

Usability features of mobile apps and healthcare mobile apps: similarities and differences.

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Abstract

The purpose of this research study is to identify the Usability Characteristics of mobile applications by mobile apps users and compare their perception and rankings to what meta-analysis studies are reporting as Usability Characteristics. This study wants to identify any differences between the mobile apps for general purposes versus medical related purposes. The preliminary results of a survey study of fifty participants confirms the Usability Characteristic ratings suggested by meta-analysis studies, but at the same time suggest that Usability, Simplicity and Understandability characteristics are much more important than was previously reported. Other findings related to how users interact with mobile apps are discussed as well.

Keywords: Mobile apps, healthcare mobile apps, usability features, mobile healthcare.

Introduction

The mobile device market has become the largest electronic consumer market in the world and one of the most prosperous in terms of the applications used in such devices. A recent survey on mobile devices shows that 90% of American adults have a cell phone, while 58% of them own a smartphone and 42 % own a tablet computer (n.a. Pew Research Internet Project, 2014). One conjecture is that the higher rate of adoption of smart devices from end users is associated with the higher number of mobile application development and their usage from the consumers.

One of the areas expecting a tremendous growth in terms of mobile application development and usage is healthcare industry. The growth mobile healthcare market has had a continuous upward arc. One report in this application market shows revenue will increase to \$392 Million in 2015 compared to \$230 million in 2010 (Williams, 2012). An Accenture survey reports data showing high mobile app usage - 59% of retail healthcare consumers use mobile apps - and high demand - 81% of healthcare consumer need help to improve their health and wellness (Accenture, 2012).

The healthcare mobility market's growth potential is based on the variety of opportunities to integrate different mobile devices on the providers' side. Such devices can be integrated into the Content, Workflow and Platform of the healthcare system. The need and growth for healthcare mobile applications is related to the willingness of both hospitals and physicians to integrate electronic health records in the very near future, the need to integrate the medical records to the pharmacy systems, and the large number of healthcare mobility service providers who are eager to integrate their products into Electronic Healthcare Systems (Camlek, 2011).

There is a need from both ends of the healthcare user spectrum: both patients and healthcare providers are slow to adopt and use of mobile applications. Research conducted by Accenture (2012) indicates that exist a consumer paradox related to healthcare mobile applications. The Accenture survey shows that 97% of consumers use Internet in general but only 72% use it for healthcare interaction. The same survey data show that 59% of retail healthcare consumers use mobile apps, but only 9% have used their healthcare insurer's mobile app (Accenture, 2012). Other studies show that there is a digital gap of using the Internet to obtain health information from patients and communicating with the providers about it. Hong (2008) found that whites are more inclined to talk to their providers about information they have found on the internet, compared with Blacks or Asian ethnicities. But, there is no information about how different races and cultural backgrounds use the mobile apps for healthcare needs.

The research paper will continue with a discussion of mobile commerce (m-commerce), mobile health (m-health) and usability studies of mobile applications. Later we will discuss the methodology used to collect data, findings and conclusions related to the data collected.

Mobile Health (mHealth)

mHealth, has been defined by the Global Observatory for e-health of the World Health Organization (WHO) as "medical and public health practice supported by mobile devices, such as mobile phones, patient monitoring devices, personal digital assistants and other wireless devices". Istepanian et al. (2005) suggest that the term mHealth should include both: the mobile communication and network technologies to provide healthcare services. mHealth can be supported by mobile devices if they are enhanced to provide medical services. Such enhancements include context awareness and improved presentation of information to healthcare professionals. The design of mobile apps used in healthcare should include medical alerts, different coloring codes for different medical conditions, and a better presentation of information on the display screen (Varshney, 2014).

Healthcare providers are well aware of the benefits of the mobile apps. Providers are looking for ways on how to improve the care to their patients and make such services more cost efficient for example; Texas Health Resources is asking inpatients to use tablets in order to manage their healthcare experience. Upon arrival to the hospital, patients are given an access code where they can access the health portal. During their stay in hospital they can use the tablets to get information when their medications are due, what procedures are scheduled for them, the caregivers assigned to them, discharge instructions, etc (Mitchell, 2012). On the flip side, providers are facing a larger amount of data entry and content development for their system in order to feed such information to patient's mobile devices. Enhancements in mobile devices (upgraded hardware, software, etc.) are often necessary and the need to reduce the decision making time from the healthcare providers is a must. Therefore, hospitals are improving their mobile application information, by reducing the number of alerts and information displayed on mobile devices of healthcare providers, which will help such professionals to have less distraction and fewer decision steps to make while using such devices (Varshney, 2014).

Usability of Mobile Applications

One meta-study conducted by Baharuddin et al (2013) along with two earlier detailed studies (Coursaris and Kim, 2006, 2011) on usability dimensions of mobile apps had similar findings:

Effectiveness, efficiency, satisfaction, usefulness, and aesthetic features were reported as 5 most important characteristics for healthcare mobile apps. . The usability features are determined by four contextual factors (Baharuddin et al., 2013). Figure 1 shows the contexts of usability of mobile devices and usability features as suggested by meta-analysis research:

- Users: This factor is related to the user demographics and profiles of mobile application users. The user's culture, age, experience with technology and mobile devices, perceptions, etc. will influence the way they use mobile devices and technology.
- Environment: physical location and environmental types and conditions will affect how users use their mobile devices and access the mobile apps in them.
- Technology: The devices types, interfaces, the access to networks and other technology related factors will affect the way users access their mobile devices and the apps downloaded in them.
- Task/Activity: Based on the task users want to perform in their mobile devices, the mobile apps may be usable or not. Some tasks may be predefined, simple, and closed ones, which increases the likely hood of using mobile apps. Other tasks that the user wants to accomplish may be difficult, complex, open, interactive tasks, and therefore the users may not be inclined to use his mobile device.

The research on usability features has mainly been reported as a meta-analysis research, where usability features are classified from the previous research published in information systems journals. A comprehensive study of usability features of mobile devices evaluated by participants in a survey is still missing. Therefore our study wants to collect the perspective of end users and their perceptions about usability of mobile applications and in particular, usability of healthcare mobile applications.

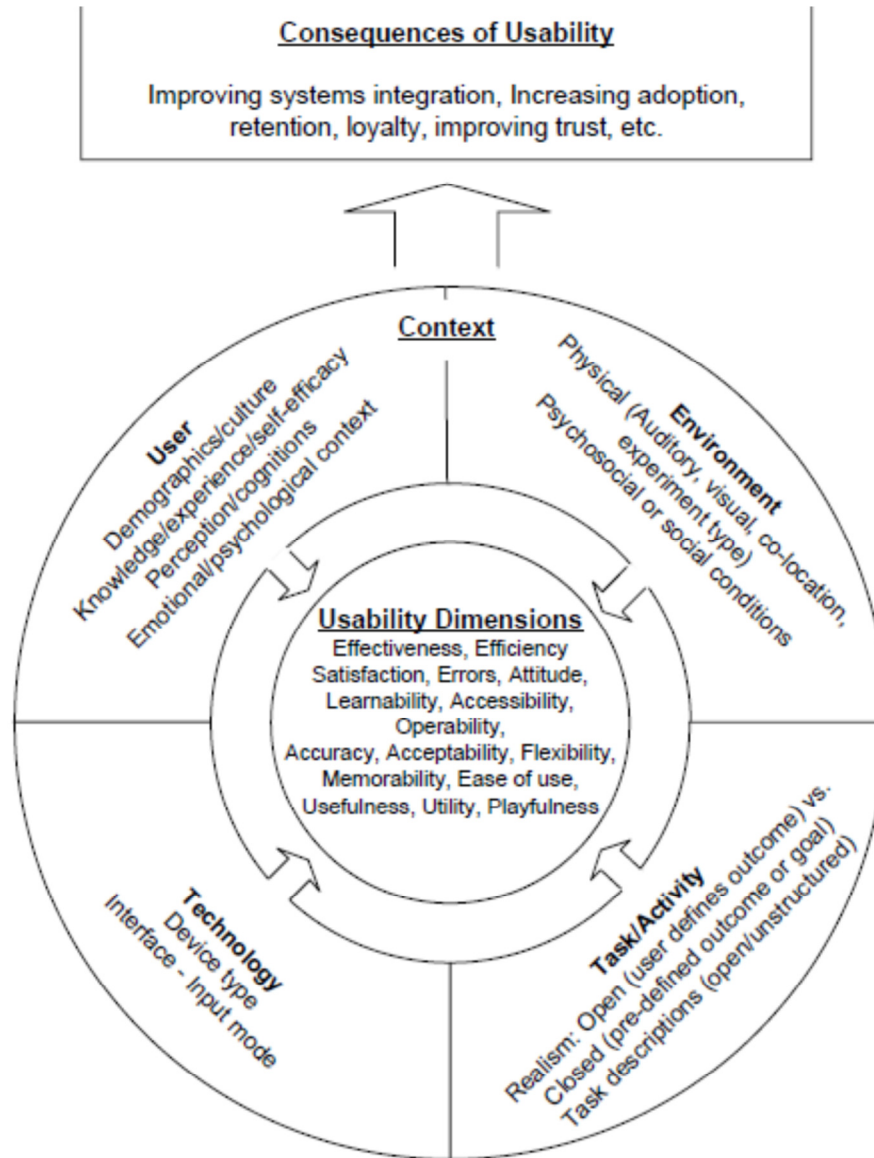


Figure 1. A suggested mobile usability framework

Methodology

This study used a survey to measure consumers' perception of usability of general mobile apps and healthcare mobile apps in their mobile devices. Baharuddin et al. (2013) framework is used to construct the five contexts which include the usability features.

The questionnaire was reviewed several times by both researchers and was pre-tested by friends who are mobile app users. The survey was posted on a facebook post of one of the researchers facebook account and friends and family were invited to help with a pre-test of the survey. The preliminary results of this pre-test are shown in the next section.

The survey data were collected from facebook page of one of the researchers. Participants were invited to take the survey within 7 days from viewing the survey link on the Facebook page.

Fifty participants took the survey and 48 of them shared demographic data. The profile of the participants is as follows:

Males were 35% of the participants, and Females were 65%. The age range varied from 18 years old to over 60 years old, where the dominant group is the 40 – 49 years age (21 participants). The demographic data on the education level shows that most participants had a graduate degree (41%) and a college degree (29%).

Findings

The most popular mobile app category (calculated with 3 points for first place; 2 points for second place; and 1 point for third place mentions) was communication (117 pts); followed by entertainment (45 pts). Third place was less obvious with Lifestyle Information, Lifestyle General, Financial Banking, and Healthcare Fitness scoring 24, 21, 20, and 20 points respectively. For our purposes, it is noteworthy that the Pharmacy category and Healthcare Medical category which included refills, medication alerts, disease management, medical information, and first aid/emergency score the lowest two categories.

Question 3 asked the respondents about why they adopt and use mobile apps. The items in this question were related to the Usability Dimensions framework suggested by Baharuddin and his colleagues (2013). The results of this survey show that the most important Usability dimensions are Usefulness (mean score is 6.02), Effectiveness (6.02) followed by Learnability (5.98), Understandable (5.9), and Simplicity (5.86).

Question 10 asked participants about the three most important characteristics of the mobile apps suggested by magazines and other public surveys. After reviewing the top ten characteristics, the participants in the study rated Usefulness (overall score 81), Effectiveness (63), Efficiency (61) and Simplicity (40) as the most important characteristics. The other six remaining characteristics were rated very low (13 and under overall score).

Question 11 asked participants on what are the most important characteristics that make them to use a mobile app. Participants ranked Usefulness (mean of 6.55), Effectiveness (6.38), Efficiency (6.38), Understandability (6.14), Simplicity (6.06) and Satisfaction (6.02).

The two main drivers in both obtaining an app and continuing to use an app are cost – it is free – and the information provided. It is interesting to note that users placed the information provided below the cost in acquisition, but higher when it came to “continued use.” This certainly reinforces the practice of providing free apps then moving to subscription plans for continued use.

With respect to the information shared by the respondents over their web apps, most feel it is not anonymous (3.69 on 7.00) and is identifiable to them (4.79). Counter intuitively the respondents also were sharing information they felt, if it were exposed, would “change their life” (4.83) in more ways than just embarrass (4.38).

Conclusions

This survey is one of the first attempts to explore what mobile app users' think about Usability characteristics and compare those with the previous meta-analysis findings. The preliminary analysis on the survey data shows that respondents' ratings on the usability characteristics are somehow different with the previous research. Interestingly, Usability, Simplicity and Understandability were three characteristics that rated higher from the mobile app users than reported in the meta analysis studies. Effectiveness and efficiency survey findings are consistent with the previous research findings.

Construct	Respondents not using Mobile Healthcare Apps	Respondents using Mobile Healthcare Apps	Differences
Users			
Technology			
Environment			
Task/ Activity Context			
Usability			
Information			
Adoption / Use			
Number of Respondents	n	n	N

Table 1. Proposed Exploratory Model for Discussion

References:

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