Customer Journey Mapping of an Experience-Centric Service by Mobile Self-reporting: Testing the Qualiwall Tool[*]

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Abstract. A focus on the user experience and user-centric perspective are considered to be essential in today's product and service development processes. Technological advancements during the last two decades have made user studies based on digital, mobile self-reporting possible. The goal of this study is to report on our experiences using a mobile self-reporting tool called Qualiwall for the customer journey mapping of an experience-centric service. The results indicate that the Qualiwall tool is especially suitable for mapping the customer experiences because it enables the collection of rich, real-time and in-situ data; however, it also possesses certain disadvantages. To arrive at more general conclusions, future research will focus on piloting the Qualiwall tool in other service-related user research situations as well.

Keywords: Service experience, customer journey mapping, mobile self-reporting.

1   Introduction

A focus on the user experience and user-centric perspective are considered to be essential in today's development processes, whether discussing products, services or places [1-3]. A number of research methods attempt to provide temporal user data by emphasising immediate user participation and self-reporting or self-documentation. The participatory design viewpoint sees users as "creative people who can participate directly in the design process when given the appropriate tools and encouragement" [4]. Self-documentation refers to participatory research methodologies where the

research participants report their own behaviour to the researchers [4]. The benefits of this approach include providing the most direct approach to user-experience annotation and affect detection [5].

Several methods and tools such as design probes [4] and diary studies exist for the purpose of self-reporting. Diaries refer to a class of methods such as experience-sampling, event-sampling and daily diary studies [6] whose features and characteristics appear to generally overlap [7-9]. Initially, these methods were conducted as pen-and-paper studies. However, because of technological advancements during the last two decades, conducting user studies using digital, mobile self-reporting tools has become possible. In fact, diary methods begin to address the limitations of participation using manual methods [7].

This has enabled the performing of real-time self-reporting studies. Real-time data gathering concerns "asking the questions in close temporal proximity to the event of interest" [10]. The benefits of using real-time research methods include the ability to acquire, for instance, higher-quality data by limiting the issue of questions having multiple meanings, reducing problems relating to memory and estimation and facilitating access to episodic details [10]. Initially, users participated in these surveys using manual tools, typically paper and pencil [7]. However, conducting user studies using more customised digital mobile and digital real-time self-reporting methods has become possible.

The goal of this study is to report our experiences using Qualiwall, a mobile self-reporting tool for the customer journey mapping of an experience-centric service. The case service was the Finlandia Trophy 2013 International Figure Skating Competition event held in Espoo, Finland over the course of a weekend in October 2013.

In this paper, we first discuss the evolution of mobile self-reporting applications and the methodological background related to user studies of experience-centric services and customer journey mapping. Next, the Qualiwall tool and its capabilities are presented, and the research design is explained. Finally, the results are viewed and a discussion and conclusions are given along with possible future research avenues and developments.

2   Background

2.1   Evolution of Self-reporting Applications

The concept of utilising mobile devices for experience-sampling by self-reporting dates back over three decades. Originally, the technology used in mobile self-reporting studies was based on using the features of mobile phones or other devices such as voice-mail [11], picture capturing, video recording, text and multimedia messaging, email [12-14] and instant messaging [15]. In addition, tailor-made, research situation specific applications have been developed [13, 16-17].

An early example of a generic mobile self-reporting application is the Experience Sampling Program (ESP), which is a system that operates on Palm Pilot handheld computers [18]. It has been reported that the ESP was already in use in the late 1990s [19]. Subsequently, numerous projects were established where mobile devices, mostly

early smartphones, were used for mobile experience sampling. These projects included Mobile Probes [13], which ran on Nokia smartphones, and MyExperience [20-21]. Later examples included Contextual Activity Sampling System Query (CASS-Q) [22] and Ohmage [23].

Throughout this development, the main benefits of using mobile devices in experience sampling, which include the collection of real-time data [20], passive data collection using various sensors that the devices are equipped with [23], inclusion of images [13], and customisability of surveys performed [21], have remained roughly the same. In addition to research projects, a large number of tools exist on the market designed for experience sampling using contemporary smartphones. Listings of these applications are also available [9, 24-25]. These products range from applications with Internet survey-type functionality [26] to tools developed purely to conduct experience sampling [27]. Typically, the experience sampling applications are available on both Android and iOS operating systems.

2.2   Experience-Centric Services and Customer Journey Mapping

User or customer experience has become a relevant topic in a number of fields of research and industry, one of which is service design. As previously stated, the importance of the customer experience as it pertains to customer satisfaction and loyalty has long been recognised by service organisations [3]. Thus, customer experience has been viewed as the core of many service organisations [28-29] by delivering "experience-centric services", which refers to services where organisations proactively craft the customer experience to create distinctive product and service offerings [30].

The customer experience has been defined as "all aspects of the end-user's interaction with the company, its services and its products" [31]. Thus, the customer experience includes three elements, the user, the product or service and the context of use [32], and examines the wider relations that exist between these elements to better understand the individual's personal perceptions at a given moment [33]. A customer experience occurs when "a customer has any sensation or acquires knowledge from some level of interaction with the elements of a context created by a service provider" [34].

Customer journey mapping is used to understand a customer's behaviour, feelings, motivations and attitudes while using a service. The customer journey includes all activities and events related to the delivery of the service from the customer's perspective. It is an emotional and physical journey that the customer experiences. The steps of the customer journey can involve anticipation of and arrival at an experience, departure, and savouring. In contrast, a touchpoint is a concept relating to customer journeys; it shows up whenever a customer "touches" a service and can occur across multiple channels and at various points in time [3].

Experience-centric services are designed to engage customers in a personal, memorable way emotionally, physically, and/or intellectually. The particularly personal nature of the customer experience in experience-centric services appears to make self-reporting especially promising as a user-study methodology. Experiences are personal

and take place in-situ. Self-reporting via smartphone applications appears especially promising as a research approach for mapping customer journeys of experience-centric services. Smartphones are widespread and are often the main personal computing device of a person. Studies conducted using a self-reporting application on a person's personal phone is relatively unobtrusive and causes limited adverse effects to the service experience relative to, for example, self-reporting via pen-and-paper or via a dedicated, extra research device that the person would need to carry around.

3   Methodology

3.1   The Qualiwall Tool

The Qualiwall tool is a research platform for administering and conducting self-reporting studies via mobile devices. The development of the Qualiwall tool originally began in 2011 as a student project. The Android operating system was chosen as the platform because it appeared to offer the largest software ecosystem, especially in mid-priced smartphones. The know-how for Android application development was also available in the team. However, other platforms may be included in the future.

The Qualiwall tool has been divided into two main components: the client software, which runs on Android OS smartphones and tablets, and the server software, which runs on an online web server. The work is divided between these components such that the client is purely an answering tool for self-reporting, and the server side software is used to create the surveys and process the results. In Figure 1, we see how the server's users access the server and create surveys that are subsequently sent to the mobile users. The answer data from the mobile users is then sent to the server and downloaded by the server users. The server application operates over the network connection, where the mobile application must be downloaded and installed separately. There can be several server users and mobile users accessing the server simultaneously.
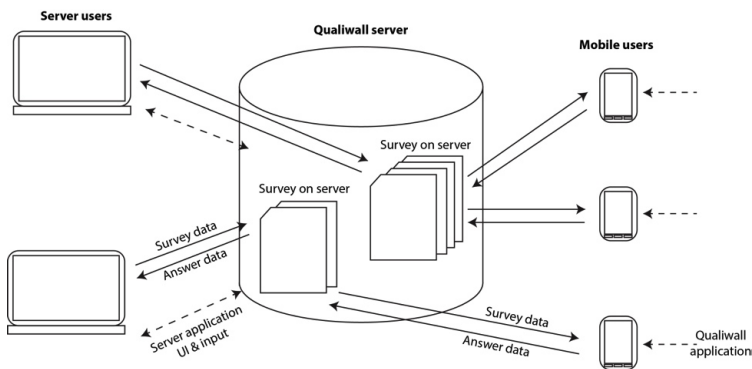

Fig. 1. The Qualiwall server with both server and mobile users

   The Qualiwall tool includes a set of prebuilt tools for building surveys. These tools include the very basic question types found on most online survey tools and traditional survey forms: a short and long free response-style answer, checkbox and radio-button selections, choosing a single alternative from a given set of possible answers, and a zero to five star rating. In addition to the basic questions, photos and video can be captured. The researcher can also record the GPS positions of the users when an answer is recorded or make the questions available for answering at certain times or physical locations.

   In the Qualiwall tool, the users and the publicity of the surveys are controlled individually. Surveys can be available to anyone or to a limited group of users. In both cases, the survey can either be open or closed, making it available to the users or not. An individual survey in the Qualiwall tool is divided into pages as shown in Figure 2. The pages are entities that can be tied to times and places and can contain several individual questions of different types. Using the page structure, more complex surveys can be built; the user may be tasked to move between different locations, each having a specific set of questions to answer at each location. In a similar fashion, the user may be required to complete a certain set of tasks at a certain time during the day.
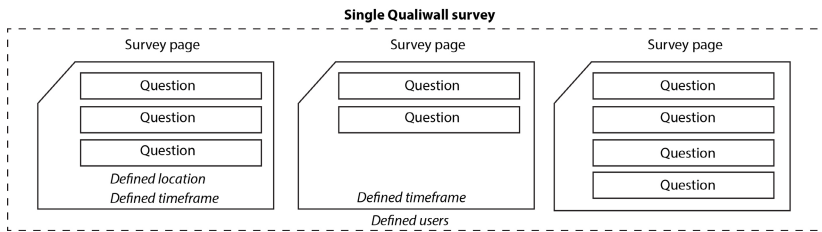

Fig. 2. Single survey with defined users, showing pages with defined locations and or time-frames, and questions on pages

   A Qualiwall survey can be closed when desired, ignoring all subsequent responses. Alternatively, an analysis can be begun immediately after the first answers arrive. In the analysis process, the data can be sorted, for instance, according to the answers given, by different respondent ids, or by data types. Subsequently, the results can be exported from the Qualiwall system in a digital format for further analysis using tools such as affinity diagrams.

3.2   Research Design

To report our experiences using the Qualiwall tool, we conducted a study at the Finlandia Trophy Espoo 2013 International Figure Skating Competition. Figure skating is an aesthetic, competitive sporting event and is a good example of an experience-centric service. Self-reported data using the Qualiwall tool was collected from participants chosen by convenience-sampling from Aalto University students and staff and Finlandia Trophy staff. The participants were mostly first-time visitors to a figure skating event. While this naturally skews results towards first timers who

form only a portion of the event's audience, omitting regular visitors, this does not affect the evaluation of the tool and research approach, which was the goal of the study. For a comprehensive study of the customer journeys at such an event, the participant sampling should attempt to cover all customer segments.

The seven participants received free tickets to the Finlandia Trophy and were given brief instructions on how to install and use the Qualiwall tool. No personal assistance was given. The participants attended the Finlandia Trophy figure skating event and self-reported their experience using the Qualiwall client software.

The participants first answered a short background survey using the Qualiwall tool. They were subsequently asked to map each touchpoint they considered relevant for their service experience before, during, and after attending the event to capture the whole customer journey. For each touchpoint, the participants created a note that consisted of a photo, the name of the touchpoint, and an evaluation on a one to five star scale indicating how positive their experience of the touchpoint was and how well it met their expectations. The participant could also leave an open comment on the note. Two screenshots from the survey for each touchpoint are shown in Figure 3.
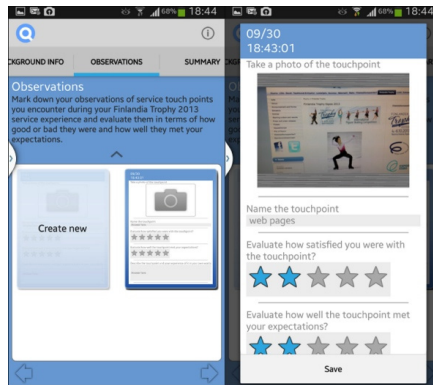

Fig. 3. Screenshots of touchpoint evaluation

To offer a comparison point to the Qualiwall self-reported data, an additional participant was instructed to compose a similar customer journey map of his experience using smartphone photos and his own notes without Qualiwall-support and another (an experienced ethnographer) collected ethnographic notes of his experiences at the event.

4   Results

In total, the seven participants who used the Qualiwall tool submitted a total of 110 notes. Two of the seven participants who used the Qualiwall tool for self-reporting had only completed the background survey and did not map any touchpoints. The other five participants mapped varying numbers of touchpoints. One participant mapped 58 touchpoints over the course of two days of attendance at the event. Another participant had logged 31 touchpoints during a single visit. The other three had mapped between 4 and 7 touchpoints during a single visit.

Table 1. A number of touchpoints identified from the data

Event website	Half of the journeys included a visit to the event website. Generally, the participants were dissatisfied with the website. It failed to create excitement prior to the event, and information was hard to find.	
Tickets	Many of the participants had mapped the tickets as a touchpoint and were satisfied with them. They included the relevant info.	
Venue entrance, outside	The venue entrance was considered uninviting, and many wondered why there were so few event posters outside.	
Venue entrance, inside	A small number of participants complained about uncomfortable crowding immediately after entering the venue hall. The area was filled with people buzzing around the many sales booths and info desks.	
Finding the seats	Almost every participant reported difficulties in finding their seats. They complained about poor signage and "temporary" signs printed on A4-paper.	
Watching the show	Everyone reported on the competition and performances positively and rated them highly.	
Eating	Another repeated observation was related to eating. The experiences were rated as average, with a few commenting on "ice hockey food". The event hall is home to a professional ice hockey team.	

As the event took place in a relatively confined space and time, the data analysis was completed more efficiently because of the small sample of participants. Based on six customer journeys (one person visited the event over the course of two days), we could identify a number of similar patterns and experiences involving the same touchpoints. Thus, the observations began to saturate on certain issues. These issues

are discussed in Table 1 with examples. It is not an exhaustive list of issues or touchpoints found from the data but, rather, is meant to illustrate the potential of the Qualiwall tool for mobile self-reporting of service experiences.

Table 2. Examples of data from smartphone and pen-and-paper and ethnographic notes

		Touchpoint	
		Finding seats	*Watching the show*
Data collection method	*Qualiwall*	*Entrance was smooth; finding the seats a small adventure.*	*The program was better than I expected, and you could see the performances well.*
	Pen-and-paper and smartphone camera	*We arrived, our tickets were scanned, and we are in! But where do we go? We see the action in front of us and get in; there are some stores, but we want to see the skaters, so we go straight into the grey curtains. A security guy stops us and asks for the tickets. We show them, and he said that our seats are on the third floor (how can I know that?). We walk to our seats on the third floor, wondering where 500 is. The signs say 400 only.*	*The ice dance presentation starts, the skaters interact and dance following the music. Is a very nice show, we are enjoying it and our daughter also. She stands up to do some jumps and turns and then she seats to watch the skaters again. It is very dynamic and in comparison to the previous parts, where everyone seemed to be doing the same routine and very rigidly, here all the couples and all the music styles are different and they dance!*
	Ethnographic notes	*We get lost, but a volunteer notices and asks if she can help us to our seats. This is great. I feel like they want to take care of us and let us have a good time. We find our seats and sit down.*	*The skaters appear and the competition starts. I have never been to a skating event before and am surprised how much the experience resembles classical ballet. The experience is much more intense than seen from the TV, although we are sitting high up. I was expecting the contrary. The charisma of the performers comes through; the performances really are of a high quality. Music and skating are well balanced. This is good!*

The participant who took notes using a pen, paper, and a smartphone camera generated a total of 22 of recordings. The participant who took ethnographic notes reported three pages (1500 words) worth of observations and included a number of images. These data were compared to the data collected using the Qualiwall tool. We illustrate this comparison in Table 2, which shows examples of the two touchpoints "finding seats" and "watching the show" from the viewpoint of data collected with the Qualiwall tool, pen-and-paper and smartphone camera and ethnographic notes. It shows that when compared to the other data collection methods, the textual data acquired using the Qualiwall tool is meagre relative to the data collected using the other methods.

5   Discussion and Conclusions

Several software tools for mobile self-reporting, which take advantage of the cameras included in mobile devices and GPS, have been developed in the past. They appear to be promising tools for user studies of experience-centric services because they support in-situ self-reporting of "fresh" customer experiences. They can also provide rich data for the purposes of customer journey mapping. However, doing self-reporting during an experience-centric service may interfere with the actual experience, though other methods of data collection, such as outsider observations and post-hoc interviews, do not necessarily capture the "true" experience.

In the experiment presented in this study, a number of participants were asked to be in the audience of a figure skating competition and document their experiences using the Qualiwall tool. For comparison, one of the participants took notes with pen-and-paper and another took notes as an ethnographer. All of the participants using the Qualiwall tool were able to use the application, and their answers were successfully transmitted to the server. The Qualiwall tool allowed for the frequent, real-time mapping of touchpoints.

The Qualiwall self-reports, the paper-and-pen customer journey, and the ethnographer's notes contained observations of similar issues. It appears that even with this relatively small sample of participants, a saturation occurred around the main issues related to the service experience. The tools used did not appear to have any significant effect on what observations the participants made. However, there are a number of clear differences in the textual data participants reported: the ethnographic notes and post-hoc-constructed customer journey map provide richer and more verbose textual data in comparison to the data collected by the Qualiwall tool. This may have been caused by the difficulty of writing longer texts using a smartphone. The ethnographer and pen-and-paper customer journey mappers were instructed to observe their experience and take notes and photographs using their smartphones, but they used a computer to compile their notes after the event, which most likely made writing easier. Thus, it appears that smartphones and tablets are not the best tools for generating extensive textual data.

In all of the methods, the notes were taken during the event, but in the cases of the pen-and-paper and the ethnographic notes, the textual data were edited by the participants after the event. Given the available data, it is impossible to draw conclusions on whether this created any differences in the observations. The subsequent editing of the notes may enable a reflection on the experience, which may slightly modify the results. One of the benefits of using the Qualiwall tool was that the answer's creation time can be confirmed from the server, and it is possible to verify whether or not all the answers are created in-situ. With pen-and-paper notes, this determination cannot be made.

When analysing at the answers obtained with the Qualiwall tool, at least two issues can be noted. First, two of the participants mapped a significantly higher number of touchpoints than the other participants. It is difficult to say what caused this difference. Perhaps these two participants were more motivated in the study than the other participants. Another explanation might be that the other participants

considered much fewer touchpoints to be significant to their service experience and only mapped those they were instructed to map. Second, a number of the participants did not return any answers from the event. This may have been caused by a number of reasons including a lack of motivation or time, not going to the event, not having a smartphone at the event, or forgetting the task due to immersion with the experience. The reasons may also be related to the Qualiwall tool and its usability. It is possible that the use of a smartphone application in the given situation was viewed as too laborious. There may also be technical reasons such as a battery becoming depleted or unknown software errors caused by different hardware configurations. Finally, it is also possible that there was a problem in the definition of the task, and the participants were not able to clearly distinguish the touchpoints from the event. Unfortunately, these questions cannot be answered based on the currently available data.

When looking at the results from existing research, we can see that similar observations have been made: the collection of large data amounts from live situations is well facilitated by mobile experience sampling [20,22], but gathering longer text answers may be difficult with these methods [22]. The research community has already drawn a number of conclusions from past experiences with mobile experience sampling, highlighting the need for multi-platform, customizable experience sampling system [35]. These development considerations and observations correlate with our experiences and current development goals.

Future research will focus on piloting the Qualiwall tool to study other experience-centric services to identify more generalisable results relating to the suitability of Qualiwall tool for customer journey mapping and service design in general.

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