

Graphical User Interface Design for Mobile Commerce Site for Women Seller in Rural Area

Kho Irene Lee Sa

Faculty of Business and Management, UCSI University Sarawak Campus

Email: irenekho@ucsiuniversity.edu.my

Shayla Islam

Institute of Computer Science and Innovation, UCSI University, Kuala Lumpur, Malaysia

Abdul Samad Shibghatullah

College of Computing & Informatics (CCI), University Tenaga Nasional, Kajang, Selangor, Malaysia

Abstract

Graphical User Interface (GUI) is a medium that allows users to communicate with electronic devices. Good GUI design is important to allow users to learn to use a system in the shortest time and effectively operate the system. Especially in rural areas with limited communication resources, a well-designed GUI for m-commerce sites that integrates women seller's personality types becomes crucial. Mobile-commerce (m-commerce) site should aid women in their efforts to sell their products directly to customers. Unfortunately, the interface design of m-commerce sites caters only to IT literate users with fast internet connections. Existing m-commerce sites' interface designs, are compact to place as much information as possible. This may lead to an interface design that looks busy and messy unless women are given proper guidance by IT experts. A research review using a GUI as a standard to allow women sellers in rural areas to promote and sell their product through an m-commerce site.

Keywords: m-commerce site, women seller, graphical user interface

1. Introduction

According to job statistics for 2021 for Sarawak Malaysia, there are 50.8 thousand unemployed citizens. That's mean about 30% of the citizens of Sarawak are not participate in labor force [1]. It is believed that housewives are the majority group of people who did not join the work force.

Culturally, housewives in rural areas are not allowed to join the work force by their family members. On top of that, with their low wages, women in the rural area will not be able to afford to pay for their children's daycare fees in their absences when they are working [2]. Furthermore, good job opportunities will only be available in cities. Transportation fees and time spent on the road may not be ideal for women in rural areas. As a result, female unemployed individuals should be encouraged to consider becoming m-commerce entrepreneur to work from home.

According to [3], village-based activities were not always sufficient to support household expenses, rural households have become increasingly dependent on various sources of income. These findings also highlight the challenging nature of rural livelihood, which is why diversification is already a survival mechanism for rural areas. Hence, rural households should consider venturing into entrepreneurship. This is crucial, especially for housewives who are unemployed but want to contribute to supporting household expenses.

To encourage women in rural areas to pursue entrepreneurship, a substantial of assistance is required. Initially, women in rural areas were required to possess certain skills in order to produce creative and traditional goods that were difficult to duplicate [2]. For instance, traditional hand craft beaded headpiece, mat-making, basketry and woodcarving. Whereas, traditional food product includes dabai cracker, tebaloi, gula mitai, pepper sweets, sago balls, kuih jala and salai lumek. Then, rural women seller must trade the traditional product in order to earn a living [4]. However, infrastructure is lacking in rural areas. The produced goods will not be able to send out due to the physical accessibility to market. The public may not be able to view the product or even be aware of its existence.

Explore in a digital environment does not only allow women seller in rural environments to have direct access to the customer without intermediaries, they can also sell the product at a higher price to users worldwide [5]. With the internet connection in place, women seller in the rural area are able to use mobile devices such as smart phone or tablet as a tool to connect themselves with the world without going through intermediaries. Considering M-commerce will be viable solution to women seller in the rural area due to devices such as desktop and laptop required complicated setup.

Hence, this research addresses the following research questions as shown below using systematic review.

RQ1: What are the user interface women seller in rural areas are comfortable to have in m-commerce site?
 RQ2: What personality types can influence women seller using m-commerce site?

Several criteria must be satisfied, so that the literature will be considered for the review:

- Studies are indexed and published as journal articles, book chapters and proceedings.
- Studies are focused on ‘up to date information’ within the m-commerce site.
- Studies are easily accessible by the researcher through public or open access.

Table 1 below is a summary table of terms use in this research study. This table will give an inside about the terms use in this research.

Table 1 Summary of Terms

Terms	Literature
Mobile Commerce site	<p>Definition</p> <p>M-commerce, also known as mobile commerce, is the trade of products via the Internet while utilizing a mobile device. M-commerce is now accessible from mobile devices that support online services partially due to the development of applications and services in the current world. [6]</p> <p>Different Types and Categories of M-commerce site</p> <p>There are two common types operating systems that support M-commerce site. That is IOS and Android.</p> <p>The popular M-commerce site use in Malaysia includes Lazada, Shopee, Mudah, GoShop, and Lelong.com.</p> <p>M-commerce site is crucial for entrepreneurs to explore online business. It cut short various heavy investments in technology for a beginner in online business.</p>
Human Computer Interaction (HCI)	<p>Definition</p> <p>The term Human-Computer Interaction/Interfacing (HCI), often referred to as Man-Machine Interaction or Man-Machine Interfacing, was immediately associated with the</p>

	<p>development of the computer or, more generally, the machine itself.</p> <p>HCI is an investigation of how people and computers communicate with one another. Researchers in HCI examine how people use computers and create novel solutions that enable innovative computer use. A device that permits interaction between a human and a computer is known as an HCI. For the many methods that people and computers communicate to work, an interface between them is necessary. [7]</p> <p>Graphical User Interface</p> <p>A graphical user interface (GUI) is a computer program that allows people to connect with computers using symbols, visual metaphors, and pointing devices. The relatively easy GUI interface has replaced the complicated and challenging textual interfaces in earlier computing, making computer use not only simpler to understand but also more enjoyable and natural. The GUI has become a standard computer interface, and its individual components are now recognizable cultural possessions. [8]</p> <p>User Interface in M-commerce Site</p> <p>Mobile devices have replaced desktop computers and laptops due to their mobility and ability to be carried from one place to another. Several sizes of mobile devices have developed to cater to different screen needs, such as mobile phones, palm devices, and tablets.</p> <p>M-commerce is an avenue that connects business leaders and their customers for multiple commerce operations via mobile devices. However, there are various challenges in m-commerce that make it harder for customers to complete smoother operations or transactions using their mobile devices, such as restrained mobile memory, user interface simplicity, size of display, and small input method or keypad.</p>
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2. Methodology

The process of systematic review includes identifying problems; from there, generating RQ; followed by a literature search strategy, then literature selection by choosing the most relevant literature. Next is results and discussion, conclusion and recommendation will be the last part. (Fig. 1)

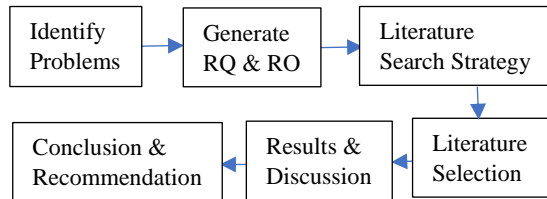


Fig. 1 literature search strategy process

In the literature search strategy process, researchers search for relevant literature related to the topic through electronic journals using related keywords. Common electronic journals used for literature search purposes include Google Scholar, ProQuest, Science Direct, Springer, and Emerald Insight. Most of the time, these common electronic journals are chosen because they are free, can be found in university libraries, have formal ways to access them, are up-to-date, and are easy for researchers to find.

Literature selection is conducted as shown in Fig. 2. With 34,000,000 literature results shown in Google search, researchers only focus on the first 200 search results through preliminary screening. 50 papers are selected based on the title of the research and relevance to the studies. Then 13 papers are selected after accessing the abstracts. Finally, five pieces of literature are selected after reading the full papers.

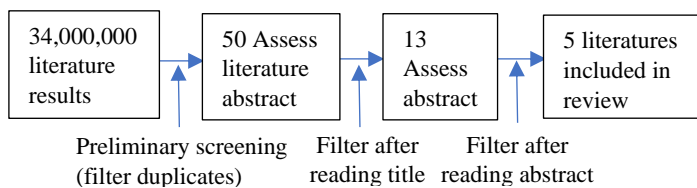


Fig. 2 Literature selection process

After going through all the literature reading, this paper will summaries the finding based on women seller in rural area intention to m-commerce site to sell their product. The outcome will be summaries based on personality types of women sell in rural area and the GUI requirement comfortable for them to start using the m-commerce site as shown in Fig. 3.

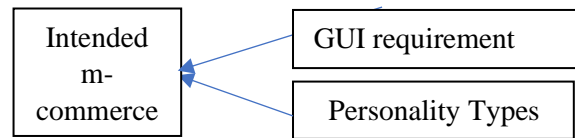


Fig. 3 Intended m-commerce site requirement

3. Result & Discussion

After a systematic search strategy, the outcome and findings will be presented and discussed. The selected five journal articles are the closest to the research topic. All the journal articles do not have a good match with the research topic. Some of the journal's topics are mainly discussed in the education area rather than in m-commerce selling products. Not only that, the journals are found to study women consumers rather than women seller selling products. Nevertheless, the journals discuss the topic of user interface in m-commerce, which fits well for carrying out a systematic review. All five selected articles range from the years 2017 to 2023.

RQ1: What are the user interface women seller in rural areas are comfortable to have in m-commerce site?

Research on m-commerce site adopted by women seller in rural area in related literature not easily identified. An area of studies related to this topic will be adopted in this study as shown in Table 2.

Table 2 Summaries of literature on m-commerce site adopted by women seller in rural area

Author	Research Title	Existing Research	Weakness of M-Commerce System	Existing Problems for Women
[9]	The roles of user interface design and uncertainty avoidance in B2C e-commerce success: Using evidence from three national cultures	This research incorporates user interface design (UID), visual aspects (VA), picture aspects (PA), and third-party seals (TPSs) as predictors of system quality use in e-commerce.	This research conducted on consumer from Kuwait, Poland and Latvia which has different culture from Malaysia. Their perception may not fit to Malaysia contact.	Not mention about women seller Respondent of the study are university students where they are digital natives Using e-commerce instate of m-commerce

			PA and formatting affect system quality of e-commerce, while TPS not affect system quality. This may not applicable to m-commerce.	Mention customer point of view instate of women merchant
[10]	Determinants for M-Commerce Adoption in Malaysia Small to Medium Enterprise (SME): A Conceptual Framework	This research state the importance of SME adopts m-commerce. There is an increase trend of m-commerce in Malaysia	SME owners could not accept modern and sophisticated technology to their company operations. SME not able to adapt globalization pressure SME feels m-commerce is not important. SME do not adopt mobile devices for monetary transaction.	Not mention about women to use m-commerce apps Majority of SME adoption rate is low

Continuation from Table 2

Author	Research Title	Existing Research	Weakness of M-Commerce System	Existing Problems for Women
[11]	Interface designs with Myers-Briggs Type Indicator (MBTI) personality types	make use of human personality types using MBTI and human computer interaction and user interface designs in electronic learning	Discuss e-learning of student in higher education would increase efficiency when user interface design customizes the individual personality of a student E-learning prefer more text driven, more graphics and mind mapping.	Not mention about women to use m-commerce apps women seller's condition is different from e-learning in higher education. It is hard to compare with the two situations.
[12]	Development of measurement instrument for visual qualities of graphical user interface elements (VISQUAL): a test in the context of mobile game icons.	a survey conducts towards 569 participants to measure their aesthetics with graphical user interface element to creative a successful graphical asset. The researcher divides GUI into 5 dimensions of perceived VISQUAL: Excellence / Inferiority, Graciousness / Harshness,	focus on discuss the singular interface elements (VISQUAL) that can be used in multiple ways in several contexts related to visual human-computer interaction, interfaces and their adaption only the survey is based on 68 game app icons	Not mention about women to use m-commerce apps

		<p>Idleness / Liveliness, Normalness / Bizarreness and Complexity / Simplicity.</p> <p>a measurement instrument for perceptions of visual qualities of graphical user interfaces and/or singular interface elements</p> <p>VISQUAL that can be used in multiple ways in several contexts related to visual human-computer interaction, interfaces and their adaption</p>		
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		<p>The journal also states the challenges and opportunities using mobile apps.</p>	<p>Language barrier is another weakness of apps available. Many Malaysians prefer to use their indigenous language.</p> <p>Low internet connectivity (2G, 3G) not able to support m-commerce apps</p> <p>Make user still prefer use mobile apps as a medium to find out more about products, but purchase offline.</p>	
[13]	M-Commerce-Interface Design: A Review of Literature	<p>This journal discusses several interface design principles that m-commerce apps must follow in order to be a good app. m-commerce interface design element include context, content, community, customization, communication, connection and commerce elements.</p>	<p>M-commerce apps has limited mobile memory, simplicity of user interface, screen size and small input method and keypad</p>	<p>This paper discusses from the customer point of view using m-commerce apps to purchase products</p> <p>This paper didn't discuss from the merchant point of view</p>

Continuation from Table 2

Author	Research Title	Existing Research	Weakness of M-Commerce System	Existing Problems for Women
[6]	M-Commerce in Malaysia - Opportunities and Challenges	Journal review paper that states the current scenario of m-commerce apps in various industrial in Malaysia.	<p>Existing m-commerce apps are complicated.</p> <p>Insecure wireless infrastructure makes it easy for intruder to get in.</p>	<p>Not mention about women to use m-commerce apps</p>

Women sellers in rural areas are the minority groups that researchers tend to forget to investigate their needs. Research studies of m-commerce site for women sellers to sell their products online need more attention. With existing studies by Hassna [9], shoppers appreciate good picture quality and formatting quality. Picture quality refers to real pictures of products with different sizes and clear pictures. As for formatting quality, font sizes to differentiate title and content, color to differentiate the information and background displayed is an important elements of m-commerce site design. Digital natives' shopper preferences may not represent the women seller's viewpoints. However, it can serve as a good guide as a basic user's requirement.

According to Yahaya [10], SME Malaysia will adopt m-commerce if it is flexible, effective, and suitable. Minimum maintenance, user-friendliness, and ease of monitoring will be considered to be adopted using m-commerce. As for individual women sellers, simplicity is the major concern on top of SME concerns. Similarly, SME owners and women sellers share the common viewpoint that they are not ready for modern and complicated technology yet. This may due to their cultural background.

Learners at higher education institutions are not comparable with women sellers in rural areas. Undeniably, a common viewpoint of learner and women seller are gaining new knowledge. In order for them to understand a new knowledge, simple and easy ways to learn are important to them. According to Subaramaniam [11], different personality types will absorb knowledge differently. Hence, women sellers are believed to adopt m-commerce if the user interface design suits their personality types. This is tally with Jylha [12] where his study focuses on VISQUAL for mobile game users. His study enforces using a visual human-computer interface where women sellers are believed to be able to adopt better compared to text explanations. So, a simple GUI based on women sellers's personality types that comes with a visual GUI will be helpful for them to adopt m-commerce.

Authors Ahmad [13] and Al-Abiary [6] have written the review paper mentioning m-commerce interface design and condition. Al-Abiary indicates that m-commerce apps are complicated due to many details. Malaysians believe m-commerce is insecure; low internet connectivity, added to the language barrier, makes them prefer to purchase offline. With those discouragements, the women sellers may refuse to adopt m-commerce to sell their products. The majority of m-commerce sites used in Malaysia are adopted from foreign founders. That may not fit into the social and cultural context of Malaysian. If adjustments can be made to cater to Malaysian context, that may improve the usability of the m-commerce site by women sellers in the future. Ahmad [13] has pointed out that a good interface

design element may encourage women sellers to sell online for long-term business expansion. Established women sellers may consider expanding their business through m-commerce sites.

RQ2: What personality types can influence women seller using m-commerce site?

All the research studies related to personality types conducted in e-learning environment in state of m-commerce site may adopted by women seller in rural area. The respondents in the journal found are higher education learner using web-based learning system as shown in Table 3.

Table 3 The personality types studies

Author	Research Title	Personality Types	Research Finding
[11]	Interface designs with MBTI personality types	Myers-Briggs Type Indicator (MBTI)	<p>Research focus on interface design preferred by higher education learner using e-learning tools</p> <p>MBTI has eight dominant dimensions, that include Introvert and Extrovert, Sensing and Intuitive, Feeling and Thinking, Judging and Perception.</p> <p>Based on the finding, the highest number of respondents are from the ESTJ, ISFJ and INFJ personality type.</p> <p>User interfaces in the mobile application has developed based on the preferred three personality types.</p>
[14]	A First Look at the Effectiveness of Personality Dimensions in Promoting Users' Satisfaction with the System	Big Five personality	<p>This research discusses personalization of user interface based on user's personality characteristics help to generate student's satisfaction in a mobile learning context.</p> <p>Big five personality make out of Neuroticism, Extraversion, Openness, Agreeableness and Conscientiousness dimensions.</p> <p>MUIDE instrument include 11 design principles includes information structure, navigation, layout, font style, size, button, color, list,</p>

			<p>information density, support and alignment</p> <p>the finding is neuroticism group was higher satisfaction when using their preferred interface.</p> <p>If learners are satisfied with the UI design, they will have high interaction with mobile content.</p>
[15]	User Interface Design for Effective E-Learning based on Personality Traits	Eysenck Personality Traits	<p>This research finds out the learner personal traits preferred web-based e-learning environment.</p> <p>Eysenck has three orthogonal higher order factors: extraversion, neuroticism and psychoticism.</p> <p>Based on the study, majority of learner are extraversion prefer blue color and times new roman font style.</p> <p>Incorporate user interface design with the preferred font and color will improve the performance of students.</p>

User interface is an important medium for women sellers to input instruction to m-commerce site. Researchers Subaramaniam [11], Sarsam [14], and Arockiam [15] carried out studies on the preferred user interface design for learners online. Subaramaniam studied the preferred mobile interface design based on MBTI personality types of learners. Whereas Sarsam [14] studied learner's preferred interface design based on Big five personality types. Arockiam [15] studied learner's preferred interface design based on Eysenck personality traits. All three researchers give advices to guide design the user interface for m-commerce. These advices are useful to implement on m-commerce for women seller to sell products online.

4. Conclusion

The journal articles about women sellers in rural areas using m-commerce sites to sell their products are hardly found. Based on the previous research studies, learners at higher education institutions are not comparable with women sellers in rural areas. The journal's collected and discussed may not represent the true perception of women sellers. However, basic user interface design may be applicable to women sellers. Further research studies should carry out to cater to women sellers in rural areas to have a better understanding of their needs.

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Authors Introduction

Irene Kho Lee Sa



She received her Bachelor in Computer Science in 2001 from university of Wollongong, Australia. In 2006, she received her Corporate Masters in Business Administrative UNIMAS, Malaysia. She is currently a Doctoral student in UCSI university, Malaysia.

Associate Professor Ts. Dr. Shayla Islam



She is a Graduate Engineer of the Board of Engineers Malaysia and the Institution of Engineers Bangladesh (MIEB-M/40624). She has also evaluated her Ph.D. thesis at the international level as the foreign examiner. She is currently a Deputy Director and Head of Research at the Institute of Computer Science and Digital Innovation (ICS DI), UCSI University, Malaysia.

Associate Professor Dr. Abdul Samad Bin Shibghatullah



He received his Bachelor's degree in Accounting from Universiti Kebangsaan Malaysia, Bangi, Malaysia, in 1999, his M.Sc. degree in Computer Science from Universiti Teknologi Malaysia, Skudai, Malaysia, in 2002, and his Ph.D. degree in Computer Science from Brunel University, Uxbridge, United Kingdom. He is currently an Associate Professor at the College of Computing & Informatics (CCI), Universiti Tenaga Nasional, Kajang, Malaysia.