28.

Destacando hábitos dos turistas em trens na Bélgica através de metodologias *human-centred design*

Eliciting tourists' habits on trains in Belgium through human-centred design methodologies

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O presente estudo destaca o comportamento de turistas durante a experiência turística através do uso de trens na Bélgica, de forma que os resultados obtidos possam auxiliar o futuro desenvolvimento de um aplicativo móvel visando a otimização da experiência turística. Para atingir isto, o usuário é envolvido nas fases preliminares do processo de desenvolvimento do produto através de metodologias human-centred design. Durante o estudo, três diferentes pesquisas de usuário qualitativas são planejadas e executadas: observações diretas, entrevistas de grupo focais e jogos de tabuleiro como ferramentas geradoras.

Palavras-chave design centrado no usuário, experiência do usuário, informação em transportes.

The presented study elicits the behaviour of tourists during the tourist experience through the use of trains in Belgium, so that the results obtained can help the future development of a mobile application that enhance the tourist experience. In order to achieve this, the user is involved in the early phase of the product development's process through the use of human-centred design methodologies. Throughout the study three different qualitative user researches are planned and carried out: observations, focus group interviews and board games as generative tool.

Keywords *human-centred design, user experience, information in transports.*

1. Introduction

The development and popularization of Information and Communication Technologies (ICTs) have influenced, directly or indirectly, several sectors of the industry. The tourism sector was one of them. Through the use of the ICTs, new concepts like e-Tourism and m-Tourism has emerged, which revolutionised the way consumers dream, plan and experience their travels. The advent of e-Tourism contributes to a large expansion of services and products of the tourism sector through the digitalisation of the process and value chains, maximizing the efficiency and effectiveness of the sector (Buhalis, 2002). In addition, m-Tourism, which in its most basic definition is the use of mobile devices in tourism, contributed to this process by removing time-space barriers and allowing access to information at any time of the day, as long as connected to the Internet.
A brief study carried by Dan Wang et al. (2014) demonstrated some of the changes happening in travel activities due m-Tourism, in which planning trips became easier, as well as trips became more flexible. As a consequence, tourists can feel more comfortable to travel less prepared and in shorter notice, moving the planning and booking activities from the agencies (or in a more advanced case, from the computer) to mobile devices, thus carrying these issues on-the-go. Moreover, the affective experience has led to more connection between users and more informative travels, having constant access to information even out of home. However, travel information often seems incomprehensible to passengers (Beul-Leusmann et al., 2014) and consequently may require extra cognitive, affective and physical effort from them. In the case of tourists, perceive travel information can be even more crucial since they are not used with the environment and usually needs more information than frequent users (Le-KlähnGerike& Michael Hall, 2014). Thus, there is still a need for improvement on the promotion of information in transportation, especially regarding tourists due the lack of studies with inclination to address tourists and non-tourists as different target audiences (Page, 2009).
This study sought to map the current travel experience of tourists using trains in Belgium. To achieve this, human-centred design methodologies were used focusing on provide useful information for the future development of a mobile application.

2. Tourism experience cycle

During the tourism activity, the tourist goes through a cycle of experiences that begins even before he leaves home. Although many tourists do not realize this, their tourism activities are already in progress from the moment they start planning the trip.
The tourism experience is, according to Tussyadiah & Zach (2011), a subjective performative action contextualized by the geographical characteristics of tourist destinations, which takes form in different dimensions of sensory, cognition/perception, social, and affective/emotion as a result of interactions between tourists and spaces. An interesting way to approach the tourism experience, consequently the consumers' tourist behaviour, is through models and frameworks, which were created in order to better describe the main phases of the experience (van Raaij & Francken, 1984). It is important to understand the concept and characteristics of each one of the phases of this cycle of experiences because people are concerned with their life experiences, and they like to improve it as much as possible (Pearce, 2005). Understanding them enable a design with appropriated solutions that fits the expectations and needs of tourists.
For this work is considered the model of Clawson & Knetsch (1974), because it highlights the phases where the tourist spends time in transportation, which is the focus of this work (see Figure 1):

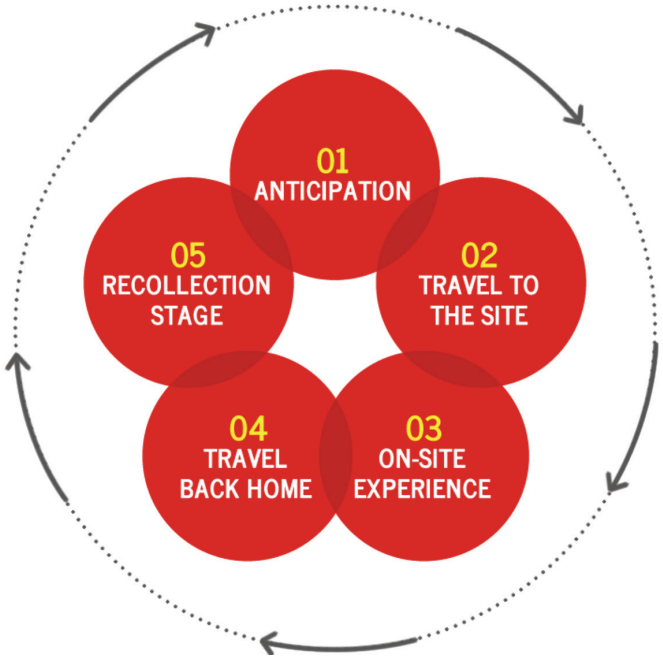

Figure 1. Five phases of the tourist experience.
Source (adapted): (Clawson & Knetsch, 1974).

One of the main issues that contributes to a positive tourism experience regarding transport is its efficiency (Moscardo & Pearce, 2004), being the balance between time and effort a factor that directly affects the passengers opinion (Grotenhuis, Wiegmans & Rietveld, 2007). Regarding the public transportation (in which the use of trains are included), different motivations and needs lead to its use, such as: car unavailability; drive-free benefit; avoid parking cost and traffic jams; and contribute with traffic reduction (Le-Klähn et al., 2014). However, different studies have shown that travelling by public transport is inconvenient and restricted (Le-Klähn et al., 2014); remains a rather dull experience (Foth & Schroeter, 2010); requires a significant cognitive and mental effort in planning (Grotenhuis et al., 2007); and lacks information (Beul-Leusmann et al., 2014; Le-Klähn et al., 2014). Each of these studies has its own particularities, but all of them have shown the importance of providing efficient travel information in order to save efforts: physical (walking, waiting, carrying, escorting, and maintaining body postures); cognitive (gathering and processing information for route planning, navigation, progress monitoring and error correction); and affective (dealing with uncertainty, worries and stress) (Grotenhuis et al., 2007).
Travel information is crucial for most of decision-makings during the travel experience, and it should help passengers go through the travel experience without feeling difficulties or inconveniences (Grotenhuis et al., 2007), avoiding unnecessary efforts. Thus, travel information becomes important not only for the travel to the site and travel back home's phases, but also for the anticipation phase (in which people look for information beforehand) and on-site experience phase (in which the time spent travelling relates to the time left for the destination, as discussed before).
The use of mobile applications, combined with other sources of information from public transportation's infrastructures is one example of technology that can increase the tourist experience of its passengers (Foth & Schroeter, 2010). For being a popular and portable technology, mobile applications can serve real-time and personal information for its users during all the phases of the tourism. Smartphones offers a wide range of possibilities supporting travellers (KaranasiosSellitto& Burgess, 2014), serving as an useful tool during the five phases of the tourism experience cycle by addressing a range of information needs that increases the interest of travellers in the travel process (D. WangPark& Fesenmaier, 2011).

3. Human-centred design

In relation to the conceptualization, design and development of mobile applications, several methodologies focused on bringing the user to the centre of the process have gained visibility in the academy and the labour market, such as human-centred design.
All products must be developed taking into account its target audience and context in which it is going to be used. The best way to understand it goes through user researches, because its focus on the dynamics of experiences and how they contribute to the construction of the user experience (Bargas-Avila & Hornbæk, 2011). The sooner, and frequent, these researches are carried out, the greater the chances to direct the design on the right way (Väänänen-Vainio-MattilaRoto& Hassenzahl, 2008).
Qualitative methods helps to achieve this detailed knowledge in a more effective way, encouraging the interpretation of key concerns related to human behaviour and their contexts (such as how people behave; what they think about products, services or situations; what are the patterns between different type of users; among others), valuing details which are extremely important in the process. There are several methods of qualitative research in the design process, which can focus on understanding the users, simulate their behaviours, or test their experiences with prototypes already developed (Unger & Chandler, 2012). For this study, three qualitative methods were chosen for the goals of this study: direct observations and focus group interviews, covering the surface level of knowledge (observative and explicit); and board game as generative tool, covering the deep level (tacit knowledge and latent needs) (Sanders & Stappers, 2012; SlegersRuelensVissers& Duysburgh, 2015).

4. Methodology

Seeking to better understand the key concerns related to human behaviour and their contexts, in a first moment an ethnographic field study was held, specifically a sequence of observations in the field. The main goal of this observation was to understand how tourists obtain the necessary information to travel by train. The degree of participation utilized for the researcher was as a passive observer (RogersSharp& Preece, 2011), in order to not interfere the behaviour of the participants and avoid actions based on the feeling of being judged by someone. As the observer was not allowed to talk with participants, it is not possible to affirm that they were indeed tourists. However, in order to assure the attention about possible variances between travellers and recognize the right people, a set of expected differences were hypothesized. Some characteristics and expected behaviour may tend to a tourist's behaviour, such as carrying luggage; unfamiliarity with the place; extra curiosity; and/or use of maps and tourist guidebooks. Spoken language may be another factor, but only in stations of smaller cities since Brussels and Antwerp, for instance, has many international workers who speak English regularly.
During nine days between 7th of February and 14th of March of 2015, passengers were observed in seven different stations, including Antwerpen-Centraal; Brugge; Brussels-National-Airport; Brussel-Centraal; Brussel-Zuid; Leuven; and Namur (see Figure 2). Being precise, they were observed

Figure 2. Plan of the stations observed in Belgium:
(1) Brussels-National-Airport;
(2) Brussel-Centraal; (3) Brussel-Zuid;
(4) Antwerpen-Centraal; (5) Leuven;
(6) Namur; and (7) Brugge.

in the hall of stations, at the platforms, at the ticket offices and at the information desks, when available. Besides that, they were also observed on the train, at the airport and sometimes in the surroundings of each station.

Although the observations provided a good set of discoveries based on actions, there was still a need for an in-depth understanding of the passengers' thoughts, such as motivations, aptitudes, mental models and frustrations during the whole experience. Seeking to collect this data, three focus groups' session were organized and held in a semi-structured interview. The sessions were carried with international exchange students of KU Leuven, living in Belgium for less than a year. This requirement fits the concept of tourist proposed by UNWTO (2014). In sum, three focus group sessions were held with a total of 17 participants, from 11 different countries (Brazil, Bulgaria, Czech Republic, Egypt, Finland, France, Italy, Portugal, Turkey, United States and Ukraine). They had an average of approximately 23 years old (minimum: 19 years old; maximum: 30 years old), and have been in Belgium for more or less 6 months (minimum: 2 months; maximum: 10 months).

Having gathered the data from the direct observations and focus group sessions, there was still a need for collecting new insights that could not be accessed during the other two methodologies. In order to assess potential user experiences regarding a future product, a board game workshop was applied using a personalised board game designed for the specific environment. The researcher mostly followed the guidelines defined by Slegers et al. (2015), also utilizing the game board designed by her team, that is loosely based on The Game of Life, simulating a journey by means of a track on a board (see Figure 3). During the game, players were allowed to ask a question to the Train Information System (TIS) via a chat program on a tablet. The TIS was presented to the participants as a futuristic and omniscient solution able to answer all kind of questions. During the workshop, an assistant researcher answered the questions remotely, Wizard of Oz style, with players not aware about the human nature of the TIS beforehand.

In sum, two board game workshops were held with a total of 12 participants, from 7 different countries (Brazil, Bulgaria, Czech Republic, Egypt, Italy, Portugal and Serbia). They had an average of approximately 25 years old (minimum: 21 years old; maximum: 30 years old), and have been in Belgium for more or less 5 months (minimum: less than a month; maximum: 9 months).

Both focus group and board game sessions were recorded in video and audio, seeking to facilitate the transcribing process, which was made manually utilizing the SaaS oTranscribe. The participants were attributed by a code and number (e.g. Fg004), in order to keep their privacy and better illustrate the quotes during the discussions of the results. Furthermore, participants of these sessions were rewarded with a cinema voucher worth 7,5€ in order to motivate and encourage them to help with real data.

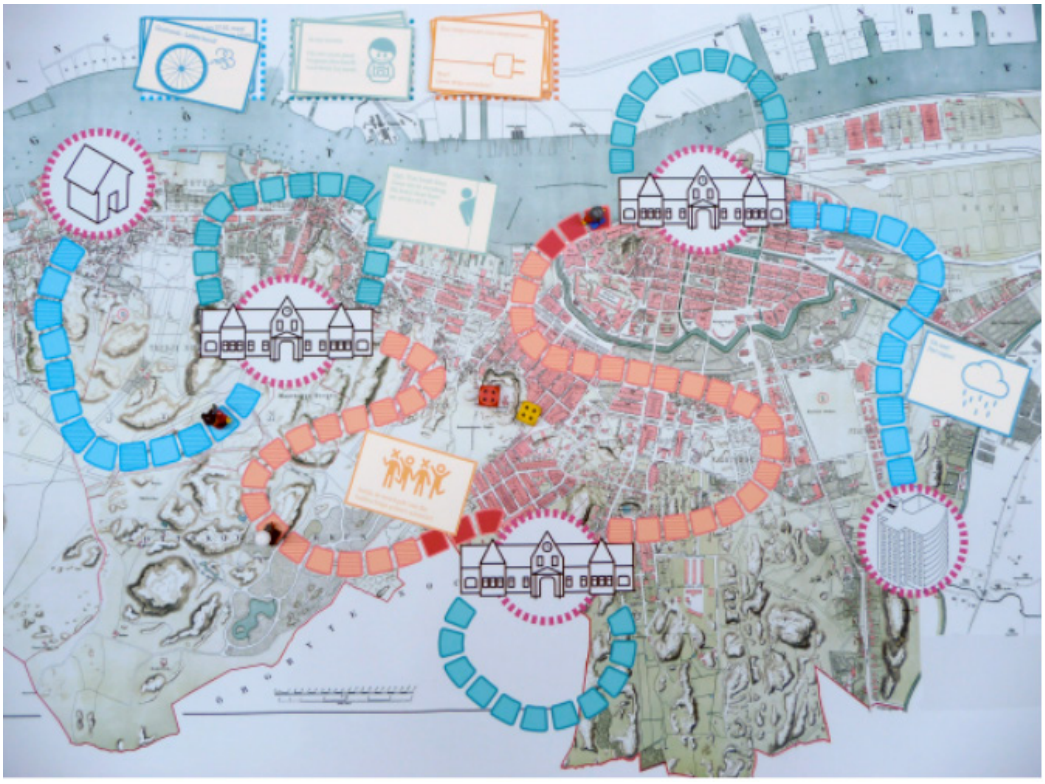

Figure 3. Board game utilized in the workshops, developed by Slegers et al. (2015)

The data collected during the observations, focus group and board game workshops' sessions were analysed through the qualitative data analysis' software NVivo 10. On the software, several nodes were created iteratively, aiming to represent a certain type of behaviour, motivation, attitude or need. This classification improved the interpretations and conclusions made from a large amount of data, consequently leading to a better understanding of the patterns observed and discussed during the user research sessions. The results from this analysis are presented in the section.

4. Results

The Belgium train system is very complex. There are many official sources of information distributed through different channels. In the same way that there are various types of tickets being sold through other channels, and accepting different payment methods in each. In addition, there are three official languages (being used according to the region); rules for bikes, pets and luggage on board; different structure of stations and its facilities; among others.

It is crucial to facilitate the comprehension of train's schedules. The quantity of information provided in the stations is often huge and thus requires a big mental and cognitive effort from tourists, confirming the problems identified through the literature about information in tourist transportation. The provision of personal information could be a solution by offering only the information needed by the user in the right moment. Moreover, provide alternative solutions in case of unexpected events could increase their tourism experience and avoid a sequence of other troubles in their schedule, such as lose a connection or appointment; arrive after the closing time of stores; and make a friend waits longer.

Regarding the train ride, the app should support the tourist on tracking the stops and may even provide tourist information about the places where the train is going through, as an entertainment for the passenger. Moreover, it is important to provide the current overview of empty seats in the carriages. This overview could also suggest the best place for tourists carrying luggage so they could keep an eye on it while travelling, since most of them do prefer to keep it close by. The availability of sockets on the carriage also may play a role on the tourist's decision when looking for a place to sit. Thus, provide this information is also relevant.

The purchase and use of tickets also need to be supported. Offer the best deals and conditions of use according to the user's preferences and trip could solve the current difficult task of understanding the best option available. Moreover, the access to computers can be very limited during a trip, so it is important to provide an in-app purchase and in-app ticket's proof that is easy and accessible for tourists. Currently, buy a ticket through a mobile device requires a Belgian cell phone number in order to send a SMS confirmation message of the purchase, which is the ticket's proof. Therewith, foreign tourists are not able to buy it. However, even if they could insert an international number, problems regarding roaming costs could create difficulties for the operation. Thus, it is important to make this process simple and usable for tourists regardless their origin, which could improve a lot the dull experience of buying a ticket and printing it out, as some of the apps previously studied already do.

Furthermore, it is understandable that tourists do not cautiously look for all the rules in the context of use of trains in Belgium. Instead, tourists seem to rely on their previous knowledge in order to act according with what they think it is right and expected by the company. However, if they do not have any previous knowledge related to certain situation, or do not feel confident about applying the same behaviour in Belgium, the tourism experience can be seriously affected by the feeling of uncertainty. Thus, the future mobile application should provide assistance regarding the basic rules of the Belgian train system, as well as the rights of the passengers in case of unexpected events. For instance, disturbances may be very common in the rail network making tourists feel damaged by those problems and willing to complain in order to get a refund.

In addition, as tourists do not know very well how the system works and what are the common unexpected events that often occur, any unusual activity can make them feel that they are missing something, or that they may need to collect more information in order to be updated about the situation. For instance, an audio announcement made, a screen displaying some random information, or simply a train slowing down or stopping in the middle of nowhere. Thus, it is important to keep them updated about any surprising event. Even in cases when the activity is not directly related to the train of the tourist, inform him that everything is still going according to the plan could be positive.

Another point that the future mobile app should support is the language barrier. Many tourists do not master French or Dutch languages. Consequently, they are much more exposed to miss important information than others. To solve this, real-time translations for disturbances and a glossary in-app for common terms could improve tourists' feeling of being up to date in the environment. This feature could support not only English, but also other main languages such as Spanish and Chinese.

Moreover, travellers may spend a considerable amount of time during the whole process of leaving home, catching a train and reaching the destination. In order to increase their tourism experience, facilities are provided in the train stations and on the train. However, sometimes tourists are in a rush and they do not have time to explore the station or the carriage to check what is available. The future mobile app should help them finding and discovering it, allowing them to make better use of all facilities available within the time available before the train departs, including tourism offices where the tourist can collect information about the destination even before leave the station.

Besides the facilities, the app also should provide information about alternative transportation in the surroundings, minimizing the effort of the tourist, who would need to look for this information by himself. Moreover, alternative transportation seems to be very important in case of unexpected events, such as delays, missing a train or strikes. In terms of shared mobility, solutions like bike or car rentals can also increase their experience in the destination. The use of bicycles can improve the tourism experience by offering a more efficient way of transport in cities where the public transportation system is not very adequate, for example. While the car rentals can make easier to reach certain points of the country that would be very time consuming if relying on public trans-

portation (such as buses and metro), or very expensive if relying on private transportation (such as taxi). It would be also important provide information about parking lots in the surroundings, relating the tourists' needs with the commuters' needs.
Inform the tourist about on-going activities happening in the destination can improve their tourism experience offering a wide range of things to do that would not be known through common guide resources, or it would consume a lot of time through searches and common websites. On the other hand, also makes them aware about the possibility of an unusual atmosphere or behaviours in certain places, for instance a beer festival, which could create a loud and messy atmosphere in the surroundings.
Additionally, tourists care about weather forecasts since it can make a huge difference in their trip's experience. Thus, inform them about the weather predictions can save time and effort in advance, allowing them to prioritize the clothes and tools that best match the upcoming weather, contributing to avoid bad experiences such as get wet by an unexpected storm.
Lastly, it is important that many of these features can be accessed offline due the lack of Internet. As only a few stations have Wi-Fi connection and this service is not provided on the trains, the mobile app has to be built as much prepared as possible for this factor. In addition, it is important that the app includes necessary information regarding useful numbers that could be very useful in case of any emergency.

Conclusions

Through the use of three different user researches methods (direct observation, focus group interviews and board games workshops) this study included users in the centre of the process seeking to elicit user habits, behaviours, needs, expectations and desires regarding the use of trains in Belgium. Direct observations helped to minimize self-reporting and biased assumptions, clarifying part of the tourists' needs and problems in different stations and trains across Belgium. Although was not possible to assure who is a tourist and who is not, the data gathered during this methodology was validated and complemented by the feedback received during the next two user researches. Moreover, this process was crucial for a better understanding of the Belgian train system, even though previous research have been made. From all stations observed, the Airport's station was the one which more feedback provided, while the Namur's station was the field with less new data collect, even though provided a new perspective due the particularities of the station and region (French part of Belgium). Focus group sessions also contributed with this work. Although the literature aware about this methodology's risks due the fragility regarding participants diverging the topic and controlling the sessions, all meetings occurred positively. The participants' discussions provided valuable user stories, highlighted relevant differences in experiences between them, and empowered more ideas. Board game workshops as generative tool also gave its important contribution to the results. The use of board games created an informal and enjoyable environment in which players felt very comfortable to play the game, give opinions and suggest opinions to others. Moreover, the use of the TIS as Wizard of Oz style incited questions that probably would not be made in traditional methodologies, as well as brought to the discussion situations that were not mentioned neither observed before, such as safety issues, hygiene, parking lots and weather. However, in both sessions some of the participants knew each other, which required an extra effort in order to control the workshop and not diverge from the topic throughout the game. To solve this problem it is suggested to make sure that participants do not know each other and also consider the use of two moderators.
In sum, the direct observations outlined what users do in the present, while the focus group interviews brought to the discussion past memories. These two methodologies helped the design process accessing the surface knowledge. Moreover, the use of board game workshops aimed to access future needs, dreams and fears of tourists. With this methodology it was possible access to a deeper level, the tacit knowledge. Through the reveal of latent needs this methodology approach an experience's domain located between the present and the future.
The big effort required by the current services proves the need for improvements in the area, which should save physical, cognitive and affective effort from the passengers.

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