

# **An engaged scholarship approach to digital service design**

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## **Abstract**

This article has as a starting point the call for engaged research on design of digital services. One of the indicated directions is to study how service innovation theory informs and may be applied to the design of digital services. In our study the focus has been on roles of the service beneficiary in the co-creative design of digital services. The digital services should enhance the everyday life situation of a specific group of customers. In our two projects, this was next of kin to persons suffering from dementia and members of equestrian clubs. The research question posed in this article is: How can learning be supported during co-creation of innovative digital services? The main arguments behind the learning approach are: 1) when applying the engaged scholarship, the researchers, developers and users are engaged in a learning community; and 2) that understanding human interactions in service design should be grounded in underlying behavioral science principles. The aim in this article is to propose a set of design implications grounded in empirical descriptions and analysis of service beneficiary roles from a learning perspective.

**Keywords:** Design of digital services, engaged scholarship, learning mechanism, boundaries

## **1 Introduction**

In March 2015 Management Information Systems Quarterly (MISQ) published a special issue on “service innovation in the digital age”. In the foreword Barrett et al. (2015) point out several directions for information systems researchers. One of these directions is to study how service innovation theory informs and may be applied to the design of digital services. Furthermore, Barrett, Davidson et al. (2015) also suggest that researchers should actively engage with the practice during the design of service.

Active engagement and involvement by researchers are not new in the IS field, see for instance action research (Baskerville and Myers 2004), action design research approach (Sein et al. 2011) or the engaged scholarship approach (Van de Ven 2007, Mathiassen and Nielsen 2008). In all the above mentioned approaches the researcher deals with real-world problems in order to be practical and relevant.

This paper will report from two service design projects (Free2Ride and HITTA) conducted between 2009 and 2012. In the two projects the researchers were engaged and actively involved in the process of designing a novel digital service by combining digital and physical products that enhanced the everyday life situation of a specific

group of stakeholders. The two projects are examples of practice-based research of service design (Donnellan et al. 2016).

One of the fundamental principles of the projects was to put through co-creation in the design of the digital service (Pralhad and Ramaswamy 2004, Prahalad and Ramaswamy 2004). Involved actors in the co-creation were developers, users, consumers and researchers. The co-creation that took place was based on service design thinking as it is presented by Barrett, Davidson et al. (2015): “Design thinking adopts a largely human-centered approach, recognizing an iterative process that moves from generating insights about end users to idea generation and testing to implementation”.

The major idea in the first project (“HITTA”) was to design and develop a digital service that could be used by people suffering from dementia and their next of kin (Johansson and Lundh Snis 2011). The second project (“Free2Ride”) was a project with the aim to design and develop a digital service to be used by members of equestrian clubs (Johansson et al. 2016). In other words, we tried to design a digital service to be used in everyday life situations.

Engaged scholarship is primarily concerned with how academic researchers can be involved with practitioners in ways that meet their often diverse needs (Van de Ven 2007) and could therefore be regarded as practice-based research (Donnellan, Göran Goldkuhl et al. 2016). Engagement in the research is described as a process that involves “negotiation and collaboration between researchers and practitioners in a learning community; such a community jointly produces knowledge that can both advance the scientific enterprise and enlighten a community of practitioners” (Van de Ven, 2007: 7).

In the two projects, three groups of stakeholders were involved: users, developers of the digital service and researchers. As researchers we saw the possibility to combine insight from service design in practice with theoretical insights on digital service design. The developers saw an opportunity to design a digital service grounded in the needs of the users, and the users saw an opportunity to enhance their everyday life with a digital service.

One example of a service innovation theory is the service dominant logic (Lusch and Nambisan 2015). In the service dominant logic three broad roles of the service beneficiary (customer or user) have been identified: ideator, designer or intermediary. The ideator shares knowledge about needs and work context, the designer mixes knowledge resources in order to design a service, and lastly the intermediary cross-pollinates knowledge across service ecosystems (Networks of actors such as suppliers, developers and customer that span boundaries to jointly deliver services). From Lusch and Nambisan (2015) description it is clear that the knowledge sharing process is important to service design. In order to share knowledge, knowledge needs to be translated (Carlile 2004), transferred (Carlile 2004) and negotiated (Van de Ven 2007), which are the fundamental building blocks of learning. To follow the call for research on how service innovation theory (service dominant logic is one example) has been applied in the design of digital services, the research question is: How can learning processes be supported during co-creation of innovative digital services? We will take a closer look at the different roles of service beneficiaries and the knowledge-sharing process with the developers.

In engaged scholarship the researchers, developers and users are engaged in a learning community (crossing knowledge boundaries between involved stakeholders). Akkerman and Bakker (2011) identify four potential learning mechanisms that can

take place at boundaries between different actors during co-creation: *identification, coordination, reflection, and transformation*. Therefore it becomes natural to apply the analytical lens of learning mechanism (Akkerman and Bakker 2011) to complement the existing literature on digital service design. The aim of the paper is to propose a set of design implications grounded in the roles of the service beneficiary and how they support learning in the co-creation of innovative digital services.

## 2 Designing and developing digital services

In (Barrett, Davidson et al. 2015) the authors point out several directions for researchers within the information systems (IS) discipline. One of the directions is to study how service innovation theory (in our article “service dominant logic”) informs and may be applied in the design of digital services. One important concept in this article is digital service, which is described as the combination of digital technology and physical products to design new innovative digital services (Barrett, Davidson et al. 2015).

The design of innovative digital services is described as combination of digital and physical components to produce novel products or services (Yoo et al. 2010). The authors suggest that the digital technology can be understood as a layered modular architecture. The four layers in the architecture are: device layer, network layer, application functionality layer and contents layer. The device layer consists of the hardware and operating system; the network layer deals with connectivity; the application functionality layer is made up of applications that directly serve users to create, manipulate, and store contents and the contents layer includes contents (Yoo, Henfridsson et al. 2010). The layered model architecture not only distinguishes digital innovation from other types of products and services it also distinguish the design process of digital services.

In service innovation theory one important aspect is the re-bundling of resources, which is described as anything an actor can draw on for support (Vargo and Lusch 2004). Resources could be tangible or intangible, such as skills and knowledge (Barrett, Davidson et al. 2015). Knowledge and skills are operant resources, which can be used to act on other resources such as tangible resources in order to create value. Thus, the translation of knowledge becomes interesting during the process of service design.

In the process of designing digital services a network of actors is involved, including the beneficiary (Lusch and Nambisan 2015). In many cases, it is a dynamic process with feedback and feed-forward processes between the actors in the network (Hardless and Jaffar 2011). From the late 1990s until approximately 2010 the more non-linear design process of innovative digital services has been dominant. One example is Form-IT, proposed by (Bergvall-Kareborn et al. 2009). One of the fundamental principles behind Form-IT is the empowerment of the users/consumers and the involvement of researchers. Form-IT is an iterative and cyclical process of three phases (Bergvall-Kareborn, Holst et al. 2009): needs, design and evaluation. Form-It shares the same fundamental principles as the design thinking presented by Barrett, Davidson et al. (2015), namely a human-centred approach and an iterative process.

The process of designing digital services could be regarded as an enquiry rather than problem solving (Rodriguez and Peralta 2014). The enquiry should have a focus on how customer and service interact, and the integration of tangible with intangible

elements. The enquiry should thereby support the understanding of the customer journey. Cook et al. (2002) propose that understanding human interactions should be grounded in underlying behavioral science principles (such as learning theory).

Many activities take place in order to create value by applying operant resources (knowledge and skills) on tangible resources (objects, sketches, codes, etc.). These activities are recurring, situational, dynamic and interactive with the objective to provide a knowledge flow (Barrett, Davidson et al. 2015). According to (Orlikowski and Scott 2015), the activities in the design of service should be built on the needs of the actors in their everyday practices.

In the service dominant logic Lusch and Nambisan (2015) describe three generic roles that the customer (the service beneficiary) takes during the activities in the design of innovative digital service innovation: ideators, designers and intermediaries. Ideators bring knowledge about their needs, working context and how they use other similar services relevant to the one in focus. During co-creation the ideator is part of the envisioning of the service. It is noteworthy that knowledge sharing has a focus on working environment, not as in (Orlikowski and Scott 2015) where the focus is on the life situation. As mentioned above, HITTA and Free2Ride are examples of co-creation of digital services with the aim to support the everyday life situation. The designer mixes and matches knowledge components and resources to configure or design new services. The designer could also make suggestions of alternative interpretations of existing knowledge components. The third and last role is the intermediary, who cross-pollinates knowledge across service ecosystems.

### 3 Socio-cultural boundaries (learning mechanism)

As described in the introduction, taking part in a learning community is about crossing knowledge boundaries between involved stakeholders. One approach to understand the involvement of the service beneficiaries during the process of creating value (applying operant resources on tangible resources) is from a socio-cultural learning perspective. In the socio-cultural tradition, learning occurs when socio-cultural boundaries are crossed (Akkerman and Bakker 2011). In the socio-cultural perspective, boundaries are understood as a dialogical phenomenon. Boundaries are defined as sociocultural differences that give rise to discontinuities in interaction and action. For example, there could be discontinuities during interaction in service design projects such as HITTA and Free2Ride, due to differences in knowledge, background, experiences and skills.

Akkerman and Bakker (2011) identify four potential learning mechanisms that can take place at boundaries: *identification*, *coordination*, *reflection*, and *transformation*. The description of learning mechanisms in the article from Akkerman and Bakker (2011) is complemented with literature on communities of practice (Lave and Wenger 1991, Wenger 1999, Wenger et al. 2002), boundary objects (Star and Griesemer 1989, Star 1990, Star 2010), handling boundaries (Carlile 2002, Carlile 2004, Scarbrough et al. 2004, Levina and Vaast 2005) and perspective making and perspective taking (Boland and Tenkasi 1995).

The first learning mechanism, *identification*, describes boundary crossing as a process in which lines of demarcation between practices are destabilized. One part of the boundary crossing is the ability to *describe one practice in light of another*. This

dialogical process is referred to as *othering*. The description of othering has similarities with brokering as it is described by Wenger (1999).

*Coordination* as a learning mechanism is related to how boundary objects (Star and Griesemer 1989, Star 1990) are used in different situations. Four dimensions of coordination are identified: *communicative connection* (Scarborough, Swan et al. 2004); *efforts of translation* (Carlile 2004); *enhancing boundary permeability* (Levina and Vaast 2005) and *routinization*.

Reflection as a learning mechanism is closely related to interventions, which take place during action research projects. One important aspect is to learn something new about their own and others' practices. Much of this learning is done by making knowledge explicit in a cyclic process of perspective making and perspective taking (Boland and Tenkasi 1995).

The fourth learning mechanism, *transformation*, describes a kind of a process based on insights during the transformation: *confrontation*, *recognizing a shared problem space*, *hybridization*, *crystallization* and *maintaining uniqueness* of the intersecting practices. *Confrontation* starts with some lack or problem that forces two intersecting practices to seriously engage in addressing the problem. *Recognizing a shared problem space* follows up the confrontation. Hybridization is described as "practices that are able to cross their boundaries engage in a creative process in which something hybrid—that is, a new cultural form—emerges". The last two insights — crystallization and maintaining uniqueness of the intersecting practices — address how the result from the hybridization is spread to the intersecting practices.

A comparison between the service beneficiary role *intermediary* and the learning mechanism *transformation* (crystallization and maintaining uniqueness) shows that both are described as an outreach from the ongoing collaboration. *Intermediary* is a role that cross-pollinates knowledge across service ecosystems and crystallization is about spreading the result to intersecting practices.

Another comparison could be between the service beneficiary role *designer* and the learning mechanisms coordination and reflection. The comparison shows that matching knowledge during co-creation is in focus. Underlying foundations of matching knowledge is the establishment of a communicative connection and efforts of translation, in order to smoothen the boundary permeability. Another foundation of matching knowledge is to take and make different perspectives.

The third and last comparison is between the service beneficiary role *ideator* and the learning mechanisms identification, coordination (efforts of translation) and transformation (recognizing a shared problem space). Ideators bring knowledge about their needs and working context in order to envision the future service. During that process there are several conditions that need to be fulfilled. One of them is the identification of a shared problem space, while another is the translation of knowledge when needs are described.

## 4 Research approach – Engaged scholarship

The main research approach applied in this paper is the engaged scholarship approach (Van de Ven 2007). The approach has a pragmatic perspective similar to other action-oriented approaches (Baskerville and Myers 2004), thus the research presented here is characterized by a pragmatic approach with an underlying interpretative philosophy

(Myers 1997). The interpretative perspective is suitable to facilitate a process of understanding during for instance the two projects mentioned above.

In the projects the researchers were involved and engaged, taking an active role in order to get a rich picture of boundaries, learning mechanisms and roles of the service beneficiaries. Engaged scholarship is primarily concerned with how academic researchers can engage with practitioners in ways that somehow meet their often diverse needs. It is also an approach to study complex problems where the perspectives of different stakeholders are important.

In this approach, four different forms are identified: informed basic research, design/evaluation research, collaborative basic research and action research. These last two forms (collaborative basic research and action research) are examples where the researcher has the attached insider perspective (being involved) and takes part in the activities alongside the different stakeholders. The attached insider researcher develops context-specific knowledge that can guide action by dealing with the complexity of the problem. In informed basic research and design/evaluation research the researcher has an outsider perspective.

In this study, the researchers adopted an insider perspective (action research and design research) and were engaged with, rather than for, the practice. Our approach to the design research was from more of an insider perspective, as design and evaluation (co-creation) was done in a continuous manner together with the stakeholders throughout HITTA and Free2Ride. To gain an understanding of the knowledge sharing process between service beneficiaries and developers regarding learning mechanisms, the researchers also took a detached outside perspective.

The design of digital service in practice will be reported from two projects: HITTA and Free2Ride (F2R). Both projects are examples where the involved stakeholders such as users, developers of the digital service and researchers co-create digital services. The planning and setup of HITTA was inspired by Form-IT (Bergvall-Kareborn, Holst et al. 2009).

The major idea in the first project (HITTA) was to design and develop a digital service that could be used by people suffering from dementia and their next of kin (Johansson and Lundh-Snis 2013). A recurring problem for next of kin and people suffering from dementia is that the person with dementia sometimes gets lost, especially when a situation is perceived as stressful. Involved in HITTA were researchers, six to eight next of kin to people suffering from dementia and three designers from a company aiming to design the digital service. The designed digital service consisted of a transmitter and a receiver (Fig. 1). The transmitter should be attached to the person with dementia and the receiver should be carried by the next of kin.



Figure 1: Transmitter and receiver

The second project (Free2Ride) was a project with the aim to design and develop a digital service to be used by members of equestrian clubs. The planning and setup of Free2Ride was also inspired by Form-IT (Bergvall-Kareborn, Holst et al. 2009). F2R started with an open approach based on the needs, where we identified several potential digital services. One need that was prioritized was safety among horse riders and their relatives (Johansson and Lundh-Snis 2013), for instance during outdoor riding alone. The digital service that was developed consisted of an application running on Android smartphones and a piece of hardware (that should be attached to the horse) that communicated in order to report when the rider was separated from the horse (Fig. 2).

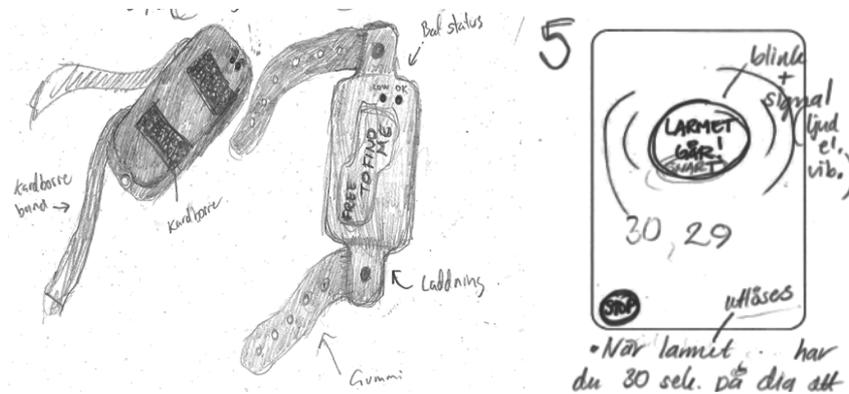


Figure 2: Early sketches of the transmitter and the interface of the application

Involved in F2R were approximately 20 members from two equestrian clubs, three developers and two researchers. In order to get a rich picture of the needs and the process the researchers collected data with different approaches such as field visits, meetings, on-line activities, questionnaires, workshops and interviews.

#### 4.1 Action and design research – Intervention and data gathering

As mentioned earlier the empirical data comes from two different projects, HITTA and Free2Ride. The planning of the Free2Ride project started in August 2009. One of the main ideas was to involve the stakeholders from the beginning, in the writing of the research application. It took two months to write the application. Involved in the writing process were two members from the equestrian clubs, the CEO from the ICT developers and researchers.

<b>Free2Ride</b>	<b>HITTA</b>
identifying needs and generating requirements	identifying needs and problems
(re)design	comparing needs vs. ICT prototype
developing conceptual prototypes	(Re)Design
evaluating the design and prototypes (the design concept)	Evaluate
developing the ICT demonstrator	Customization
evaluating the ICT demonstrator	

Table 1: The iterative phases

The two projects followed a structure of iterative phases. In Free2ride there were six phases and in HITTA five phases (Table 1). HITTA started with the main idea to learn more about the needs of relatives in order to customize (in this paper customization is interpreted as significant improvements to an existing product) the ICT product based on the needs. In Free2Ride the starting phase was more open, with new ideas being generated by the members of the two equestrian clubs.

HITTA lasted for about four months, and during the project the researchers gathered about 20 hours of empirical data (workshops and meetings) plus different kinds of document (photos, sketches and documents). Free2Ride lasted for 17 months. During the project the researchers gathered approximately 60 hours of data through workshops, meetings, field visits, on-line activities, and interviews. In Free2Ride we also gathered different kinds of documents (photos, sketches, scenarios, videos, logs and documents).

#### 4.2 Informed basic research – interpretation and analysis

As mentioned earlier, the aim of the paper is to propose a set of design implications grounded in empirical descriptions and analysis of service beneficiary roles from a learning mechanism perspective. The presentation of the empirical data will follow the three service beneficiary roles: ideator, design and intermediarie. The three roles will serve as themes (Myers and Avison 2002). When describing the roles, one episode from each project will be presented.

In order to prepare the analysis the empirical data from each project (HITTA and Free2Ride) was structured in a timeline. In that timeline three episodes was selected were the different roles (ideators, designers and intermediaries) of service beneficiary interacted with the developers in order to cross knowledge boundaries. The episodes was thereafter analysed in relation to the learning mechanisms (Akkerman and

Bakker 2011). The analysis served as a foundation for identifying design implications. The presentation of the three roles will end with an analysis from learning mechanism perspective.

## 5 Design of digital services

The two projects have some similarities. One similarity is that the digital service should *support the everyday life* of the intended group of users. Therefore it became necessary to understand their everyday life. Another common denominator between the projects is that the projects relate to safety within everyday life activities. The designers of digital services need to know more about situations where their service could help out. In order to reach that goal, the early workshops were dedicated to create scenarios (as described further in 5.1).

In the HITTA project the next of kin of persons with dementia described their everyday life and their concerns. For instance, if a family member is away doing an errand, maybe the person with dementia “wants to go for a walk during the time the next of kin is away”, so when the family member comes back, there is nobody at home. This is part of the everyday life of a next of kin to a person with dementia and this is perceived as stressful. One of the goals of HITTA is therefore to “reduce the amount of anxiety perceived by the next of kin”. Service design is complex (Rodriguez and Peralta 2014) and during the design process we need to understand human behavior and an individual’s interactions and relations to other human beings (Cook, Bowen et al. 2002).

In Free2Ride, the members of the equestrian clubs reported that one very frequent activity among recreational horse riders is to take a ride in a nearby forest or park. On many occasions the horse riders are riding on their own. If an accident happens, the horse rider is by herself in a place where there are not many people around. Therefore it becomes natural to address safety with Free2Ride!

### 5.1 Ideator

Before the Free2Ride project started, the researchers set up a meeting between representatives from equestrian clubs and the developers of digital services. In that meeting the general idea was to formulate an application to get funding. As usual, one item on the agenda was introductions. The developer of digital service introduced the company as experts on wireless communication, especially Bluetooth data transmission. The equestrian clubs presented their business and problems within their business according to two themes; communication and safety.

The third step on the agenda was to formulate scenarios based on the digital service and the two themes. After approximately one hour, four scenarios were developed by the equestrian clubs and the developers. The first scenario relates to communication and safety:

“Accident during an outdoor horse ride

A horse rider is out riding in the forest, the rider is equipped with a Bluetooth transmitter with a built-in GPS, the transmitter has an alarm function linked to the horse that allows the alarm to be activated and the transmitter begins to send information to a relative of the horse rider if the rider fell off the horse or the horse gets too far away from the rider.”

The first meeting in HITTA between the developers of digital services and the next of kin to people suffering from dementia was in an apartment in Varberg. The apartment belonged to the health care service in Varberg. The first meeting started with a presentation of the developers and their company, after which the next of kin made a short presentation of who they are. The developers demonstrated their transmitter and receiver. The next of kin didn't say much, they mostly listened and asked some questions. The next item on the agenda was to create scenarios based on the next of kin's life situation and the digital service.

The researchers had prepared sticky notes with the words: Who? How? When? What? Where? When the next of kin started to work with the scenarios, the developers circulated and discussed with the next of kin. During the discussions the developers made statements like: This is really interesting. On one of the sticky notes the next of kin had written:

“What?

If a person has disappeared, where should I start looking? No information about direction! Go on the internet to get an indication of the location of the missing person”

After the work with the scenarios the groups presented their sticky notes in a round table discussion. A lot of questions were asked by the developers and the next of kin.

The two empirical examples describe the process of presenting one's practices in light of the service to be designed, which is one example relating to othering, reflection and transformation (Akkerman and Bakker 2011). It is not that much; describe one practice in light of another (Othering), describing one practice (making knowledge explicit (Boland and Tenkasi 1995) more in the light of the service design to come (transformation - recognizing a shared problem).

The two examples also describe the process of creating and presenting scenarios. This process could be regarded as applying operant resources (knowledge, such as the experience from the next of kin) to tangible resources (the scenario could be an object or sketch). The scenario could also be regarded as a boundary object (Star 2010, Akkerman and Bakker 2011) which enhances the communicative connection, translation and boundary permeability. Boundary permeability is described as how smooth the interaction is between practices (Akkerman and Bakker 2011) regarding the number of discontinuities and misunderstandings. One example relating to boundary permeability is “No information about direction! Go on the internet to get an indication of the location”, from the quote above. The next of kin couldn't understand why information about direction was missing on the transmitter and receiver, so they asked a lot of questions. The developers tried to describe why the information about direction was missing! During their explanation they realized that they made a mistake, they told the next of kin we have made a mistake – information about direction should be included.

## 5.2 Designer

During a workshop in HITTA one of the next of kin, Lars, took an initiative. Lars said he wanted to show us something. He had copied a newspaper clipping (Table 2) from the local newspaper and described what had happened to him and his wife rather recently.

<p>...länge sen som han gick fri från ett fängelsestraff.</p> <p><b>Kvinna hittades välbehållen</b> 12/12 09</p> <p><b>VARBERG.</b> Den 73-årige dementa kvinnan lämnade sin bostad i Varberg klockan 21.40 i måndagskväll. När hon inte hade kommit hem 22.15 larmade hennes man polisen.</p> <p>Polisen startade upp sökandet och påträffade kvinnan några timmar senare. Kvinnan var utom fara, förutom att hon var lite nedkyld.</p>	<p><b>Female found in good condition (2/12/2009)</b></p> <p>The 73 year old demented female left her apartment in Varberg at 9:40 p.m. on Monday. When she did not return at 10.15 p.m. her husband (Lars) called the police.</p> <p>The police started searching for the female and found her a couple of hours later. The female suffered from slight hypothermia and her life is not in danger.</p>
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Table 2: Newspaper clipping

Lars explained that similar incidents had happened afterwards. Lars had a two-fold purpose in showing the newspaper clipping. First, he wanted us (researchers and developers) to get a deeper understanding of the life situation of a next of kin to a person with dementia. Second, according to Lars, one essential need was to point out that in most situations in which persons with dementia become separated from the next of kin they are close to home or the next of kin is actually fairly near the person with dementia but cannot find her or him.

Lars described two other occasions when he had been separated from his wife. The first was when they were at an airport and she suddenly disappeared just before they were going to board the airplane. The second occasion was at the Gothenburg Opera where she disappeared during the break between the acts. These two situations were extremely stressful for both Lars and his wife.

One of the developers started to ask follow-up questions, such as: “How far did your wife go?” and “What is the maximum reach of the sender and receiver?” During the discussion the other next of kin supported these ideas and recognized themselves in Lars’s description. The developers started a discussion based on Lars’s initiative, and their opinion was that his input was truly important: “Maybe this is the first time we really understand the life situation of a next of kin to a demented person.” I asked Lars after the initiative why he acted as he did. He answered: “Because the developers and researchers listen to our opinion and to some extent are engaged in our well-being.”

As mentioned before Free2Ride was a project that lasted for 17 months. During one part of the project we used a Web-based platform as a communication tool. The forum was used by the researchers and the members of the equestrian clubs to post news, questions, design documents and progress reports. One of the news items (a link to a newspaper and Swedish Television) that was posted, regarded safety during indoor horse riding.

During the late summer and early autumn of 2010 the Swedish national television and a national newspaper reported on two accidents that unfortunately led to the death of two teenage girls [1,2]. Both accidents took place during indoor riding when practicing show jumping. The teenage girls were skilled show jumpers who had practiced for many years and on these occasions they were practicing on their own. We don’t know exactly what happened during the accidents but the outcome was terrible. A few weeks after the news was posted the researcher checked the forum for comments

and feedback. To our surprise no comments were made by members from equestrian clubs or the developers. At the following workshop that took place three weeks later we were quite surprised (again), because the developers and members started to discuss the accidents. One of the threads in the discussion was about the relevance of digital service. Another thread in the discussion was about the design specification and our prioritization on safety during both indoor and outdoor horse riding. Unfortunately (and in a strange way) the accidents did confirm our design specification and our prioritizations. One consequence of the discussion was that the evaluation of the prototype took place indoors.

One of the major ideas in the role of the designer is to match knowledge (Lusch and Nambisan 2015) between practices. The newspaper clipping that Lars showed relates to establishing communication and translating knowledge (Akkerman and Bakker 2011), and he used the newspaper clipping as a boundary object (Star 1990, Star 2010). The newspaper clipping also started a process of perspective making and perspective taking (Boland and Tenkasi 1995). After the process the developers realized that on many occasion when a person with dementia is missing, the next of kin is nearby. In Free2Ride there was a similar process due to the posting of newspaper links addressing accidents during the practice of show jumping. The developers realized that on occasion, accidents also happen indoors, not only during outdoor horse riding.

### 5.3 Intermediaries

One of the stakeholders (the service beneficiary) in the learning community could be regarded as a community of practice (Wenger 1999) such as the equestrian clubs involved in Free2Ride. The equestrian club members have a lot in common, for instance a shared interest, problem or concerns. But that does not necessarily mean that the community is a homogenous group. It could consist of heterogeneous actors, where the actors share the same interest but act and contribute to the community in different ways and thereby have different needs when it comes to the use of digital services. In an equestrian club there are for instance semi-professional horse riders (who compete on a regular basis), recreational horse riders (who don't compete), instructors, "pony-moms" (in Swedish "ponny mammor") and a large group of people that just help out (who are not interested in riding a horse). A semiprofessional horse rider practices a lot, maybe two to three hours every day. During the practice there is interplay between the horse and the horse rider. One concern during the practice is the workout by the horse: how strenuous was the work out, and in the long run how could we improve the workout? The well-being of the horse was a major concern. On several occasions during Free2Ride there were several loud discussions between the members of the equestrian clubs. Two of the common denominators among the different groups within the community is the well-being of the horse and the safety of the rider.

In the second project, HITTA, the concern of the community of practice is the caretaking of the person with dementia. Depending on the progress of the dementia, caretaking takes place either at home or in an institution. If the caretaking takes place at home the next of kin is offered support from home care services. The amount of time and support from the home care services is dependent on the progress of the dementia; it could range from one or two visits per week to multiple visits per day. In many cases the major caretaker is the next of kin, such as wife, husband, son or

daughter. The next of kin is on duty 24/7. During the workshops the next of kin discussed their situation between each other and more or less compared each other's lives. Depending on the progress of the disease the life situation differed. On one occasion one of the next of kin didn't feel too good, he hadn't been getting a full night's sleep for at least one week. He talked a lot to the other next of kin, asking questions about their situation at home. He had one major question he needed to straighten out, if it was time for his wife to be placed in an institution. This is not an easy question! But the discussion with the others helped him feel better.

The role of the intermediary cross-pollinates knowledge between service ecosystems (Lusch and Nambisan 2015). The empirical episodes presented above describe cross-pollination of knowledge, but not between service ecosystems. Instead it describes cross-pollination of knowledge within a community from a service ecosystem. In that eco-system the service beneficiary is a heterogeneous group of people. In HITTA and Free2Ride the service beneficiaries were a group that consisted of many different roles. In HITTA it was dependent on the progress of the dementia and in Free2Ride it was dependent more on how much practice. The crystallization (Akkerman and Bakker 2011) is between heterogeneous groups within a community of practice.

## 6 Deriving design implications

The starting point of this paper was the call for engaged research on design of digital services (Barrett, Davidson et al. 2015). One of the directions pointed out is to study how service innovation theory informs and may be applied in the design of digital services. In our study the focus has been on roles of the service beneficiary (as an example of service innovation theory) in the design (co-creation) of digital services. The digital services should enhance the everyday life situation of a specific group of customers, in our two projects next of kin to persons with dementia and members of equestrian clubs. It is worth noting that the services are not limited to a working context, as the digital service could be used in everyday life.

The research question posed in this article is: How can learning processes be supported during co-creation of innovative digital services The main arguments behind the learning approach are: 1) when applying the engaged scholarship the researchers, developers and users are engaged in a learning community; and 2) that understanding human interactions in service design should be grounded in underlying behavioral science principles.

The aim in this article is: to propose a set of design implications grounded in the roles of the service beneficiary and how they support learning in the co-creation of innovative digital services.

The first proposed design implication is: **The understanding of value-in-use of the digital service for everyday life activities is dependent on the process of making knowledge explicit.**

Knowledge has been described as an operant resource, which can be used to act on other resources such as tangible resources in order to create value (Vargo and Lusch 2004). A foundation for creating value is to have an understanding of value. What could be regarded as value in the everyday life situation (outside work context), for instance safety, is not easy to grasp for the involved actors. Another argument that relates to safety is a statement from the empirical data "well-being". In order to un-

derstand value-in-use an understanding of “well-being” in everyday life activities is necessary.

The second proposed design implication: **It is not enough to understand the needs of the service beneficiary; designers of digital services aiming to support everyday life activities need to understand What? How? Why? in the everyday life practice of the service beneficiary.** Three broad roles of the service beneficiary (customer or user) have been identified within the service dominant logic (Lusch and Nambisan 2015): ideator, designer or intermediary. The three roles are placed in a working context where they express needs, envision the service, share knowledge, design knowledge components and cross-pollinate knowledge. But the background story, why the service is important, is not described in relation to the roles. The empirical data has a lot of rich descriptions relating to background stories.

The third proposed design implication: **Engagement and trust are interrelated and embedded in co-creation of the digital service for everyday life activities.** The main argument behind the third design implication is a statement from the empirical data: “Because the developers and researchers listen to our opinion and to some extent are engaged”. In the related literature on service design, trust is not explicitly mentioned, nor is it explicitly mentioned in the learning mechanism perspective. Implicitly, trust could be regarded as an underlying behavioral science principle (Cook, Bowen et al. 2002). Akkerman and Bakker (2011) describe transformation as a learning mechanism that starts with confrontation. The confrontation is regarded as a process that leads to engagement and thereby implicitly relates it to trust. Future research could focus on the relationship between engagement and trust during the design of digital services aiming at everyday life activities.

The three proposed design implications is a response to the call for research on how service innovation theory informs and may be applied in the design for digital services (Barrett, Davidson et al. 2015). The presented research is also a response to Barrett, Davidson et al. (2015) suggestion for research where the researchers actively engage with the practice during the design for service. The findings have not been related to other findings on design within IS. One of the future research directions is to carry through a literature survey on design and development of digital services where a learning perspective has been applied as an analytical lens.

## 7 Conclusion

As outlined in the introduction, the aim was to propose a set of design implications grounded in empirical descriptions and analysis of service beneficiary roles from a learning mechanism perspective. In this study we started to explore the empirical findings from two projects, HITTA and Free2Ride, in order to gain a deeper understanding of service design, service beneficiaries and learning mechanisms. In conclusion, we have derived three design implications for the design of innovative digital services that aim to create value in everyday life situations regarding safety:

- The understanding of value-in-use of the digital service for everyday life activities is dependent on the process of making knowledge explicit
- It is not enough to understand the needs of the service beneficiary; designers of digital services aiming to support everyday life activities need to understand What? How? Why? in the everyday life practice of the service beneficiary

- Engagement and trust are interrelated and embedded in co-creation of the digital service for everyday life activities

The three proposed design implications are a response to call for engaged research in design of digital services for the information systems researchers interested in this kind of design. This list is not exhaustive; instead the characteristics have emerged through the two projects. The proposed design implications have not yet been tested or evaluated in a setting similar to HITTA and Free2Ride, aiming at enhancing everyday life of a specific user group. It is important to evaluate these characteristics in practice during service design research which could lead to insights for the service design researcher.

## References

- Akkerman, S. F. and A. Bakker (2011). "Boundary crossing and boundary objects." Review of educational research **81**(2): 132-169.
- Barrett, M., E. Davidson, J. Prabhu and S. L. Vargo (2015). "Service innovation in the digital age: key contributions and future directions." Mis Quarterly **39**(1): 135-154.
- Baskerville, R. L. and M. D. Myers (2004). "Special issue on action research in information systems: making is research relevant to practice-foreword." MIS Quarterly **28**(3): 329-336.
- Bergvall-Kareborn, B., M. Holst and A. Stahlbrost (2009). Concept design with a living lab approach. System Sciences, 2009. HICSS'09. 42nd Hawaii International Conference on, IEEE.
- Boland, R. and R. Tenkasi (1995). "Perspective Making and Perspective Taking in Communities of Knowing." Organization Science **6**(6): 350-372.
- Carlile, P. R. (2002). "A pragmatic view of knowledge and Boundaries:Boundary Objects in new product development." Organization Science **13**(4): 442-445.
- Carlile, P. R. (2004). "Transferring, translating, and transforming: An integrative framework for managing knowledge across boundaries." Organization Science **15**(5): 555-568.
- Cook, L. S., D. E. Bowen, R. B. Chase, S. Dasu, D. M. Stewart and D. A. Tansik (2002). "Human issues in service design." Journal of Operations Management **20**(2): 159-174.
- Donnellan, B., Göran Goldkuhl, M. Helfert and J. Sjöström. (2016). "Pre-ICIS Workshop on practice-based design and innovation of digital artifacts." Retrieved 161002, 2016, from <http://sigprag.net>.
- Hardless, C. and A. D. Jaffar (2011). "Heterogeneous Inter-Organisational IT Innovation Creation: Institutional constraints in a public sector oriented market." Scandinavian Journal of Information Systems: **23**(1): Article 2.
- Johansson, L.-O. and U. Lundh-Snis (2013). "Co-Creation in a Boundary Practice: Lessons Learned from an Engaged Scholarship Approach."
- Johansson, L.-O., U. Lundh Snis and L. Svensson (2016). A boundary practice perspective on co-creation of ICT-innovations. SCIS 2016.
- Johansson, L. O. and U. Lundh Snis (2011). The Dynamics of Interaction: Exploring a Living Lab Innovation Process from a Community of Practice Perspective. Pacific Asia Conference on Information Systems.

- Lave, J. and E. Wenger (1991). Situated learning: legitimate peripheral participation. Cambridge, Cambridge University Press.
- Levina, N. and E. Vaast (2005). "The emergence of boundary spanning competence: Implications for implementation and use of information systems." MIS Quarterly **29**(2): 29.
- Lusch, R. F. and S. Nambisan (2015). "Service Innovation: A Service-Dominant Logic Perspective." Mis Quarterly **39**(1): 155-175.
- Mathiassen, L. and P. A. Nielsen (2008). "Engaged Scholarship in IS Research:The Scandinavian Case." Scandinavian Journal of Information Systems **20**(2): 3-20.
- Myers, M. D. (1997). "Qualitative Research in Information Systems." MIS Quarterly **21**(2): 241.
- Myers, M. D. and D. Avison (2002). Qualitative Research in Information Systems, SAGE Publications.
- Orlikowski, W. and S. V. Scott (2015). "The Algorithm and the crowd: Considering the materiality of service innovation."
- Prahalad, C. K. and V. Ramaswamy (2004). "Co-creating unique value with customers." Strategy & Leadership **32**(3): 4-9.
- Prahalad, C. K. and V. Ramaswamy (2004). "Co-creation experiences: The next practice in value creation." Journal of interactive marketing **18**(3): 5-14.
- Rodriguez, L. and C. Peralta (2014). "From Product to Service Design: A Thinking Paradigm Shift." FORMakademisk–research journal for design and design education **7**(3).
- Scarbrough, H., J. Swan, S. Laurent, M. Bresnen, L. Edelman and S. Newell (2004). "Project-based learning and the role of learning boundaries." Organization Studies **25**(9): 1579-1600.
- Sein, M. K., O. Henfridsson, S. Purao, M. Rossi and R. Lindgren (2011). "Action Design Research." MIS Quarterly **35**(1): 37-56.
- Star, S. (1990). "The structure of ill-structured solutions: boundary objects and heterogeneous distributed problem solving." Distributed artificial intelligence **2**.
- Star, S. L. (2010). "This is not a Boundary object: Reflections on the origin of a concept." Science, technology and Hman Values **35**(5): 601-617.
- Star, S. L. and J. R. Griesemer (1989). "Institutional ecology,translations' and boundary objects: Amateurs and professionals in Berkeley's Museum of Vertebrate Zoology, 1907-39." Social Studies of science **19**(3): 387-420.
- Van de Ven, A. H. (2007). Engaged Scholarship:A Guide for Organizational and Social Research, OUP UK.
- Vargo, S. L. and R. F. Lusch (2004). "Evolving to a New Dominant Logic for Marketing." Journal of Marketing **68**(1): 1-17.
- Wenger, E. (1999). Communities of practice: learning, meaning, and identity. Cambridge, Cambridge University Press.
- Wenger, E., R. Mcdermott and W. M. Snyder (2002). Cultivating communities of practice. Boston, Harvard Business School Press.
- Yoo, Y., O. Henfridsson and K. Lyytinen (2010). "The New Organizing Logic of Digital Innovation:An Agenda for Information Systems Research." Information Systems Research **Forthcoming**.