THE CASE OF AN INNOVATION CONTEST – PARTICIPATORY DESIGN IN A SOCIAL CONTEXT

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1. Introduction

Innovation and/or being perceived as innovative are emphasised in corporate visions as one of the key factors to stay (or become) competitive. Today, contemporary firms undergo a transition in business models and product development in which increased innovativeness is needed. Expanding from a business competition based on delivering standalone products, most firms now make an effort to compete by delivering value or experiences. Product-service systems are one such research area that aims to understand so called result-oriented value and functionality provided in long-term business relationships [e.g. Tukker at al. 2009]. The fact that customers, users, consumers and other stakeholders assess the benefits of the product or service as a whole is well known [e.g. Mello 2002], but is also often forgotten in the concept development of solutions. Hyysalo [2003] has found that user information merely advises the design in minor ways, since the engineers' activities in the product development process tend to filter out such information already in early stages. When managing user needs they can broadly be approached in three ways [Eason 1992], [Kaulio 1998]:

- For users – the development work is done on behalf of the user. The design team gathers information from which they extract 'user statements'.
- With users – the development work (or parts of it) is done in collaboration with the users. The design team allows users to interact with the solution to react or respond to a proposed solution.
- By users – the users themselves are actively involved and partake in the development of their own solutions. The design team might not be involved until after a rough solution is found.

However, Patnaik [2004] concludes that user needs that are universal for nearly everyone are a base for powerful creation of the future for firms. He also explains that users themselves are commonly not aware of such needs, but rather experience them as troublesome. Finding solutions for such situations calls for larger systemic innovations and cannot be fulfilled by conventional approaches of product development. In short, user involvement matters as well as innovation. And both confront the way we do things, because if we do like we always do, the outcome would be what we have already done.

Innovation activities or processes strive to create purposeful and focused *change* in a firm's economical or social potential [Drucker 1998]. Innovation, and in particular a mix of the incremental and radical types [Jacoby and Rodrigues 2007], is important for companies. Product development companies are, on one hand, experts in the incremental type of innovation. This is because product innovation [Moore 2004] focuses on improvements in performance, lowering of costs, increased usability and similar enhancements. Radical innovations [Jacoby and Rodrigues 2007], or the comparable term disruptive innovations, on the other hand, seem to appear from nowhere [Moore 2004]. This type of innovation is hence not straightforwardly captured in processes and procedures, but rather supported by leadership for open minds and creativity. The *activities* to develop innovations are therefore a key to achieve a certain level of innovativeness in the intended outcome. Innovativeness, e.g. the degree of novelty of

the outcome, is a puzzling perspective of innovation activities. It raises questions like: What would be low or high innovativeness? And, who should judge it? Should it be new to the world? New to the industry? New to the market? Or, just new for a customer? One suggestion clarifies that innovation could be assessed in respect of the 'interruptions' it causes in established technologies, markets, products and services, for example [Garcia and Calantone 2002]. From this it could be argued that a real breakthrough innovation thus creates some sort of disruption in the current situation for the customer by supporting another behaviour, causes some sort of shift in the company's production or offering procedures, and in the end challenges the whole industry and its current markets and technologies.

Design which can be described as the intention to change a problematic situation, thing, condition or similar into something better is closely interlinked with innovation activities, as for example suggested by design thinking [Brown and Katz 2009]. Design thinking is one approach to human-centred and empathic design that directly addresses innovation activities in teams. Moreover, it provides, at least, a possibility to bring abstract innovativeness down to real life and social innovation activities. At the same time, this democratises innovation activities when putting them into the hands of potential users [e.g. von Hippel 2005]. A core issue is thus to make ordinary people participate in innovation and design activities, while such practices are challenging in many ways. This paper aims to describe and exemplify a number of challenges in team-based innovation in a social context, ultimately identifying implications for collaborative idea generation and concept development. Here, a social context for the team denotes (a) a direct interaction with a client by whom they are not employed, (b) the task of developing concepts for someone else, and (c) the collaborative efforts among team members.

2. Background and research approach

This research started at the beginning of 2000, studying students carrying out global, creative and user-oriented product development. The student projects were performed under realistic conditions, and provided insights into team-based innovation activities. This early research led to packaging the results into a workshop format for radical innovation activities. The format consisted of approximately 40 creative methods, which were highly inspired by IDEO's needfinding approach [Patnaik and Becker 1999], [Kelley 2001], [Kelley 2005]. Thus, similar approach of collaborative design workshops have been used by researchers before, e.g., in a single case study of service design [Almefelt et al. 2009]. However the strength with this study is the longitudinal base of framework, development and application collected thorughut more than 10 years. Between 2007 and 2009, this format was used at 8 workshops with company representatives, and during 2009-2010 the format was further developed based on the experiences from the workshops [Ericson and Törlind 2013], methods such as now-wow-how and using concept templates to share ideas between groups is example of activities that have been included in the workshop format. The new format was tested at 5 workshops, again with company representatives involved. Several of the workshops were filmed to create a permanent corpus of data, making it possible to go back and analyse what actually happened. The video documentation provided insights into details that otherwise would have been hard to capture, e.g. modifications to the methods carried out by the participants. In total, 6 different types of companies have participated in all workshops during 2009-2010. The companies were large in size manufacturing industry firms and all acted in business-to-business environments. On average, each workshop had 9 participants and typically lasted for two days. The format from 2010 has been packaged into a set of cards to facilitate activities executed by the company representatives themselves. The package of the format was on-demand from a manufacturing company that had decided to implement the format in their innovation projects. Three training sessions were held for educational purposes, with each session lasting for three working days. On the first day, the researchers lead the workshop and the company representatives participated. On the second and third days, the participants were trained to use the format and its methods. In parallel, they evaluated the framework in relation to its potential to contribute to their creative work. The participants were people from one company, although they came from different countries (Germany, France, USA, Korea and Sweden). In total, 25 people were trained. All the participants were engineers and experienced technical product developers.

From the experiences of transferring the facilitation of the workshop to external persons, it was realised that the format could be packaged in a simpler format. In the evaluation from the hand-over to the

company it was stressed by the company representatives that they mostly used the cards describing the facilitation and not all the developed support material. These experiences led to the formalisation of the workshop format into an easy-to-read booklet describing a simplified idea and concept development four-step loop of activities, i.e. inspiration, immersion, idea generation and implementation. This format was used in courses at the university from 2011 onwards, and was also used in 2013 as the basis for an innovation contest introduced as measures to bring companies and laymen together in a creative workshop aiming towards an innovative outcome. Each innovation contest has a client, who defines the topic and the design brief that the participants should take as their starting point. The client consists of one or two representatives from e.g. a company, an organisation or a municipality. The innovation contest has an award for the winning team and it is the client that finances the award. The client thereby has a stake in the outcome of the workshop, and the facilitators and the participating teams sign a non-disclosure agreement. The contest is a full-day activity, in which the client is present as a resource for the teams and also decides on the winning team. The overall agenda for the full day is moderated by researchers, i.e. the developers of the workshop format. Teams, e.g. students, individuals or citizens, voluntarily sign up for participation. Approximately 5-8 teams of 4 participants take part in each innovation contest. The innovation contest was improved in two revised versions during early 2014 and late 2015, and the latter format will be active in 2016. The 2014 format introduced a joint activity and a number of new methods, and the late 2015 version will support the participants' activities by implementing a deck of creative cards. This decision was taken due to the challenges found in studying the activities that the 2014 format supported. Nevertheless, during 2014 and 2015 fourteen innovation contests have been conducted and studied, half of which have been based on the old format and half of them on the 2014 format, which included a joint activity. The 2014 format also introduced new methods that made an attempt to support dialogues and visual storytelling among the teams.

At least two researchers up until 2012, and four researchers from 2013 onwards, have participated in running the innovation contest, and interchangeably acted as process leaders and observers during the workshops. Participatory observations [Eisenhart and Graebner 2007] and analyses of the participants' material from the workshop have provided one type of empirical data. Another set of data has been obtained by using a method for easy and individual feedback direct from the participants. The method has been used throughout the years, from 2000 onwards. The method called 'I like/I wish' is adapted from Stanford University, USA and provides feedback in respect of what the participants have experienced (I like) and what they think needs to be improved (I wish). The individual feedback is given directly after each workshop (on the way out) and is not discussed with the participants. This has the advantage of participants not being forced to express negative feedback aloud and in front of the process leaders. Several of the innovation researchers involved have jointly and continuously analysed the material and, as explained, improved the format over time – or at least made an effort to do so frequently. In summary, the progress of the format used in the innovation contest briefly describes the following phases:

1. Observations of students' user-oriented product development in teams. Insights into team-based innovation activities.
2. Exploration and testing of methods, processes and procedures, mainly on courses but also at workshops with companies.
3. Revised workshop format based on observations of team-based innovation activities in companies.
4. Implementation in the innovation contest.
5. Revised formats based on observations of team-based innovation activities in the innovation contests.

3. The phases of the workshop format

Prior to the innovation contest, the process leaders have agreed on the design task and also on keywords or topics that are related to it. The client presents the company or the organisation and e.g. its purpose, products, services and/or offerings. The current procedure in the innovation contest prescribes four phases.

The first phase is a joint activity in which all participants in mixed teams brainstorm on general keywords or topics that have been agreed upon with the client beforehand. This phase has received positive comments from the participants and was introduced to provide the possibility get to know each other. At first we thought that this stage was not important because of the fact that the workshop is a contest, but this has turned out to provide a base of ideas, associations and explanations that gives a better start for the teams compared with departing directly from a competitive environment. One benefit is that the participants get 'warmed up' and that the most apparent ideas will be listed directly. Also, there are concerns about competition in innovation that can be partly mitigated with a joint and collaborative phase.

The second phase is preceded by the client's presentation of the design task. An effort has been made to keep it open. Importantly, the design brief should not include descriptions of how things should be done, but rather be presented as a *"How might we…?"* question [Brown and Katz 2009]. The second phase includes methods to address users and their needs in depth, as well as techniques for idea generation. It is suggested that the idea generation follows a *"What if we…?* proposition procedure [Brown and Katz 2009], and for example the use of brainstorming techniques to explore opportunities.

The third phase is concept development. The teams are provided with materials for prototyping and methods for visualising their concepts. The fourth phase is presentation, i.e. pitching their ideas to the client. A checklist consisting of questions, e.g. who is the user, what is the real problem, where does it occur and how does your concept contribute to solving it, is provided to aid the presentation.

The overall phases of the 2014 format of the workshop format are illustrated in Figure 1. Starting from upper left corner, the first phase – joint brainstorming – is followed by the presentation of the contest's topic by the client. The teams investigate the needs and start generating ideas based on these discoveries. During this stage the teams get initial structured feedback from the process leaders. The development of concepts (lower right corner in Figure 1) is usually a phase in which the participants do not like to be disturbed, but if they need help they can ask for it. The last phase consists of the development and rehearsal of a sales presentation and the actual presentation. The final presentation is made to all participants, and all are welcome to comment and ask clarifying questions regarding the suggested concept.
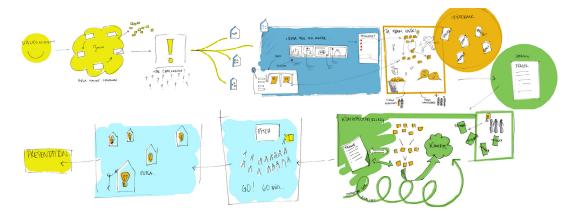

Figure 1. Illustration of the activities in the innovation contest

Typically, most questions from the participants are about how the concept differs from existing solutions and in which ways it will meet the requirements of the design task. Most questions from the client are about how to implement the concept and what would be needed to do so in the future.

4. Challenges in the innovation contest

Human-centred design and empathic design can be said to be two sides of the same coin. Human-centred design actively involves all types of stakeholders, e.g. students, inhabitants and/or people in common. The activities always start from either involving or focusing those people that the design or the innovation is aimed at. Thus, the starting position is always empathy with these people [IDEO org].

Human-centred design has the potential to find answers to 'wicked problems', e.g. problems that do not have one definitive formulation but several interpretations, problems that do not have right or wrong answers but useful and useless solutions, and problems that are often a symptom of another problem [Rittel and Webber 1973]. Having identified a wicked problem hence means that there is the potential to find really innovative solutions, because an unsolved situation is embedded in it. This can be compared to Patnaik's [2004] identified importance of searching for and finding common user needs.

One challenge that we have encountered in the innovation contest is thus how to structure the design task or brief. The company, the client, would usually like to be precise in the formulation of the task, but that would – as we have seen – hamper the teams' creative interpretation of the problem. Moreover, if the design brief is too precise, the teams rarely explore the root cause of the problem, i.e. search for common needs; instead they address the 'symptom' [Rittel and Webber 1973] of the problematic situation directly. The teams are therefore provided with several methods to confront the design task, e.g. by using the method of asking '5 whys' [e.g. www.mindtools.com]. Teams that jump into solutions [Patnaik and Becker 1999] have so far not yet exceeded the client's expectations; rather, they have just focused the most obvious interpretation of the task and thus present a slightly improved version of an existing solution. That solution has often already been expressed in the client's presentation of the task, if it was precisely formulated. The opposite, i.e. a too openly defined design brief, often results in teams being paralysed and not knowing where to start. A suggestion like 'start anywhere' is not useful in such a case. Most teams instead turn to the client and start interviewing and asking the client to provide the right answer. 'Dancing with ambiguity' [Leifer and Steinert 2011] may be more comfortable for experienced and skilled designers, but is still important for those who want to find an innovative solution to a wicked design problem.

A basic challenge seems to be related to the participants' interpretations of 'innovation'. That is, if they interpret innovation in the conventional terms of an outcome that should be accessible for a market, e.g. something patentable, their task will be overwhelming. If, instead, they interpret innovation as the work to create new ideas, new concepts and so on for users, their task may be more achievable. The latter explanation is embedded in the agenda for the innovation contest, but is not stated explicitly. The format allows for activities to find ideas and new concepts, but does not cover detail design and production issues, for example. In other words, the format does not emphasise radical innovation as an outcome, but rather as the core perspective of efforts to meet and fulfil user needs. Also, the term 'users' might cause confusion, e.g. if the idea is new there is nothing to use yet and consequently no users [e.g. Redström 2006]. Another key challenge for the participants is therefore to manage efforts to create and design potential users or people who are likely to become users [Redström 2006]. The efforts to address this topic seem more comfortable for non-designers or social sciences students. The teams of engineers commonly first decide on an existing solution that they relate to the design task, and then add users to that existing solution. The study shows that the teams address users in a way, but also that they are more prone to make exaggerated generalisations if the users they have in mind are for example from another culture, another age group or another profession, or have preferences that differ from their own preferences. This exaggeration happens regardless of whether the participants are citizens or students, so it cannot be argued that it relates to students' playful attitudes. Importantly, the team has to start with this exploration, and the decision they make here about who the users are seems to have a direct relationship to the innovativeness in the solution. Exaggerated users are fun for the moment, but as it seems they do not generate better or wilder ideas, or winning concepts.

Each team in the innovation contest is fairly homogeneous, since they voluntarily sign up to participate to the workshop and bring their friends. Yet, all together the participating teams provide a heterogeneous group of people possessing a diverse set of educational backgrounds, preferences and skills. Over the years, we have found that the educational background – particularly in student teams – has an effect on how they approach a design brief or task. Generally speaking, engineering students, e.g. industrial designers, architectural designers or mechanical engineers, prefer to go directly into improvement of the existing solution or a similar solution. Students from more social sciences, e.g. service design, quality management or economy, approach the design task by making an effort to discuss and think out a solution. There are pros and cons with both approaches. Engineering students, it seems, are more comfortable in joint activities with a product as a focal point. They can address user needs, but mainly

in terms of how an improved product would be used. In Patnaik's [2004] categories, such needs are called qualifier needs, i.e. immediate types representing problems with existing solutions, and new ideas result in no change to the concept. The disadvantage with such an approach in a social context is that it does not tackle the root cause of the design task and neglects implementation problems. The benefit of the approach is that the solution and its value adding features can be visualised and thus directly understood by the client. Such tangible solutions can often be directly realised in the client's production. Social sciences students, it seems, can account for market needs, e.g. activity and context needs according to Patnaik's [2004] categorisation. Such a perspective can propose new offerings for a specific situation in which people have similarities, e.g. in respect of age or profession. The disadvantage with such an approach in a social context is that it usually does not visualise the solution or the problem. Typically, the client can sense the concept but cannot readily understand its immediate value. This seems to involve a delay in insights of benefits. The client often describes these intangible concepts as something they have also thought about, but have not found an answer for. Even though the social sciences students do not provide a solution, the client often concludes that their thoughts about the problem have been confirmed as being right. Nevertheless, in the innovation contests the clients have to decide on a winner. At the end of the workshop process leaders, researchers and the client have a meeting to discuss the proposed concepts. The choice of the winner is the client's responsibility, but the client thinks out aloud during the meeting. In the client's evaluation of the innovation contest, they describe the value of the different approaches all together, and on returning to work they often use bits and pieces from the different teams' concepts. However, during the innovation contest the clients seem more prone to select designed tangible concepts as the winner.

5. Suggestions for process leaders of innovation in a social context

This paper aimed to end up by identifying suggestions for collaborative idea generation and concept development. Some challenges have been described, e.g. interpreting an open-ended design task, bearing with the 'wickedness' of an innovation task and approaching the task from different perspectives of the problem at hand. The longitudinal study which forms the basis for this paper was conducted in a social context, i.e. related to the triple helix responsibilities and to support team-based and participatory design in firms. We have found that it is not straightforward to involve common people in the creative stages of idea generation and concept development. Despite efforts to equip the participants with useful and appropriate methods and procedures, there is a risk of not reaching the innovativeness sought for. There is a need to firmly but humbly facilitate the creativity of the teams. In order to facilitate the processes, there is a need for an external (to the task) process leader, or process leaders, and in such a role it could be useful to be aware of some suggestions.

One suggestion is to provide different types of feedback to the teams depending on if they found the task too narrow or if they got lost interpreting it. Importantly, it is not practical to ask the teams if they need support with a problem. We usually sit down and listen to the discussions for a while and by doing so it is possible to draw a conclusion on the type of support that the team needs, e.g. methods to create shared views or methods to allow different views. Another suggestion is to push the teams to test partial features of their (initial) ideas, and by doing so they usually reveal more perspectives of the problematic situation they are dealing with. Without exception to date, teams need to be pushed in the last phase to reflect on who will use their solution and what added value it will bring compared to existing solutions. Yet another suggestion, especially when the participants in a team are non-designers, is to encourage them to be visual, e.g. to suggest that they perform a skit that exemplifies the problem. The non-designers' point of view has proven important, but has been hard to communicate to the clients, and being visual is often out of their comfort zone. Here, it is important not to provide fancy materials as a process leader, e.g. if you use stick figures, others can too. And vice versa, when the participants in a team are engineers, they need to be encouraged to forget about artefacts in the initial phases. This has proven to be very difficult. Addressing people's needs upfront is generally explained by them as being 'fuzzy' and 'subjective' and not directly related to a physical solution, but in hindsight they admit that they may have suffered from a fixation on an existing product in their idea generation phase. To summaries, the need for for an external process leader is visible in the workshops and impact the teams performance as well as understanding and framing of the problem, the facilitator support teams to;

- Provide different types of feedback depending on their scope and interpretation.
- Push themselves to test features of an idea, to reveal more perspective of a problem situation.
- Encourage them to be visual in explaining ans exemplifying ideas.

However, those engineering teams that have succeeded in connecting and visualising all steps from problem, context, needs, dreams and vision to an innovative solution have also succeeded in the contest. It can thus be concluded that the real challenge is to encourage the teams, regardless of their skills and background, to reflect on what they have done so far in order to confront the design task before progressing to a solution mode, i.e. to capture and formalise the unbroken story from context and needs to an innovative solution.

Acknowledgements

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