti Knitwear's organization vision, continued by the organization structure, towards the meaning of Inti Knitwear garments.

Garments of Inti Knitwear are handmade and thus entirely unique (handmade garments are never exactly the same). The main value of Inti Knitwear is to preserve handmade production processes. They believe that best things in life are still made by hand.

Like most profit organizations, Inti Knitwear is structured in a pyramidal form. At the top there are two founders, one that takes care of Inti Knitwear's production part in Ecuador, while the other is responsible for the consumption part, which is worldwide. Descending in power, there are a series of managers on each side; Followed by the Inti Knitwear designers and knitters on the production side and retail personnel on the consumption side. Due to this structure there is a gap between production and consumption. This in the sense that only the founders have an overview of the interactions among the many conflicting agendas of those involved at the organization. While the vision of Inti Knitwear focuses on the relation of actors with the deep meeting of products, the current organization structure of the label, like many other organizations, is a structure that isolates actors from the deep meaning of products.

Since the founders seem to have most awareness and access to Inti Knitwear's production and consumption process, they were the ones that were asked to describe the (deep) meaning of Inti Knitwear garments (Fallan, 2008). This meaning can be summarized as 'a sophisticated handmade garment that is entirely unique in fit, colour, material, and comfort'.

Servitization of the product

The servitization was based upon the designer's (second author of this paper) vision on the case described in 'Research methodology, context, and design - Case study setup'; enabling customers to interpret a more holistic and therefore a deeper meaning of Inti Knitwear garments. In order to enable such holistic interpretation a communication channel was created between consumers and producers. Therefore, engaging these two actors in a

meaningful dialogue was the purpose of the servitization. In specific, for the customers this entailed closer awareness of a garment's origin and production process, but also the possibility of personification of wearable garments through a subscription to a specific producer (in this case a knitter). For producers this was to provide awareness on a garment's destination and this way a meaningful increase of commitment in production. In the scope of this paper we only focus on the consumer interpretation of Inti Knitwear garments.

A total of two services were designed for an exclusive line of Inti Knitwear garments: (1) 'Meet Your Knitter' service, and (2) the 'Our Garment' service. An app called the 'Intimate App' was developed through which these two services were provided to the Inti Knitwear customer.

Service 1: Meet Your Knitter
'Meet Your Knitter' service enables Inti Knitwear customers to inquire information (the people, the story, and the process) behind Inti Knitwear produced garments. This can be done by scanning a garment's tag using the Intimate App. The app then downloads and displays one or more movies related to that unique garment and its production.

Service 2: Our Garment
'Our Garment' is a service for Inti Knitwear customers who have purchased a garment and used the 'Meet Your Knitter' service. The 'Our Garment' service only unlocks after using the 'Meet Your Knitter' service. The 'Our Garment' as a service opens up a communication channel between the Inti Knitwear customer and knitter. Using this service, customers can send photos to knitters to thank them, communicate how they prefer to wear a garment, and this way provide them with a source of inspiration. Later, this information is used by knitters to design and propose knitwear targeted for a specific customer in such a way that the garments resonate with their style. Knitters can propose their designs by knitting and sending sample garments to the specific customer through Inti Knitwear's sales force.

Probing outcomes

In this sub-section we explain the process and outcomes of two probes introduced earlier in 'Research methodology, context, and design - Case study setup - (3) probing':

Probe 1: Initial meaning of Inti Knitwear garments
Probe 1 was prepared in three days. The package consisted of: a letter containing the probe assignment, a pack of Post-Its, and some pencils. In total two participants were recruited to take part of the first probing experiment. Since Inti Knitwear is a female fashion label, these were both female: Anouk aged 23 and Bertie aged 53. Anouk and Bertie both received a probing package and were asked to perform the assignments and return the package the next day.

Within the probing assignment, the participants were asked to select their favourite purchased Inti Knitwear garment. Next, they were asked to wear their favourite Inti Knitwear garment and describe what the garment means to them. This was done using Post-Its on which keywords and explanations/stories were written and later returned with the probe package to the researchers. In general, the participants were made sure that nothing they would say or do is wrong. This was done on purpose to allow self-expression and to capture the deep meaning of the garments.

The participants came up with keywords and a corresponding explanation/story to describe the meaning of their favourite purchased Inti Knitwear garment. Anouk chose a scarf and Bertie chose a blanket. Bertie for example, described her blanket using the following keywords: 'support, adventure, warmth, security, magic, and power'. For the keyword 'support', Bertie provided the following story:

Bertie (probe 1): "When I am lonely at home and feel sad or anxious, then the wool of this blanket can give me the warmth of a real person."

The data acquired was multi-faceted and multi-layered; the inquired meanings were both personal and general or in other words subjective and objective. Figure 2 gives an impression of the conceptual meaning categories created from the inquired meanings. The map was also used to define the relation between various categories. Analysis of the map from the perspective of the two participants enabled us to summarize the meaning of Inti Knitwear garments as: 'a functional garment made of high quality materials, that is aesthetically nice, and has this home-sweet-home feeling'.

Probe 2: Meaning of servitized Inti Knitwear garments
After probe 1, a second probe was developed and deployed in ten weeks (April - May 2013). The probe was designed in The Netherlands within a time frame of two weeks. Then five weeks were spent in Ecuador to execute the probe in the context of production. For the context of production the package consisted of: a letter containing the probe assignment and a couple of inspirational photos from the customer. The assignment was to design and knit a sample garment and later knitting a 1:1 sale garment. For the context of consumption the package consisted of: a letter containing the probe assignment, the Intimate App, the sample garments, and later a 1:1 scale garment with a tag that could be scanned to see a video of the producer (see Figure 3).

Two full cycle experiments were performed. Each experiment was performed with a different knitter (producer) and different end-user (customer). In total four participants took part in probe 2, i.e. two knitters in Ecuador, Mercedes and Narcicia, and two customers, Marieke and Laura, in The Netherlands.

The chronological procedure of the probe can be summarized as following: The probe started with the two customers in The Netherlands. The first step was to interact with the early version of the Intimate app via their computers through which they could meet the knitters and send them inspirational photos through the device. After this was done, the knitters could receive printed photos as inspiration material for knitting and in this way indirectly meet the customers. Next, each knitter created a knitwear garment sample that was sent to the customers. The idea behind the sample garment was proposing a garment concept to the customers that they could order a 1:1 scale version of. After viewing the sample garment the customers could send their written feedback to the knitters. This feedback was translated from Dutch to Spanish and communicated to the knitters by the local manager. Based on this feedback the knitters created a 1:1 scale garment.
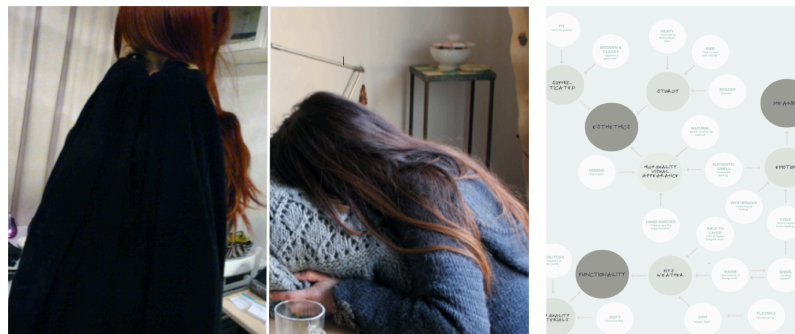

Figure 2. Anouk wearing her scarf, Bertie holding her blanket (left); Map with the conceptual meaning categories of Inti Knitwear garments owned by two loyal customers (right).

Figure 3. Mercedes (knitter) and Marieke (customer) (left); A garment tag and the Intimate App displaying a 'Meet Your Knitter' video (right).

These videos were uploaded on a server and could later be viewed by the customers by scanning the garment's tag. The probe ended with customers receiving the 1:1 scale garments that they had ordered, and scanning the tags to see 'Meet Your Knitter' video(s). The latter part of the probe was video recorded for this research.

Like the previous probe, the customers were asked to wear the garment with this time the addition of scanning the garment tag using the Intimate App and watching 'Meet Your Knitter' video. In other words, making use of 'Meet Your Knitter Service' and describing what that specific Inti Knitwear garment means to them. The participants described the meaning of the Inti Knitwear garments after servitization as following:

> *Marieke (about the 1:1 scale garment, Figure 3): "Due to this type of information, the garment increases in value. It is no longer just a garment, but a garment with an underlying thought. A true challenge, a relaxed working environment, a 43 years old Ecuadorian lady. The life of Mercedes. A garment that I will give to my daughter, and she to her daughter, and so on. A forever garment".*

> *Laura (about the 1:1 scale garment): "Narcicia explains who she is, what she does and why. I believe it is very special that somebody is creating something for you right there right now. Extraordinary! ... Yes, this experience adds something. It defines a setting, a true understanding. You do no longer take the 'object' for granted. And due to I expect I will never throw away this garment. It simply would make me feel guilty".*

As can be seen from the participating consumer descriptions transcriptions, we can summarize the meaning of the servitized Inti Knitwear garments now as: 'a personal and unique garment that tells a story, is thought provoking, and inspires'.

Reflection and discussion

Innovation of meaning?
The probing results indicate a meaning innovation in Inti Knitwear garments. Moreover, the meaning of the initial Inti Knitwear garments differs to that of the Inti Knitwear garments that are servitized with 'Meet Your Knitter' and 'Our Garment' services. Namely, 'a functional garment made of high quality materials, that is aesthetically nice, and has this home-sweet-home feeling' vs. 'a personal and unique garment that tells a story, is thought provoking, and inspires'.

Design-driven innovation based on servitization of products?
In probe 2, the meaning described by customers for the Inti Knitwear garments seems to be an implication of servitization. For example, Marieke perceives the information provided through the two services as an increase of the value of the garment, i.e. the garment itself as

not just a garment but also one with an underlying thought. Servitization of products seems to be a promising approach for design-driven innovation but could also have some drawbacks. "Table 1" provides an overview of the pros and cons that servitization of products could have for a firm and its producers and customers. Our reflection is on two levels and more an exploration rather than validation: (1) Specifically on the two services created in our case study; and (2) A more generic reflection.

Pros	Cons	Other
Specific reflection		
» The two services could contribute to the sustainability of garments due to their personification and this way increase their value. People take better care of more meaningful/valuable products and will not easily replace or dispose them. » It is expected that the two services generate a garment quality increase since the knitters receive more than just monetary value for the work that they do.	» Services that create transparency, can be seen as a threat to firms that do not have a strictly controlled ethical/sustainable production processes and infrastructure.	» One can wonder to what extend services designed based on western ideology would work for non-western parts of the world? Something that requires further investigation.
Generic reflection		
» New services (new meanings in offerings and brand identity) could result in the generation of new markets or differentiation from competitors leading to increasing market share. » Firms can keep a big part of their established, already invested in, infrastructure. » New services could add a new meaning layer on products. Hence, a product could receive different meanings through services for different target segments and this way is attractive for multiple target segments. » Services add touch points for meaning inquiry from customers and producers, which can be valuable for business development.	» New services might increase the product price. The customers that do not appreciate the services might not be happy with this. This means if the services do not match all customers some customers might be lost due to price increase for not appreciated services.	» Because of the reflections explained in the cons column, the servitization was only proposed for a part of Inti Knitwear's garment collection, not the entire collection. This can both limit or enable business possibilities.

Table 1. Pros and cons of servitization of products for a firm and its producers and customers (our specific and generic reflections).

5. Conclusions

We have explained and through a practical case study on fashion shown how servitization of products can be used as an approach for design-driven innovation. Using probes we were able to illustrate that the meaning of Inti Knitwear garments was changed through their servitization; i.e. due to adding services to garments, they were interpreted differently by customers.

The case study can be seen as a promising early Meta level investigation of servitization of products for design-driven innovation. However, understanding the full potential of servitization of products for radical innovation of their meaning requires probing with more participants and additional case studies. In this case, our research is limited to two probes with six participants, which focused more on initial experimenting and explaining a novel approach for servitization within the domain of design-driven innovation.

With this work we hope to inspire strategic and innovation designers and researchers to consider servitization for design-driven innovation (expand service design to other fields) and perform more research on this far from fully utilized, yet promising approach.

6. Future work

We are currently writing another paper, which has a more Micro level focus on the case; I.e. service design based on design-driven innovation. Furthermore, we are expanding our number of case studies and contexts (e.g. to mobility and care). Our intention is to eventually experiment with servitization for design-driven innovation on system level. In specific, we are interested in radical innovation of meaning(s) in product service systems. Last but not least, the second author is currently taking this project to the next level through piloting.

Acknowledgements

References

Baines, T. *et al.* (2007). State-of-the-art in product service-systems. Proceedings of the Institution of Mechanical Engineers, Part B, *Journal of Engineering Manufacture*, 221(10), 1543-1552.

Eriksen, T. (2010). *Small Places Large Issues*. London: Pluto Press.

Fallan, K. (2008). De-scribing Design: Appropriating Script Analysis to Design History, *Design Issues*, 24(4), 61-75.

Gaver, W., Dunne, T., & Pacenti, E. (1999). Cultural probes. *Interactions*, VI(1), 21-29.

Gebauer H., Friedli T., & Fleisch E. (2006). Success factors for achieving high service revenues in manufacturing companies, *Benchmarking*, 13(3), 374-386.

Heskett, J. (2002). *Toothpicks & Logos: Design in Everyday Life*. Oxford University Press, New York, NY, USA.

Koskinen, I., Zimmerman, J., Binder, T., Redström, J., & Wensveen, S. (2011). *Design Research Through Practice: From The Lab, Field and Showroom*, 1st edn, Morgan Kaufmann, Burlington, MA, USA.

Krippendorff, K. (1989). On the Essential Contests of Artifacts or on the Proposition that 'Design Is Making Sense (of Things)', *Design Issues*, 2(5), 9-38.

Kazmierczak, E.T. (2003). Design as Meaning Making: From Making Things to the Design of Thinking, *Design Issues*, 19(2), 45-59.

Norman, D.A., & Verganti, R. (2014). Incremental and Radical Innovation: Design Research versus Technology and Meaning Change, *Design Issues*, 30(1), 78-96.

Matelmäki, T. (2006). *Design Probes PhD thesis*, University of Art and Design Helsinki, Finland.

Mathieu, V. (2001). Product services: from a service supporting the product to service supporting the client, *Journal of Business & Industrial Marketing*, 16(1), 39-58.

Morelli, N. (2003). Product service-systems, a perspective shift for designers: a case study - The design of a telecentre. *Design Studies*, 24(1), 73-99.

Neely, A. (2007). Servitization of manufacturing an analysis of global trends, *Proceedings of the 14th European Operations Management Association Conference (EUROMA)*, Ankara, Turkey, 17-20 June.

Negus, K. (2002). The Work of Cultural Intermediaries and the Enduring Distance Between Production and Consumption. *Cultural Studies*, 16(4), 501-515.

Oliva, R., & Kallenberg, R. (2003). Managing the transition from products to services, *International Journal of Service Industry Management*, 14(2), 160-172.

Schön, D. (1983). *The Reflective Practitioner: How Professionals Think In Action*, Basic Books, New York, NY, USA.

Vandermerwe, S., & Rada, J. (1988). Servitization of business: Adding value by adding services. *European Management Journal*, 6(4), 314-324.

Verganti, R. (2009). *Design-Driven Innovation - Changing the Rules of Competition by Radically Innovating what Things Mean*, Harvard Business Press, Boston, USA.

Verganti, R., & Öberg, Å. (2013). Interpreting and envisioning - A hermeneutic framework to look at radical innovation of meanings, *Industrial Marketing Management*, 42(1) 86-95.

Walker S. (2013). Design and Spirituality: Material Culture for a Wisdom Economy, *Design Issues*, 29(3), 89-107.

Yin, R.K. (1994). *Case Study Research: Design and Methods*, 2nd edn, Sage Publications, Thousand Oaks, CA, USA/London, UK/New Delhi, India.