Service Innovation Through Touch-points: *Development of an Innovation Toolkit for the First Stages of New Service Development*

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This paper reviews one of the central areas of service design, the area of touch-point innovation. Specifically, it describes the development and use of a card-based toolkit developed in the AT-ONE project - the AT-ONE touch-point cards. These cards have been developed to assist cross-functional teams during the first phases of the New Service Development (NSD) process. This paper describes and analyses the development of the tools, their intended use and their evaluation following actual uptake by several commercial service providers. The results show that the toolkit assists the innovation process during the first phases of the new service development process and helps develop team cohesiveness. The card-based approach offers a tangibility that teams find useful, and that offers multiple usage alternatives. In addition, the paper describes the multiple functions that tools used in service innovation need to accommodate, and how design makes an important contribution to this. The work also reflects upon the materials of service design and suggests that touch-points are one of the materials used by designers to understand, explore and develop innovative service solutions. Suggestions for further work are included that include aspects of toolkit tangibility, usage areas and touch-point innovation.

Keywords – Touch-points, Methods for Service Innovation, Touch-point Cards, Toolkit, Cross-functional Teams, Service Design, Innovation.

Relevance to Design Practice – Describes how innovation in new service development processes can be achieved through focusing on touch-points, and describes a toolkit approach to foster this in service organisations. The toolkit, and its uses, offer service designers, service organizations, project teams and researchers a valuable resource for innovating services. This gives insights into the materials of service design and the nature of service design itself.

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Introduction

The field of service design is expanding rapidly in practice, and a body of formal research is beginning to appear to which the present article makes an important contribution. As innovations in services develop, there is an increasing need not only for research into emerging practices and developments but also into the methods that enable, support and promote such unfolding changes. This article tackles this need directly by referring to a large design research project, and performing a related practice-based inquiry into the co-design and development of methods for fostering service design in organizations wishing to improve their service offerings to customers. In particular, with reference to a funded four-year research project, one aspect is elaborated on that uses cards as a method to focus on the importance and potential of touch-points in service innovation. Touch-points are one of five aspects in the project that comprise a wider, integrated model and means for implementing innovations in service design.

Touch-points are the points of contact between a service provider and customers. A customer might utilise many different touch-points as part of a use scenario (often called a customer journey). For example, a bank's touch points include its physical buildings, web-site, physical print-outs, self-service machines, bank-cards, customer assistants, call-centres, telephone assistance etc. Each time a person relates to, or interacts with, a touch-point, they have a service-encounter. This gives an experience and adds something to the person's relationship with the service and the service provider. The sum of all experiences from touch-point interactions colours their opinion of the service (and the service provider).

Touch-points are one of the central aspects of service design. A commonly used definition of service design is "Design for experiences that happen over time and across different touch-points" (ServiceDesign.org). As this definition shows, touch-points are often cited as one of the major elements of service

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design, and the term is often used when describing the differences between products and services. They form the link between the service provider and the customer, and in this way, touch-points are central to the customer experience. It is not surprising then, that touch points are mentioned as one of the three pillars of service design (Koivisto, 2009, p.142)

Due to the importance of touch-points as part of service design, there is considerable interest regarding how a project team can innovate within the area. This article considers existing touch-point research and describes the development and use of a card-based toolkit used to help project teams develop innovative new services. It focuses on how project teams can innovate services through the use of touch-points and contributes new knowledge to the field of service innovation.

Research Questions & Outline of Article

The research presented here contributes to the limited discourse around touch-points by identifying categories of touch-point innovation. It proposes a methodological approach to innovation suitable for cross-functional project teams. Further, a toolkit is described, along with its implementation and evaluation.

Two related layers of research questions are also addressed. First, at a broad, contextual level it is asked: 1) What role might the notion of touch-points play in further conceptualising the design of innovative services methodologically? 2) How may card based methods oriented to touch-points be incorporated in a workshop based approach for fostering service innovation? Second, at a more operational level, two additional questions are asked: 3) How may cross-functional teams innovate service touch-points during the early stages of a project? 4) In what ways can design-based tools assist team integration at the first stages of a service innovation project?

In answering these questions, the article takes the following form. The next section surveys existing research into touch-points. This is followed by a section relating touch-points to the innovation context within which methods in service design function. The paper then moves on to present the design and implementation of the designed methods to a specific case. Further, a section on evaluation describes the results obtained from multiple iterations of the cards when used in business innovation contexts. Finally, the concluding section discusses the implications of the use of card-based methods in service design and the broader issue of the materials of service design. Overall, the article argues that touch-points are a valuable innovation area for service design, and that a card-based approach fits the service innovation context very well. It also suggests that there is a similarity between the broader methodological approaches used for product design/interaction design and service design, but that the materials and application of methods are different.

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Research into Touch-points

Despite touch-points being a major part of service design, there is little, or no, documented research within the area (Howard, 2009). In order to find research into touch-points, one has to move to other disciplines, yet this research uses a different terminology and has a different focus and approach. Within service design, existing knowledge comes mainly from practice-based consultancy and can be traced back to literature from marketing and CRM (customer relationship marketing). This literature generally focuses on the need for strategies for the integration of multiple channels, often with focus upon integration into a CRM system. In marketing and CRM, the term multi-channel delivery is often used instead of touch-points, and the focus has been mostly on CRM systems themselves, rather than customer experiences or touch-point interactions. Design of individual touch-points is not covered, and neither is innovation through touch-points other than at a cursory level.

The concept, however, of designing points of contact between the service provider and the customer is not new. Shostack (1984) introduced thinking around touch-points as part of services, using the term tangible evidence as part of what she termed "service blueprinting". Shostack describes touch-points as, "Everything the consumer uses to verify their service's effectiveness. The setting, including colour schemes, advertising, printed or graphic materials and stationary, all proclaim a service's style. The design should not be carelessly delegated to outsiders or left to chance" (p. 137). She also used the term "orchestration" to describe how these points of contact should be designed.

In the medical domain, the term emotional touch-points has started to appear in the research literature (Dewar, Mackay, Smith, Pullin, & Tocher, 2009). The use of the touch-point term here is more in alignment with usage in service design, since it relates directly to the customer experience along the customers service journey. However, the term is specifically applied in their article as an interview tool for eliciting critical incidents during a service journey, i.e., as an evaluative tool for completed services, rather than as an innovation tool during the early stages of the design process. This application of touch-point thinking to user-insight work is interesting and can be incorporated into service design approaches.

Within marketing, integrated marketing (Iacobucci & Calder, 2003) is the area that places most importance upon touch-points. Integrated marketing combines three elements that are closely related to service design; an understanding of consumer behaviour, focus upon brand and the link to customer experience. Integrated marketing takes a holistic view of services in which the coordination of touch-points is one major part of linking what is termed contact experiences to the brand. Fortini-Cambell (2003) describes touch-points as being: "in a more complex consumer experience ... there may be literally hundreds of small elements

of experience the consumer notices"(Fortini-Cambell, 2003, p. 63). However, here there is only the recognition of the importance of touch-point co-ordination within integrated marketing with no guidance as to how innovation processes can achieve such goals.

In CRM, the focus is on using technology to organise and automate relationships with customers and prospective customers. It is typically centered upon automating and integrating interactions, often with a focus upon efficiency rather than upon the customer experience. Payne and Frow (2004) describe CRM as "a management approach that seeks to create, develop, and enhance relationships with carefully targeted customers to maximise customer value, corporate profitability, and thus, shareholder value" (Payne & Frow, 2004, p. 527).

Within CRM research the term touch-points has been used within a context of maximising profitability and shareholder value. Technology is used to organize, automate, and synchronize business processes, principally sales activities (Payne & Frow, 2004, Hogan, Almquist, Glynn, 2005). Recent developments in CRM practice show a new attention being paid towards touch-points as part of the customer experience (Choy, 2008). Again, the importance of coordinating (or even orchestrating) touch-points is mentioned in CRM, but there is little or no guidance as to how this can be achieved.

There is a clear lack of literature to provide methods, approaches or case studies describing how a project team can work to achieve the goals described in the literature. Much literature covers the importance of touch-point orchestration (Payne & Frow, 2004, Holmid, 2008, etc), however, there is little literature available regarding how this is done, how this could be done or how this should be done. Holmlid (2008) states: "For design management the challenge becomes one of both coordinating multiple service channels, and the coordination between service channels" (Holmlid, 2008, p. 7). There is therefore a clear need for assistance that helps project teams achieve these two goals. However little or no research exists to help project teams with the *what* and *how* of touch-point orchestration and innovation. The work presented here, therefore, describes a methodology to assist cross-functional teams when working with touch-points. Further, through analysing the methodology in contexts of use in professional innovation projects and via evaluations of its value in use, this research goes some way in answering the questions previously raised.

Context of This Work

At the Fuzzy Front End of the Service Development Process

The fuzzy front end (Smith & Reinertsen, 1998) describes the phase at the start of the NSD (New Service Development) process. The NSD process is related to the New Product Development process (NPD), and refers to the specific differences encountered when innovating in services rather than products. NSD literature is limited in quantity and quality in relation to the well researched NPD process. Service Design, as part of NSD is barely mentioned, in contrast to the increasingly rich documentation regarding the role of product design in the NPD process.

The fuzzy front end phase of projects has come into focus during recent years, being described as the most important part of service innovation by innovation managers (Allam & Perry, 2002; Allam, 2006). This is because the earliest phases of the development process offer the greatest opportunity for transformational innovation. Approximately 66% of life-cycle costs are decided during this phase, whilst only about 5% of development costs are utilised (Berliner & Brimson, 1988). Kelley and Storey (2000) summarise its importance in this way:

> While previous management disciplines have rationalised and routinesed the back end of the new service development (NSD) process, the front-end of the process remains a knowledge-intensive black art that appears, from all industry studies available, to be consuming an increasingly large portion of the total concept to cash-flow cycle time. (p. 45)

The fuzzy front end is increasingly being focused upon by designers as they are given a more explorative and open brief (Sanders & Stappers, 2008). This phase is also seen as an opportunity to lift design up to a strategic and tactical level of an organisation. Clearly, in terms of methods, there is a critical need to develop means to achieve this. Such methods are also important when it comes to building links and supporting innovation in the cross-functional teams that are now used in most development projects during new service development.

Cross-functional Development Teams

The process and tools described in this paper are aimed at assisting cross-functional development teams, where the teams, together with designers, explores the project mandate and develops ideas through workshops. Cross-functional development teams are now used in most development projects. Such teams include relevant stakeholders representing different functional areas within (and from outside) an organisation, across diverse disciplines. This article does not question the relevance of cross-functional teams in an innovation perspective while recognising that opinions are divided regarding their effectiveness in innovation processes (de Jong & Vermeulen, 2003; Ancona & Caldwell, 1992; Sethi, Smith, & Park, 2001). However, since the majority of commercial innovation projects utilise cross-functional teams, this project has chosen to develop tools to support such teams as part of the new service development process.

Challenges facing cross-functional teams include the development of team collaboration, internal culture and team communication (Shikhar1 & Colarelli, 2009), as well as the achievement of a common understanding and shared vision of the object of development (Molin-Juustila, 2006). Cross development teams therefore provide rich nests of knowledge and situated experience; however, without clearer methods for getting at this knowledge during the initial work at the fuzzy front end of innovation processes, service design practices and research will be restricted. To meet these challenges, a large research and development project called AT-ONE has been developed. This project is one of very few that addresses support for cross-functional teams at the fuzzy front end of services. It is, however,

important to emphasize that the design, processes and insights it offers are very early and are offered as part of the emerging inquiry into methods and their uptake in service design. The sections that follow therefore need to be read as an exploratory, case related inquiry that seeks less to be declarative and solution-centred but, in keeping with the tenor of design itself, aims to also find issues, better identify them and communicate them.

The AT-ONE Project

This work is part of the AT-ONE research project. AT-ONE is developing process support, and tools, for cross functional teams during the first stages of the NSD process. The AT-ONE method helps teams map, ideate and conceptualise potential new services through a structured series of workshops (Clatworthy, 2008).

Each of the letters of AT-ONE relates to a potential source of innovation in services, and the letters can be seen as a set of lenses through which a service can be viewed. The method therefore runs workshops with focus on each of the following lenses:

A– New combinations of ACTORS who together can provide improved services

T– Orchestration and development of TOUCH-POINTS to provide innovative services

O– Developing new OFFERINGS that are aligned to brand strategy

N– Understanding customer NEEDS and how new services can satisfy them

E– Designing customer EXPERIENCES that impress the customer

The work described here relates to the development of the method for innovation in touch-points, the letter T in AT-ONE. This work can be utilized for innovations based exclusively upon focused workshops on touch-points in which cross-functional teams work together.

Design and Implementation

The research approach taken was one of participatory action research (O'Brien, 2001) in which the author was involved in planning, developing and evaluating the support tool through several iterations together with commercial service providers using innovation briefs of commercial relevance.

The Choice of Cards as an Innovation Tool

The idea for developing a tangible tool emerged when we started running workshops in the AT-ONE project three years ago. As part of the Touch-Point workshops, we found ourselves using touch-point examples to help with both mapping and analysis (before a workshop) and for idea generation during the workshops themselves. In addition, we identified a need for activities that help build project team cohesiveness, common understanding and common goals.

Within service design, one of the early successful large-scale initiatives was the RED programme, coordinated by the Design Council in the UK. One of the projects within RED was the Diabetes Agenda (RED, n.d.) in which patients were given agenda cards as a preparation for a health consultation. The cards were considered a great success by the stakeholders, and this, together with the need for examples in workshops, inspired us to look into cards for the AT-ONE project. When we looked more deeply into research on design for collaborative teams (Molin-Juustila, 2006), and cards or games as an innovation support tool (Brandt, 2006; Brandt & Messeter, 2004; Halskov & Dalsgård, 2006) we found considerable support for the development of a tangible tool. One of the motivations for using cards was the important role that they can play for forging team collaboration towards a common goal. Brandt (2004) describes this as follows:

> ... movements within a community of practice has both open periods in which creativity and discussions have room to unfold and more narrow periods characterised by consensus and/or decision-making, including the location of these in physical artefacts. (p. 128)

Brandt refers to the participatory design tradition in design, in which physical manifestations are a central part of the process, something she describes as reification, which is "the process whereby people within a community of practice create physical artefacts on the basis of a common understanding of the practice" (Brandt, 2004, p. 128). We were interested in developing a tool that could support group processes through reification for a service. We saw this as both a challenge and opportunity, since services are often described as immaterial and experiential rather than tangible. The idea of developing a tangible tool to assist with the development of an intangible service was particularly appealing.

Use Context/Requirements Specification

Based upon existing research into touch-points, the needs of cross-functional teams and card-based tools, the project therefore developed a card-based tool to assist with the following seven goals:

Team building for cross functional teams:

1. To build a common understanding of touch-points and their role as part of a holistic service design.
2. To assist with team cohesiveness, team culture and mutual respect within the team for different disciplines and views.

Analysis and mapping:

3. To gain an overview of the multiple touch-points used during the customer journey.
4. To identify critical touch-points during the customer journey.
5. To understand the limitations and possibilities of each touch-point that the company utilised.
6. To identify who is responsible for design, development and maintenance of each touch-point.

Idea generation:

7. To generate ideas regarding how to innovate through changes in touch-point usage, design or implementation.

The Development Process for the Cards

The development process has been iterative and evolved over the past three years. Several touch-point workshops have been held with cross-functional teams from industrial clients. In addition, student projects working with industrial clients have also utilised the cards as part of the workshop process.

The cards were initially developed to enrich existing innovation workshops based upon the touch-point analysis and mapping. A need was quickly identified during these workshops to have a checklist or resource bank of possible touch-points to save time and to reuse knowledge. We found however, that developing the cards helped further develop the tools, so the tools and cards developed together. The tools and the cards have been prototyped several times and improved each time, most recently during workshops during the Autumn of 2010.

Figure 1. The first cards were images of individual touch-points and fairly large. Their tangibility was good, but they were too large when mapping complex service systems involving many touch-points. They were also difficult to hold, group and manipulate by hand.

The first cards were images denoting different touch-points. They were larger (ca. 15x15cm) and placed on foam-board. This made them tangible elements that were easy to handle and share; they were a strong improvement on post-it notes. However we found two problems with them. Firstly, they were too large and unwieldy when many touch-points were being grouped, simply taking up too much space on a table or a wall. Secondly, it was unclear from some of the images which touch point they represented - the images were ambiguous.

The second cards were made as an innovation game for one of the industrial partners in the project. The intention was to identify touch-points specifically for lottery and betting contexts. This time the cards were of normal playing card size. We found that the size worked well for the game context, and was a size that worked both on tables and on walls when used for group work. In the images, we attempted to show both the touch-point and the use context. This caused two types of confusion. Firstly, ambiguity of some images caused confusion, similar to the first series. Secondly, the association to context made it difficult to distinguish between the object in the images as a touch-point (for example a glass) or the context being a touch-point (a bar). This confusion raised questions within the group during group processes and transferred focus from the innovation process to discussion of card meaning. Although not a significant problem, it interrupted the flow of conversation.

During development of the third and present set of cards, the project leader and designers discussed the issue of confusion and multiple interpretations. This led to two decisions, the first being that we would put the name of the touch-point on the card. This enabled a quick recognition of the touch-point, and together with the image, presented an unambiguous representation. This led to a discussion regarding the choice of images for the cards and the usage of the cards themselves. Were they to be abstracted and inspirational for idea generation in themselves, or should they be concrete representations of the touch-points? Our second decision was to make them as clearly descriptive and concrete as possible based upon the confusion earlier reported. This eliminated the

Figure 2. The second series of cards were playing card size and incorporated into a game. They included more contextual information about the cards by showing the touch-point in its natural place of use.

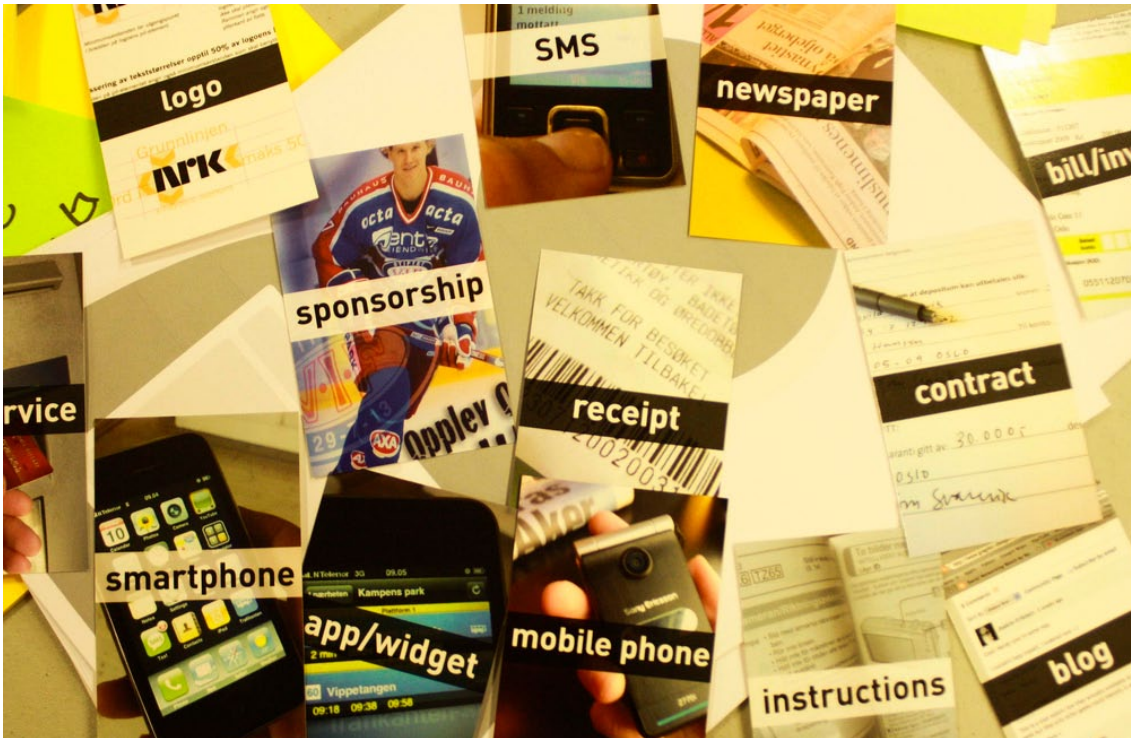

Figure 3. The final cards added a text label to the image, and contextual information was reduced. This was found to improve group processes. (photo: Nina Lysbakken)

problems mentioned earlier and smoothed out group processes allowing the group to focus on the innovation process rather than negotiation of individual card meaning.

Innovation Tools Developed Using the Cards

The project explored different approaches to innovation through touch-points using experimentation over a period of three years, comprising 32 workshops together with commercial service providers. A clear pattern of innovation types developed during this process, and from these, the project identified six different use contexts. Each of these contexts enables a different aspect of service innovation and utilises different creative techniques. The use contexts for the cards presented below were chosen to maximise the divergent nature that characterises the front end of innovation. They assist teams working within innovation projects with a wide variety of innovation goals. These range from benchmarking an existing service, through incremental improvements to an existing service, and transformational innovation and the development of a totally new service.

Use Context 1: Mapping an Existing Situation

The cards help map out an existing situation; for example, a team can go through each stage of a service (or customer) journey and pick out the touch-points that are relevant at each stage. From this, many aspects can be discussed, such as which touch-point is most important to the customer, which are used in a sequence, which are most frequently used, etc. This helps get the discussion moving around how customers view the service through touch-points and how they often jump between them.

Use Context 2: Identifying So Called "Pain Points"

Once the service journey has been mapped out, there are many options open to a project team. One of the things we find useful is to identify the touch points along the service journey that don't perform particularly well from a customer point of view. This can be a useful means for improving consistency of experience along the service journey.

Use Context 3: Whose Touch-point is it Anyway?

In large organisations, different departments can be responsible for the design and content available through different touch-points. This often comes as a shock to an organisation, but is something that is usually noticeable from the customer perspective. There can be different tones of voice, interaction styles, use of images, typography and especially different terminology. Identifying who is responsible for each touch-point and finding ways of coordinating between them can be very useful. This assists an organisation's coordination activities around the customer experience.

Use Context 4: Touch-point Migration

An organisation might get lazy, or might just not have routines in place for updating their touch-points. Over time, a touch-point might become out of date or there could be a better touch-point alternative that can be used as a replacement or addition. This is particularly relevant when it comes to use of technology and discussions regarding self service. Going through the touch-point cards can give ideas for new touch-points and can help map out a migration strategy from one touch-point to another.

Use Context 5: Touch-point Addition or Removal

This challenges today's situation by removing important touch-points. Based upon the touch-point mapping, the main touch-point at each stage of the service journey is removed, and idea generation is used to find a better replacement. If it cannot be replaced, then the team has gained a deeper understanding of the touch-point's importance and role. An alternative to this is to pick a random card at each step of the service-journey and discuss how it could be used to improve the service. We have added some specific touch-points for this, such as "service integrated into a product" or "smart phone". This can be a useful task in many ways, particularly to help challenge today's situation, which might have deep historical roots and need updating.

Use Context 6: Forced Association to Create New Services

In this task, participants are asked to select random cards (two or more) picked from the pack and then to use them to design a service based only on the cards. Forced association is an idea generation technique to force you away from logical thinking. Doing this with the touch-point cards forces the team to break with pre-conceived understanding. It's a fun and challenging way to look at touch-points and often unearths useful reflections regarding a service.

Evaluation of the Touch-point Cards

The evaluation of the touch-point cards employed multiple methods. This included semi-structured interviews with selected workshop participants, discussion sessions with workshop participations, a questionnaire developed for workshop participants, and participative and non participative observation. The questionnaires were filled out by workshop participants at the conclusion of touch-point workshops in which the cards were used.

Evaluation of the toolkit took place during 2010, the final year of the project. The toolkit has been utilised during five workshops, each of a minimum three-hour duration. Participant numbers in the workshops have varied from six people to 24 people. The evaluation data all relates to the final version of the touch-point cards.

The interview guide was informed by observation of several workshops combined with the insights gained from the literature review of touch-points in service innovation. The questionnaire was a standard questionnaire developed for the evaluation of the AT-ONE workshops by the project team. It consisted of open questions requesting information about positive and negative aspects of the workshop itself, and multiple choice questions related to the innovation potential of the workshop at a project level. These questions were developed from literature regarding innovation metrics in companies (Perrin, 2002; Brusoni, Prencipe, & Salter, 1998; Andrew, Haanæs, Michael, Sirkin, Taylor, 2008). Furthermore, the questionnaire and interview guide drew on discussions within the projects cross-disciplinary validation team.

Participants at the workshops were primarily project participants in commercial service innovation projects at the fuzzy front end of a project in the telecom field or within public health services. Since these workshops have been at the fuzzy front end of large innovation projects, the evaluation process has not been able to follow the ideas and concepts from the workshops through to market. However, a separate validation activity has evaluated the effect that the AT-ONE workshops have had upon participating organisations. This work is close to completion and will be described in future articles.

The following section describes the evaluation of the cards in relation to their intended function. Additionally, a finding is described that relates to their tangibility and how the cards afford cognitive and social support through cognitive-gestural movement.

Assistance with Team Building in Cross Functional Teams

Molin-Juustila (2006) discusses the five critical elements that together create team cohesiveness during the fuzzy front end: personality barriers, different cultural thought worlds, language barriers, organisational responsibilities and physical barriers. Similar elements are identified by Persson (2005) and Pei (2009). Of these, the cards (used as part of collaborative workshops) have had positive effects on four of these five elements. The fifth, physical barriers due to geographical location, is not addressed by co-located workshops.

It is difficult to distinguish between the role of the cards themselves and the role of collaborative workshops in these positive team building results. The cards assist with the reduction of cultural thought worlds by giving a common context for collaboration within a customer-centric service innovation framework provided by the AT-ONE process. In terms of language barriers, the toolkit establishes common terminology through clearly defined tasks. Additionally, the use of images on the cards, together with clear texts makes understanding of card content unambiguous. Organisational responsibilities are a specific focus for one of the tools, such that organisational roles for touch-point development are specifically identified.

Comments from participants support the relevance of the cards for team building. They were reported to be "very useful as a common point of reference" and that the participants "quickly developed a common understanding" and that "the use of visual tools simplified the process and created a common understanding in the group."

Analysis and Mapping

The cards were found to be effective when it comes to their ability to assist the analysis and mapping of existing situations. They were seen to assist the holistic understanding of a service by allowing a visual overview of all touch-points along the whole customer journey. They also allow the team to focus upon individual touch-points. This seems to be aided by the combination of clear images and texts which allows them to be

viewed individually and also in combination. This ability was also useful when identifying critical touch-points or possibilities or limitations of individual touch-points. The same can also be said when it comes to identifying who is responsible for each touch-point. Some workshop participants compared the content of the cards to a checklist, others commented on the cards modular ability, saying "the cards' physical form and visual presentation make it easier to scale the process," and that "the process is built up like Lego blocks, meaning that you can unfold ideas on a large scale." Further, they reported that it was "easy to see touch-points in relation to each other and spot overlaps or things missing."

Idea Generation

The cards were given positive evaluations in terms of their potential for generating new ideas. Firstly, the cards encouraged both systemic innovation (changing the whole service system) and innovation in individual touch-points. For individual touch-points, innovation related to removal (or addition) of touch-points, and also to changes to the interaction design of an individual touch-point. Further, the cards aided alignment of touch-points to brand strategy. Workshop participants commented upon the cards ability to "make you both concrete and experimental at the same time" and their ability to "open up the process." In addition, several participants commented that the cards opened up a breadth of ideas. One workshop participant commented: "When I first looked at the cards, I thought the majority were not relevant for our project. However, when we started using them, I realised that this was not true, and seemingly irrelevant cards suddenly contributed to the improvement of the service (workshop participant, October 2010).

We asked participants in the workshops to evaluate the use of the toolkit to evaluate the ideas that were generated in terms of their contribution to new ways of thinking, the number of ideas generated during the time available, the relevance of the ideas for their project, and the perceived uniqueness of the ideas. These can be considered pointers to innovation potential. The results were consistently positive, scoring high ratings on all dimensions. Considering that the participants in the workshops were from innovation projects – many with innovation leadership roles – this shows that the cards fulfilled their function in terms of generating novel yet relevant ideas.

One issue commented on by a few participants was that the cards might inhibit the radical thinking in which invention of new touch-points could arise. Similarly, it was commented that a missing touch-point could potentially have negative consequences, since using the cards constrained thinking within the alternatives given. This is something we have considered, but have not experienced when running workshops. The cards deliberately suggest a very broad range of touch-points, many of which are outside the scope of traditional touch-point thinking. Indeed a common comment is that participants initially considered many touch-point cards unnecessary or irrelevant. Once used, this changes to an expression of how useful the broad approach turned out to be. However, it is difficult to know if a potential solution is inhibited without using controlled testing procedures, which have many practical disadvantages in the project context. In practice, we have not been able to observe situations in which the cards have constrained idea generation.

Over time, we have identified a need to continually update the touch-points. As an example of this, we have had to add a new category of touch-point - the iPad/tablet, since this new touch-point was launched during the first 6 months after the touch-point cards were produced. We see that the touch-point cards need continual updates to remain contemporary and relevant.

Needs Elicitation

Recent developments in the AT-ONE project have included using the cards during the customer insight phase of a project. The cards have been used as an aid for needs elicitation when interviewing potential users of a service. For example, we have recently used them to elicit preferences regarding touch-points when contacting customer service in a telecommunications company. They were found to be useful and allowed potential customers to compare different touch-points, prioritise touch-points and think aloud about touch-point preferences. It was clear that the tangible form of the cards assisted the cognitive process when users were answering questions, grouping together, or prioritizing. The use of the cards for needs elicitation is a new and promising area of use for the cards, and one which we will be exploring in more detail in the future.

Figure 4. The way that people held the cards and moved the cards assisted cognitive and social processes through movement and placement.

Assisting Embodied Communication and Cognition

One of the findings from observing card-use in teams is that the cards afford embodied interactions at the individual and group level and thus support the cognitive and social processes involved when carrying out tasks within teams. This was an unexpected result, since the cards were developed primarily as a visual checklist of touch-point examples. It became very clear that the way the participants used the cards showed a clear interaction between mind and body. The following modes of use clearly demonstrate how the physical form of the cards, together with physical position and movement, assist the workshop process.

Chunking - Grouping Cards Together to Save Short Term Memory

This is perhaps an expected pattern of use - participants in the workshops grouped the cards in their hands as a type of short-term memory storage while they focused on other cards. There was a continual negotiation between potential new cards and the group in hand that occurred physically. The participants would pick up a card and hold it up to the group in hand to question its relevance to the group. This seems to use a combination of visual cues, position cues and movement cues to identify relevance. It became obvious that the action of moving the new card toward the group assisted the cognitive process of grouping.

Negotiating Alone / Evaluating Through Position or Movement

Participants would hold a card (or sometimes more than one) and, whilst still holding it, move it physically around the table to see if it fit with other cards. This is a form of negotiation through physical movement and position in which the physical movement becomes a strong support for cognitive processes.

Negotiating or Explaining Within A Team Through Movement or Position

This is a behaviour in which a card (or sometimes cards) are held in the hand and moved to assist a verbal argument or explanation within a team. This mode of use is similar in both cases, although the former is a form of questioning within a team ("what if this was the main touch-point at this stage") while the latter is used as explanation ("you can see that this touch-point doesn't fit here"). The physical movement seems to be slightly different between the two. One being a physical expression of questioning by the way the card is moved and the timing of the movement expressing uncertainty. This can be compared to more definite movement and different timing that gesturally expresses fact.

These modes of use of the cards suggest that the cards themselves, together with their content actively assist the processes of mapping, grouping and social negotiation through their form and use. This assistance is not afforded by lists or through a digital sorting mechanism.

Discussion

The work presented here is one of the few research investigations covering touch-points and service design. Although its focus is upon a toolkit for innovation through touch-points, it also is one of the few documented studies of service design at the fuzzy front end of service innovation. As such, it offers insights and raises points for discussion at multiple levels. These range from discussion of the touch-point cards themselves, methods in service design, and reflections upon the nature of service design itself. This section therefore discusses both the specific and the general, and is divided into sections of broadening relevance, starting with the cards themselves.

The Card-based Tools

The touch-point cards and related tools were shown to have a positive effect upon the three main requirements that the project had identified from both research and practice - cross-functional team building, analysis and mapping, and idea generation.

One issue raised by workshop participants is the danger that they can in some way constrain thinking within the content shown on them. Does the tool direct innovation towards incremental innovation rather than encouraging transformational innovation? A set of cards showing existing touch-points might be considered to encourage an inductive approach to innovation, and therefore a focus upon *what is*. However, our findings show that this is not the case. At the early stages of a project, the goal is divergence, i.e. to generate a large number of ideas covering a broad area. We found that the cards encourage an abductive approach where the goal is to consider *what can be*, rather than just what is (Margolin & Buchannan, 1995). Evaluation of the cards by participants shows a high score for number of ideas, idea relevance and idea novelty. We conclude, therefore, that transformational innovation using touch-points does not mean the invention of a touch-point. Transformational innovations can as much be the removal of an existing touch-point, the reordering of touch-points within a customer journey, or the addition of a new (to the service) touch-point. Internet trading of stocks and shares is an example of this, in which an existing touch-point has been utilised in a new context, rather than the invention of a new touch-point. This conclusion has implications for service innovation with touch-points, since the goal is not necessarily to invent touch-points, rather to introduce new (to the service) touch-points, a reordering of touch-points or harmonisation of touch-points. As such, the findings here support the term "orchestration" used by Shostack (1984).

Additionally, we noticed that design students particularly enjoyed framing non-analytical use of the cards, such as "forced association" or "can I use it here" in which random combinations of cards are used to generate ideas. The open nature of this form of use was considered fun, exciting and liberating, even though many of the ideas generated were not usable in a commercial context. This enthusiasm was not shared by participants with business or marketing backgrounds. They found the open approaches offered by these to be too open, and considered them inefficient since they produced a relatively large number

of irrelevant ideas. This is an interesting observation and can have multiple explanations, for example that business has an expectation of efficiency and performance throughout the design process, including idea generation. It perhaps also highlights the difference between "design thinking" and "business thinking". This difference is repeatedly mentioned in the design thinking literature (eg. Lockwood, 2010). In Lockwood's anthology, this is frequently mentioned, for example the need to "look beyond what is, to what could be" (Fraser, 2010, p. 39) or to "let go of reality - to be expansive and inspirational" (Jones & Samalionis, 2010, p. 187). These are therefore common themes in the intersection of business and design. They do, however, have a consequence for cross-functional processes where designers and business disciplines meet, such that workshops need to strike a careful balance between exploratory and analytical approaches.

A second issue regarding the touch-point cards themselves is that of forms of representation. The cards were developed iteratively and ended up as representations of the touch-points combining text and image. This raises a question of what the images on the cards represent in use. Experience from their use showed that the cards had to have an immediate identifier, so that a welcome package card, for example, is immediately identified as a welcome package by the workshop participant. We found early on in the project that ambiguity here disrupts the flow of a workshop significantly.

Another issue to note is that the cards have to assist the participants with an understanding of how that touch-point can function in the project context. Since one of the key aspects of services that the AT-ONE project is focusing on is the customer experience, the cards had to assist the workshop participants' understanding of the functional and experiential qualities of the touch-point in its use context. We considered several representational forms, from neutral to highly symbolic, with varying degrees of context included. During different evaluations of the cards, we found that their context of use varied greatly. A betting context, insurance context, and educational context are very different in terms of touch-point representation. This suggests that the cards should be depictive rather than connotative. The balance that we chose (depictive with some use-context) was developed over several iterations and functioned well. However, a great many alternative visual representations could have been chosen or explored, from hand-drawn sketches to abstracted icons. These were not explored as part of this work, and it would be interesting to explore the relationship between touch-point representation and innovation outcome. Such a study would necessarily have to explore the core meaning of each touch-point, and would most likely unearth some fundamental understandings of touch-point qualities in the process. This could further our understanding of how touch-points help deliver experiences.

Card Based Tools in Service Design

An interesting finding, and one that was noticeable through observation of the AT-ONE workshops, is that the cards afford embodied communication and embodied cognitive processes. It became clear that holding, moving and grouping the cards all supported the cognitive processes involved in the task. The task of touch-point innovation became simpler and more involved because of this embodiment. This is an important finding when considering the design of group tools, and one that only became apparent through observation of their use. Our initial focus in the project was upon developing a visual checklist; it was only by chance that we discovered the affordance that the cards offered for embodied communication and cognition. From observation, this affordance is provided not only by the size and form of the cards but also their combination with the visual nature of the content. This finding is supported by Sirigu and Duhamel (2001), Wachsmuth, Lenzen and Knoblich (2008) and Tversky (2005), who have identified the clear link between cognition and motor and visual imagery. For development of new workshop tools, it is clear that the size, image and mode of use should be given greater attention to afford the cognitive and social processes that they aim to assist. This also suggests that digital versions of the cards will not function as well as the card-based ones.

Finally, the recent use of the cards as a task-aid to support user interviews offers a new area of application for the cards. When given cards to sort, discuss and prioritise as part of user insight interviews, we found that users consider the cards very helpful. They work as memory aids and shared objects that aid discussion around specific themes. They help the users reflect and express aspects related to their experiences of services in use and assist in the formation of a dialogue around existing solutions and potential improvements. This is partly explained by the affordances explained in the previous paragraph, and supports the further use of tangible tools when interviewing or gaining user-insights. The use of cards as part of participatory design is not new, and Brandt (2006) describes cards and games in detail. However, we found that cards improved interview responses, and added a participatory design dimension to the interviews. This encouraged interwoven discussions of what is and also what could be.

Together, these two findings support the further development of the card-based techniques that are popular in service design. They suggest that service design should increasingly make tangible tools to support the development of intangible services, and that cards particularly offer support to this. The designers' card sets can be simply produced, and service designers should therefore develop and use cards more often. Service design, as it develops further, should explore and build upon the rich vein of knowledge already developed within the participatory design field and adapt this to the service innovation field.

Touch-point Innovation at the Fuzzy Front End

This study has presented insights into touch-point innovation and its nature. Several issues arise from this, most notably the need to understand individual touch-points and at the same time combine them to produce a holistic result. In service design, the focus is "about how an experience would flow across channels ..." (Løvlie, Downs, Reason, 2010, p. 174). This adds a requirement for extra levels of understanding from the designer. Not only do they have to understand qualities of touch-points at an individual level, they have to understand how they combine to create a holistic service,

in relation to a desired brand image. This is particularly relevant at the fuzzy front end of innovation, since this phase defines the whole service – both its offering and means of delivery. At present, we have a poor understanding of exactly how this occurs when it comes to services. To shed light on this, further work to explore how designers work with touch-points as well as an exploration of the customer experience is needed.

A second aspect related to the fuzzy front end that this study raises is the relationship between the designed solution and its delivery. Service value is often described through its 'value in use' (Vargo & Lusch, 2008) and as such, there is a need to study downstream effects of touch-point decisions on the final customer experience. There is a lack of research linking design decisions during the fuzzy front end to the final delivered customer experience. This would be a very useful research area to explore, and could help further validate the value of this toolkit, and other service design approaches.

The Materials of Service Design

At a more general level, this research inquiry explored the area of tangible tools for intangible services. This raises the question of the materials used to form solutions in service design. In product design, the use of physical prototypes and modeling as a form for reification are well researched (Brandt, 2004). The materials of product design are numerous, and materials such as foam, cardboard and clay are commonly used in the early stages to both explore a problem and attempt to solve it through explorative modeling. In service design, it is difficult to physically model a service in the same way. Foam, wood and clay are difficult to use, since a physical representation of a single artefact does not capture the holistic nature of services. The materials of service design are therefore different. However, modeling is possible, and in service design, the object to be modeled is the whole system and its individual parts. Modeling touch-points over time is an example of this, in which the aim is to understand the customer experience as an outcome. This work suggests that touch-points are one of the central materials of service design, together with cross-functional workshops, card-based tools, visualisations, post-it notes and timelines. This is complemented by role-playing and rapid prototyping. Although not specifically identified in existing research, this is supported by descriptions of the service design process by Jones and Samalionis (2010) and the tools of service design, as described by Saco and Goncalves (2010). Further work to understand and explore the materials of service-design would be useful, since it will assist in the development of new tools, new processes and an understanding of service design itself. Discussion about the material of service design, introduces therefore a discussion about the nature and characteristics of service design.

The Nature of Service Design

These findings also reinforce the role of touch-points as one of the central means of providing the immaterial experiences that are services. The cards were used in several commercial service innovation projects, and gave a valuable insight into the nature of service design itself. The work here supports the simple definition of service design that is commonly used, that of designing for experiences that occur over time and across touch-points.

Two aspects became very clear from this study. The first is that service designers focus upon the orchestration of a service in which the choice of individual touch-points and their relation to other touch-points is important. This requires an understanding not only of individual touch-point qualities, but also of their potentials when combined in particular ways. The second relates to the orchestration of touch-points over time. Common to both of these is an understanding of the parts and the whole and the innumerable alternatives that this affords in relation to how a customer might experience the service. Both of these findings support existing research into the need for touch-point orchestration (Shostack, 1984: Payne & Frow, 2004; Holmlid, 2008). However, this orchestration occurs today through use of tacit knowledge using heuristics that are practice-based. There is a great need for research that examines the heuristics of touch-point orchestration, both during the design process and at points of service delivery. Over the long term, research that identifies and presents such heuristics would be beneficial. Such heuristics could further be developed towards a pattern language for touch-point orchestration in services. In interaction design, patterns are becoming a common means of documenting proven solutions to recurring design problems (Borchers, 2000). It would be very useful if the same could be explored in service design, when it comes to touch-point interactions and orchestration.

Conclusion

Although regularly discussed and described in practice-based consultancy, there is little or no research into the nature of touch-point innovation or how one coordinates multiple touch-points. There is therefore a need to support touch-point innovation as part of the new service development process, particularly in terms of how cross-functional teams can innovate using touch-points. This need is particularly evident during the first stages of innovation, the fuzzy front end, in which major decisions are made regarding service functionality and structure.

This research takes the first steps towards establishing a body of knowledge on touch-points in service design. It does this by pulling together research on touch-points from integrated marketing, CRM and co-design, together with research into cross-functional teams in innovation processes. It then describes how this was used as a basis for the development of an innovation toolkit which was developed through, and evaluated over, several workshops together with service designers and service providers.

One of the findings of this work is that touch-point orchestration is often mentioned as central to service success. However, orchestration as a term is not defined, nor are methods described that can be used to achieve such orchestration. This work unpacks the term orchestration and identifies seven aspects of touch-point innovation relevant to the performance of cross-functional teams at the early stages of the new service development process. Two of these aspects relate to team building through the use of cards and workshops. Four relate to analysis and mapping

of touch-points, which assist touch-point orchestration. Finally, one aspect relates to idea generation based upon changes in touch-point usage. From this, the project has developed a card-based toolkit consisting of six tools that enable and encourage these seven aspects. Development occurred in several iterations together with participating companies.

Evaluation of the card-based toolkit shows that it has a positive impact upon all seven identified aspects. The results show that a card-based approach assists and encourages the development of team collaboration, communication, the achievement of a common understanding, and shared vision of the object of development. This supports findings from the use of cards, toolkits and games when used in product and interaction design. In addition, the toolkit assists touch-point orchestration by assisting with analysis and mapping of touch-points in a group context. Finally, the toolkit assists with idea generation. It aids new ways of orchestrating touch-point combinations, and the identification of new touch-points for a particular context.

We discovered that the design of the cards affords embodied thought and interaction, and usage modes are described for this affordance. This finding helps explain why card-based tools are popular in service design, and has consequences for the future design of card-based tools. Finally, it was discovered that the cards can be used in other contexts, particularly as a support tool for user-interviews. We encourage, therefore, the development of card-based tools specifically aimed at supporting customer insight work based upon these findings.

This work also contributes to the discourse on touch-points and service design at a broader level. It discusses the question of materials used in the development of services, and the nature of service design itself. In product design, modeling materials such as clay and wood are used to explore and solve problems in an iterative process of understanding, exploration and solution. In service design, we believe that the same effect can be achieved through modeling touch-points over time. This points to the fact that touch-points are one of the main materials of service design. This needs corroboration, but has consequences for the development of service design research, teaching and practice.

Although raising many questions, the work presented here has limitations. Firstly, the development of the cards did not base itself upon long-term studies of touch-point innovation in service design. Instead, it used knowledge from practice, together with published work from other fields to identify issues of importance in touch-point innovation. Further work, such as case studies, is needed to give a richer understanding of how touch-point innovations occur. Secondly, we chose to develop the cards through practice as part of touch-point innovation workshops which, although giving many benefits, also had limitations. For example, comparisons of alternatives and in-depth analysis of design decisions were not possible. In particular, an in-depth study of touch-point representations was not possible, and we hope to see exploration of this area. This would give a better understanding of the core meaning of individual touch-points and how such touch-points deliver specific customer experiences. Such work could move towards the development of patterns for touch-point use in service design.

Further work is needed at each of the multiple layers discussed in this article, from development of the cards themselves, to broader issues regarding the characteristics of service design. There is a need to discuss and elaborate the seven aspects of touch-point innovation identified in this article. We would also like to see studies that show how touch-point decisions made at the early stages of a project impact the final customer experience when developed and finally delivered. Further work to explore alternative and richer touch-point representations is needed to gain a deeper understanding of the nature of touch-points, their individual characteristics and how they contribute to an orchestrated solution. We would hope that this work also initiates discussion around the materials used to explore and develop service designs. This will contribute to a greater understanding of the similarities and differences between service design and other design disciplines. As service design develops, this understanding will be increasingly important.

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