

The Usage of QR Codes among Young Generation in Johor

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Abstract: QR code is define as an identification mark for a type of matrix barcode. Based on the previous research, there is still lack of research conducting the IS Success Model by doing the qualitative method in Malaysia. The purpose of the study is to discuss the usage of QR code among the young generation in Johor. This research used the qualitative method with semi-structured interviews for the data collection. In this study, the researcher focused on the young generation in Johor among the range of age from 18 to 30 years old for the interview sessions. Around 15 respondents from a population of 3.76 million peoples were selected to take part in the interviews. The type of interviews used in this study is semi-structured. The reason of using QR codes were experience new things, social media, making online payment, request new friends, save information, questionnaire and attendance of classes. QR codes were beneficial to others by provided detail information easily, connect the online and offline media, cashless payment, and record attendance. The challenges were speed of internet connection, apps installation, inconvenient for elderly people, management of shops, security risks and cybercrime. QR codes can be innovated in future that widely used in the medical field, new marketing resources and improved ability of connection. They can use QR codes to punch cards instead of fingerprints that reduced system error.

Keywords: QR codes, Usage, Young generation

1. Introduction

1.1 Research Background

Recently, the coronavirus disease (COVID-19) spread widely around the world. Many countries suffering from the bad impact including economic, political issues and social that bring by COVID-

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19. 'CO' means for corona, 'VI' for virus and 'D' for disease. COVID-19 is a new disease that related with Severe Acute Respiratory Syndrome (SARS) and others types of common cold (Lisa Bender, 2020). All of the experts and scientists as Civil Protection Headquarters highlight that is not disaster, just an epidemic including a serious respiratory infections disease (Rudan I, 2020).

As Hur, J., & Chang, M.C. (2020) state, WHO announced the COVID-19 belongs to a global epidemic disease that first positive case initiate from Wuhan, China. As their observation, the diseases are high infectivity, so separation and social distance from everyone are needed in the world. The report shown the result of high infectivity cases raise in Itali because of the Italian weak awareness to the COVID-19. When the epidemic is started at the Itali, they not doing the isolation with stay at home, still can see the Italian gathering with their family and friends (Livingston E and Bucher K, 2020).

A lot of reports have manifested that take actions with social distance and stay at home are needed to implement immediately. Cause by the epidemic, Prime Minister of Malaysia Tan Sri Muhyiddin Yassin has announced to implement movement control order (MCO). The extension of MCO cause all of Malaysians stay at home for a long period. The increasing of cases will be constant extension of MCO (Diyana Pfordten and Razak Ahmad, 2020). Online purchasing daily supplies becoming popular to great majority of Malaysian. Using high technology with smart phones, laptops and tabs can allow the users to enjoy online shopping without go out. When doing the online payment, the effectiveness of product codes in instance QR codes are play an important role in the marketing field (Ahmad Adel Mostafa, 2014).

QR code can be called a Quick Response code that has designed by DENSO WAVE, an automotive industry in Japan. QR code defined as an identification mark for a type of matrix barcode (Yue Liu, Ju Yang, Mingjun Liu, 2008). The usage of QR codes are convenience that focus on young generation in Johor. As S. Tiwari, (2016) states, QR codes have a high capacity of data storage, faster scanning system, omnidirectional readability and other advantages including error correction in case that the code has damaged but also can be read successfully. The high technology in the development of smartphones increases the popularity of QR code in high demand of market place. At the same time, QR codes have grand capacity of storage ability compare to standard barcodes, they are flexibility to use and quick read with majority of the smartphones (Jackson, D., 2011). Among the young generation in Johor especially the local university students, they have following the trend of using high technology in their daily life. The use of QR Code has proliferated in many areas, such as foreign country studies by Trivedi, R., Teichert, T. and Hardeck, D., (2019) stated that lack of the research conducting the IS Success Model in doing the qualitative method. As theory of Delone and McLean, IS Success Model declared as system quality, information quality, service quality, perceived usefulness, perceived ease of use, perceived satisfaction, perceived risk and behavioral intention (Rana, et al, 2015).

1.2 Problem Statements

In concomitant with the increasing growth in smartphone penetration, the use of QR Code has proliferated in many areas, such as foreign country studies by Trivedi, R., Teichert, T. and Hardeck, D., (2019), for instance, stated that lack of the research conducting the IS Success Model in doing the qualitative method. It given the influence to young generation to follow the current trend of technology (Dong-Hee Shin, Jaemin Jung, Byeng-Hee Chang, 2012). However, many have argued that the use of QR code among the young generation is rather fragmented, where less consider about the motivation of the customer to scan the QR code. Based on previous study, there is a need to investigate the usage of QR Code among young generations in Malaysia.

1.3 Research Questions

- (i) What is the usage of QR codes among the young generation in Johor?

1.4 Research Objectives

- (i) Discuss the usage of QR codes among the young generation in Johor.

1.5 Scope of the Study

The scope of this research was covered the usage of the QR code. The young generation in Johor among the range of age from 18 to 30 years old will be selected as the target population because of the more details information can gather from them.

1.6 Significance of the Study

This research is important because it showed the usage of QR codes not only benefit in a foreign country, especially in Malaysia recently follow the trend of using QR codes for online payment. Exactly the limited of the previous study in Malaysia, the high technology have a systematic system uses wisely among the young generation in Johor. Seek for competitive advantages, several industries provide online payment to the customers. In Johor, students in university and the workers scanning the QR codes for their attendance. As proven, the students in UTHM accept the scanning QR codes in class to get more learning materials. This research paper can be referred by the researchers who use the qualitative method.

2. Literature Review

Literature review as references of the previous study that can improve the research. The documents involving idea, methods and data that acquire information linked to the topic of conducting the research. This chapter will discuss more detail in the usage of QR codes and IS Success Model.

2.1 IS Success Model (Delone and McLean)

Based on theory of Delone and McLean, IS Success (Information System Success) Model is a model that sustain as long-lasting for information system (IS) and information technology (IT) research. (Anand Jeyaraj, 2020). In this study, the researcher will conducting the interviews with around 15 target respondents in Johor about the usage of QR codes.

Table 1: Conceptual Framework

DIMENSIONS	CATEGORIES	SOURCES
1. Use	- Existence - Influence - Frequency - Place - Application	-Self-develop
2. Information	- Sharing - Reliable - Easy to understand	- Self-develop - Modiehi W. R., (2017)
3. System	- Security - Innovation - Potential	- Abel Nasser H. Zaied, (2012) - Self-develop

4. User Satisfaction	- Challenges - Expectation - Recommend to others	- Self-develop - Hanae R. and Youssef A. M., (2015)
5. Net Benefit	- Advantage - Payment - Improvement	- Self-develop

2.2 Past Studies on the QR Codes

QR codes are related with high technology devices for instance smartphones, laptops and tabs that all of them are popular to use among the young generation. The development for the Internet of Things (IoT) technology are continuous improvement to become an essential part of smart home and smart building (Peng Cheng Huang, et al. 2017). The usage of QR codes can be founded in several field for instance marketing, engineering, hospitality, management in an organization, information technology, social science and business law as displayed in references.

Table 2: Past Studies

	Author	Objective	Methodology	Strength	Weakness
1	Sean A. Tanner et al. (2019)	To understand adoption of QR code delivered mobile marketing	Qualitative Semi-structured interviews	Explore the impact of domain specific innovativeness (DSI)	Low involvement product context Foreign study in Ireland, not in Malaysia
2	Riccardo Focardi et al. (2019)	To usable state-of-the-art cryptographic primitives inside QR codes	Quantitative	Improve QR code security	Foreign study in Italy, not in Malaysia
3	Byung-Cheol Oh, et al. (2020)	To investigate the use of pneumatic extrusion technology to eliminate the need for filaments	Quantitative	Personalising drug formulation design by scanning QR code of QRODF	Foreign study in Korea, not in Malaysia
4	Sinan Gultekin, Ahmet Ural and Ulas Yaman, (2019)	To propose an automated approach for embedding QR codes on the interior flat surfaces of 3D	Technical	Implement Rhinoceros 3D and Grasshopper3D software	Approach with scanning via the background light Study only

		printed artefacts			focus on technical method, not suitable for main references
5	Hong Zhou, et al. (2018)	To identify the original species of the homonymous CMM Xueting	Experimental Quantitative	The effectiveness of QR code in labelling system for Xueting-related herbs	Foreign study in China, not in Malaysia
6	Joseph Tawanda Jamu, et al. (2016)	To evaluate the effectiveness, acceptability and the feasibility of QR codes for multiprofessional Just in Time learning in a clinical in patient environment	Quantitative Qualitative Semi-structured interviews	Provide curated, high-impact information	Foreign study in UK, not in Malaysia Focus on both methods makes it be complicated
7	Yeong Guy Kim and Eunju Woo, (2016)	To determine the moderating effects of food involvement on the relationship between perceived information and perceived usefulness	Quantitative Questionnaire	Availability in sampling are a convenience Quick for data collection	Foreign study in Korea, not in Malaysia Risk of the sample may be biased by volunteers
8	C.E.H. Ventura, et al. (2016)	To identify how the QR codes motivate the use of technology in several applications on the manufacturing industry	Experimental Technical	Proposes the possibility of directly machining QR codes on CDC machines Allow companies to directly mark their parts using already installed machines	Challenges in machining codes with different sizes and materials Foreign study in Brazil, not in Malaysia

9	Seda Demir, et al. (2015)	To investigate the current use and future intent of use of QR codes in mobile marketing among college students	Quantitative	High recognition level to QR codes in Turkey Different types of target population	Foreign study in Turkey, not in Malaysia Adoption of QR codes are low
10	Rohit Trivedi, Thorsten Teichert and Dirk Hardeck, (2019)	To measure the QR code effects in print advertising along five different stages of consumer decision making, using advertisement appeals with moderating effects of product category involvement	Questionnaire Interview Secondary data	As remind to consider advertisement context	Focus on both method make it be complicated PHD level of article not suitable for degree level of researcher Foreign study in German, not in Malaysia Less consider about the motivation of the customer to scan the QR code
11	Leo L., Jason C. and Danielle T., (2013)	To gain insight into patrons' preferences for QR code design as well as data about their potential benefits	Survey Pilot test Focus group	QR codes easy to use in variety of library services on their mobile devices	Foreign study in USA, not in Malaysia
12	Fei Xu, (2014)	To explore methods of producing QR code, its customization, artistic look and applications and elaborate the technique of	Technical	The study is expected to facilitate the growth of QR code's visibility and success, and its mainstream adoption	Foreign study in USA, not in Malaysia

		generating QR code for library bibliographic records			
13	Tingting Chung et al. (2019)	To examine the impact of QR code scanning on two informal learning outcomes which are increased interest and greater knowledge understanding	Qualitative Quantitative	Study provides empirical support for the value and usefulness of mobile technologies	Focus on both method make it be complicated Foreign study in USA, not in Malaysia
14	Elizabeth Berndt-Morris and Kari Chrenka, (2014)	To promote services in a way that demonstrated our ability to embrace new technologies and reach patrons in alternative ways	Survey Quantitative	Promotional materials will continue to use as as promotional tool	Foreign study in USA, not in Malaysia
15	Michelle Kelly Schultz, (2013)	To determine the extent to which QR codes are appropriate for use in libraries and museums	Observation Interviews Open-ended questions	High awareness of QR codes in general	Foreign study in Canada, not in Malaysia
16	Jun Song, et al. (2018)	To propose a threat-oriented QR malicious link detection framework, QRfrence, based on a novel machine learning-based link threat-degree evaluation model	Quantitative Technical Experimental	The researchers evaluated the utility of the proposed framework using real-world datasets	Foreign study in China, not in Malaysia
17	Ryosuke Kikuchi, et al. (2018)	To propose a novel technique for embed QR codes onto CAD models consisting of freeform surfaces represented by B-	Technical	The results and applications of their demonstration might prove to be useful	Foreign study in Japan, not in Malaysia QR codes can't work on material that are too dark or

		spline surfaces, which produces 3D QR codes			too light in color Their work only considers embedding the QR code completely within a single B-spline surface
18	Erkan Bal and Huseyin Bicen, (2016)	To determine the effect of Augmented Reality and QR Code Integration on achievements and views of undergraduate students taking computer course	Experimental Pilot test Control group	Related with use of novel technologies in learning process in an applied way	Foreign study in Australia, not in Malaysia
19	Lucy L. Gu, et al. (2016)	To examine the effectiveness of three social media based recruitment channels for sampling rural adolescent populations for online health research	Online survey	Reach potential of three social media recruitment channels in rural adolescent populations The potential for social media based recruitment channels for saving both time and money can be substantial	Foreign study in USA, not in Malaysia
20	David Lorenzi, et al. (2014)	To integrate QR code systems and corresponding smartphone applications into existing government services with the goal of providing	Case study	Improve the quality of services provided by various government branches to the public	Foreign study in Pakistan, not in Malaysia

a new level of
interactivity for
the public

2.4 Literature Gaps

However, the literature gaps in this research are foreign study, lack of the local study in Malaysia discuss about the usage of QR codes and IS Success Model. The usage of QR codes can be founded in several field for instance marketing, engineering, hospitality, management in an organization, information technology, social science and business law.

3. Research Methodology

Research methodology is a systematic review that defining a problem, formulating a hypothesis, collecting and analysing data, discussions and conclusions. A good research method can assist to well decision making. It can be defined as an aim to gain knowledge for problem-solving. Fundamentally, the researchers will follow steps by steps to their works for instance the process of describing, explaining and predicting phenomena. (Rabiah Eladwiah Abdul Rahim, Chen Soong Der and Norashidah Md Din, 2020). This research can be classified as applied research.

3.1 Research Design

The research design in qualitative research is a way of open thinking in the way of conducting qualitative research. By using the IS Success Model (S. Nalintipwong, et al 2019), getting the new perspective from this method compare with the quantitative method.

3.2 Data Collection

The primary data were collected by interview forms. The interview was developed the idea from respondents whose have experienced to use QR codes in their life. The interview will be held by using Google Meet. The secondary data were collected through the investigations from articles, journals, thesis, websites and reports for instance Emerald Insight, Science Direct, Scopus, Springer and Department of Statistics Malaysia Official Portal related with the usage of QR codes that refer to IS Success Model.

Table 3: Respondents Details

Participant	Sex	Age	Education Level	Job Title
1.	Male	23	Degree	Student
2.	Female	23	Degree	Student
3.	Female	23	Degree	Student
4.	Female	20	Diploma	Student
5.	Female	23	Degree	Student
6.	Female	23	Degree	Student
7.	Female	23	Degree	Student
8.	Male	24	Degree	Business owner
9.	Female	23	Degree	Student
10.	Male	23	Degree	Student
11.	Female	23	Degree	Student
12.	Male	23	Degree	Student
13.	Male	26	Master	Student

14.	Female	23	Foundation	Clerk
15.	Female	23	Degree	Student

3.3 Data Analysis

Data analysis in qualitative research referred to interpretation of data collection which involved interview process. The interview protocol focuses on five main conceptual framework that were use, information, system, user satisfaction and net benefit by theory of the Delone and McLean.

4. Results and Discussion

This research was involved 15 respondents among young generation in Johor. The result of data analysis will be discussed in this section according to the research objectives stated in Chapter 1. The aim of the research to discuss the usage of QR codes among the young generation in Johor. The significance of the study shown by lack of similar study in Malaysia. The usage of QR codes can be explored in five conceptual framework which are use, information, system, user satisfaction and net benefit.

In use quality, all of the respondents knew the existence of QR codes before the Covid-19. They have used before the Covid-19 occur in Malaysia. The reason of using QR codes were experience new things, social media, making online payment, request new friends, save information, questionnaire and attendance of classes. During the Covid-19, all of respondents started to follow the rules and regulation of the government Malaysia. They have recorded personal information because easier government tracked the location in certain places. Most of the respondents quite often used QR codes based on their daily activities in every week. The respondents have used in shopping mall, supermarkets, shops, food stalls, workplace, university, post office and parking lot. All of the respondents used MySejahtera apps to scan QR codes. Other application were TNG e-wallet, Boost apps, Grab pay, Code Reader Apps and Facebook Scanning Code.

In information quality, most of the respondents thought QR codes were a good way to sharing the information. The reason of the statements were convenient to use in group discussion, business method and link to the website directly. The information in QR codes can be easily access for the users. The apps provided up to date and reliable information with the latest news. The application tracked covid to let the users known the Redzone area. Most of the respondents thought the information easy to understand because summarize all the info, function, content and design of the information.

In system quality, most of the respondents asserted the security system of QR codes can be trusted because protected by government, function of QR codes and privacy of personal organization. For the innovation part, all of the respondents stated different opinion by prediction in future. They thought innovation of QR codes in future were flexibility to access. QR codes as tool of advanced technology can be seen potential to the users. Most of the respondents declared function of connection network that created user's engagement.

In user satisfaction quality, most of the respondents stated the challenges that faced in usage of QR codes. There were speed of internet connection, apps installation, inconvenient for elderly people, management of shops, security risks and cybercrime. Their expectation to the usage of QR codes were systematic system and payment transaction. All of the respondents will recommended to others. The reasons were easy to use and convenience.

In net benefit quality, they stated the advantages of using QR codes with their reasons. There were provided detail information easily, connect the online and offline media, cashless payment and record

attendance. Most of the respondents have experienced the online payment in scanned QR codes method. The reasons were reduced careless payment, save time and convenient. At the same time, four respondents stated they never used online payment with QR codes. Most of the respondents stated QR codes enhanced their daily. The reasons were save time, protection, online payment transaction and add friends.

Furthermore, the finding is supported by Seda Demir, et al. (2015) who have found the same result on high recognition level to QR codes in certain countries. This study is discovered the current use and future intention by use of QR codes in mobile marketing among college students in Turkey. In Malaysia, the recognition of QR codes are high before affected by Covid-19.

5. Conclusion

The aim of the research to discuss the usage of QR codes among the young generation in Johor. The research question was investigated through a qualitative approach by using semi-structured interviews. The literature review was expressed relevant to the research topic on the usage of QR codes and conceptual framework of IS success model by theory of Delone and McLean. QR codes can be innovated in future that widely used in the medical field, new marketing resources and improved ability of connection. They can use QR codes to punch cards instead of fingerprints that reduced system error. There are a few suggestions to future researchers who are interested in conducting similar research on this topic. They can concentrate on how the usage of MySejahtera apps impacting the usage of QR codes in Malaysia by using quantitative method. They also can use research topic about the acceptance level of MySejahtera apps by using TAM model in other cities in Malaysia. The target respondents could be not limit to young generation only. Moreover, future researchers can use the findings of this research to discover this topic further.

This research had some limitations that can be affected the process of data collection and analysis of the research. First, there were restriction geographically in this research because researcher only surveyed the topic among population in Johor. Besides, the sample size of respondents was lower than expectation of study that only 15 respondents out of a population of 3.76 million people involved in the interview. Qualitative approaches cannot be expanded to wider populations that comparing with quantitative methods. Next, limited time for researcher to collect opinions of the respondents because the data analysis and interpretation time-consuming. Furthermore, the researcher faced issues of anonymity and confidentially in the process of presenting findings.

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Appendix A (Optional)

INTERVIEW PROTOCOL

Research Objective:

To discuss the usage of QR codes among the young generation in Johor.

Research Question:

What is the usage of QR codes among the young generation in Johor?

Sections:

Section A: Interview Background 'notes to interviewee'

Section B: General Interview Information

Section C: How the usage of apps impacting the usage of the QR codes in Malaysia?

Section A: Interview Background 'notes to interviewee'

1. Thank you for your participation. Your opinion will be valuable to this research.
2. Giving an overview of the study and its aim.

Objective:

To discuss the usage of QR codes among the young generation in Johor.

3. Asking for a permission to use recorder device.

4. Clarifying the nature of confidentiality of responses is guaranteed.
5. Ask if further contact can be made afterwards for data saturation.

Section B: General Interview Information

Date:

Time:

Location:

Respondent Name:

Education Level:

Phone/E-mail:

Section C: How the usage of apps impacting the usage of the QR codes in Johor based on IS Success Model?

USE

1. Before the covid19 do you know the existence of QR codes? Do you used it before? Why?
2. How covid19 is affecting your usage of QR codes?
3. How often would you using QR codes?
4. Where do you usually use QR codes?
5. What are the application that you used to read QR codes?

INFORMATION

1. Do you think using QR codes is a good way to share information? Give your reason.
2. How the apps provides up to date and reliable information?
3. Do you think the information easy to understand? Why?

SYSTEM

1. Do you think the security system of QR codes can be trusted? Give the reason.
2. What do you think about innovation of QR codes in future?
3. Can you explain the potential of QR codes?

USER SATISFACTION

1. In your opinion, can you please explain what are the challenges of using QR code?
2. What are your expectation from the apps before using it?

3. Will you recommend to your friends and family to use it? Why?

NET BENEFIT

1. In your opinion, can you please explain what are the benefits of using QR code?
2. Have you use QR codes for online payment? Why do you want to do it?
3. Can you describe how the use of QR codes have enhances your daily life?