Travel Experience Cards: Capturing User Experiences in Public Transportation

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Abstract— **The paper presents a Travel Experiences Card (TEC) set, produced as a tool to understand user experiences in public transportation. The card set allows exploration of diverse user experiences, from preparing travel to arriving at the destination. The set is designed using images taken during participant observation and photographic documentation of public transportation experiences. Two ways or working with the card set are proposed, one based on forced association technique and the other on focus event tool. These allowed for the breadth and the depth of exploration, respectively. We tested the cards in one pilot workshop to fine-tune it as a tool, and then applied it in two workshops in order to evaluate its usefulness. We used three important experiences for users of public transportation: safety, joy, and arriving on time. We found that the method was useful for eliciting rich responses from our participants, and for understanding the ecology of experiences. We also consider the process of designing the card set, and its evaluation, to be of relevance.**

Keywords—service design; interaction design; experience design; customer journeys; experience design cards.

I.   INTRODUCTION

Service Design (SD) has gained popularity as an approach to modern business, design research and design education [1]. Like Human Computer Interaction (HCI), SD is a multidisciplinary field. It gained momentum with the introduction of design thinking [2]–[5] some years ago. Many interaction designers have moved into service design field [6], and some HCI designers, including user experience designers, are now involved in the design of services and related research. The evolvement of service design also sparked strong interest in user experience (UX) with services and ways of working with those experiences. In service design, the term *customer experience design* is understood as a holistic concept, which integrates all aspects of the service. The service may be provided by one or more companies, but is considered as one service, as long as the customer experiences the service as one [7]. Of course, every encounter with a product or a service that we use is an experience. *Heterogeneity*, as a characteristic of the service, is a consequence of both the diversity in delivery by a provider and the diversity of people experiencing a service. Customer experience design strives to craft experience that matter and to control a number of factors that shape that

experience [8]. The more positive the experiences are, the more loyal the customers will be to the service provider [9]. This has, ultimately, consequences for the company's long-term competitive advantage, as well as on the shaping of values in business other than profit.

Designing good public transportation services is neither a small task nor an inexpensive one. It may be so that "*Being able to profit from innovation is a major incentive to invest in innovation activities regardless of the type of innovation*" [10]. However, service innovation and design, including customer experience design, depend to a much larger degree on collaboration with external parties [11]. Among those parties are universities and design communities aiming at increased benefits for the society as a whole, not just profit. More and more frequently, customers, or users, as we will also call them, are given a stronger voice in the design of services, and service design is often characterized by close work with users and users' involvement in design processes.

In this paper, we continue looking at ways of improving user experiences with public transportation. In [12] and [13], we have considered design for increased visibility of travelling information and ways of gathering and analysing data containing users experiences with the system. In this paper, we take a different approach. We consider using service design and user experience design approaches to describe customer journeys and sets of related experiences.

Our concern is that of methodology: 1) how to engage users in discussions around services and experiences in ways that can promote "good" service and experience design, and 2) how to make use of a "good" tool, such as cards, which are frequently used in HCI [13]. In line with Clathworthy's approach [15] to service innovation, we have designed a tool, a set of travel experience cards, to help us gather relevant information about user experiences while travelling.

The card set addresses all stages of the travel with public transportation, from planning the trip to arrival to destination. The purpose of the tool is to provide data on user experience in initial phases of new service design. The tool was tested in a pilot workshop, then re-adjusted and applied in further two workshops. The set could be used to create customer journeys, address touch points the journey contains, and experiences between the touch points. We have particularly focussed on the latter. The goal of those two workshops was to evaluate the card set as a tool, primarily for its usefulness. The paper reports on the results regarding the evaluation of the tool.

The paper is structured as follows. In Section II, we provide background material on service design, customer journeys, touch points, experience design, and introduce the ecology of experience. In Section III, we present our case, the development of the Travel Experience Card (TEC) set and a way of using it. Section IV provides discussion on the use, and usefulness of TEC. Section V concludes the paper and addresses the future work.

II. CUSTOMER JOURNEYS AND ECOLOGY OF EXPERIENCE

Service design and customer experience design draw on methods from various fields; several of these methods are familiar to HCI researchers, such as scenarios, role-playing, personas, card sorting, focus groups, and observations. We therefore provide definitions for those methods that HCI researchers may be less familiar with. Service design uses more explorative ways to challenge problem areas, in contrast to HCI design with its more analytic and positivistic approach [16]. In this section we define the main service design concepts we use in the paper.

Defining *services* is challenging, as there exist multiple and competing views. For the purposes of this paper, we view a service as an exchange between a service provider and a user in a particular moment of time and space. Lavrans and Polaine [6] define *service ecology* to be a diagram of all the actors affected by a service and the relationships between them, displayed in a systematic manner. Using service design as an approach to design of a service implies: *"...designing services that are useful, usable and desirable from the user perspective, and efficient, effective and different from the provider perspective. ... service design takes holistic approach in order to get an understanding of the system and the different actors within the system"*, [1, p. 3].

Service design may be considered as *"design for experiences that happen over time, and across different touch points"*, a definition given by Clathworthy [15].

A. Customer Journeys

Customer journey is one of the most effective tools in service design. It is similar to storyboards and use cases in HCI, helping to visualize a service in an organization or company. In [16], Koivisto explains customer journeys as follows: *"Services are processes that happen over time, and this process includes several service moments. When all service moments are connected, the customer journey is formed. The customer journey is formed both by the service provider's explicit action as well as by the customer's choices"*.

We consider customer journeys to be formed not only by service moments, but also include all the experiences within and between those moments and user's responses to those experiences.

B. Touch Points

A customer journey is comprised of touch points, the service moments as described by Koivisto [16], or nodes in a visual, graphical representation of a journey. A touch point forms a link between the provider and a customer, and as such, is the origin of customer experiences with service in question. Touch points form one of the three pillars of service design [17, p. 142].

While touch points are a fundamental part of service design and a starting point in re-design of services, we consider the intervals between them to be important for user experience design.

C. Understanding travel experiences and their ecology

An approach to understanding experiences may be that of Nardi and O'Day [18], who use the term 'information ecology' to describe an interrelated system of people, practices, values, and technologies within a particular local environment. This ecology approach, applied to service ecology [6], and the framework for studying user experiences while interacting with technology developed by Forlizzi and Battarbee [19], shaped our theoretical perspective. *"Experiences and emotions are not singular events that unfold without a relationship to other experiences and emotions"*, [19].

Building forth on these understandings, we define *ecology of experiences* as an interrelated, scalable set of experiences along a particular customer journey. In this paper, the context for creating customer journeys is that of travelling with public transportation.

D. Service Design Cards

A good tool for helping to address touch points in the initial stages of service development is a set of service design cards, see [14]. Clathworthy provides six different use contexts for the cards and evaluates the cards related to their intended function. The cards were found to help with team building in cross-functional teams. Further, they were found to be helpful in assisting with the analysis and mapping of existing situations, generating ideas for new solutions or approaches, needs elicitation and facilitation of communication.

III. DEVELOPMENT OF TRAVEL EXPERIENCE CARD SET

The service design cards described above provided the inspiration for the user TEC set. The modified card set was recently successfully used in another project [20].

Tangible objects, such as cards, and the images depicted on them, are known to facilitate visual thinking and help with finding a common language for communication within groups of people with diverse backgrounds. The common understandings are built through negotiation and discussion of associations and concepts related to images [21], some of good examples of use of cards can be found in [22], [23].

We next describe:
- Design of the TEC set
- How can TEC set be used

A. Design of the TEC set

We started from the perspective of being users of public transportation ourselves. We used participatory observation and photographic documentation [24] to record our own and other travellers' experiences. Armed with cameras, two of the authors went traveling and collected a large amount of

pictures documenting what they considered to be meaningful moments representing public transport traveling experiences of various kinds.

The next step was to map their customer journeys and sort the images of experiences [14] according to touch points on the journeys. However, we found out that it would be more meaningful to consider segments of all customer journeys. All users of public transportation plan their journey in some way. Perhaps the starting touch point for the journey is a smart phone app. The next touch point may be purchasing the ticket on the smart phone, or walking to the tram. Whatever touch points on a particular journey are, they all consist of the subset of the steps shown in Fig. 1. These steps are: planning the trip, making sure one has a valid ticket, arriving to a stop, embarking, traveling (this can be interrupted by, for example an accident, a ticket control, or other forms of disruption), disembarking, perhaps repeating some of the steps if transfer was needed, arriving to a final station and arriving to a final destination. The images for the cards in Fig. 1 were not home-made, rather found on the net, intentionally somewhat different in style than the images we collected. A purple colored stripe was used to further differentiate these cards.
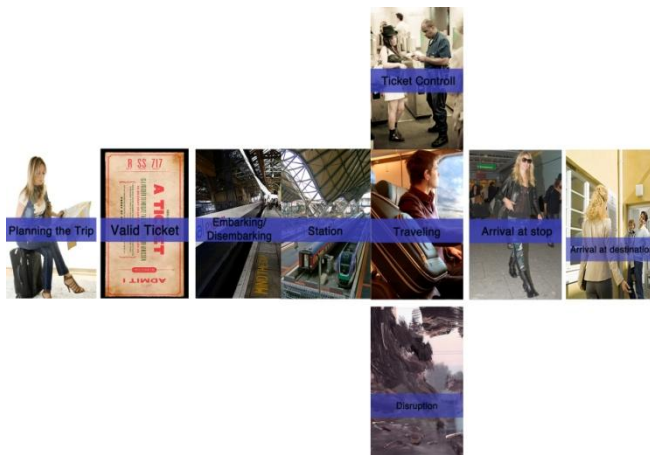

Figure 1.   Cards with purple stripe represent segments of a trip

The images collected as representations of touch points and user experiences in public transportation were then sorted into categories corresponding to the segments of customer journeys. There were too many cards in each category. We reduced the number of images by selecting images perceived to be meaningful for everyone, or choosing one image among several that best represented the user experience (the photographers were not part of this process). One or two words were chosen for each image and typed on red background. The first set of TEC cards was thus made, consisting of two different types of cards, those representing segments of the customer journey, and a mixture of touch points and experience cards.

In order to ensure that images convey appropriate experiences and that the text is suitable, we have done quick-and-dirty user testing: we have simply shown the cards and asked two students, who are public transportation

users, what they see on cards and if words match what the image conveys. At this stage, we did not want a perfect set of cards, but rather, the one that that was open for modifications and additions. We, for example, chose not to make separate cards for embarking and disembarking, even though one of our testers suggested it. We wanted to see if distinctions in experiences between these two segments were important for users. If they were, separate cards would be designed for the final set.

B. How can TEC Set be Used?

The set of experiences on a customer journey representing a trip using public transportation is very rich. In order to start understanding how to use them and what we can expect to learn from the use, we decided to choose a small set of experiences and focus instead on the use of cards as a tool for working with selected user experiences effectively. Three experiences were proposed as workshop themes: safe travel, arriving in time, and joy while traveling. These were chosen on the basis of the experiences collected during the participatory observation phase. The purpose of using these three experiences was to find ways in which the cards could best be used, in order to gather and understand information that could serve as the basis for designing better travel experiences. We did not study these experiences themselves.

Figure 2.   Touch point cards, such as a smart card, and experience cards, such as feeling safe, as they relate to the trip segment Station.

There are two components to the TEC card set: the TEC *cards* and the TEC *tools*. Tools are the ways in which the cards are used in working with users. We have worked with two tools. The first TEC tool is based on the *forced association concept*, and is carried out in relation to every card representing a segment of the journey. This amounts to nine rounds of forced associations, as there are nine cards describing the segments; Fig. 1. Thus, experiences of safety, joy and being on time, each explored in one workshop, were considered across all segments of a journey. A summary of the workshop results can be found in Table 1.

TABLE I.   USING TEC TO LEARN ABOUT EXPERIENCES

Stage	Experience		
	Safe	*Joy*	*On time*
Plan the trip	Getting the right information	Coffee Planning software works Having choices Sitting comfortable Access to maps Sheltered Nice view Not crowded Cleanliness	Information about destination Access to maps Buy ticket online/app saves time Having ticket ready
Valid ticket	Getting the right ticket Feeling safe paying for the ticket	No line-ups at ticket machine Working card reader/Feedback from reader Convenient location Hassle-free app Fast service	No line-ups at ticket machine Find the ticket reader Working card reader/Feedback from reader Buy e-ticket while already in buss/train Charged mobile phone
Station	Finding your way Physical safety	Feeling safe No waiting No crowd Good coffee Frequency of departures No special users (no baby carriages, no wheelchairs) Cleanliness No smoking Find platform easily Access to toilet Protected from bad weather	Find platform Map of station/metro Impossible to hear information via speakers Information about destination Information for visually impaired Information about disruptions

Stage	Experience		
	Safe	*Joy*	*On time*
Ticket control	Aggressive behavior of ticket controllers	Having a valid ticket No disruption	Disruption Make you miss your stop
Embark /Dis-embark	Validity of the ticket Getting in the right buss/tram etc. Getting off the right stop/station	Driver greets travelers Easy to get in/out No crowd	Too crowded to get in Delay because of children, people with bicycles or stroller, people in wheel chairs
Travel	Fellow travelers Sexual harassment and other violence	Enough space Fast No crowd Information about destination Feelings safe Drivers (?) Charging battery Wifi access	Disruptions
Dis-ruption	The unknown	Speakers that work Waiting area Emergency exit relevant information	Information via speakers Emergency exit
Arrival Stop	Finding way to destination	Mind the gap Finding way to destination Maps No crowd/strollers Recycling of garbage Access to toilet	Map about location Finding way out of the station Valid ticket to get out of station Working card reader Ruter app to check route to destination
Arrival des-tination	Feeling safe, street crime	Being on time Price (of getting to destination)	Time

Figure 3. The cards in use. The cards depicting experiences and touch points are used in conjunction with every segment of the trip, addressing just one kind of experience at the time.

The process of association required about an hour each time, with 3-5 participants; see Fig. 3. We needed to use convergent and divergent conversations, opening up for stories, reflections and memories, but also sense making of these, now collective, experiences.

The second TEC tool we called the *focus event*. A specific, significant event from a person's life, related to the use of public transportation, is placed in the focus of discussion. By significant, we mean an event that is out of the ordinary, either positive or negative. For example, losing a wallet on a city bus, with driver's license and a whole lot of other important documents, would be significant. The cards, both segment and experience/touch points, relevant for a focus event are found and their influence on the event is discussed. The focus event is based on the same experience as the rest of the workshop in which it is used. The process around the focus event takes approximately 5 minutes per event. Again, we were interested in evaluating usefulness of cards for exploring experiences and services related to such events.

IV. DISCUSSION

The first workshop was a pilot workshop where the three authors took time to try different versions of tools, to discuss how it feels to work with touch points and user experiences vs. segments of the journey and user experiences. The protocol that we decided on was to go first through the experience of *safety* in public transport by forced association, followed by a discussion related to a focus event. The subsequent workshop on *joy* as an experience in public

transportation was done with two of the authors and three users of public transport, two of them PhD students, and the third a master student in design, use and interaction study program. The last workshop on *arriving on time* included the authors, and two students, one PhD and one master student in the same program.

A small number of participants were involved in the workshops, but they all had a solid background in both user experience design and various methods of working with users, including co-design, participatory design and user-centered design. This is relevant because most of them have worked with similar methods before and could give qualified opinion about the tool, both from the direct experience of using the cards themselves and from their prior experiences of working with users. We felt that five participants with such background were sufficient for giving us the feedback on the TEC set and the tools we chose (the forced association and the focus event) to address TEC's perceived usefulness for design of better user experience when taking public transportation.

A. On the use the cards in workshops

The workshops with our participants started with explanation of the goal of the workshop, the TEC set, and what it is to be used for in the future. We then asked the participants to focus on what gives them, as users of public transportation experience of joy or arriving on time. During the workshop on joy, it became clear that we were missing several experience cards: weather, space, valid ticket, toilet, charging battery, time, and price of ticket. During the workshop on arriving on time, experiences that help users, or are a hindrance to reaching their final destination on time were considered. During this exercise two new experience cards were proposed: *ticket control* and *event*. Ticket control was perceived as both a segment card and an experience card. The event experience card refers to large events, such as sports championships and matches, in which large crowds of people use public transportation. During these events it is often impossible to arrive on time.

By constructing common understanding and meaning giving to the cards, for the entire length of the trip, we found that a number of combinations of experiences have emerged as important. For example, a card with a term 'crowd' was used extensively. It was related to several segments (station, ticket, embarking and disembarking and traveling) to both feeling of lack of safety, lack of joy and danger of being late. One of the participants then mentioned that there is really nothing one can do with this knowledge. This started a whole discussion on the strategies that people use to avoid crowds. At the end of the discussion, all participants agreed that, actually, there are opportunities for making things better by design.

The same conclusion was reached regarding the use of cards to address focus events. We illustrate this with two examples. One participant told a story of a woman who had a very unpleasant experience on the train. She never enjoyed taking public transportation again, and never took trains very early in the morning or late in the night. The card that she held while talking about the experience is 'feeling safe',

'feeling safe', depicting station in dusk, empty, and not giving the feeling of being safe; see Fig. 2.

The second example had to do with embarrassment over being caught without valid ticket and blaming several touch points involving technology that were not working properly at the time. In both cases, cards representing related experiences were found and participants considered frequency of such events, their impact on people's lives, possible design solutions etc.

B. Vocabulary

It was important for the participants to understand the TEC cards. Only then could they really engage in working creatively with them. As it was not possible to have a card representing each individual experience, the terms describing the cards were chosen with care. We found out that some cards needed to be broad enough to allow for several different interpretations. Others, as for example 'ticket' needed further specification: *valid ticket* and *price of ticket* were the requests from our participants. There was also a suggestion to further specify attributes relevant to the validity of the ticket, such as the visibility of information.

C. User's comments

After each workshop, a few minutes were set aside for asking the participants about their experience with the TEC cards. One of the participants (male, 39) said: *They were good to get the conversation going and explore different topics in a quick and easy manner.* Another participant told us: *The images put you kind of into a memory lane. When I look at the station card, I remember my own station and I can feel the experiences. They make me more aware of the things I should think of. I would never come up with as many examples of experiences as we jointly did* (female, 27). Asked whether it was boring to repeat forced association technique, the participants agreed that it was a good experience, connecting the detailed pictures around each segment card into a larger picture which was more relevant: *This was actually a learning experience for me* (female, 26).

V. CONCLUSION AND FUTURE WORK

Understanding user experience is important in design of interactive products and services. People's experiences with public transportation, even with a single touch point, such as ticket validation, are very different. Heterogeneity makes working with user experiences challenging.

The TEC set was found to respond to this challenge adequately. Heterogeneity remained visible, yet a common understanding of experience one focused on during the workshop emerged.

The size and the feel of cards were found to be satisfactory. Part of their appeal was attributed to images. The images were taken out in the field, but were generic enough to easily evoke memories of many diverse experiences. The other part of the appeal was tangibility of the cards. They served as tangible pointers to experiences, evoking memories and facilitating conversation about experiences. They enabled rich communication, in depth when working with focus events, and in breadth when working with forced associations across all segments of a customer journey. Our focus was not on re-designing services at this time, yet, many ideas and thoughts that emerged on during the workshops would be worth pursuing further.

While these conclusions are in line with previously published work and thus not revolutionary, we hope that we have explained the process of creating the tool and its evaluation (by users of public transportation, with good understanding of design processes) in such a manner that it is inspirational. This method of creating a set of cards for studying user experiences is rather fast and fun. The set can be used to understand a range of experiences in a given context of use, both in breadth and in depth, identifying clear design and innovation opportunities.

We have tested a small number of TEC tools (forced association and focus event) and we will further explore other possible tools. Our future work also includes scalability, and different application areas. In terms of scaling, we are interested in two types. The most obvious one is to use the experience cards in much a larger setting, with large number of users. However, we are also interested in understanding the scaling of experiences themselves, how they become larger and larger until the small ones are forgotten. Finally, we want to bring this method into other application areas, such as service innovation and customer experiences in the library, or with young patients in transition from children's hospitals to adult ones.

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