

User Satisfaction On Smart Phone Interface Design; *Information Quality Evaluation*

Ikhlas Zamzami

Department of Information Systems, Kulliyah of
Information and Communication Technology,
international Islamic university
Kualalumpur, Malaysia
ikhlas.zamzami@gmail.com

Murni Mahmud

Department of Information Systems, Kulliyah of
Information and Communication Technology,
international Islamic university
Kualalumpur, Malaysia
murni@iium.edu.my

Abstract— Today, smart phone evolution become an important and highest competition channel through which many organisations launch and market their services to the users. Applications have delivering services by different way of attractiveness. The quality of information provided through mobile technologies is seen as one of the most critical dimensions towards organisational achievement and success. In fact, User interface designed for mobile device is the main concern in designing applications. Currently, there is few of research that particularly evaluates the quality of information on smart phone interface. In fact, the information quality has been deliver by smart phone , which is important for user convenience, has not been evaluated. In this paper, the researcher will be examined in three main areas: mobile interface design, the information quality of the applications, and whether this information has met user satisfaction.

Keywords: *information quality, mobile interface, user satisfaction*

Introduction

Now a days, mobile devices that serve as channels for accessing services have been the critical concerns by many organizations. The information quality in terms of location-awareness, information provided, and channel used may be improved over time. Furthermore, the small size of mobile interface is the main concern in designing running applications. Because of the friendly nature of mobile phones and their interactive applications, many organisations have created their services using mobile technologies to reach their audience. Some researchers have examined the satisfaction in mobile context and they found that information quality is the key element for mobile internet. Good information also enhances user loyalty in making use of mobile device.

Currently, there is lack of research on evaluating the quality of information's smart phone from user point of view. The evaluation of information quality on mobile interface design for organisations site is unclear. This paper come to evaluate information on smart phone interface from users to come up with their satisfaction.

I. LITERATURE REVIEW

1. Overview of Information Quality (IQ)

According to DeLone and McLean (2001), information quality refers to “quality of information within what system produces”. Information system rates the information quality as a measure of semantic success of information system. Lee et al. (2004) grouped the information quality into four criteria: a) intrinsic IQ, which implies that information has quality in its own right such as accuracy, reliability, credibility, consistency, and objectivity; b) contextual IQ, which refers to the main requirements that the information must be faced within the contexts of the task at hand such as timeliness, relevance, completeness, and currency; c) representational IQ, which refers to the way of presenting the information within specific context; and (d) accessibility IQ, which emphasises on the importance of computer systems that present the information (Lee et al., 2002).

Moreover, Jeong and Lambert (2001) explained that IQ can be measured based on three main dimensions that will lead users to make decision making. The first dimension is the information content, which refers to the accuracy, relevance, security, validity, and completeness of the information. The second dimension is the information format, which emphasises on the design and links. Finally, the third dimension is the physical environment, which is related to user accessibility.

Several other studies (Auster & Choo, 1993; Culnan, 1985; Miller, 1996; and Smith, 1996) have expanded those three IQ dimensions introduced by Jeong & Lambert (2001). The studies categorised the dimensions into three, namely perceived usefulness, perceived ease of use, and perceived accessibility.

The first dimension named perceived usefulness focuses on the importance and unstableness of the information. This dimension concerns on how relevant, informative, meaningful, important, helpful, and significant is the information for user's decision making. It is more about website delivery – how accurate, relevant, timely, secure, and valid the information is.

The second dimension is perceived ease of use, which is more about self-efficacy (Bandura's, 1982). In general, perceived ease of use refers to ease of learning,

understandability, controllability, skilfulness, and usefulness. It is also more about free of effort and difficulty when searching for information. This dimension focuses on web design, format, navigation, clarity, links, and colour appropriateness.

Lastly, the third dimension is perceived accessibility that can be measured using three other dimensions. The first one is physical access to the information source, followed by the interface between system and user, and lastly the ability to physically retrieve the desired information.

The distinguishing factor between perceived ease of use and the other two dimensions (namely perceived usefulness and perceived ease of use) is the concerns about website's connectivity, interactivity, load ability, retrievability, and search options.

2. Mobile User Interface Design

User interface and mobile size are the two main concerns in designing mobile device (Goyal et al., 2003). Currently, the competition among mobile devices manufacturers in producing mobile devices that are small and thin but with wide screen size is increasing. User interface on mobile devices is part and parcel of any applications that allows users to use and interact with the mobile devices (Goyal et al., 2003). This interface shows content screen, windows, menus, control, and any parts that user can see and use. User will keep on using and interacting with interesting and attractive interface, and vice versa. There are three principles that need to be followed in designing user interface: 1) let the users be in control of the interface, 2) reduce user's memory load, and 3) make the user interface consistent (Wiley & Sons, 1997). Rayport and Jaworski (2001) conducted a study on design elements of customer interface. They highlighted seven factors named 7C's that can be used to evaluate the user interface of electronic services in e-commerce. The 7C's are context; what the system will deliver, content; how the system will deliver, community; how the users can communicate with each other, customisation; how will tailoring system for each user, communication; how system will interact with their users, connection; the link between systems, and commerce.

In addition, Lee & Benbasat (2003) have extended the 7C's framework to cover two important issues. The issues are grouped into mobile device constraint and mobile setting. This extension happened to make the framework more fixable to work within mobile environment. Because of this extension, the framework has advance capabilities that can be implemented in other area such as in developing mobile interface for e-Government services.

- *Mobile Device Constraints*

Mobile device has fewer sources than the normal desktop computer. In comparison to desktop computer, mobile device has lower performance such as limited input/output, less convenient, lower multimedia and processing

capabilities, smaller screen size that could affect the navigation activities, lower number of scrolling within one page, and limited content and delivery within a page (Lee & Banbasat, 2004). Moreover, mobile device has short-term memory, which would limit the activities and thus subsequently cause low user performance.

- *Mobile Setting*

Mobile setting refers to the mobile environment where mobile users can perform their tasks in terms of time, place, and context. The setting mostly converges at three points of view: 1) spatiality concern where the user can carry the mobile anywhere and anytime, 2) temporality in which mobile users can access the internet even when engaged in normal phone call, and 3) context ability, which means that the circumstance at the level of interaction with others. However, regardless of what the information holds and contains, the issues are how the users can find information to his/her satisfaction. Mobile setting could be an infrastructure, location, resources nearby, context, application, system, and time (Jones & Brown, 2003).

3. User Satisfaction Concept

User satisfaction refers to the feelings received by the user before, during, and after communicating with a website (Pérez-Mira, 2010). According to DeLone and McLean in information system success model, user satisfaction can be measured from recipients' response to the use of the output of an information system. Next, Naylor et al. (1980) defined satisfaction as "the result of the individual taking outcomes that have been received and evaluating them on a pleasant-unpleasant continuum".

Yao and Zhao (2010) built user satisfaction model with six dimensions:

- Citizen expectations, which refers to citizen's expectation towards e-Government before using it.
- Perceived quality, which evaluates the overall quality of the system, services, information, and application after using it.
- Perceived value, which refers to citizen's perception towards the benefits of electronic service that they can obtain from the e-Government.
- Government image, which refers to what would be remembered from e-Government experience.
- Citizen reliability, which refers to citizen's confidence and support towards online services; whether they will re-use the services or not.
- Citizen participation, which refers to the initiative of the citizens to participate in online services.

II. METHODOLOGY

The study conducted by experiment design. Experiment design is the process of planning a study to meet a specified objectives. Planning step an experiment properly is very important in order to ensure that the right type of data and a sufficient sample size and power are available to answer the research questions of interest as clearly and efficiently as possible. In the study case, the researcher conducted 11 responds to participate on the study. The general condition for all responds are ; use smart phone , use the applications and browsing internet use the phone . Te specific condition are; individual assessment for each respond to do some tasks using the smart phone within limited time. After that answer the questioner

Define abbreviations and acronyms the first time they are used in the text, even after they have been defined in the abstract. Abbreviations such as IEEE, SI, MKS, CGS, sc, dc, and rms do not have to be defined. Do not use abbreviations in the title or heads unless they are unavoidable.

Data collection

the data collection is depend on the tasks check list and questioner . First , the task check list are focus on , check email, browse web pages , check social sites, chatting , register, and search. Second, the questioner content four parts are Demographics, The usefulness of information , use information , and access information .

Data analysis

First part, Demographics: in the figure1 , the participants are different level of education and age . the majority of participant are from bachelor degree from 21-to 26 years old. Between 27-35 years old have master, phd and higher education. In table1, presenting the time spending by the participants with each of tasks practising by them regularly. The result shown that participants spending all the time of use phone in social network sites by 100% percentage. After that search and browse by 81% , and after plying by 54% percentage .

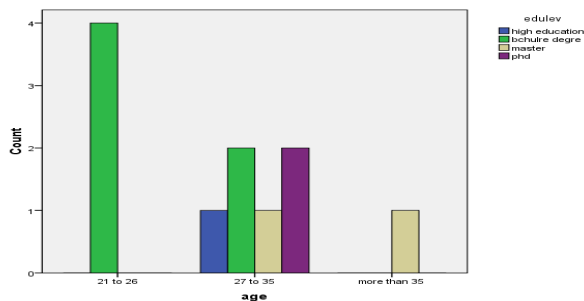


Figure1:

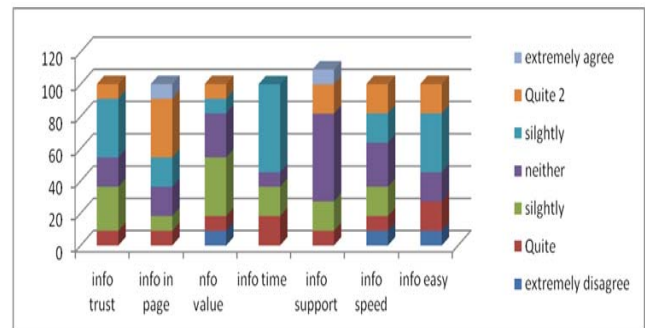
Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
sarch *time	9	81.8%	2	18.2%	11	100.0%
plye *time	6	54.5%	5	45.5%	11	100.0%
news *time	5	45.5%	6	54.5%	11	100.0%
study *time	3	27.3%	8	72.7%	11	100.0%
chat *time	9	81.8%	2	18.2%	11	100.0%
social *time	11	100.0%	0	.0%	11	100.0%
email *time	7	63.6%	4	36.4%	11	100.0%
bank *time	2	18.2%	9	81.8%	11	100.0%
reg *time	2	18.2%	9	81.8%	11	100.0%

Table 1:

Second : the usefulness of information : In the Figure 2 , the usefulness measurements have been highlighted are how much the information are trusted by users , the amount of information per page , the value of information , availability of info, support information for the user , and the easy of use information . the result shown that participants agree by the majority of them of trusted info , availability of info , and easy to use info . But the disagree got the majority on supporting info the user to do their request, the value of info , speed of info, and trust of info .

Figur2 :



In the figure3 , The over all information quality highlighted the quality of info, performance of info, effectiveness , easy of info, understandable, and overall usefulness . participants are agree got more in the clear and understandable of information quality , effectiveness, and easy of use information . on the anther way , participants are disagree with information performance and information quality overall .

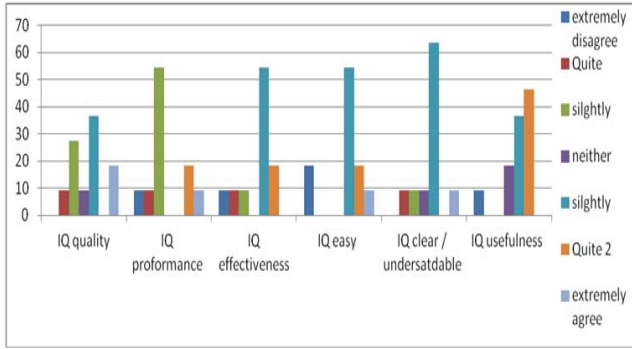


Figure3 :

Third: use of information ; figure 4 highlighted the use of information measurements which are ; easy of use , clear to use, availability, remembering, fixable, frustration info, size, colour , and error. The result shown that participant agree with clear , colour, and free or error. But they are disagree with availability , remembering fixable, size of information , and easy of use .

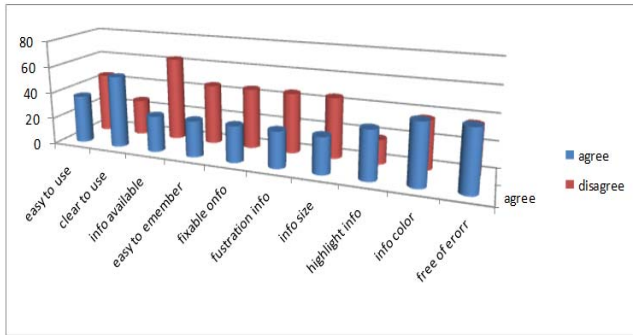


Figure4 :

Fourth : access information : this part contents retrieve info, easy of access, download info, access personal info, and navigable info . participants are disagree with ability to access personal information and navigable information . but they are agree with the ability to access information , retrieve , and download information as shown in figure 5 .

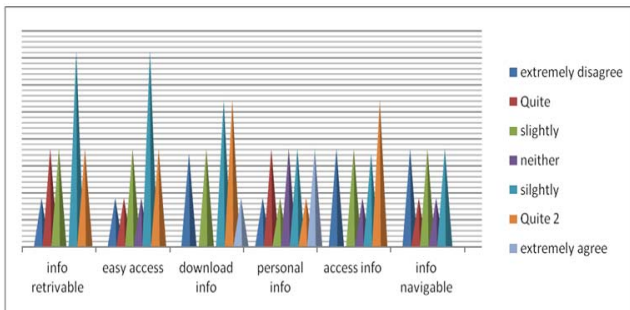


Figure5 :

For the security and privacy of information as an important part of information quality on the web world. In figure 6 presented the measurements scales which are protection ,

security, trust, authorization , level of secure, password , bank info, and request for upgrade the level of security . the result shown that the lines have high indicator in area of un satisfy and disagree form participated on the level of security and privacy, and agree area have low indicator from them .

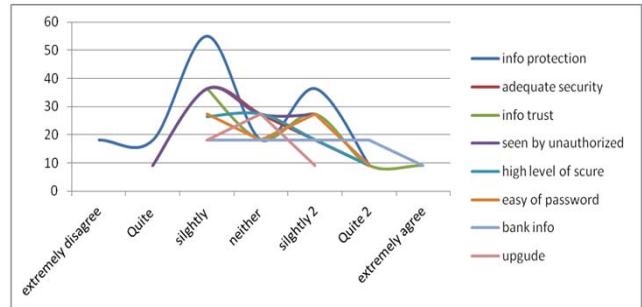


Figure5:

III. DISCUSSION AND RECOMMENDATIONS

The study conducted educated responds' to evaluate information quality for smart phone interface. Responds' are using applications and web browsing by phone, they convert their daily needs . However, participants' have been disappoint with the usefulness of information on the area of supporting this information for them to do their work , the amount of information should be reduced to meet user need , the value of information not fully satisfied users which may need for more focus on the right information . In addition , participants' are concern about the performance of information which is make their work because of loading time and also the overall quality got average from them which mean there is some disagree with the quality .

In the use of information, participants' are disagree about the availability of information all the time, the difficulties of download information especially from the multimedia, the difficulties of remember the information flow , the size of information not suitable with the interface either so small or very big , and some of them feel frustration to try over and over to got some info . Lastly, access information faced users difficulties to access personal information, and the ability of navigate information anytime , anywhere . Also, the security and privacy of information were the important part for the participants' and the most part got disappoint them. the most of measurements' variables are unsatisfied users . This variables are security level, password length, unauthorized person, information secure, and trust information.

The main recommendations are coming from the simple were ; information should meet users need by provide specific information , upgrade the quality of information from the size , colour , and speed. Also they seen that information need to be more fixable and available anytime and anywhere. In addition, they request to make information easy to use , access, navigate, and upgrade the performance.

In focus, they request to upgrade the security of information and privacy.

CONCLUSION

In this paper, the researcher have been viewed the three dimensions of the study which are information quality, mobile interface, and user satisfaction. This study also comes up with evaluate information quality for mobile interface from user experience. And to determine the level of user satisfaction towards the information used besides determining how the information quality is going in realty . By the end, users are satisfied with some parts like clear of information and ability to understand it . However, participants' have disappointed with many parts of the quality. Problem still there users will use their smart phone either they are satisfied or not . As a result, taking care of information quality its to provide the excellence to the applications looking for over success .

For the further study, the researcher will to examine a specific application to evaluate their information. And for future research coming result will be useful for an organization to assess their information to meet user need and make them more satisfied.

REFERENCES

- [1]. Abramowicz. W, Bassara. A, Filipowska. A, and Zebrowski. P, "Mobility implications for m-government platform deign," *Cybernetics and system: an international journal*, 37:119-135, Taylor&Francis Group, DOI: 10.1080/01969720500428255,2006.
- [2]. Bandur. A, "A social cognitive theory of action . An international perspectives," North Holland: Elsevier, pp.127-138, 1989.
- [3]. Delone. W, and Mclean. E, "The Delone and Mclean Model of Information Systems Success: A Ten-Year Update," *Journal of management Information Systems/spring* 2003. 0742-1222/2003,2003.
- [4]. Jeong. M. and Lambert. C, "Adaptation of an information quality framework to measure customer' behavioral intentions to use lodging web sites," *Hospitality management,Elsevier*, PLL:S0278-4319(00)00041-4,2001.
- [5]. Lee. Y, and Benbasat. I, "A framework for the study of customer interface design for mobile commerce," *international journal of electronic commerce / Spring* 2004, Vol.8,No.3,pp.79-102, 2004.
- [6]. Lee. Y, Strong. D, Kahn. B, and Wang. R, " AIMQ: a methodology for information quality assessment," *Information & Management* 40th , PP:133-146. PII:S0378-7206(02)00043-5, 2002.
- [7]. Mahatanankoon. P, Wen. H, and Lim. B, "Evaluating the technological characteristics and trust affecting mobile device usage," *International Journal of mobile communication, Inderscience Enterprises*, pp662-681,Vol 4, 06, 2006.
- [8]. Sheng. H, and Trimi. S, "M-governmnet : technologies, applications and challenges. *Electronic government*," An international journal, Vol. 5 No, 2008.
- [9]. Kushchu. I, and Kuscü. M, "From e-government to m-government : Facing the inevitable," *Mobile Government Lab*, <http://www.mgovlab.org>,2004.
- [10]. Rayport. J, and Jaoworski. B," *Introductions to e-commerce*," New York: McGraw-Hill,2001.
- [11]. Rossel. P, Finger. M, and Misuraca. G, "Mobile e-government Options: Between Technology-Driven and User-Centric. *The Electronic of e-government*," Vol.4, No.2. PP:79-86,2006.
- [12]. Naylor. J. C, R. D. Prichard, and D. R. Ugen," *A Theory of Behavior in Organizations*," Academic Press, New York,1980.
- [13]. Chatzinotas. S, Ntaliani. M, Karetosos. S, and Costopoulo. C, "Securing m-Government Services: The Case of Agroportal," www.mgovernment.org/resurces/euromgvo2006/.../8_Chatzinotas, 2006.
- [14]. Naqvi. S, and Al-Shihi. H, " M-government Services Initiatives in Oman," *Issues in informing science and information technology* 6,2009 .
- [15]. Goyal. D, Chong. H, Shum. P, Tong. Y, Wang. X, Zuo. Y, and Kuek. W, "Design &Implementation of User Interface for Mobile Device," *IEEE* 0-7803-8185-8/03, 2003.
- [16]. Thunibat. A, Zin. N, and Ashaari. N," *Mobile Government Services in Malaysia: Challenges and Opportunities*," *IEEE*,978-1-4244-6716-7/10/,2010.
- [17]. Antovski. L, " Improving Services Matching in M-government with soft technologies," *IEEE international symposium on personal, indoor and mobile radio communication* , 1-4244-1144-0/07,2007.
- [18]. Yao. J, Lin. Y, and Zhao. P, "E-government evaluation based on citizen satisfaction and its implementation," *IEEE*, 978-0-7695-3997-3/10, DOI: 10.1109/ICEE.2010.143,2010.
- [19]. Pérez-Mir. B, "validity of delone and mclean's model of information systems success at the web site level of analysis," *PhD thesis* , Louisiana State University,2010.