iPhone Mobile Application Design: The Case of Hacettepe University Libraries[1]

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Abstract: *Thanks to the features of the mobile devices which have been constantly evolving, there has been a diversity of mobile applications. It is highly possible to find a mobile application to carry out any transaction in an application store. Users, whose expectations have been increasing, hope that libraries will be accessible and controllable. Hence, libraries should move towards mobile platforms so that users can easily get access to them. In this study, we first review the criteria that should be paid attention when designing mobile applications for iPhone and then describe the iPhone mobile application that we developed for Hacettepe University Libraries.*

Keywords: *Mobile application design; mobile usability; iPhone application.*

Introduction

Mobile devices, which have become one of the most indispensible parts of our life, allow us to access social networks, to shop and to carry out banking transactions independently from space and equipment. Internet research carried out by Cisco Company reveals that mobile video will be 66% of the world's mobile data traffic by 2014, with a 131% growth between 2009 and 2014 (Cisco, 2009). The Internet Report of Morgan Stanley Research shows that the users who have Internet access through mobile devices will outnumber the users who have Internet access through desktop computers in 2013 when the current growth rate is taken into consideration (Morgan Stanley, 2009).

Today, mobile devices have turned into a universal device for every kind of communication (Rainie and Anderson, 2008). Thanks to the developing technology, the significance of mobile applications in solving such problems as security, bandwidth, location detection and data capacity has increased. This rapid development process caused the users to come up with more demands. It is not enough for them to find what they look for on the network; they also want to be able to find "just-in-time" information without changing their location (Johnson et al., 2010), usually through the use of their mobile devices (Anderson & Wolff, 2010).

At this juncture, institutions providing information services should take innovative steps toward the reorganization of their services and render these services to users in order to satisfy their information needs. For libraries, applications should be devised so that they can be accessible even through mobile media (Dempsey, 2009).

The most difficult part of mobile application design is that content should be given on a small screen. This means that there is no place for something which is useless and has no value for users. In order to achieve this, the requirements, expectations and behaviors of users should be taken into account and the design process should proceed in harmony with users' expectations (Biel, Grill, & Gruhn, 2010).

In this study, the criteria for iPhone mobile application design are elaborated. A mobile application developed for Hacettepe University Libraries (Beytepe Library, Medical Library and the Library of the Ankara State Conservatory) is described (Hacettepe, 2010).

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[1] The iPhone mobile application for Hacettepe University Libraries was developed to satisfy the requirements of an undergraduate course (BBY 405) offered by the Department of Information Management of Hacettepe University during the Fall Semester of 2010-2011.

Mobile Media and Libraries

Tomi Ahonen (2008) focuses on advantages and disadvantages of mass media along with their importance in our social life. He defines mobile devices as the genuine mass medium coming after the printed press, recordings (sound recordings, CDs, DVDs, etc.), cinema, radio, television and the Internet. While mobile devices have the features of the other six media, they are different in terms of being personal, always carried, and their "always on" feature.

Smartphones such as iPhone and Android have the feature of sharing audio, text, or image files simultaneously. Along the way, applications developed for mobile devices offer a rich experience to the users (Rayport, 2009). Facebook, the most frequently used social network site, has approximately 250 million users with mobile access. The activity of these users is twice that of users with desktops (Facebook, 2011).

Users having constant access through their mobile devices need more complicated information services and expect libraries to be easily accessible, dynamic and controllable. At this point, libraries should take steps to change their way of rendering information service and to carry their services to the environment of the users (Dempsey, 2009). Users are ready to accept the library services that they are used to. Hence, mobile libraries (m-libraries), the sources of which can be accessed through the use of mobile devices, are one of the wisest solutions.

When library services are ready for mobile use, user accounts, digital reading rooms, electronic books, journals, articles, etc. can be attained during mobility as well (Needham & Ally, 2008).

The iPhone Mobile Application

With the opening of mobile application stores, mobile phones have become a computer platform. Mobile phones are turned into devices with which you can play games, use GPS and watch movies. Users began to shop, carry out their banking transactions and use social networks with the use of mobile applications (Anderson & Wolff, 2010).

If you are a user of Apple App Store, which has 99.4% of the whole market, you will not experience any difficulty finding an application (Foresman, 2009). The App Store has more than 350.000 applications (Apple, 2011). Such applications, developed in such an environment, must be designed in a sophisticated way that will distinguish them from their rivals. Things that should be watched during the design process of iPhone mobile applications might be itemized as: user-friendly interface, target group and a kind of different attitude about its use.[2]

Content

The most difficult part of a mobile application design is that content should be given on a small screen. There is no place for a trivial detail which confuses the users and is useless on a 3,5-inch sized screen. In order to benefit from this small screen, content should be rendered in a simple way which will not puzzle users.

Mobile information architecture is a process of constituting a sketch and structure to mark out the information which mobile sites and applications will have to encompass (Fling, 2009; Kukulska-Hulme, 2007). Applications developed in harmony with this architecture are easier to use in terms of practicality and more successful in terms of serving the purpose of the users.

The size of the content is also significant. Mobile applications are programs with a small size. If they begin to take up more space, they shut down automatically. Therefore, contents like decorative screen images and flashes should be avoided and pictures should be used in a compressed way (Clark, 2010). Applications taking up too much space are also problematic in terms of accessibility. It takes time to install programs since mobile devices connect to the Internet via 3G or Edge speed (Fling, 2009).

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[2] There are many sources examining the mentioned features (Biel et al., 2010; Fling, 2009; Group, 2009; Nielsen, 2009; Owoh, 2010). Although different categorizations are made under different headings, criteria discussed in these sources largely correspond.

User-Friendly Interface

Accessing the content and using it in an effective way is as important as the content. The most crucial point while rendering the content is the existence of a usable[3] interface which will ensure the delivery of information in the shortest time (Uçak & Çakmak, 2009).

If the use of an application needs a huge time investment or seems to, then its use in the long term is a marginal probability (Krug, 2006). Research shows that users analyze mobile applications that they can download in less than 10-15 seconds. If the interface seems a bit complicated, they try another application which has a similar content (Fling, 2009).

Users benefit from what is rendered to them (some features like menu, content, form, graphics, etc.) in order to attain their aims (Morville & Rosenfeld, 2006). If more emphasis is given to usefulness during the design of such features, users will go through a less annoying process in which they will be more satisfied (Krug, 2006). In a well-done design, a user will know what it is and how it is used by just a glance at one page, and he/she might do that without concentrating on it much. It is a kind of utopia to suppose that users might understand all of the functions of a system when these functions are given just on the interface (Nielsen, 1993). What kind of a reaction will be seen might change from user to user, but intensive pages and background image are a little bit problematic. Thus, simplicity should always be in the foreground.

Another quality criterion about usefulness is the harmony of web pages with mobile browsers. Web pages for mobile devices should be designed by taking into account the small screens of cell phones, smart phones, iPads, and so on. For instance, mobile devices cannot handle web pages where information is presented in multiple columns.

Target Group

The determination of the target group is significant since this plays an important role in the identification of the practicality, and as a result of this, of providing usefulness and service quality. What users need, what their priorities are, how often and when they will use the application, are among the essentialities during the design process.

While designing an application, what has been aimed at by the designer might be different from the need of users. Called "design blindness" by Nielsen (1993), this might be defined as the situation in which the designer supposes that the design of the interface is flawless and excellent. For example, designers suppose that users will browse the pages carefully, and choose the best by analyzing all the choices. But what users choose is the logical option rather than the best one[4] (Klein, 1999).

A Different Kind of Usage Technique

What is important while developing a mobile application is how the content is presented. Some features like navigation, camera, microphone, gravity sensor (accelerometer) which are found in iPhone, might create an advantage during the presentation of the content. For example, when users make use of an application called SoundHound to search a music database, they do not have to type words. If sound is introduced through a microphone, then a search on the database is carried out and information about a song is retrieved.

iPhone Mobile Application for Hacettepe University Libraries

For someone on the move, sources and services of the libraries have become accessible through an application. Also, thanks to some features like barcode scanning and navigation, this process has become more functional.

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[3] Usability is defined as a level of users' performing their goals in an efficient, comfortable, and acceptable way and is the main factor in measuring the success of system interfaces.

[4] Klein asserts that people (firemen, pilots, etc.) who have time pressure, ambiguous goals, and variable conditions, take decisions which are risky and prefer to choose what they think is the most logical one at first glance instead of focusing on the possible solutions and choosing the best one. Also, he alleges that web users are not looking for the best options, because they are usually in a hurry and think they will not suffer as a consequence of guessing wrong. In Nielsen's practicality tests, the frequent use of the backspace button might be given as proof of this.

We used the mobile libraries report prepared by Cambridge University to identify services to be included in our mobile application (Fig.1) (Needham & Ally, 2008). Authors of the report asked users about library sources and services they want to make use of when they are mobile. Users wanted to get information about the working hours of the library, its place on a map, its contact information, online catalogue and lending information.

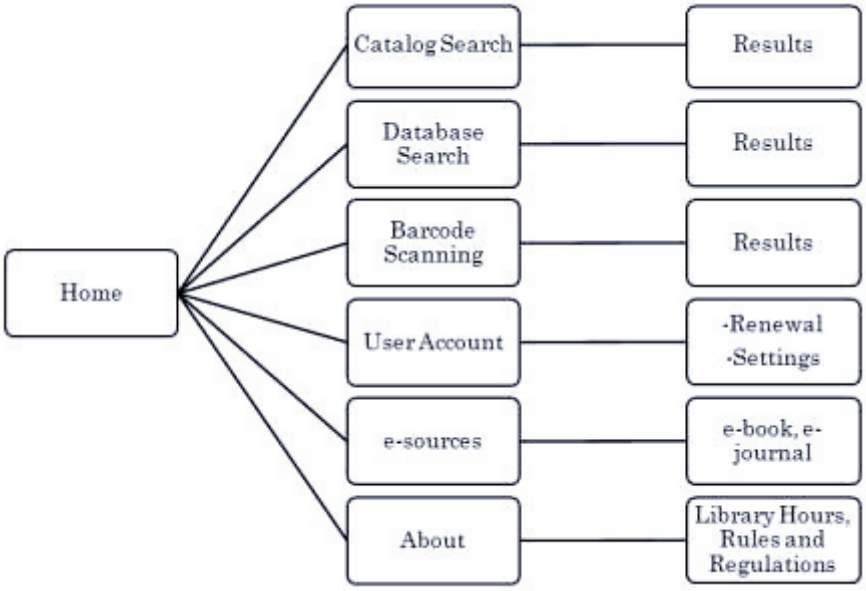

Figure 1. Map of the library application

Barcode Scanning[5]

When the barcode of a book is scanned,[6] it is possible to see information about the nearest place where this book might be found along with a list of opinions about it. In order for this feature to be used in an effective way, an Internet connection is needed (Wi-fi, 3G or Edge). In Figure 2, the barcode of a book titled "Information Architecture for the World Wide Web" is scanned.

Local Searching

In this feature, if the book whose barcode was scanned is found in Hacettepe University Libraries, it is given in the first line. Then, by making use of navigation features, nearest libraries owning the book are given in accordance with their distance (Fig. 3).

[5] Barcode scanning technologies have been applied to the system with the use of RedLaser SDK (http://www.redlaser.com/).
[6] Barcodes can be scanned in the form of UPC-A, UPC-E, EAN-8, EAN-13, QR Code (square code), Code 39, Code 128 and ITF.

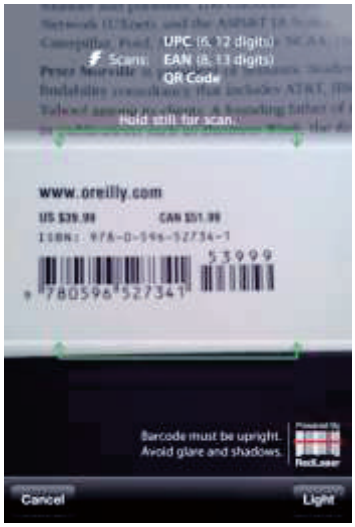

Figure 2. Screen of barcode scanning.

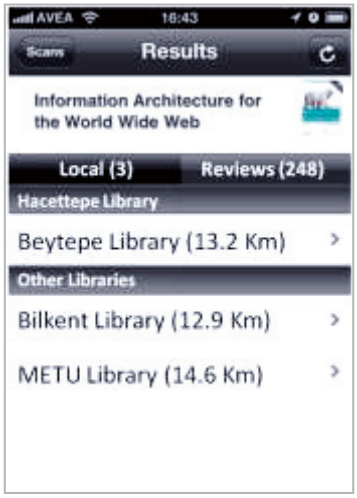

Figure 3. Results of barcode scanning and tab of local search.

When clicked, a connection to the web site of that library is established and relevant information about the book (e.g., call number, where it is located) is rendered (Fig. 4).

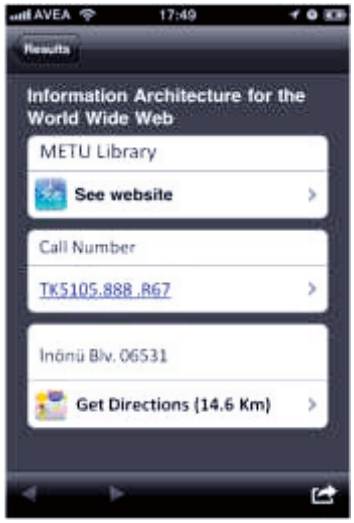

Figure 4. Information for METU Library

When 'Get Direction' tabs are clicked, the directions to get to the library are provided (Fig. 5).

Figure 5. Screen of way finder

Book Reviews

On the screen where the results of barcode scanning are listed (Fig. 3), when the comment tab is clicked, comments about the book along with the number of comments on sites like Amazon, GoogleBooks, WorldCat and LibraryThing are listed[7] (Fig. 6).

Figure 6. Results of barcode scanning, tab of reviews

When the scan button is clicked, the lists of the books whose barcodes have been scanned beforehand are given (Fig. 7). From results, favorite choices might be marked and sent via e-mail.

[7] Barcodes of the books hold ISBN information. Hence, information about the book, cover, comments taken from related sites are formed from ISBN information.

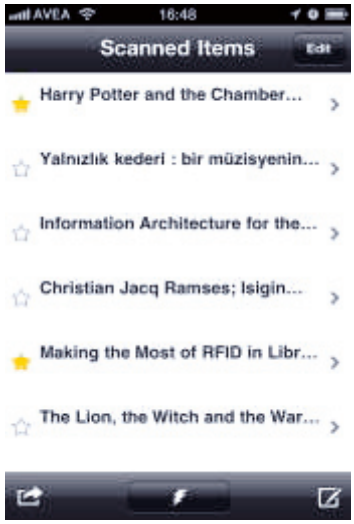

Figure 7. Screen of barcodes scanned beforehand

Conclusion

The Hacettepe University Libraries Mobile Application provides users with an opportunity of accessing library sources through iPad, iPod Touch[8] and iPhone. This application, which was developed in accordance with mobile information architecture and practicality principles, has gained a structure which is useful as an outcome of the features of barcode scanning and mapping the nearest libraries. Users are provided with more diverse information about what they are looking for in comparison with that of libraries (comments available on the Internet about the book, where a particular book might be found elsewhere, etc.). Through this application, some services and sources of the libraries have been moved to a mobile environment.

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