A User Study of Mobile Web Services and Applications from the 2008 Beijing Olympics

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ABSTRACT

This paper describes a business user study using a packaged suite of mobile Web services and applications deployed at a real-time event, the Beijing Olympic Games in August 2008. These applications were an Olympics guide, menu reader, phrasebook, Sports Tracker [3], photo sharing on Ovi [4], and Nokia Maps [2]. To evaluate its feasibility and use, we used logging, surveys, and statistical analysis for collecting and analyzing the data. We discovered that guests found the Olympics guide application to be the most popular, followed by Nokia Maps and then photo sharing on Ovi. The results demonstrate that the techniques used in our evaluation can be used to determine the type of applications that are relevant to consumers at a real-time event, and suggests ways for improving the mobile application design and user experience.

Categories and Subject Descriptors

H.5.2 [**User Interfaces**]: User-Centered Design, Evaluation/methodology

General Terms

Design, Measurement, Human Factors, Performance

Keywords

Mobile Web Application, User Study, Mobile Interface, Usage, Mobile Design, User Experience

1. INTRODUCTION

Mobile Web usage and mobile Web application usage is increasing rapidly with the adoption of sophisticated phones such as the Apple iPhone, phones based on Google Android, and Nokia S60 series phones. There have been user studies on how users use the mobile Web [1, 5] and tracking mobile Web usage [1, 5, 6], but little work on practical studies of large numbers of users (except for [1]) and the types of mobile Web applications that are applicable to use in specific environments.

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In our work, we study the usability and usage of mobile Web services and applications in the context of a user study in a real-time environment, using a packaged suite of applications that are designed around the 2008 Beijing Olympic Games. We analyze the user experience and behaviour through logs and surveys, in order to determine which applications are the most feasible and relevant to users. The results have implications that suggest how practitioners can better design and deploy mobile Web services and applications in activity-oriented settings and real-time events.

2. USER STUDY AND APPROACH

In our user study, we wanted to discover the types of applications that were the most often used, the types of applications that were more useful than others and why, the types of applications that were more helpful than others and why, and the ease of use of the applications. We deployed a set of all-in-one mobile Web services and mobile Web applications as a packaged travel and tourist guide for business guests to the Beijing 2008 Olympics, to make their stay in Beijing and the Olympics a memorable one and to show how mobile Web services and applications could be useful. From all guests invited globally, a total of 180 guests out of 220 candidate guests consented and participated in the study. Each guest was provided with a Nokia N82 mobile phone, instruction guide, survey and the following applications to use: Olympics guide, Menu Reader, English-Chinese-English phrasebook, Sports Tracker [3], photo sharing on Ovi [4], and Nokia Maps [2] application. A total of 158 users actively participated in the study giving an 88% participation rate. 88 of the 158 users completed our survey (55% participation rate) for obtaining feedback on the usability of the applications.

To evaluate the usage and usability of the applications, our data collection methods involved using a survey and logging application. The survey was used to measure usability and for each application, we asked guests whether they had used this type of application before, asked how easy and how helpful each application was to use on a scale of 1 to 5 (1 was for worst and 5 was for excellent), asked whether they would use each of that application again in the future (yes or no), and asked them to provide any free-form comments about the application. The logging application was installed on each mobile phone and recorded (in the background) the time that each application had started and when the ap-

plication was exited, in order to measure the usage of each application for each time it was invoked. The time used for each application on each day was then calculated for each participant.

3. DATA ANALYSIS AND RESULTS

From the user study, guests took altogether 2344 photos (78% participation rate), out of which 1363 photos were uploaded to the Olympics album on the Ovi photo sharing service with 58% of photos uploaded to public. Active use of the services was 300 hours collectively (or 1.7 hours/guest), with 3845 individual application launches, giving an average usage time of 4.7 minutes per application.

3.1 Usability results

Guests found the Nokia Maps application to be the most helpful to use (4.1), followed by the Olympics guide (4.0) and menu reader (4.0). However, guests found the phrasebook to be the most easy to use (4.1), followed by the Olympics guide (4.0) then Nokia Maps (3.8) and Sports Tracker (3.8). Overall, guests found that Nokia Maps was useful to determine where they were at all times. Overall, users found it difficult to search by place name because an address was needed, and the map did not show nearby landmarks near a certain area like a bus stop or restaurant.

Guests found the Olympics guide difficult to search, browse and obtain updated results. The menu reader was not very easy to use as it was rated the lowest (3.6) from the survey because it was slow and inaccurate. Many guests found the photo sharing application difficult to use (3.7) because they could not upload photos to the Ovi photo sharing web site due to connectivity issues, and they could not post the next photo until the previous was uploaded. Many guests therefore mentioned that easier search was needed. Guests found that the phrasebook application did not provide a complete dictionary of words, but rather just common phrases. For the Sports Tracker, many guests felt it was designed for athletes rather than ordinary users therefore guests did not find it the most helpful (3.5).

For the applications that users would likely use in the future, most respondents said the Olympics guide (53), followed by Nokia Maps (52), then photo sharing on Ovi (40).

3.2 Usage results

Overall, at most 20% of the users used the phrasebook, Sports Tracker and menu reader applications, around 20% of the users used photo sharing and Nokia Maps more than 6 times, and around 30% of the users used the Olympics guide for more than 6 times. All users used the photo sharing application to access the Ovi photo sharing service (although not necessarily uploading photos from the phone).

In terms of the number of times an application was used, photo sharing was the most heavily used application (1034), followed by the Olympics guide (650), Nokia Maps (631), menu reader (249), Sports Tracker (150) and the least used was the phrasebook (132). Guests spent the most time using the Olympics guide (102.7 hours), followed by Nokia Maps (86.9), photo sharing (79.5), Sports Tracker (12.3), menu reader (6.5), and the least used was the phrasebook (3.7). For the average time used, the Olympics guide came up on top with an average time of 13.4 minutes, followed by Nokia Maps (8.3), Sports Tracker (4.9), photo sharing (4.6), phrasebook (1.7) and the lowest was the menu reader (1.6).

For the total time used for each application throughout the duration of the user study, we discover that users spent the most time on the Olympics guide, photo sharing, and Nokia Maps. The least used applications in terms of time are the menu reader, Sports Tracker and phrasebook. We also discover that as an application's mean usage increases, then its mean usage time also increases. That is, the more times that an application is invoked, then the longer duration of time that the user will spend in total in the application. The most popular applications that emerge from this are the Olympics guide, Nokia Maps and photo sharing. We discovered that users on average spent significantly more time on Nokia Maps (10.63 minutes) and Olympics guide applications (8.79 minutes).

4. CONCLUSIONS

In this paper, we described a user study of mobile Web applications and services for the Beijing Olympics to study how people use them, in order to analyze how easy to use and how helpful the applications were, and their usage patterns. Results showed that the Olympics guide application was the most popular, followed by Nokia Maps and then photo sharing on Ovi. The implications of these results were used to suggest how usage patterns can be used for when to use the applications and how user activity and environment can be used to improve the applications as well as to develop personalized mobile Web applications. We plan to create a comprehensive logging application that allows users to enter in the task what they are doing and report their problems with the application immediately on the phone that can either be stored locally or even sent to a Web site for data collection. For future work, we intend to take the user feedback to improve on our applications and deploy them in different environments and with different sets of users.

5. REFERENCES

[1] Y. Cui and V. Roto. How people use the web on mobile devices. In *WWW '08: Proceeding of the 17th international conference on World Wide Web*, pages 905–914, New York, NY, USA, 2008. ACM.

[2] Nokia. Nokia Maps. http://maps.nokia.com, 2008.

[3] Nokia. Nokia Sports Tracker. http://sportstracker.nokia.com, 2008.

[4] Nokia. Ovi photo sharing service. http://share.ovi.com, 2008.

[5] A. Sellen and R. Murphy. The future of the mobile internet: Lessons from looking at web use. *Hewlett-Packard Labs Technical Report, HPL-2002-230*, 2002.

[6] T. Yamakami. Towards know-when technology in the mobile information space: long-term user trace log analysis in the mobile internet. *Web Intelligence, 2003. WI 2003. Proceedings. IEEE/WIC International Conference on*, pages 545–549, Oct. 2003.