LEADING INNOVATION THROUGH DESIGN

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SUPPORTING NPD TEAMS IN INNOVATION: STRUCTURING USER DATA ON THE FOUNDATIONS OF EMPATHY

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Gathering and analyzing user data in new product development (NPD), both qualitative and quantitative, can be a strong driver for innovation in companies. While ideally user data should be obtained through direct interactions between NPD departments and targeted users, time and cost restrictions often make this impossible within organisations. Moreover, in larger companies, user data is not always shared across departments and/or is not presented in a way that is useful for NPD departments. This paper presents a tool specially developed for the NPD department of a large company in the retail branche to collect and combine user data generated by various departments and use this for inspiration for new product ideas. The tool is based on theory of empathy in design and on the requirements of the NPD department of this company

Keywords: empathy; innovation; user data

INTRODUCTION

Proficiency of organizations in conducting (user) research in the fuzzy front end of the new product development (NPD) process has shown to be a strong predictor of market success (Cooper and Kleinschmidt, 1987). Furthermore, gathering and analyzing user data in product development, both qualitative and quantitative, can be a strong driver for innovation in companies. While ideally user data should always be obtained through direct interaction between NPD departments and targeted users, time and cost restrictions often make this impossible within organizations (McGinley and Dong 2011, Sleeswijk Visser 2009). In these cases user data has to be indirectly communicated.

The user in this article is defined as the end user of a new developed product or service. He/she is not necessarily the customer of a company, since customers can also purchase products or services for others to use, such as their children for example. NPD departments in this article are defined as groups of employees of an organization that are responsible for designing new products and/or services. Their composition may differ per company, however they are usually multidisciplinary. People in these departments have many things to consider and have busy schedules; therefore user issues can often be overshadowed by other important activities (McGinley and Dong 2011). Providing them user data in ways that they can directly apply within their design activities could strongly enhance the innovative capabilities of an organization.

However, in large organizations, different departments have different responsibilities and objectives. Therefore their motivations and ways to gather and document user data might also differ, which can make it less valuable to other departments. Furthermore, employees of large organizations are often mainly concerned with their own objectives within the department.

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Therefore user data can remain within the boundaries of the department even though it could provide valuable insights to other departments as well (if communicated well), such as to NPD departments**.**

In general, departments such as market research, marketing, customer relationship management (CRM), sales (retail), customer care and [digital] media are concerned with collecting several types of user data. These departments possess user insights which are meaningful to them, but which might be meaningful for other departments as well, such as NPD departments. We believe that transforming existing user data to other departments can be useful for NPD departments as well. We think that structuring and communicating user data from other departments based on principles from empathy theory will help NPD departments to more effectively use user data in their NPD activities. This paper presents a framework for communicating and using user data to and by NPD departments. A tool was developed based on this framework and tested in a case study to evaluate the framework.

INNOVATION STRATEGIES AND THE ROLE OF USER DATA

Different types of innovations require different data sources as input. The design of products and services for current users with current needs typically requires research data that relies upon gathering and analyzing evidence of the current situation. On the contrary, for products and services targeting future use there isn't any directly applicable data, since typical research activities focus on current needs rather then giving a glance into the future. When NPD departments want to innovate by addressing future needs, a thorough understanding of the users (e.g., their needs, dreams, motivations, feelings), without the constraints of the current context, is essential.

Imagination and intuition are the main mechanisms of people in NPD departments when starting to think of possible future experiences. They interpret data and call upon their empathic abilities to come up with solutions that will fit in a future context and will be used by future users (Fulton Suri 2008). The job of designers in NPD departments is therefore not accurately describing the world as it is, but rather how it could be, making subjectivity of data desirable. Empathic design techniques could be the key in facilitating this. Within this article empathic design is defined as a design process that utilizes any tool or method that (implicitly or explicitly) aims to enhance empathy within the design team. There are already tools that aim to enhance empathy through presenting data accordingly, like personas (a.o. Grudin and Pruitt 2002), however they have many pitfalls. We propose a framework for structuring and communicating user data to enhance empathy with users, thereby sparking innovation in large organizations.

BUILDING BLOCKS OF EMPATHY

An important aspect of user data is therefore the facilitation of gaining empathy with users, but how can empathy be enhanced in the design process? Empathy can be viewed as (1) an ability, (2) as a construction of components and (3) as a process (Kouprie and Sleeswijk Visser, 2009). Empathy as an ability refers to a person to identify with- and understand another person's feelings, ideas and circumstances. Empathy has a cognitive (understanding) and an affective (feeling) component (Baron-Cohen and Wheelwright 2004). Both components should be facilitated through user data in the NPD process. Enhancing empathy with users in design processes is not magically achieved at one insightful moment. Based on psychological theories empathy is a process that runs through different phases. Its application to design consists of four following phases; discovery, immersion, connection and detachment (Kouprie and Sleeswijk Visser, 2009) (see table 1). We suggest that communicating user data to NPD departments should be implemented by these four phases of the empathy process.

Table 1 The process of empathy consists of four phases: discovery, immersion, connection and detachment.
Source: Kouprie and Sleeswijk Visser, 2009.

	Discovery **Entering the user's world** **Achieve willingness**	The process starts with the designer approaching the user. He makes a first contact with the user, either in person or by studying provoking material from user studies. The designer's curiosity is raised, resulting in his willingness to explore and discover the user, his situation and experience.
	Immersion **Wandering around in the user's world** **Taking user's point of reference**	After the first encounter with the user's experience, the designer takes an active role by leaving the design office and wandering around in the user's world (data from qualitative user research). The designer expands his knowledge about the user and is surprised by various aspects that influence the user's experience. The designer is open-minded, interested in the user's point of reference. He is being pulled into the user's world, and absorbs without judging.
	Connection **Resonating with the user** **Achieve emotional resonance and find meaning**	In this phase, the designer connects with the user by recalling explicitly upon his own memories and experiences in order to reflect and be able to create an understanding. He makes a connection on an emotional level with the user by recalling his own feelings and resonates with the user's experience. At this phase both affective and cognitive components are important; the affective to *understand feelings*, the cognitive to *understand meanings*.
	Detachment **Leaving the user's world** **Design with user perspective**	The designer detaches from his emotional connection in order to become 'in the helpful mode' with increased understanding. The designer steps back into the role of designer and makes sense of the user's world. By stepping back out to reflect, he can deploy the new insights for ideation.

USING EMPATHIC DESIGN TECHNIQUES TO STRUCTURE USER DATA

User data, collected throughout many layers in the organization, holds a potential to inspire NPD departments through empathy. When data is communicated accordingly, using empathic design techniques as in table 1, it could spark the imagination of NPD departments. When time and cost restrictions do not allow design research to be done by NPD departments themselves, this could be an input for innovation. The data has three levels of characteristics: its content, its form and the qualities. Different aspects are important in different phases of the process in enhancing empathy. The discovery phase is for example mainly focused on creating the willingness of NPD teams to empathize; e.g., through evocative pictures and quotes. The immersion phase requires more in-depth analysis through raw data and stories. They help the team members to dive deep into the lives of users, revealing tacit information like their ambitions and fears, whereas the discovery phase mainly aims to attract the attention of a wide range of employees through acquainted demographics. No new information should be communicated in the connection and detachment phase. In the connection phase the NPD team members call upon their own subjective

experiences to help them to create an emotional link with the user, which exemplifies the importance of subjectivity and authenticity (see table 2).

Table 2 is based on literature research (Kouprie and Sleeswijk Visser, 2009) and expert insights gained through open-ended questionnaires. Firstly literature research was done to extract the potentially important aspects of user data in facilitating the enhancement of empathy in the NPD process. The results of this exploratory phase were implemented in an open-ended questionnaire. Although literature research provided valuable theoretical foundations for a framework, we missed the perspectives from design practice. Professionals on this matter were therefore approached to validate the preliminary list of important aspects and give their opinion based on their experiences. Three experts shared their insights through the open-ended questionnaire.

The first practical implication for the framework that came out of the questionnaires was that representativeness of an "average" user was not important for gaining empathy. As one expert concisely put; *"Real is more important than average".* In marketing conversations the user is mostly represented by statistics. This may be true in the objective and scientific sense, but in design research this is less valuable. It doesn't inspire and one can certainly not empathize with an average. Furthermore, the word average indicates a certain quantity, and therefore goes in spite of in-depth quality; *"In my experience 'average' is a term [that is used] when little depth is intended in user research"*

Therefore 'representativeness' as a quality of user data was left out of the framework. On the contrary, the evocative nature of user data to attract attention and spark curiosity in the discovery phase was added as an important aspect. It creates the willingness to empathize and is key for the rest of the process. Furthermore, demographics were found important by the experts as a complementary tool that can help communicating to other departments (like marketing) than NPD departments. They are mainly used to working with these kind of parameters and will therefore be more open to a discussion. Therefore this data is most useful in the discovery phase to attract the attention and (in combination with evocative pictures) to create the willingness to empathize. Like these two quotes show; *"Demographic data is a great stimulator to get them (marketers and intelligence managers) excited." "Different people respond to different stimuli. Some statistical data is often sought to evidence design decisions. The more accessible these are, the more likely they are to be understood and recalled."*

Also the representation of this kind of (solid) data is considered as complementary; *"Data representations can be an accompaniment, but not the main tool."*

Since empathy is a human trait and humans recall stories better than sheets of data, every expert underlined the value of storytelling. Storytelling is a form of representing data rather than data on itself. This form of data however requires time, and fits best in the immersion phase. It requires credible sources that have to be communicated explicitly. Every expert also indicated that credibility of user data is very important, like this quote depicts; *"Storytelling can have huge impact, but requires source data to be considered trustworthy."* Also personal tacit information (like ambitions, fears, motivations etc.) needs storytelling to be communicated and understood. These points were also indicated as very important by the experts; *"In my point of view you cannot understand underlying motivations if you don't tell stories. There is always a context needed to exemplify the underlying needs and motivations."*

So on the one hand you need stories with credible sources and accompanied by data representations. But on the other hand you would also need data in which designers can immerse themselves. Raw data typically provides this mechanism, while also contributing to the credibility and validity of data. One expert pointed out that raw data helps to show that it is about real people and not some random statistics; *"Raw data [is important] to show that it is about real people."*

However raw data, in the sense that it is unrefined, could be too complex to be understood by all. This can work against the "easy to understand" and "fast to use" principles, which are important in large organizations that work on tight budgets. Raw data should therefore be edited to

make it more accessible, while containing its richness and rawness. On the other hand, the "fastness" and "easiness" of data is less important in the immersion phase since it requires time by its nature. Therefore raw data can best be used in the immersion phase, as is also stressed out by the experts; *"Raw data is useful when edited in a way that can quickly be accessed."* The experts did not all agree on the inherent qualities of data. While, as discussed before, there was a consensus about that representativeness not being so important, the thoughts about the 'inspiring' differed. The fact that inspiration is important in the design process is a given, however some experts argued that this was more due to serendipity in the process than a quality you can add to the data. Nonetheless, inspiration is important in the detachment phase in the sense that one leaves the data with new insights gained. These insights are based on an increased understanding of the users and their needs and serve as a starting point for ideation for new product/service concepts. So in that sense a valuable quality of the data is inspiration, even though it is difficult to evoke inspiration. This was confirmed by the experts; *"[Inspiration is] difficult to generate or demand and quantify. Serendipity." "Inspiring is important, but that always happens."*

As last*,* there was a consensus about the fact that data should be easy to use and fast to implement. However, it was also clear that the represented data by its nature is not easy. So if one should take the time to immerse in it to empathize, the "easiness" is not the most important factor anymore. (Even though accessibility for all should be maintained.)

Concluding, the expert interviews confirmed the findings from empathic design literature but added more insight to be able to fill in the framework (see table 2). The elements in this framework are not new, but the mapping of 3 data types onto the empathic process is new.

Table 2 *A communication framework to enhance empathy. For each phase of the empathic process, a set of preferred data types is presented according to its content, form and qualities.*

	Discovery phase	Immersion phase	Connection phase	Detachment phase
Content of data	Demographics Social context Physical context	Personal tacit information Social context Physical context	-	-
Form of data	Visuals Photographs Quotes	Storytelling Raw data Video clips	-	-
Qualities of data	Fast to use Easy to understand Evocative/provoking	Credibility Validity	Subjectivity	Inspiring

THE DESIGN AND TESTING OF A TOOL TO INSPIRE NPD WITH USER DATA

The framework was applied by developing a tool, consisting of a sharing platform and a board game (figure 2) for workshops in a case study. The company in this case study is one of the largest ones in the retail branch globally. It operates more than 3000 stores and has over 200 000 employees in 10 countries in Europe and the U.S. Although the company has built up a lot of knowhow about their end users, it has failed to share this effectively interdepartmentally up to now. A proposition was done to the company to tackle this problem based on internal interviews within the organization and the framework we propose. It's most important requirements were the accessibility, its ability to inspire and the amount of time it would take to use it. Since the NPD team members in the organization are rather busy with their daily tasks, and work on a tight budget, they don't have the means to spend much time on investigating user data. The result is a combination of a sharing platform (video and large screens across the organization) where employees can plan presentations and invite their colleagues, and a board game that they can use together to translate the newly gained insights into concrete product ideas. We have chosen for a board game because it supports all participants of the game to work together towards a goal. This concept is based on the four phases of the empathy framework.

Discovery – The main goal of the discovery phase is to create curiosity and willingness to empathize with a person. The important aspects of data, as can be seen in table 2, are therefore implemented in the tool. The discovery phase starts by inviting your colleagues to the presentation that you want to give about a new insight. An agenda function, with playback options of some kind is therefore needed. This agenda function encompasses all the relevant elements from table 2, like demographics of the target group, evocative pictures explaining the new insight and quotes. An example is shown in figure 1, where the visual trigger contains qualitative and quantitative elements. The organization has an infrastructure with large screens in their offices, so with some additions of inspiring data (think of TEDtalks and youtube), it is easily understandable and fast to use.

Figure 1 The tool consists of a sharing platform, providing sparks of user data and richness to immerse, followed by a game tool which supports connection and detachment of the empathy process and continues with supporting the creative process; diverging, exploring, converging and closing.

Immersion – The immersion phase is facilitated by the choice of the medium itself, presentations. After being triggered by the first numbers, pictures and quotes, storytelling and narratives are needed for the NPD team to be able to immerse in the user data. Here the presenter (often someone who was in charge for collecting and analyzing the user data in his/her department) will explain and show the results. These are an integral part of presentations. But it also gives the opportunity to show videos of real people, which could give a glance at more tacit information. Raw data can be presented in a way that the audience can understand it, thereby making it more accessible while keeping its value.
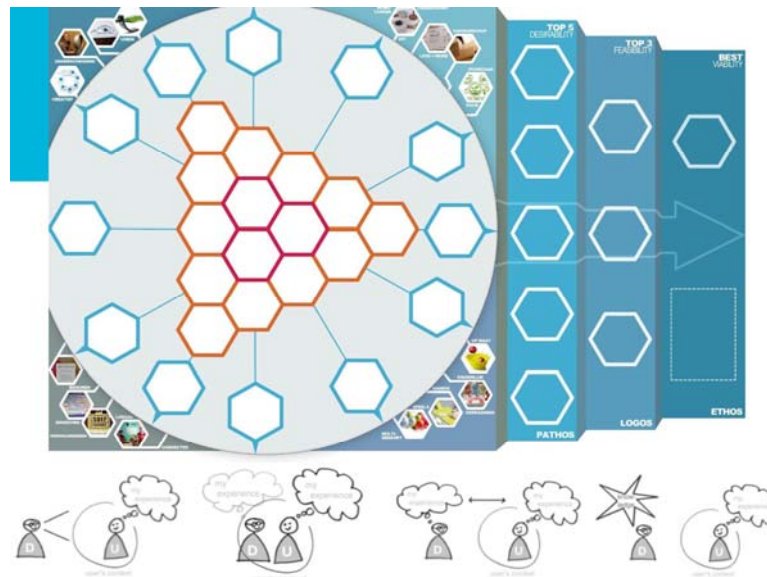
Figure 2 The game starts with creating a persona in the middle of the board based on the user data and discussions about the participants' own imagination of the users' needs, motivations and feelings. This is followed by annotating insights based on combining the persona characteristics with elements of the company's innovation strategy (in the outer corners of the board), leading to initial ideas. An iterative ideation and selection process leads to a winning idea.

Connection & Detachment – In the connection and detachment phases no new information is communicated. Rather the employees have to reflect on their own experiences or from their relatives to be able to understand the user data on an emotional level and be able to connect with the users. Then they have to detach from the users' worlds and step back in the helpful mode and be in another mindset (of ideation). These phases were facilitated in the concept by a board game to be used in two hour workshop that was developed especially for the company in the context of this project (see figure 1 and 2). The tool aims to finish the process of enhancing empathy for a target group, while also making the step to translating these insights into new ideas for the company. Therefore it encompasses several ideation techniques, but also makes the employees reflect on their own experiences with the target group, making subjectivity of data possible. The group discusses and defines a persona in the game tool based on the new insight and their common experiences. This gained knowledge is then used as inspiration for ideation.

The tool was tested in a series of three workshops where the sharing platform was simulated and the board game was constantly improved by experimentation. In a multidisciplinary setting the tool was used to treat real problems of the company, thereby also introducing the new way of working to employees throughout the organization.

DISCUSSION

The results of the workshops with these tools were surprisingly well received by the participating employees in terms of fitting the customer's needs and innovativeness. Using the existing displays through the company served as triggers raising curiosity and willingness to participate in a workshop. Video was a powerful tool as a means to get people immersed in the user data. However, watching video is a rather passive way of being informed, and after watching the video presented by the facilitator, the raw data is gone. In the second and third workshop we tackled this by adding prints of video fragments to be used in the board game. The connection step worked also well, although we are still searching for a better balance between emotionally connecting with the users' stories, which needs time, and speeding up the workshop since the employees don't have much time for workshops. The benefit we saw by doing this step in the game tool is that the participating employees share their own experiences and also prejudices towards the target group

with each other. They have a moment to talk together about the target group and about themselves. By discussing their different views and experiences they learn more about the nuances about the target group and realize it is about everyday people like themselves. Even though this is still a rather quick step, which theoretically would need more processing time, it provides a quick and deep understanding of the users. Other than the concrete things such as the videos and game board, the process behind it got lots of compliments by the employees, underlining the importance of empathy and human-centered design. One of the category managers that came up with a viable and desirable idea said; *"Why don't we do this for all our product ranges?"*

CONCLUSION

This paper discussed a case study about a new sharing platform and a board game for workshops for a large company in the retail branch. The development of the platform and the tool were based on empathy theory from literature and on a questionnaire with experts in this field. The case study has shown that the empathic process can be applied to the activities and process within this company, benefits the understanding of users and supports idea generation for the NPD department. This was just one case with one particular company. Further research will focus on the implementation of the framework for other NPD companies and thereby detailing the framework. The implementation of empathic design techniques to drive innovation in an organization can be complex, but moreover has many benefits. This framework will provide organizations a simple reference to structure and communicate user data. Now user data that holds these insights can stay idle within the departments that have collected them. By using this framework to share these data organizations can enhance empathy of NPD departments with users, thereby improving their innovative capabilities.

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