

Evaluating the usability of a mobile tourist guide: the mesh-t outdoor mobile application

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Abstract

Mobile tourism guides have placed themselves, in recent years, as essential apps for any smartphone or tablet user. Within this context and throughout its course, the mesh-t project: pervasive, ubiquitous and context-aware technologies in tourism, has sought out to approach the potential of these e-tourism applications in integrated services, through a transdisciplinary effort between the academic and professional world. Waging on ubiquity, participatory culture and transmedia storytelling as core concepts, within the mesh-t project different technical solutions have been developed in an attempt to create a unique and flowing experience. This paper describes work done on evaluating the usability of the outdoor mobile guide, one of those abovementioned solutions, by outlining the selected methodology, which included a combination of heuristic analysis and field trials, and presenting some of the preliminary results gathered so far.

Keywords: e-tourism, mobile guide, m-tourism, usability evaluation, ubiquity

1 Introduction

The **mesh-t** project (Raposo, Beça, Figueiredo, & Santos, 2012b), has developed 4 technological solutions: a museum multimedia mobile guide; an interactive wall; a web portal; and a context related multimedia outdoor travel guide, which are expected to result in a unified system and experience. As stated by Lee & Mills (2010), mobile technology's strengths, such as ubiquity, immediacy and portability, give the tourism industry the opportunity to meet their customers' information needs in relation to products and services prior to their purchase, an advantage towards satisfying customer expectations, improving convenience and decreasing costs. The mesh-t multimedia travel guide was designed based on that exact advantage, in order to enhance the touristic activity in the city of Aveiro, Portugal. As the touristic activity may be progressively viewed as a unified experience of transmedia interaction and social interplay (Raposo, Beça, Figueiredo, & Santos, 2012a; Raposo et al., 2012b), user experience satisfaction arises as fundamental and, in this context, the mobile application required usability evaluation, which will be described in the remaining of this paper.

2 Methodology

The designed usability evaluation was based on a combination of two different approaches: heuristic evaluation with experts and a phase of field tests with users (a

first user session to validate the methodology and a second one conducted after the application refinement).

2.1 Heuristic evaluation

The heuristic evaluation session started with a written inquiry about the evaluator's mobile phone use habits, regarding interaction with the mobile phone's operative system, functionalities and applications. Afterwards, the evaluator would interact with the app, installed on a Samsung Galaxy S smartphone, according to a given step-by-step guided tour script and then navigating freely on the application. Finally, during the tests, each evaluator was asked to take note of any flaws or poor quality aspects identifiable according to the usability principles defined by Bertini, Gabrielli and Kimani (2006) for evaluating mobile interaction. The research team provided an observation checklist. On the checklist, the evaluator would write down a description of the problem, its disrespected heuristic and the gravity of the situation identified, according to an adaptation of Nielsen's problem gravity scale¹(1994), and possible suggestions for solving each problem identified. As to the participants, the group was made up of 7 experts, selected amongst researchers or developers at the University of Aveiro, in the area of Information and Communication Technologies. The described sessions had an approximate duration of 50 minutes and were held in a controlled environment.

2.2 User tests

Following the heuristic evaluation, user tests were conducted in a context equivalent to the mobile guide final context of use. Field trials are a common usability evaluation process, specially when used as part of an iterative development process, thus allowing the progressive refinement of system requirements as represented by the Murshid guide evaluation (Echtibi, Zemerly, & Berri, 2009). As to the replication of the usage context, factors as time constrains, lighting conditions and Internet signal and access were taken into consideration, as they inflict on the user acceptance of mobile applications (Höpken, Fuchs, Zanker, & Beer, 2010). Each session included a written inquiry on mobile phone utilisation and a period of interaction with the application, both guided by instruments similar to those created for the heuristic evaluation – although adjusted according to the updated version of the application and to the context of use. After the utilization period, the participants were asked to answer a written questionnaire based on the their interaction with the application and to evaluate several usability aspects, such as easiness of use and future use intentions (Kurata, 2012; Linaza et al., 2012). As to the users, 4 users participated in the first session and 6 took part in the second one, all of them familiar with the use of Android smartphone applications. In addition, the sessions were held during the day, in a outdoor environment, between Points Of Interest (POI) included in the mobile guide.

¹ The Nielsen's gravity scale addresses the severity of a reported usability problem (0 – No problem at all; 1 – Cosmetic problem; 2 – Minor usability problem; 4 – Catastrophic usability problem). For the stated heuristic evaluation, participants were asked only to report usability problems using a severity scale from 1 to 4.

3 Data analysis

3.1 Heuristic evaluation results

The mobile guide heuristic evaluation resulted in an overall identification of 62 problems (an average of approximately 9 problems per evaluator) and 31 problems identified by at least two users. Figure 1 presents the distribution of these heuristic related problems and the level of gravity attributed to each one along the given set of heuristics.

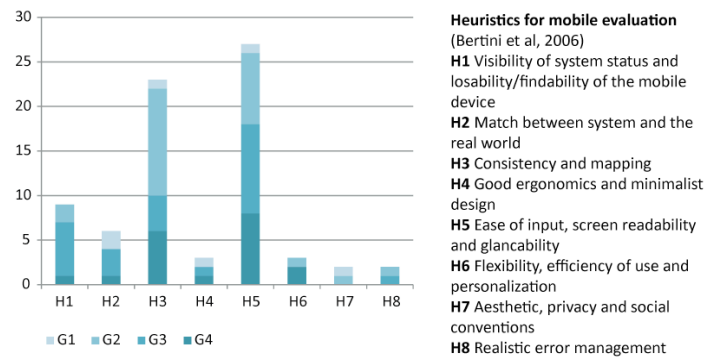


Fig. 1. Distribution of registered problems and respective gravity by heuristic

The displayed results show the “Consistency and mapping” and “Ease of input, screen readability and glancability” heuristics as those more frequently disrespected and with greater gravity. On the other side, the “Aesthetic, privacy and social conventions” and “Realistic error management” heuristics were revealed as the least problematic.

3.2 User tests results

Since the purpose of the first field trial session was to validate the selected methodology, this section will only present some of the most significant data collected from the second session, specifically regarding users’ opinions about the mobile guide (Figures 2) and task difficulty (Figure 3).

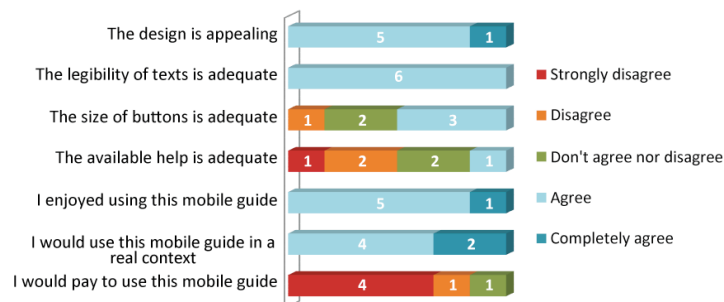


Fig. 2. Opinions about the mobile guide's usability related statements

Regarding users' opinions and beside agreeing on the appeal of the design and adequateness of text legibility, all of them implied they had enjoyed using the mobile guide and they would use it in a real context. However, they were reluctant to pay for such service.

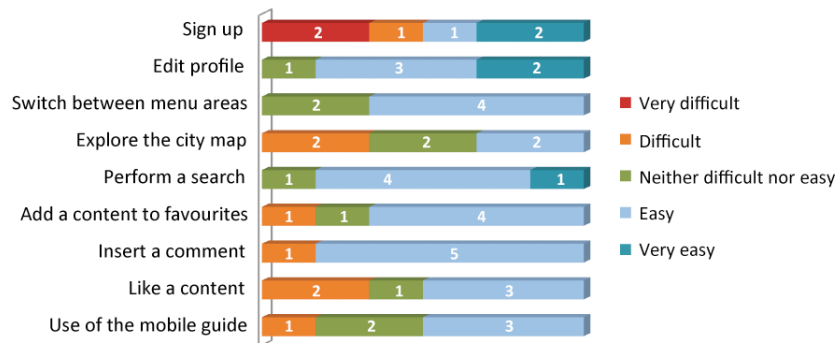


Fig. 3. Task difficulty level attributed to different interaction tasks

Editing profile and performing a search were the easiest tasks among all users. On the other hand, signing up and exploring the city map were the most ambiguous – easy for some, difficult for others.

The participants were also asked about what they appreciated the most and the least in the mobile guide. The most appreciated aspects were the extension of the touristic activity to a social dimension, the combination of different cultural resources and the possibility of avoiding tourist guides and brochures. As to the least appreciated aspect of the guide, it was the difficulty of using the mobile guide.

To better understand the user's opinion about the potential use of the travel guide, the inquiry asked if they would use the guide in a real context and solicited reasons for such opinion. As a result, the participants reaffirmed that they would use it because of its utility and practicality. In addition, they were asked to reflect on additional features, therefore referring the possibilities of displaying transportation info and health POI info, purchasing tickets related to the referenced POI or dislocation between POI and the integration of the mobile guide with a website.

4 Conclusions

The selected convenience sample - few participants with similar backgrounds - constitutes a limitation in what addresses the obtained results. Nonetheless, regarding the evaluation results so far, the consensual satisfaction of the tested users towards the experience with the mesh-t outdoor guide is an important input to the next project phases, with the refinement and development of the final app version. Still, a wider perspective must be held in order to define solutions for the detected problems and guarantee the creation of a successively better tourist guide. Also noteworthy, in such an iterative design process of an outdoor touristic application, it was essential to incorporate field tests with realistic conditions and potential users in the evaluation's methodology and both the heuristic evaluation and the first user test session allowed for the improvement of the application towards a better usability level and the refinement of the evaluation methodology.

4.1 Future work

The continuity of the project will include new field trials with different users and the subsequent update of the application, to improve it and reflect the new suggested functionalities. As to the reluctance to pay for the application, it is important to understand if this is merely associated with a pre-disposition of the users towards free applications or with the touristic nature of the mobile application, and also to reflect about the mesh-t guide future development and marketing strategy.

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