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User Satisfaction of Information Display on Mobile Devices and Desktop Computer: A Comparative Study

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Abstract: *Internet is a worldwide system with interconnected computer networks. Nowadays, mobile devices and desktop computer are among the popular tools for the user to access the Internet. How the web page display on the mobile devices and desktop computer screen will influence the user usability toward the website or the web application. Therefore, this study aims to assess user satisfaction on the display of web page on mobile devices and desktop computer. A total of 260 respondents were selected to answer the online questionnaire. The End User Computing Satisfaction (EUCS) model was used to examine user satisfaction in terms of content, accuracy, format, ease of use and timeliness. The findings show that the respondents are more satisfied with the display on desktop computer compared to mobile devices. The results suggest that the web designer should improve the web page display on mobile devices so that the user satisfaction can be improved.*

Keywords: User Satisfaction, Web Page, Mobile Devices, Desktop Computer

1. INTRODUCTION

The Internet, computers and mobile devices such as smartphones or mobile phones has become an integral part of our lives in this Digital Age. Digital technologies have changed every aspect of our lives allowing us to immediately access and share information worldwide, to communicate and to interact with the people around the world (Kantardjieff & Ng, 2012). The digital technologies allow sharing and interacting in real time within any location and any time. There will be no boundaries for user to share information and connect within each other around the world.

The Internet users in the world had rapidly increased due to the advance technology. Internet World Stats (2017) stated that the Internet usage had reached 3.7 million users in year 2000. It has dramatically increased and had reached to around 24.5 million of Internet users at June 30, 2017. The number of Internet users will keep on increasing and the number of mobile users will have an impressive gain as the smartphones usages are continuously increased.

The invention of smartphones brought huge impact to the Internet users growing rate. Smartphones becoming more and more popular due to the advances computing capabilities and unique features. Nowadays, smartphones and computer are the most common devices that used by the user to access the Internet. In Malaysia, the digital devices usage had shown as significant increase. According to the report published on We Are Social website in 2016, the smartphone devices usage had reached to 71% in 2016 where the laptop or desktop computer was only 35%. This means that smartphones had become the basic necessity for most of the people in this era of technology. In 2017, the same website report that the rate of smartphones usage has increased to 81% in 2017 and the laptop or desktop computer user was just only increased 2% compared to 2016.

As the Internet growing rate increased, the web developer for mobile based apps and desktop computer need to always alert to the perception of the user so that the web page design could fulfil the user needs and requirements. The accessibility and usability of the web pages viewed on the mobile devices and desktop computer could increase users' intention to browse that entire website or use the web application. Thus, the aim of this study is to assess the user satisfaction on the display of web pages on mobile devices versus desktop computer. The user satisfaction will be examine in term of content, accuracy, format, ease of use and timeliness by using the end user computing satisfaction (EUCS) model.

2. LITERATURE REVIEW

According to Mielach (2013), mobile devices are becoming the preferred way to access the Internet for a majority of people. More and more users are performing web searches on their mobile devices and not their desktops. As the mobile market continues to grow at an exponential rate, users are leaving their desktops and taking in more information from their smartphones (Melvin, 2015). The use of mobile devices is becoming more commonplace, with data regularly able to make the transition from desktop systems to pocket and handheld devices such as smartphones (Botha, Furnell, & Clarke, 2009). The mobile devices such as smartphones were in the growth to surpass the desktop on web browsing in this era of technology.

Previous studies stated that user satisfaction in different perspectives. Convenience, empathy, ease of use, information quality, fun, reliability, responsiveness, accessibility and freedom and control are the factors that influences the user perspective in term of web desktop design (Kuo, Lu, Huang &Wu, 2005). Rouse (2015) stated that the layout, usability, content size, number of control could affect user's intention to reach the entire design in mobile apps. Another perspective of authors categorized the web design characteristics based on atmospherics, new stories, signs, products and services and overall effectiveness (Fink & Laupase, 2002).

User satisfaction can be examined by the EUCS framework introduced by Doll and Tokazadeh (1988). EUCS gives an overall satisfaction to the pleasurable degree with the fulfilment experienced of the user. The EUCS framework consists of four variables that are content, accuracy, format, ease of use and timeliness. Overall satisfaction of the user was the key determinant for the entire system to increase the usability.

3. METHODOLOGY

In this study a total of 260 Universiti Utara Malaysia students were randomly selected as the respondent. Student is a group of internet users that are actively using internet for their education purposes (Sian et al., 2013). The questionnaire was adapted from Doll and Torkzadeh (1988). Five variables was employed to determine the user satisfaction which are content, accuracy, format, ease of use and timeliness as shown in the framework in Figure 1. Table 1 depicted the measurement used in this study. The Five Likert point rating scale is used which are 1 = strongly disagree; 2 = disagree; 3 = neutral; 4 = agree and 5 = strongly agree. The questionnaire has been distributed to the respondents through online by using Google form.

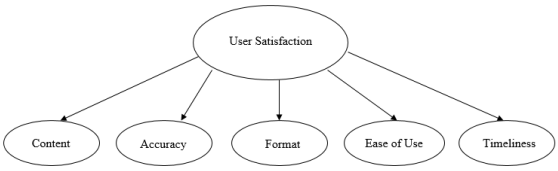

Figure 1. Research framework of user satisfaction

Table 1. Variables and measurement for user satisfaction

Variable	Code	Measurement on mobile devices / desktop computer
Content	C1	The display on the {mobile devices / desktop computer} provide the precise information I need.
	C2	The information content in {mobile devices / desktop computer} meet my needs
	C3	Display on the {mobile devices / desktop computer} provide the information to be just about exactly what I want.
	C4	Display on the {mobile devices/ desktop computer} provide sufficient information.
Accuracy	A1	The information display on {mobile devices/ desktop computer} is accurate.
	A2	I am satisfied with the accuracy of the information display on the {mobile devices/ desktop computer}.
Format	F1	The display is presented in a useful format in {mobile devices/ desktop computer}.
	F2	The information is clearly display in {mobile devices/ desktop computer}.
Ease of Use	EOU 1	The {mobile devices/ desktop computer} is user friendly.
	EOU 2	The {mobile devices / desktop computer} is easy to use.
Timeliness	T1	I can get the information that I need quickly in {mobile devices/ desktop computer}.
	T2	The website provides up-to-date information in {mobile devices/ desktop computer}.

4. FINDINGS

The 80% (208) of the respondents are female and 20% (52) are male. Most of the respondents come from the group of 21 – 23 years old, with 205 respondents (79%). Majority of the respondents using smartphone to access the Internet which consists of 188 respondents (72%) and 72 respondents (28%) tend to use desktop or laptop when accessing the Internet.

There are a total of 156 respondents that spend more than 5 hours in accessing Internet per day which is 60% from the total respondents and 97 respondents (37%) spend 3 to 5 hours per day to access Internet.

4.1. Reliability Analysis

Cronbach's alpha test has been performed on the independent variables; content, accuracy, format, ease of use and timeliness. Table 2 shows the scores for each variable toward user satisfaction on mobile device while Table 3 shows the scores for each variable toward user satisfaction on desktop computer. The result indicate that the variables are consistent and reliable because the Cronbach's alpha for all variables are 0.7 and above.

Table 2. Cronbach's alpha scores for variables toward user satisfaction on mobile devices

Variables	No of Items	Cronbach's alpha
Content	4	0.871
Accuracy	2	0.803
Format	2	0.831
Ease of Use	2	0.789
Timeliness	2	0.761

Table 3. Cronbach's alpha scores for variables toward user satisfaction on desktop computer

Variables	No of Items	Cronbach's alpha
Content	4	0.761
Accuracy	2	0.776
Format	2	0.716
Ease of Use	2	0.721
Timeliness	2	0.700

4.2. Content

The variable content consists of four questions which represented by C1, C2, C3, and C4. The results as shown in Table 4 indicates that the students are satisfy with the display on desktop computer compared to display on mobile devices with the average mean values 4.03 and 3.73 respectively.

Table 4. Descriptive Analysis of Content

	Mean Score	
	Mobile Devices	**Desktop Computer**
C1	3.82	4.04
C2	3.72	4.01
C3	3.65	4.04
C4	3.7	4.03
Average	**3.73**	**4.03**

4.3. Accuracy

The second variable that used to identify the end user satisfaction in mobile devices and desktop computer is accuracy. The results as shown in Table 5, indicates that the students are more satisfied with the accuracy of display from desktop computer with the average mean is 3.92 compared to 3.55 for mobile devices.

Table 5: Descriptive Analysis of Accuracy

	Mean Score	
	Mobile Devices	**Desktop Computer**
A1	3.54	3.92
A2	3.55	3.92
Average	**3.55**	**3.92**

4.4. Format

As for the format, the average mean for desktop computer is 4.09 compared to 3.62 for mobile devices (Table 6). This indicates that students are more satisfied with desktop computer compare to mobile devices.

Table 6. Descriptive Analysis of Format

	Mean Score	
	Mobile Devices	**Desktop Computer**
F1	3.64	4.09
F2	3.59	4.08
Average	**3.62**	**4.09**

4.5. Ease of Use

In term of ease of use students found that it is easier to get information from large display of desktop computer compared to mobile devices. The mean averages are 4.08 and 3.88 respectively.

Table 7. Descriptive Analysis of Ease of Use

	Mean Score	
	Mobile Devices	**Desktop Computer**
EOU1	3.78	4.09
EOU2	3.97	4.06
Average	**3.88**	**4.08**

4.6. Timeliness

In term of timeliness the average mean score for desktop computer (3.93) is slightly higher compare to mobile devices (3.80).

Table 6. Descriptive Analysis of Timeliness

Mean Score		
	Mobile Devices	**Desktop Computer**
T1	3.84	3.95
T2	3.76	3.9
Average	**3.80**	**3.93**

5. DISCUSSION

The findings show that student spend most of their time in accessing Internet. Most of them spent minimum of 3 hours per day to access Internet. This is because students in Universiti Utara Malaysia are actively using Internet to communicate and engage in their class discussion online. They also frequently access the university portal to obtain the lectures notes, slides, guidelines and other academic materials. To access to the Internet, students will use either desktop computer or smartphones.

The results show that the user satisfaction on desktop computer is positive in terms of content, accuracy, format, ease of use and timeliness compared to mobile devices. The content display on desktop computer could provide clear information to the user as the screen size for desktop is much bigger than mobile devices. The screen resolution for web desktop design is 1024x768 pixels while the smartphones is only 320x480 pixels. The smaller display on smartphone only brings user to lesser information at once. Thus, desktop computer are preferable because it provide precise and sufficient information to the user.

In term of accuracy, the students are more satisfied with the desktop computer. Since the desktop computer display all information in one full screen, the students believes that the information is more accurate compared to the mobile devices. The format of information display on desktop computer is also found to satisfied students better compared to mobile devices. This is due to the fact that, mobile devices displays are small and limited. Thus, information on the web page cannot be displayed in a complete format. In addition to the size constraint, the students also found that the web page display on desktop computer screen is easy to use and navigate rather than the mobile devices. This is in line with previous study by Thaneshan et al. (2017).

In term of timelines, this study shows that the display on desktop computer and mobile devices does not give much effect on the timeliness. In both desktop computer and mobile devices, students can get the same up-to-date information from the web pages. The only constraint is that, on mobile devices students have to scroll to the bottom in order to get the page update information.

Overall the students' satisfaction level on the information display in desktop computer is higher compare to the mobile devices. Therefore, students tend to use desktop computer to access Internet rather than mobile devices. Mobile devices are mostly use during travelling and mostly convenient for communication purposes.

6. CONCLUSION

To conclude, this study is important to understand the user satisfaction on mobile devices and desktop computer. The user satisfaction is significant factor that can provide an overview to the developer of mobile apps on mobile devices and desktop computer. By knowing the user satisfaction in different angles, the developer can make the improvement on the web page design in order to satisfy the user.

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