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Digital Service Design for Service-Oriented Business Models

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Abstract

Today, digital solutions are integral and strategic parts of most service-oriented organizations. Similarly, the ICT (information and communication technologies) sectors are also moving towards service-oriented business models because of advancements in mobile and cloud technologies. Therefore, the service-oriented approach must be applied to innovating, designing and developing service solutions. This paper describes experiences from the digital service design and development processes in which several stakeholders were involved. This iterative design process resulted in several innovate mobile and cloud based services. The study results demonstrate that inventing or designing new digital services in cross-disciplinary teams by using the holistic viewpoint of the customer journey ensure better integration of business expectations and technological possibilities. The contribution of this paper is the experiments which result in innovative mobile and cloud based concepts, applications or services.

Keywords: Digital Services, Mobile, Tourism, User-Centered Design

Introduction

According to the Gartner research, ICT will develop more in the next 20 years than it has during the last 20 (Biscotti & Sommer, 2010). This might be an amazing research opportunity for today's decision makers and consumers, as we have already seen dramatic changes in digitalization in our society. However, the ICT sector is still moving towards service-oriented business models because of the latest developments in mobile and cloud

technologies, internet of things applications as well as the popularity of social computing (Dubey & Wagle, 2007; Turner, M., Et al., 2003; Leeflag et al., 2014; Porter & Heppelmann, 2015). The different devices, servers, applications, and software systems are connected to each other through cloud computing in the service-based ICT sector. Therefore, service design will play a significant role in the future design processes of new digital services, and the service orientation should change as digital services are

innovated, designed, and developed. The traditional software development models, wherein required specifications are too often just listings of desired features and the development of user experience is only tied to usability and user interface planning, are lacking when compared with the service orientation approaches.

Digital solutions are currently an integral part of most service processes in almost all private and public sectors. Many public and private organizations are looking for means to increase productivity, save on costs, develop more automation approaches, utilize the Internet more efficiently, and refine ICT, which are also seen as a key facilitators for improvements (Ala-Pietilä, et al., 2013). The ICT sector also permits several new business models and services that are not possible without modern Internet technologies. Therefore, they have become strategic assets for many modern Internet-based companies, such as TripAdvisor, Zalando, Alibaba and Uber (Moritz, 2014).

Today, digital solutions are delivered as a service in most use cases. In addition to this, contemporary advancements in Internet technologies; mobile and cloud services; software development frameworks, such as Vaadin and PhoneGap; and rapid prototyping tools, such as Fluidui.com and BuildFire.com; have provided unique opportunities to develop faster prototypes and more robust mobile applications (see e.g. Grönroos, 2014; PhoneGap Community, 2015).

In the cloud service model, the application is delivered as a service over the Internet; in other words, it can

be characterized as the online delivery of software where the software system itself is hosted by the service provider (Benlian, et al. 2009). Although the main elements of graphical user interface and navigation structure appear to be similar for all companies, the customers can actually create content unique to their systems and configure the software to some extent. Hence, the end users and companies receive business benefits from the cloud services, but they do not need to take care of hosting those services. That is why they are delivered as a service: the service provider is responsible for the technical tasks that are needed in running the cloud services.

In the user or customer-driven development models, value co-creation is an essential part of the innovation and design processes (Galvano & Dali, 2014). For example, the latest research on marketing and sales has placed much attention on value co-creation, where salespeople and customers design value proposals together (Haas, et al., 2012; Alamäki & Kaski, 2015). In the ICT sector, value co-creation mainly takes place in user-centered design processes, where all stakeholders have been involved in the design activities or might potentially impact solutions proposals in all phases of the development process, not only in the beginning (Alamäki & Dirin, 2014; 2015).

Users as Designers

Digital service development is not a straightforward linear process, but instead requires several iterative experiments before the final productizing and commercialization. Blank (2012) believes that discovering

customers' real problems and needs is the most important part in creating new and financially valuable solutions. He continues that in the iterative development model, going backwards is a natural and valuable part of learning and discovery, whereas the traditional linear product development model sees going backwards as a failure or waste. Finding the right customers and markets is often unpredictable, and software and digital service developers need to fail several times before they get it right (Blank, 2007; Ries, 2010). For example, the Angry Birds mobile game was initially only a fifty second game developed by Rovio Mobile corporation. Similarly, another game developer, Supercell Corporation, started first to build games for the users of Facebook before they pivoted in their strategy and focused only on table computer.

The participation of users in the actual innovation processes is a more effective way to acquire user knowledge than traditional data collection methods (Holopainen & Helminen, 2011). The service design method brings value in integrating the different stakeholders and their needs to the digital service development processes (Cook et al., 2002). It also ensures that the customer experience is reviewed, especially from the vantage points of the customer journey and touch points (Zomerdijk & Voss, 2010). The customer experience has a direct impact on the success of digital services and their commercial potential, as it has become the most significant critical success factor in the software business.

The usability and user experience considerations in mobile and cloud service development are becoming

increasingly important in contemporary mobile and cloud application developments (Dirin & Nieminen, 2013; 2015; Nieminen, 2004). Digital service usability requires multi-level usability assessments, which form a complex, yet important process. This is accomplished by applying appropriate software development methods, such as user-centered design (UCD) or lean product development—and now the service design movement would provide new approach to this challenge. All of these methods consider users to be key stakeholders at various design and development stages. Hence, developers need to involve users continuously in the development process and refine the design concept into a serviceable system based on users' feedback (Gould 1985; 1997, Kujala & Kauppinen 2004).

The term 'user-centered design' is attributed to the writings of Norman during 1980s (e.g. Norman & Draper, 1986). The user-centered design of interactive systems has seen an increased importance in product development organizations, as it both cuts costs and improves usability. Furthermore, design methods should also pay special attention to the business benefits of this design method because it ensures that end users are involved in the same processes as business owners (Kaski, Alamäki & Moisio, 2014).

Unlike the user-centered design method, in which users are consulted continuously at various stages of mobile application concept development, the lean development principle is based on the value that the product provides to the consumer. Lean concepts originated from the

lean manufacturing principles developed by Toyota, and lean software development originated with the writings of Poppendieck (2003). The lean model focuses on customer feedback and reduction of waste. Based on lean software development principles, waste is defined as any part of the development process that does not create value for consumers. The lean startup approach combines user-centered design principles with the lean method. In this approach, rapid experiments by real users with so-called 'minimum viable products' represent valuable co-creative processes that aim to limit wasted codes and programming (Ries, 2010).

Research Objective and Methodology

The research objective of this study is to contribute the discussion and practices of digital service design. Therefore, this study focuses on the following research question; How multi-disciplinary design teams would enhance the integration of various stakeholders' perspectives and design viewpoints in the digital service design processes?

In order to increase our understanding of the digital service design practices and answering to our research question, we use case study approach (Benbasat, et al., 1987; Eisenhardt, 1989; Yin, 2009). The experiences described in this paper are based on development projects wherein various stakeholders have ideated and designed digital service concepts and prototypes either as a research project, student project, or in short one or two day InnoCamps. The design experiences in InnoCamps were collected through an action research

strategy during and after the workshops. The results of the user-centered design process in the mobile guide for tourism companies project and the higher education course work experiences were originally published elsewhere (Alamäki & Dirin, 2014; 2015; Dirin & Alamäki, 2015), but this paper discusses them further because they look prioritize the viewpoint of the customer's journey.

Case Studies: Experiments from Digital Service Design Events

1. SoLoMo InnoCamp

In the SoLoMo (social, local and mobile) InnoCamp event, over fifty (n=50) ICT, tourism and service professionals shared their innovative new services for tourism sectors in 2013 in Helsinki, Finland. The participants were from city organizations, companies, and other public organizations. This happening was organized by The Centre of Expertise Program (OSKE) and Haaga-Helia University of Applied Sciences. SoLoMo is a mobile service that utilizes social, local and mobile functions in digital applications and services. According to the oral feedback collected during and after the InnoCamp by using the action research strategy, participants were satisfied with the working methods and the overall results. The participants represented different professional backgrounds and worked in teams to improve the inventing and defining of relevant ideas and concepts for selected tourist segments. The target tourist profiles were acted out and presented to participants by illustrating their typical service journeys. As the result of these

working team activities from the InnoCamp event, we came up with several new useful digital service concepts.

2. Digital Finance InnoCamps

Two Digital Finance Service InnoCamp events in cooperation with four private companies were organized by Haaga-Helia in 2014. Picture 1 depicts the team working session in the aforementioned event.

In the first Digital Finance InnoCamp event, which was organized in spring 2010, we had 80 participants, and 100 participants took part in the second Digital Finance InnoCamp event in the autumn of 2014. Participants consisted of ICT and business students, companies, and relevant city sector representatives, in addition to the instructors who facilitated the activities. The student feedback (n=17) was collected after the autumn 2014 InnoCamp event, which revealed that they appreciated working with professional experts and the multidisciplinary nature of the team work. Similar experiences were mentioned in informal discussions with the instructors who planned and managed the InnoCamps at both events. Several new concepts were created in the workshops, and the companies have selected the ones with the most potential for further review and prototyping.



Picture 1. A multi-disciplinary group working in the Digital Finance InnoCamp.

3. Mobile Guide for Outdoor Tourism Companies project

Similar cross-disciplinary concept development experience was gained in the mobile tourism project (Alamäki & Dirin, 2014; 2015). In this project, the participants were tourism and tourism-related companies (n=7), along with their customers (n=50), in addition to the tourism and ICT students and teachers (n=20) from Haaga-Helia University of Applied Science. Pictures 2 and 3 depict two different field test trips in the previously mentioned research projects. The stakeholders' cooperation ranged from designing of the application concept up to testing activities. As with the InnoCamps, these events provided significant multidisciplinary team work and co-creation experience for all stakeholders in several service design phases.



Picture 2. A field test trip where a mobile guide prototype was used by tourism experts, a partner company, and a German navigation consultant who reviewed concept with regards to European markets.



Picture 3. Testing concept and prototypes with tourism students in the snow-showing tour.

4. Mobile Tourism course project

Similar findings were realised based on submitted course feedback, where ICT students (n=21) worked in cooperation with tourism students (n=9) in designing mobile tourism applications to boost Porvoo tourism industries (Dirin & Alamäki, 2015). In this feedback survey, the visualized customer journey was also cited as being helpful when innovating and conceptualizing new mobile services.

Discussion

These cases show that involving stakeholders in the design process as equal partners promotes rapid development and more quickly integrates business expectations, user needs and technological possibilities. Thus, this study supports and validates the model presented in the Figure 1. We should invent, define and design new digital service approaches in cross-disciplinary teams by using a holistic, end-to-end process viewpoint for promoting user experience, business benefits and technological feasibility. The end-to-end approach in software development is closely

related to the customer journey principle used in the service design literature.

In addition to cross-disciplinary co-creation, this paper highlights the importance of understanding the customer journey, i.e. the end-to-end process, as it has a lot of potential to influence user experience in software and digital service design. The design, development, management, and maintenance phases of digital services involve several stakeholders. This does not refer to the life cycle of digital products, but to the service design and production processes, which include an assortment of user roles with varying orientations and interests. Digital service and software development would benefit greatly from a broader and more holistic viewpoint. Ramirez (1999) states that the customers are not just the consumers of products anymore, but they have an increasing role in the value co-creation.

The well-known saying ‘a chain is only as strong as its weakest link’ applies well to the usability of digital services ranging from those used in electronic commerce or financial and payment services to the playing of mobile games. It is especially relevant in the digital services sector, which is an integral part of physical service experiences, such as visiting in zoos, restaurants, or shopping malls. Therefore, the customer’s journey as a part of service design method is a robust principle that will ensure the user-centered perspective is considered. In applying service design principles you promote better integration of new technologies to the current service processes and their customer experiences.

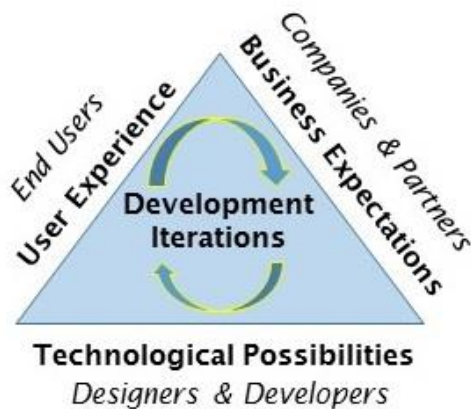


Figure 1. The key stakeholders and their contributions to the design process (Alamäki & Dirin, 2015).

The project results discussed here demonstrate that digital service development should adopt a broader perspective than the traditional use-case analysis and requirement specifications in the software development process. This paper emphasizes that highlighting the customer journey as a planning viewpoint puts attention on the customer's essential needs from the holistic view. In addition, when designing digital services, we should put more emphasis on emotional and motivational factors, as they have become a critical success factor in the user experience (Alamäki & Dirin, 2014). Hence, we should not only speak about human-computer interaction, but also a human-computer-context interaction.

The stakeholders of the customer journey, i.e. different user profiles of digital service, vary from end-users, administrators, developers, salespersons and economic customers to business process owners. Therefore, the cross-disciplinary teams designing new digital services using customer journey-based

planning predict better integration of end users' cognitive and emotional expectations, service processes, business requirements and new technological means.

Conclusions

The ICT sector is transitioning from the design and development of on-premises software towards service-oriented business models based on the latest advancements in mobile and cloud technologies, as well as social computing. Therefore, the service orientation should change the way digital services are innovated, designed and developed. In the 1990s, desktop and on-premises software products were the most essential elements in digital value creation. During the last decade, the software as a service (SaaS) business model has become the key element of value exchange, and software products are mainly a part of service-based value creation ecosystem. Hence, digital service design and development processes should still be more customer driven, as the end users and customers are currently a party to value co-creation. This means that in designing new digital services, it is recommended that developers start by analyzing the customer journey and defining possible touch points where digital means could bring value. This approach is much more than just collecting and listing of technical requirements and drawing of work flow diagrams.

Technological features are only enablers in creating new types of service experiences. Thus, the key questions are 'How will users gain

value?’ and ‘What drives their motivation?’ We can find answers by continually involving all stakeholders

in the customer journey in value co-creation.

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