Perspective and Use of Empathy in Design Thinking

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***Abstract*—The paper takes a closer look into one of the main attributes of Design Thinking: Empathy. The motivation for doing so has its roots in the post Design Thinking period, which we are entering now, following a rich decade of the use of this approach to innovation. Approaching a Designerly Thinking perspective of what the designer does in practice, five different epistemological paths will give an understanding of the effects empathy has in the design process. Empathy is addressed by exploring two main aspects, the emotional and the cognitive. The theoretical perspective of Design Thinking, seen as a reflexive practice, or as a creator of meaning, or even as a problem solving activity, is used to understand how empathy can be used in a design context. This aspect is then further analyzed using the results of a large workshop where Design Thinking was used.**

Keywords-Empathy; Design Thinking; Designerly Thinking; Service Design.

I. INTRODUCTION

During the last decade, Design Thinking was considered by many to be one of the best ways to foster innovation and creativity in companies and organizations, to attempt to solve complex problems, also named wicked problems [1], and to innovate products and services. Nowadays the future of Design Thinking is unsure. From the management research field, some of the previously strongest supporters are confident the era of Design Thinking is over [2-5].

Others from the field of design research argue that more ownership of relevant parts of the method should be taken [6], and abandon those that do not work. This situation has many reasons, but risking oversimplification, we can say that the two fields, business management and design research, have been pulling design thinking in two very different directions.

On the one hand, the field of management adopted Design Thinking on their terms, as best explained by Nussbaum [4]: "Companies absorbed the process of Design Thinking all too well, turning it into a linear, gated, by-the-book methodology that delivered, at best, incremental change and innovation." On the other hand, the design research developed a different approach. For the latter, thinking as a designer is not exactly a new savoir-faire, and therefore possibly, some of the relevant attributes of Design Thinking have been overlooked [6].

The strength of Design Thinking is the ability this approach has to combine the desirability a human can experience, and the economic viability and the technical feasibility of an innovative idea (see Fig.1).

As elaborative forces, Design Thinking uses rapid prototyping, abductive reasoning and empathy to enact innovative results. Although all three are of interest, the focus will be on the latter. Empathy will be addressed in this paper using two main aspects, the emotional and the cognitive.

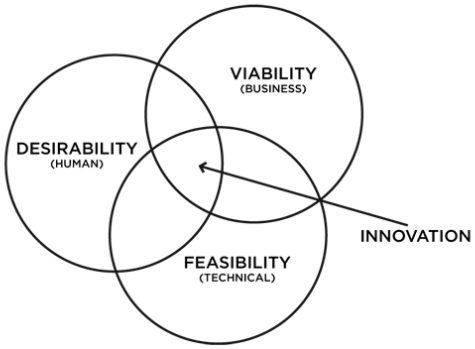

Figure 1. Overview of Design Thinking.

In order to emphasize the effect empathy may have in a design process we need to define different discourses explaining what designers really do in practice. Approaching a Designerly Thinking perspective on designer's activity, five different epistemological discourses will be used [6] to explain the role the two aforementioned aspects of empathy havw in each discourse.

As a case study, to address the aforementioned intersection between Design Thinking and empathy, the paper will present results from a workshop organized by a Norwegian University Library addressing Open Access services. The methodologies used in this research are photo-ethnography and annotations in vivo. A longer discussion group meeting was done the day after, to collect additional data and perspectives.

The article is structured as follows: In Section 2, an introduction to Design Thinking is followed by Section 3 where the Designerly Thinking perspective is presented. Section 4 is an introduction to empathy. Section 5 will present the role empathy has in five different perspectives of Designerly Thinking. Section 6 highlights the results from the workshop, while Section 7 is the discussion, and Section 8 concludes the paper.

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II. DESIGN THINKING

As an approach, Design Thinking may help to innovate services and products. Using a combination of immersive understanding of users need, rapid prototyping, and abductive reasoning, this approach may result in the best possible solution [7][8]. The rapid prototyping act in the Design Thinking process, provokes small advancement based on partially known information [2], and the outcome is a high quantity of results one can further analyze. Sorting the outcome in the end, the result of a Design Thinking process, gives a handful viable ideas. A negative and interesting side effect is the problem with the "recreation" of all the steps of the rapid prototyping process [9]. This will leave out some learning issues for the participants where this approach is used, and obviously probing a repetition of the process with the same outcome. The empathy ensures a broad representation of knowledge in the process [10], while abductive reasoning explains why the result is adequate, given the context. Overall, the process of Design Thinking allows the result to be a technical viable solution, a desirable output for users and an economical feasible project [7] (see Fig. 1). Another strength Design Thinking has, is the possibility to tackle complex and ill-defined problems [8], ranging from business to societal context [11]. These types of problem, often coined "wicked" [1], have been debated in the design milieu for an extended period of time, as they can be an entry port for designers into new areas [9], bringing new understanding to complex issues.

III. DESIGNERLY THNIKING

To emphasize the effect empathy may have in a design process, we need to define different discourses explaining what designers really do in practice. Designerly Thinking addresses how the practice of being a designer, and the theories trying to explain and understand the act of designing, coexist in the same sphere, and how we can understand the two from an academic perspective [6].

Approaching a Designerly Thinking perspective on designer's activity, five different epistemological discourses will be used [6] to explain the role the two aforementioned aspects of empathy has in each discourse:

- Design and Designerly Thinking as the creation of artefacts. The core concept is the science of the artificial [6].
- Design and Designerly Thinking as a reflexive practice. The core concept is the reflection after the creation process, helping the cyclic process of designing with added new competence and understanding.
- Design and Designerly Thinking as a problem-solving activity. The core concept is a methodology to solve complex and wicked problems [1].
- Design and Designerly Thinking as a way of reasoning and making sense of things, and is based on the practical activity done by designers.
- Design and Designerly Thinking as creation of meaning. The core concept is relevant as it links theory and practice.

Each of the five discourses has their own theoretical foundation and background [6], and also describes the concepts they address.

The relation between empathy and the aforementioned theoretical discourse of Design Thinking will be discussed in Section 7, where this pluralistic perspective will try to point out what empathy contributes to the "designerly" part of the process.

IV. EMAPTHY

It is possible to divide reflections around empathy into two main dimensions. The first may be seen as an emotional empathy, being an instinctive, affective, shared and mirrored experience [12]. More specifically, as a person, one feels what other people experience. The other dimension of empathy is cognitive, where one understands how others may experience the world from their point of view [12][13]. Since this is a state that is not actually experienced by a person, it may lead to misunderstandings and subjectivity. The lack of a degree (how much of empathy one experiences) may reinforce this problem [14].

In a design process, we can address and use empathy in different ways. Firstly as a tool to design with, requiring the transformation of this emotional feeling in an attribute [15]. Secondly designers can use empathy to acquire insight into users' needs and in doing so, inform the design process [7]. For instance, in a Design Thinking process all the participants in a design team need to be empathic with the users they are designing for in order to create relevant solutions. Using an approach toward cognitive empathy, designers apply different methods to build up that competence and insight, enabling them to prioritize the needs of the users and make the results of the process more desirable [7].

Designers may use a variety of approaches to gain a cognitive empathic insight. The following two examples illustrate how this can be done. First, designers can use "experience prototype". Using a medical wearable device [15][16], like a small remote heart monitoring device, over a period of time, would inform a design team of how a person wearing the device feels in everyday situations. This would be very difficult to understand otherwise. For example, driving to work, taking a bus or eating, are easy tasks that, for a person with special needs, may be extremely hard to perform. Then, the design team may get insight into how difficult it is to perform these simple tasks and can gain emapthy by understanding. The second example is related to how a group of interaction design students solved their project task. The task was to design a rescue boat. In order to gain an understanding of the experience and feeling of getting rescued at sea, they rescued each other in a swimming pool, and the empathic insight helped them to develop a very interesting and relevant prototype. Both examples show how to acquire a cognitive empathic understanding and insight, in this case, the designers did not need to *feel* what the real experience was.

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Design Thinking invites participants in a design process to share their own empathic insights related to the task at hand. In fact, this is one of the strengths of the approach: all participants bring empathy into the process.

Cognitive empathy has also an effect on the way participants of a design team work together. It is observed in [17] that differences in competence and knowledge between members of a design team do not affect the overall team performance, since the empathy for others participants points of view, expressed as a cognitive based "social sensitivity", functions as an equalizer [18].

In the design process, the participants contribute to the process through different roles: as themselves, as designers, librarians, managers, IT people and so on [8], bringing with them the cognitive empathy represented by the roles they hold. In addition, they may also have empathy for the role of a user they argue for or against in a given context of the project.

V. DESIGNERLY THINKING AND EMPATHY

Mapping the pluralistic perspective of the theoretical discourse of Design Thinking, also the Designelry Thinking aspect, and how we can use empathy in the design process, we can tentatively produce the following overview presented on Table 1. This will be further analyzed in Section 7.

TABLE I. OVERVIEW OF DESIGNERLY THINKING AND EMPATHY

Theoretical Perspective	*Core Concept*	*Empathy*
Design and Designerly Thinking as the Creation of Artefacts	The science of the artificial	Emotional
Design and Designerly Thinking as a Reflexive Practice	Reflection in action	Cognitive and Emotional
Design and Designerly Thinking as a Problem-Solving Activity	Wicked problems	Cognitive (Holistic)
Design and Designerly Thinking as a Practice-Based Activity and Way of Making Sense of Things	Designerly ways of knowing	Cognitive (Constrained)
Design and Designerly Thinking as a Creation of meaning	Creating meaning	Cognitive (Interpretation of context)

VI. THE CASE

The analysis of empathy in regards to Designerly Thinking in this paper is compared with findings from a day long workshop organized by the University of Oslo Library to address Open Access services provided by the University of Oslo.

The problem was a lack of cooperation and coordinated strategies by all the departments involved in helping researchers use Open Access as a channel for publications. To envision and map how the journey for a researcher would looks like when approaching all the different steps to, at the end, publish an Open Access article, the workshop used a specific method belonging to the Design Thinking sphere. "User journey" and "touch points" [19] are widely used to address services. User journey is the representation of all the steps a customer need to perform to achieve the final goal of the service. An easy example is a trip using a plane. The journey starts usually online where the ticket is bought and then printed. The next stage is arriving at the airport using train, bus or car, and then the trip goes further until the customer lands at the destination. Each situation where the user is in direct contact with the service provider is called a touch point. Using Service Design Cards [20][21] (see Fig. 2) one can make the aforementioned journey, where each card is a touch point.

Figure 2. Representation of a User Journey from one of the workshops groups.

For instance in Fig. 2, the user journey in the picture is from one of the groups in the Open Access workshop. The journey represents a researcher that has finished a research project, and then realizing that the contract done with the research project fund provider requires publications in an Open Access journal or make available the papers in an Open Access repository.

As represented in Fig. 3, the researcher then may use different touch points to achieve that goal. Those touch points are well suited to be redesigned in the spirit of Design Thinking method. One can, for instance, combine them or replace them with new technologies that improve the service experience.

The methodologies used in this study are photo-ethnography and annotations in vivo. Eighteen participants were invited. Two participants were interaction designers,

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four participants were from the library working with Open Access, and four participants from the library working directly with researchers. Finally, eight participants from different department of the University working as research consultants, in regard to different types of research projects. After an hour with an introduction to Design Thinking, all the participants were then formally divided in three groups. Each group had a unique exercise consisting of different user journey researchers may have had when publishing Open Access. A longer discussion group meeting the day after with three of the library staff that had organized the workshop, gave the possibility to collect additional data and perspectives. Analysis of pictures, annotations and results from the discussion group meeting, was performed in regard to empathy.

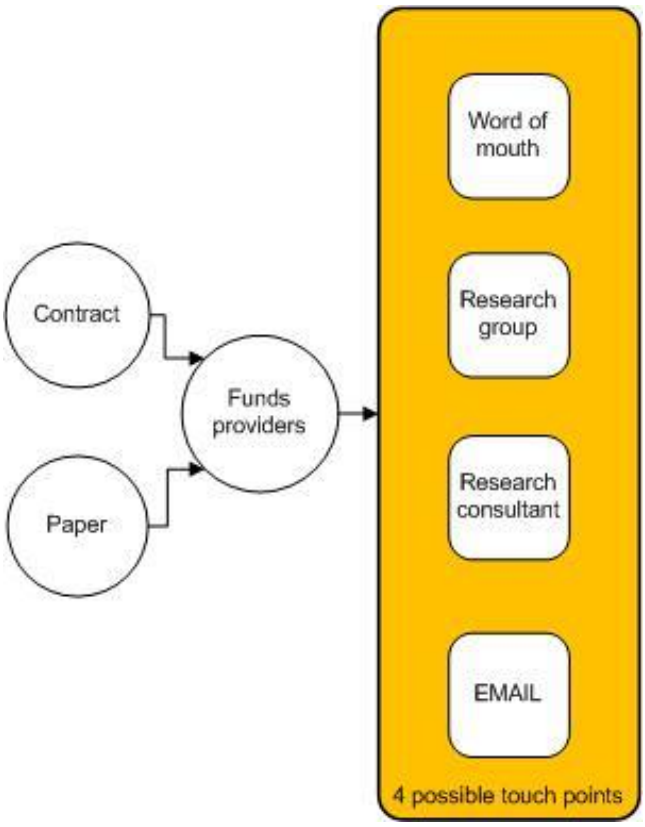

Figure 3. Excerpt from Figure 2, showing a very complex group of touch points.

Observations, among others, concluded that all three groups managed to develop good user journey. Discussions about issues researchers had in their work and research situations were contextualized and represented well by the Service Design cards. On the other hand the participants discussion about the issues the research faced were not unanimous. The researcher needs were not equally supported. Different department had different methods to approach and help the researchers, resulting in misunderstandings about the users perspective.

VII. DISCUSSION

Table 1 shows some interesting points to be discussed. In the first row, the Designerly Thinking perspective, invites understanding the making of an artifact as the core result. In the Design Thinking process, when creating artifacts, one of the generative drives is the making of various prototypes in a rapid way.

An instinctive and affective experience, as in emotional empathy, can be necessary to foster creativity and innovation [22] when a designer is prototyping in a rapid way. The use of tactile, visual and audio inputs in the creation process, can explain the necessity of the designer not using cognitive empathy.

Also the "quantity" and "quality" of empathy applied probably cannot be equal in all the prototypes. In this case a graduation of empathy can be used as an extra indicator to help designers choose the most relevant prototype.

The next phase of a design process can be the selection of the best prototypes. The type of empathy used in this situation seems not to be cognitive, therefore it can be more relevant to focus on emotional empathy. To sort out all the prototypes, an instinctive, emotional, affective experience can be a valuable first insight and can make the design process more effective. For instance, trying a new model of a bike, gives naturally a better insight then *imagining* how a user experiences the ride.

The second row has also some points worth to mention. The reflexive practice based on Schöns [23] approach, implies a reflection-upon-the-creation effort from the designer. As a result, the practical competence can have an incremental learning boost [23]. Cognitive empathy may explain partly how the designer embodied the improved new competence gained from the practice and their tacit knowledge. Using emotional empathy, on the other hand, we may explain what the effects of instinctive, affective and emotional new experiences, are in relation to their own abilities as designers, creativity and theirs learning processes. A possible use of this relation between reflection-upon-the-creation and empathy can be in the context of the educational curriculum to form design practitioners [24].

The third row is straightforward when it comes to empathy. Large complex problems, also known as wicked [1], can only be solved if the design process takes in accounts a holistic view of the user needs. Point eight in the definition of the properties of a wicked problem states the necessity to take in account that "solving a wicked problem is one shot operation with no room for trial and error."[1]. This definition requires from the designer a deep insight of the problem area and the user perspective. Cognitive empathy can, in this regard, be a valuable source of information.

Row four addresses partly the reflective tradition of [23] and the experience-centered design [25], nevertheless it has a scope more focused on how practitioners elaborate knowledge grounded in practical experience. Cognitive empathy may have a role since the result of making an artefact must be grounded in knowledge on prior usage. For instance, the designer of an Alessi coffee maker, must base

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the new idea on prior knowledge of how such an artifact works. At the same time, a cognitive empathy is needed to understand how the new design can change the experience when making a coup of Italian coffee.

Finally row five advocates for a Designerly Thinking approach to the act of creating meaning. In this case the artifact is only a medium to articulate and transmit the result of the creation [6]. The Design Thinking process already from the first immersive stages of discovery and interpretation process [7][8], seems to gain substantial support from cognitive empathy, giving insight of user needs and the context.

The analysis of data from the workshop and the discussion group meeting was done in regards to how empathy works and gives additional support for the aforementioned understanding. The main findings suggest a need to better include the cognitive empathy of the participants, and also understand how the interpretation of different contexts may contribute on the process of including empathy. This is in line with the Designerly Thinking understanding in row 5 in Table1, the Design and Designerly Thinking as a creation of meaning.

Related to the aforementioned workshop, to help the outcome of a design process where the results are better services, the participants need to experience how the situation of a researcher is when publishing a paper. What we learned from the workshop, was the unique role the cards had. In fact they helped bringing out problems and misunderstanding, while the empathy was changing in the discussions from a cognitive perspective, where the experience gained over the years when in touch with researchers was relevant, to an emotional one, where first-hand experience in the process of participating with the researchers in the process of publishing Open Access was an emotional new experience.

VIII. CONCLUSION

The paper has presented an overview where the use of different types of empathy in the pluralistic perspective of the design process seems fruitful. Firstly, it gives an overview of this attribute in regards to the theoretical discourse of Designerly Thinking, secondly it address also the necessity to understand how different types of empathy work during different design effort. The table used in the paper, can be a valuable tool when addressing the correct type of empathy used in different design situations.

The use of emotional and cognitive empathy in the design process needs to be addressed by the research community to better understand how it can be used to gain a more adequate user insight.

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