

CHAPTER 1

INTRODUCTION

1.1 Introduction

In parallel with the advancement of Information Technology, the icon field for mobile devices has made a major contribution to the development of icon design in various fields such as science, engineering, medicine and education. Using the icon brings many benefits to industry, making it increasingly popular as a tool for understanding and communicating meaningful representation. Using these icons can help visualize the activities of the human mind. When an icon is used in a specific context, it triggers memories and associations in the user's mind, resulting in what we call the icon's meaning (Horton, 1994).

Today, icons are abundant and practical. They are commonly found and displayed in mobile devices, notebook screens, smart TVs, and frequently seen in airports. Icons are beneficial as they expedite brief communication. While their form is simple, their understanding can be extensive. Moreover, nearly all communication happens through the interaction of icons and constantly assisting the earliest established forms of writing. Thus, icons play an important role in communicating the information and interpretation using visual representations (Zender & Mejia, 2013).

People frequently communicate for business and daily activities via mobile applications (Wang & Li, 2016). The icons are broadly used as visual representations in mobile application that can assist in information acquisition and understanding. Icons

refer to small graphic images that display on mobile devices. They have a number of functions, such as branding, defining goals and attracting user interface visual attention (Yang, 2015). The icons can create better visual perception, capable of conveying the meaning of information (Batista et al., 2019; Chandler, 2007; Lin & Lin, 2014; Landa, 2014; Qiang & Fei, 2016; Zender & Mejia, 2013) and easy to recognize and to remember (Qiang & Fei, 2016).

Icon design is the process of creating a graphic symbol capable of communicating a meaning. The element of icon design is the significant component for the mobile user interface that contributed to improving the usability and acceptance of applications. A broad set of guidelines for icon design is substantial, specifically relating the style attributes of icon design. Therefore, icons must be designed with prudence and easily identified. Otherwise, this will create uncertainty (Salman et al., 2007; Zender & Mejia, 2013).

For this research, icon design was studied on its elements to assist in illustrating the icon design for the genre of Surah. Certain approaches in the icon design analysis can be used to visualize the Surah's genre within the Quran domain. The Surah in Quran has a complete amount of knowledge to be provided to the human being and we must read, understand the idea of the Surah and practice the teachings in our daily lives. Using the icon can help users visually understand the idea of Surah and motivate in reciting the Quran.

Therefore, this chapter discussed the background and issues on icon design and reciting Quran among youth in the Quranic domain. This chapter covers the research background, problem statement, research purpose, research objectives, research questions, hypotheses, rationale of the study, the significance of the study, the scope of the study, thesis structure and conclusion. This chapter also discusses the research

framework for the study being conducted. Definitions of terms are given at the end of this chapter that define the concepts and key terms contained in this thesis.

1.2 Research Background

Nowadays, icons have become vital in communicating the information in various fields such as science, medicine, communication and advertising. Today, graphic technology specifically using icons can convey the information and messages faster and more effectively using the interesting and interactive environment to enhance accessibility of information. People usually look at graphics on the webpage and applications compared to text pages before reading (Lin et al., 2013) and graphic advertisements are better at catching user attention than text ads regardless of the image size (Goodrich, 2010). Hence, that is why people are always claiming, “a picture is worth a thousand words”. In research, the graphic such as icon can be utilized to enhance the meaning of the learning subject or information (Malamed, 2015). Figure 1.1 shows the sample of icons that represent the objects to enhance the meaning. Icons have many benefits including saving space, quick recognition and recall, no translation needed, and visually pleasing (Harley, 2014; Horton, 1994; Qiang & Fei, 2016) that can assist in understanding the meaning of information.



Source: Malamed (2015)

Figure 1.1: Sample of icons

An icon is a visual of an object, action, concept, or idea of an object. If the object, action, or idea is not immediately clear to the users, the icon is confusing and frustrating (Chandler, 2007; Lin & Lin, 2014). Furthermore, Batista et al. (2019) had defined icon as representational image requiring no special learning for a categorical referent. Icons are substantial objects of study. They have the simplicity of form contrasted with many other communication tools whose visual forms are much more complicated. An icon's simple visual form lessens interpretative complexity. Icons also tend to have a very specific intended meaning (Zender & Mejia, 2013).

Icon design is processed to generate icons to convey a particular meaning and better visual perception (Yang, 2015). The icon design studies for mobile applications reviewed that the design of the icon is based on specific icon design elements such as recognizable, consistency, color, and many more as the principle of icon design for mobile application. The appropriate icon design would allow users to identify their meanings without any additional instructions. Considering ways of creating valuable icons that require interdisciplinary research activities can benefit designers and researchers (M. Wang & Li, 2016). Therefore, it is significant to have a proper icon design element in the mobile user interface for higher icon usability and acceptance (Kamarulzaman et al., 2020; Salman et al., 2007; Zender & Mejia, 2013).

Semiotic studies on icons were first uncovered by Charles Sanders Peirce in Peirce's Theory of Semiotics (1931-1958) as the fundamental theory representing information as a visual sign to convey the information faster to the user. Peirce classified signs into three aspects, namely representamen, object, and interpretant to communicate the message (Chandler, 2007; Sandera et al., 2014). Icons with semiotics were widely applied in many fields to simplify the meaning of the information and assist in comprehending abstract information. Due to the capability of the icon, it motivates

the people to comprehend the messages and therefore ease their work and activities. Therefore, the benefit and potential of icon and icon design in conveying the information can be extended to the Quranic domain in this study to assist in visualizing of information and increasing capability of understanding and practising the Quran.

Quran is a complete Book of Wisdom and the source of knowledge provided to humankind. It is the responsibility for all Muslims to engage in the Quranic learning that can shape us to be true Muslims and rounded human beings (Mazlan et al., 2016). Reciting the Quran is one of the strongest ways Muslims can do to raise the degree of devotion to Allah, the Almighty Creator (as cited by Alwi et al., 2014). Allah has mentioned in the Quran *“And certainly, We have made the Quran easy for remembrance, but is there anyone who will mind?”* (Al Quran. Al-Qamar 54:17). Besides, in surah Yusuf, verse 2 *“Surely we have revealed it an Arabic Quran that you may understand.”* (Al Quran. Yusuf 12:2). Thus, instead of solely reading the Quran, we as Muslims must be able to understand it, so that we can convey the message and practice it in our life (Mazlan et al., 2016).

Quran’s domain has large and complex information that creates difficulties in acquiring the knowledge. According to Utomo et al. (2020), Muslims have difficulty understanding the Quran content. This is because the content of the Quran has its interpretation and rich semantics of words. Besides, some studies mentioned youth has lack of awareness on continuous reciting Quran although many technologies are available nowadays (Anas et al., 2017). Therefore, it is important to focus on the reciting Quran that can assist Muslims in understanding the idea of Surah and thus can motivate them in reciting Quran (Abd Rahman et al., 2017; Abdullah, 2020).

Reciting the Quran is the focus for Muslims in Malaysia. The aim is to improve the skills in reciting, comprehension, and appreciating learning of the Quran. Today, a

new trend is to recite the Quran via mobile applications. Alternate methods for reciting Quran and attempts to improve those aspects are highly beneficial and deemed as a good deed in Islam (Ibrahim et al., 2012). Getting a mobile application that enables searching, reading, and listening to Quranic verses would be a useful tool for people. In this study, the semiotic icon design application was developed to visualize the genre of Surah that can assist to motivate youth in reciting Quran.






In Malaysia, many techniques in reciting Quran exist, using conventional Quran (Mushaf) and technology. A few reciting techniques for conventional Quran exist, namely Quran with Tafsir such as Tafsir Al-Ibn Katsir and Tafsir Nur al-Ihsan (Faizan & Hussin, 2014), Quran with color Tajwid, Quran with Waqaf Ibida', Quran with Calligraphy and Khat (Hassan & Khairuldin, 2019), Quran with Translation, Quran with Muslimah theme and color Tajwid and Quran Amazing with Tafsir (Naurah, 2019). Besides, reciting Quran also has an alternative way of using technology such as reciting the Quran through mobile application, namely Smart Quran by JAKIM in collaboration with Malaysian Communications and Multimedia Commission (MCMC) and Ministry of Home Affairs (MOHA) (Hassan & Khairuldin, 2019), Muslim Pro, Quran Kareem and so on. Although there are many techniques for reciting Quran physically and using technology, however, limited studies have been conducted on the technique of reciting the Quran using icons. Thus, the study on icon design for the Quran domain has space for exploration.

Nevertheless, several issues are found in icon design and Quran domain from the literature. The business had focused more on the aesthetical aspects or elements of icon design for several years but less attention was paid on other elements of icon design in mobile applications (M. Wang & Li, 2016) especially on the element related to icon meaning such as recognizable and semantic (Zender & Mejia, 2013). Besides, some

studies mentioned that research related to ease of use of icon design for numerous user groups is also still narrow (Ghayas et al., 2013, 2019). Therefore, it is vital to focus on icon design elements that relate to meaning that can assist in understanding the information and facilitate recognition (Cheng & Patterson, 2007; Salman et al., 2007; Yang 2015; Zender & Mejia, 2013).

Salman et al. (2007) stated that in studies on icon design especially for medical information, the icon design should be identifiable, intuitive, and easy to recognize by the users with no error to ensure the correct information to the user. Icons must be designed cautiously to be recognizable. Otherwise, doubt would be increased, various problems can be provoked, and raise various interaction problems. Hence, the proper designs of iconic-based interfaces are also significant for the correct functionality of the applications (Cheng & Patterson, 2007).

Besides, there is also a study on the icon comprehension problem of the sample of five icons in mobile banking by Yang (2015) where the user had trouble in understanding the icons. Figure 1.2 listed five problematic icons with original meanings of icons and their contexts. The study found that the ineffectiveness of icons is typically affected by the oversimplified form, inappropriate message, ambiguous message, and bad association among the icons and pre-existing mental models. The icons were identified as lacking in element recognition, relevance, and uniqueness (Yang, 2015). In this research, the elements of recognition and relevance were taken into consideration to ensure that the icon is easy to be comprehended.

Icon	Intended meaning	Context
	Make a payment	This icon is displayed in a mobile banking app. After clicking this icon, users could enter the payment screen and perform actions like select payment method, choose date and enter amount of money to pay, etc.
	Discover	The discover icon is found in a social app. After clicking this icon, users are able to browse text content within the chosen topics.
	Baby journals	This icon is part of an infant and mom mobile app. After clicking this icon, users could use the app to write journals and store photos about the baby.
	Social activity	Users could check available social activities by clicking this icon.
	Birth and baby club	This icon is also found in a baby related app. This baby club is a place where moms/dads could talk with each other regarding topics of baby raising, breastfeeding, etc.

Source: Yang (2015)

Figure 1.2: Meaning and Context of Problematic icons

In addition, Zender and Mejia (2013) in their studies on comprehension of icon stated necessary reason would be that many icons are not recognized as expected. Icon comprehension studies show failure rate of 90 percent on the comprehension of medical icons designed for crossing language and cultural barriers. Despite the ordinary failure of icons, not much is written on how they work from either a theoretical or a practical approach. Many books present the latest symbols of icons, but few volumes explain how visual symbols of icons function or how they can be enhanced. Studies also mentioned that despite the apparent simplicity, clarity, and consistency of icons, the icons are a combination of symbols. The single icon may incorporate several different symbols to construct meaning. To encourage clarity, semantic elements may assist. Thus, it is crucial to focus on comprehension of icon design to ensure the icon is

recognizable and narrow in semantic range but at the same time maintain the simplicity, clarity, and consistency of the icon design (Zender & Mejia, 2013).

Furthermore, scholars also mentioned they are facing challenges of the uncertainty of icons due to the lack of standard use for most icons (Batista et al., 2019; Merdenyan et al., 2014). When the icons signify very abstract concepts, it will be difficult for the user to make the correct analogy; therefore, the image must be supplemented by a text label. But in some interpretations, there was ambiguity. It is feasible to perform a redesign to enhance the icon designs not recognized by the user and that do not perform well during an evaluation. A user's understanding of an icon is important to ensure the message is delivered well. Due to the lack of standard use for most icons, text labels are frequently used and essential to convey the meaning and lessen uncertainty of the icon. Although uncertain icons would increase several interaction problems, properly designed icons improve the end-user performance (Merdenyan et al., 2014).

Based on the issues discussed earlier, the researcher found there were gaps and potential of icon design in Quran domain that can be explored in this research. Overall, the issues in icon design were lack of studies that focus on icon design elements related to the icon meaning such as recognizable, semantic (Ghayas el al., 2019; Yang, 2015; Zender & Mejia, 2013), familiarity (Ghayas et al., 2019) at the same time maintain the simplicity, consistency (Guo, 2016; Zender & Mejia, 2013) and color (Guo, 2016a) of icon design. This might lead to misleading, confusion, and information comprehension problems. Besides, some studies mentioned that research related to ease of icon design for numerous user groups are also still narrow (Ghayas et al., 2013, 2019). The proper icon design is beneficial to ensure the icon is recognizable and communicates the correct meaning to the user.

Besides, in the Quranic domain one issue is that youth have less motivation in reciting Quran due to low comprehension in Arabic and lack of awareness in reciting the Quran although many technologies are available. Muslim also faced difficulty in understanding the content of Quran because of its interpretation and rich semantics. Based on issues in the icon design field and the Quranic domain discussed, there are gaps in icon design studies and the Quran domain that can be further explored in this research.

Hence, this study would like to explore the icon design that focuses on the element of icon meaning such as recognizable, semantic, familiarity at the same time maintain the simplicity, consistency and color of icon to assist in understanding of information in the Quranic domain. Therefore, the benefit of icon design can be extended to the Quranic field to increase the capability of understanding and practicing. This study will propose an appropriate icon design to be used to assist the identification and interpretation of the idea or genre of Surah in the Quran.

1.3 Problem Statement

Icon has been widely used in many fields such as science, engineering, and medicine to deliver the information faster to the user. The benefit of icon in the mobile user interface includes space-saving, fast recognition and recall, no translation needed, and visually pleasing (Harley, 2014; Qiang & Fei, 2016). The icons are also utilized for branding, specifying goals, and creating appealing user interface for visual attention (Yang, 2015). Icon design is a process to generate the icon to express a specific meaning and better visual perception. Hence, the icon design is significant for mobile user interface for higher icon usability and user acceptance (Kamarulzaman et al., 2020).

Businesses had focused more on aesthetical elements of icon design for many years; however, other elements of icon design are less explored (Lin & Chen, 2019; Wang & Li, 2016) especially on the element related to icon meaning such as recognizable, semantic (Ghayas et al., 2019; Yang, 2015; Zender & Meija, 2013), familiarity (Ghayas et al., 2019) at the same time maintain the simplicity and consistency (Guo, 2016; Zender & Meija, 2013) and color (Guo, 2016) of the icon design. Poor icon design might lead to misleading information, confusion, and comprehension problems. Therefore, the proper icon design is vital to ensure the icon is identifiable and comprehended to avoid confusion (Batista et al., 2019; Landa, 2014; Salman et al., 2007; Yang, 2015).

Besides, some studies mentioned that research related to icon ease of use, and icon design for a variety of user group is still limited (Ghayas et al., 2013, 2019). The icon design research can be improved by concentrating on any specific area of study. Proposed elements for icon design can be applied but might need further work by accessing and adjusting through questionnaires, observations, interviews, and evaluation by experts to study the most beneficial icon design elements and recognizing the actual situation associated to icon design (Kamarulzaman et al., 2020).

Furthermore, many studies on icon design are beneficial to communicate the information faster to the user; however, the researcher found there are limited icon design studies in certain domains including the Quranic field. There is yet to be a basic set of icon design elements for the Quran domain. In Malaysia, basically Mushaf of Al-Quran is now displayed using technology for reciting Quran. Many studies focus on techniques in reciting Quran through the conventional Quran (Mushaf) and using technology (mobile application). Most studies focus on the reciting Quran using translation, tafsir, color tajwid, waqaf ibtida' and Muslimah theme (Al-Ihsan, 2014;

Naurah, 2019; Wan Hakimin et al., 2018), and reciting Quran through mobile application (Jabatan Kemajuan Islam Malaysia, 2019; Ministry of Home Affairs, 2021). There are many techniques for reciting the Quran; however, the researcher found there are limited studies conducted on technique of reciting the Quran using icons.

Besides, one survey mentioned that Muslim youths were less motivated in reciting the Quran due to low comprehension of Arabic language used in the Quran. A Youth Survey for Malaysia and Indonesia in 2011 reported that 73 percent of youth read Quran sometimes and 78 percent youth understand Quran little (Keng et al., 2011). One study mentioned youth lacked awareness on continuous reciting Quran although many technologies exist nowadays (Anas et al., 2017). Hence, it is important for youth to understand the idea of Surah in the Quran that can motivate them in reciting the Quran. Furthermore, the efforts of IT experts in the field of the noble Quran are still limited and emphasized solely on direct use of information technology techniques such as storing, listening, and searching without more elaborated domain techniques. This supports that there is a lack of application that focuses on detailed techniques in the Quran domain. Thus, the study on icon design for the Quranic domain has room for exploration.

Therefore, there is a need to propose a semiotic icon design as a supportive tool and technique in reciting Quran that can assist youth to visually understand the genre of Surah in Quran thus motivating them in reciting Quran. This study focused on the design and development of a supportive tool for motivating in reciting Quran using icons. This application employed the Peirce Theory of Semiotics (1931-1958) (Chandler, 2007), the icon design elements (Kamarulzaman et al., 2020), the ARCS Model of Motivational Design (Keller, 2000), and the Prototyping model (Sommerville,

2016) to produce the semiotic icon design to visualize the genre of Surah that can motivate youth in reciting Quran.

1.4 Research Objectives

This study aims at studying the appropriate semiotic icon design as a supportive tool to assist youth in reciting the Quran. Four research objectives (RO) are outlined in this study:

1. To identify appropriate semiotic icon design elements for reciting Quran.
2. To design fidelity of semiotic icon design for motivating youth in reciting Quran.
3. To develop a prototype of semiotic icon design application for motivating youth in reciting Quran.
4. To evaluate the icon design, usability, motivation, and acceptance of Semiotic Icon Design Application for reciting Quran (SIDAQ) using PACMAD Usability model, ARCS Model of Motivational Design and Technology Acceptance Model (TAM).

1.5 Research Questions

From the objectives of this study, research questions (RQ) have been prepared to complete the study. The research questions to be answered are:

1. What are the appropriate semiotic icon design elements for reciting Quran?
2. How to design the fidelity of semiotic icon design for motivating youth in reciting Quran?

3. How to validate the fidelity of semiotic icons for motivating youth in reciting Quran?
4. How to design the prototype of semiotic icon design application for motivating youth in reciting Quran?
5. How to develop the prototype of semiotic icon design application for motivating youth in reciting Quran?
6. What are the responses on the icon design, usability, motivation, and acceptance of Semiotic Icon Design Application for reciting Quran (SIDAQ)?
7. Does the semiotic icon design element influence youth's motivation in reciting Quran?
8. Does the acceptance of Semiotic Icon Design Application for reciting Quran (SIDAQ) influence youth's motivation in reciting Quran?

1.6 Hypothesis

Based on the fourth research objective, seventh and eighth research questions, two research hypotheses have been developed and tested through statistical analysis.

1. Research Question 7: Does the semiotic icon design element influence youth's motivation in reciting Quran?

Hypothesis 1: There is a significant influence between semiotic icon design elements and the youth's motivation in reciting the Quran.

2. Research Question 8: Does the acceptance of Semiotic Icon Design Application for reciting Quran (SIDAQ) influence youth's motivation in reciting Quran?

Hypothesis 2: There is a significant influence between acceptance of Semiotic Icon Design Application (SIDAQ) and the youth's motivation in reciting the Quran.

1.7 Rationale of the Study

Despite acknowledging the important value of information in Al-Quran and the vital role played by icons to visualize the information, empirical research in icon design related to Quran is relatively rare and new. As a result, the motivation of this empirical study is to extend knowledge of semiotic icon design in literature by specifically focusing on the semiotic icon design elements and the supportive tool and technique used for motivating in reciting Quran. There are three main approaches focused on this study namely, semiotic icon design, motivating youth, and reciting Quran. This section summarizes the rationale behind these three approaches for this study.

The rationale for using the semiotic icon design approach in this study is to satisfy the objective of the design and development of semiotic icons for reciting the Quran. Semiotic icon design is the process of generating a visual sign to convey a particular meaning and better visual perception with the ability to communicate meaning. This approach is practical and widely used in many fields to simplify the meaning of the information and assist in comprehending the abstract information. Due to the capability of the icon, it motivates the people to comprehend the messages and therefore ease their work and activities. In this study, the semiotic icon design was created to assist in visualizing the genre of Surah in the Quran that can motivate youth to recite the Quran.

The rationale for using the motivating approach in this study is because motivation is an essential aspect of instructional strategy. Motivation ensures that the users keep on using the learning objects after the initial usage. Since the users of mobile applications cannot be controlled like students of traditional classrooms, therefore motivation is needed to sustain interest among users of such applications. Despite its

importance, however, most developed mobile applications have neglected the motivation aspect. This is even though motivation encourages retention among users especially if the information is complicated.

The focus group of this study is in motivating youth in reciting Quran. This is because there were issues found that youth have less motivation to recite the Quran due to the low comprehension in Arabic (Keng et al., 2011) and lack of awareness in reciting Quran although many technologies available (Anas et al., 2017). Muslims also have difficulty understanding the Quran content (Utomo et al., 2020). Hence, there is a need for an alternative way in motivating the youth in reciting Quran such as a support to visualize the idea of Surah, thus motivating them in reciting the Quran. Besides, youth also is an important asset to the country today as they will determine the direction of the country in the future (Najib, 2015). The motivation in reciting Quran is crucial as guidance on the rules and manners that can benefit youth to be good Muslims and future leaders. Youth also have high intentions on technology (Gaidhani et al., 2019). Hence, the focus group of study due to its important essence and the current needs of the younger generation for youth in Malaysia.

Therefore, this study proposed to integrate the semiotic icon design and motivation aspects to cater to the problems faced by youth in reciting Quran which is to be continuously engaged to understand the message or idea of Surah that can motivate them in reciting the Quran. The ARCS model of motivational design is suitable because the main goal is to build up and retain motivation. Furthermore, it is widely used in education and information technology research.

The rationale for using the reciting Quran approach in this study is because the study on semiotic icon design is still new in the Quranic field and there is a gap to

explore. The selection of three Surah in the Quran which are Surah An-Nur, Surah Al-Hujurat, and Surah As-Saff were because they contain rules of Islam, message on human life and manners, and as a reference to the Muslim. It is the basic Surah that guides the Islamic community. This study focused on the semiotic icon design for the genre Surah that contains the rules and manners that can benefit the young generation. The icon design for the genre of the Surah can be generalized to other Surah is as it has the generic meaning between the Surah in the Quran to be practiced in life. Overall, the rationale of the approach mainly selected based on the previous literature and expert recommendations.

1.8 Significance of the Study

The icon is widely used in many fields such as in science, engineering, and education to deliver information and perception to the user (Connie, 2015). Using the icon brings many benefits to the industry, making it increasingly popular as a tool for understanding and communicating. The benefit of the icon is saved space, fast to be identified and recalled, no translation needed and visually pleasing (Harley, 2014; Qiang & Fei, 2016). However, icon use is still at infant stage in the Quranic domain. Through previous studies in other fields such as science, medicine, engineering, and education, it is posited that using icons can express the specific meaning of information faster and with better visual perception although there is complex information. Therefore, it is believed that using the icon design in reciting Quran, youth will demonstrate similar benefit to visually understand the Surah genre that can motivate them to recite the Quran.

Theoretically, Semiotic Icon Design for reciting Quran (SIDQ) was designed based on the semiotic approach in Peirce's Theory of Semiotics and literature review

on comparative study of icon design elements from previous studies to be adapted into the Quranic field. In general, this study contributes to the field of semiotic icon design. This study also contributes to the body of knowledge in the Quranic field pertaining to the icon design for Quran. This will enrich the literature review on semiotic icon design elements that focus on meaning. Besides, this study also contributes a newly developed semiotic icon design and extension of semiotic icon design framework for reciting Quran using the Peirce's Theory of Semiotics (1931-1958) (Chandler, 2007), icon design elements (Kamarulzaman et al., 2020), ARCS Model of Motivational Design (Keller, 2000), Prototyping model (Sommerville, 2016), PACMAD Usability model (Harrison et al., 2013) and Technology Acceptance model (TAM) (Davis, 1989). This theoretical approach was limited to being conducted in icon design studies.

Methodologically, this study applied the design and developmental research (DDR) Type 1 approach integrated with ADDIE Model, which explained the systematic process to develop SIDQ and SIDAQ and simultaneously, focusing on the experimental design to test the icon design, usability, motivation, and acceptance of the application to the real respondents. It contributes to the framework design for semiotic icon and instructional design (ID) with DDR approach, fidelity semiotic icon design, application and evaluation of icon design, usability, motivation, and acceptance of semiotic icon design application for reciting Quran. Overall, it provides contributions to the summative and formative evaluation of SIDQ and SIDAQ. Lastly, it can provide a detailed process for developing mobile application throughout the DDR phase that can be guidelines for other researchers.

Practically, this is the new approach in the research of the Quran which focuses on visualizing the Surah genre using icon technique. This technique will provide an alternative technique in reciting the Quran using the icon that can visualize the genre of

Surah. This study potentially will provide an alternative tool for promoting icon design in the Quran domain. Indirectly, this application can enrich the reciting media of Surah in the Quran using the icon. Besides, the study will promote the field of semiotic icon design and icon design in the Quran domain. The apps may serve as a supportive tool that can assist youth to understand the Surah genre and thus motivate them to recite the Quran. Furthermore, this study also can assist the nation in the innovation of semiotic icon for the Quran industry. This innovation can visualize the Surah genres that can assist youth in reciting and practicing the Quran. The output also could produce a mobile application for reciting Quran and Mushaf Quran with the semiotic icon.

Empirically, the study contributes to the responses of the evaluation on the SIDQ and SIDAQ on the aspect of icon design, usability, motivation, and acceptance of semiotic icon design application for reciting Quran. It also contributes to the formative and summative evaluation of SIDQ and SIDAQ. Thus, it is hoped that this research will contribute theoretically, methodologically, practically, and empirically to the body of knowledge of icon design to assist in visualizing the genre of Surah and thus motivate youth in reciting the Quran.

1.9 Scope of the Study

The scope and limitation of this study involved the design of semiotic icons and the development of semiotic icon design application for the Surah genre in the Quran domain. The sample for this study is three (3) Surah in the Quran which are Surah An-Nur, Surah Al-Hujurat, and Surah As-Saff. These Surah were selected because they contain rules of Islam and rules of life as Khalifah, as a reference to the Muslim as their verses contain messages with very close connection to human life and they form the basic Surah containing a guide to the Islamic community as recommended by the three

(3) experts in Quran. The icon design for the genre of the Surah can be generalized to other Surah as it has the generic meaning between the Surah in the Quran to be practiced in life and as a guidance. The study on the icon design for this Surah sample aimed specifically for youth because it related to the manners that can benefit the young generation. Youth have a high intention in technology use, so this research would like to propose the semiotic icon design as a supportive tool and technique in recitation Quran using icon.

The target user for this study is the youth from age 15 to 30 years old from the Central region consisting of Selangor and Negeri Sembilan from secondary school and higher learning institutions. The youth age is grouped into three (3): age 15 to 17, age 18 to 22, and age 23 to 30. The youth come from Islamic and non-Islamic educational backgrounds. The icon design and prototype of the application were evaluated by three (3) experts in Quran, and three (3) experts in Information Technology (IT). This in line with Nielsen (1993, pp. 156) who recommended about three to five evaluators for evaluation, which can identify about 66-75 percent of the usability problems in the application interface. Seventy-four (74) youth were randomly selected as research respondents. The evaluation of the study involves the aspect of icon design, usability, motivation, and acceptance of the application through questionnaires and interviews. The pilot study involved thirty-seven (37) youth and a preliminary study (survey) with one hundred and thirteen (113) youth respondents.

1.10 Research Framework

Figure 1.3 summarizes the research framework for Semiotic Icon Design for reciting Quran (SIDQ). The framework discussed the work processes involved in this study. The research framework is based on the design and development research (DDR) approach integrated with the ADDIE instructional design model. Three (3) main phases are involved in this study which are: needs analysis, design and development, and evaluation phase as the umbrella of this research. The detail phase employed ADDIE five (5) stages which are analysis, design, development, implementation, and evaluation. The Prototyping model is also being used throughout these five (5) stages until the final evaluation of Semiotic Icon Design Application for Reciting Quran (SIDAQ) prototype. The four (4) steps in prototyping are to define prototype objectives, define the prototype functionality, develop prototype, and evaluate prototype. The prototype was developed to demonstrate how the application design component will work in a particular situation (Fabil, 2009). The study adapted the Peirce's Theory of Semiotics (1931-1958) (Chandler, 2007), icon design element (Kamarulzaman et al., 2020), ARCS Model of Motivational Design (Keller, 2000), Prototyping Model (Sommerville, 2016), and fidelity technique (Cao & Kamil, 2015; Jackson & Ciole, 2017; Mcelroy, 2017; Zezovski & Hultgren, 2016).

There was an evaluation on icon usability using the People at Centre of Mobile Application Development (PACMAD) Usability Model (Harrison et al., 2013), motivation using the ARCS Model of Motivational Design (Keller, 2000), and acceptance using the Theory Acceptance Model (TAM) (Davis, 1989).

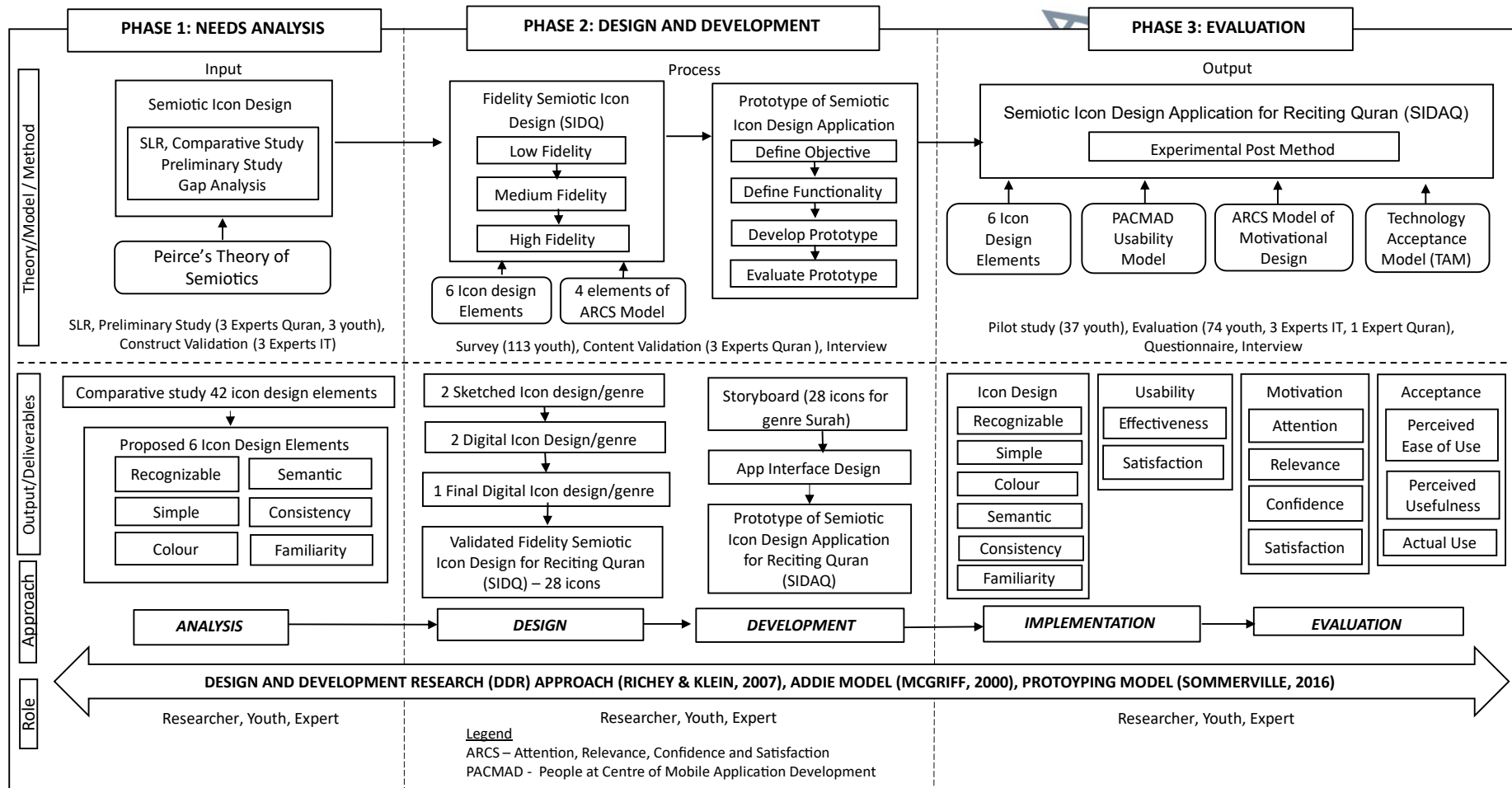


Figure 1.3: Research Framework for SIDQ and SIDAQ

In phase 1, the Needs Analysis phase, the analysis stage focused on the analysis of the needs of the study and literature review. This stage employed the first step in the prototyping model, define the objective of the prototype to develop a clearly defined purpose, objectives, and needs for the semiotic icon design and semiotic icon design application to determine what the application should be able to do, and the plan involved. The review of the study covers the topic of icon design, the issues and problems, theories related to icons, and elements of icon design for mobile applications. The review on the theory of semiotics was also conducted on supporting theories related to visual icons. Peirce's theory of semiotics was selected as the theory for this study due to its suitability and practicality for the visual icon. The researcher performed the systematic literature review (SLR) and comparative study in understanding the concept of icon design and to find the appropriate elements of icon design for mobile application. Through this phase, basic concepts and ideas are built to support the research done. A review of the various icon design elements was analysed by comparing the icon design element from previous studies from various fields such as science, advertising, IT, medicine, communication, design, and Islamic content. The comparative study was done for forty-two (42) icon design elements for mobile applications within forty (40) studies.

Based on the literature review, there are limited studies conducted on the areas of icon design for Islamic content such as Quranic that make it possible to execute in Quranic domain for visualizing the Surah genre. The comparative analysis found the most common ten icon design elements in the mobile application. Six (6) suitable icon design elements were selected for this Quran study. Among the related six (6) icon design elements are recognizable, simple, color, semantic, familiarity, and consistency. These six initial icon design elements were validated by three (3) experts in IT to

determine the suitability of the elements and to represent the areas of knowledge to be evaluated in this study. The validated icon design elements will be applied in the design and development phase. The outcomes from this phase produced a proposed six (6) icon design elements for mobile application that guides the icon design for reciting Quran in phase 2, Design, and Development. The results of the literature review answered the first research question of this study.

Phase 2, Design and Development phase involved the design and development of the semiotic icon using the fidelity technique embedded with six (6) elements of icon design and four (4) elements of the ARCS Model of Motivational Design. In the design stage, the second step of prototyping, define prototype functionality was applied to decide how fidelity of icon design and foundation of the icon design interface was placed. This step visually conceptualized the main features of the icon design. This stage employed the proposed six (6) icon design elements (recognizable, simple, color, semantic, familiarity, and consistency) from phase one and the element of motivational design from the ARCS Motivational Design Model (attention, relevance, confidence, and satisfaction) using fidelity technique (low-fidelity, medium-fidelity, and high-fidelity). The fidelity steps involved sketching two (2) icon's designs per genre, digitizing the two (2) icon's designs per genre, and finalized one (1) digital icon's design per genre. The sketching was performed using paper sheet and the digital icon with digital sheet using Adobe Photoshop software. These steps were filtered till we get finalized one (1) digital icon.

A survey was done for the digital icons with one hundred and thirteen (113) youth respondents and content validation of final digital icon design by three (3) experts in Quran and thirty-seven (37) youth from Quranic background. The results from the survey and validation processes are discussed in detail in Chapter 3 and 4. The output

of this phase is the fidelity of semiotic icon design named Semiotic Icon Design for reciting Quran (SIDQ). The results of the semiotic icon design and icon validation were the directions to answer the second and third research questions of this study.

In the development stage, the third step of prototyping, develop prototype was applied to decide what to be placed in the semiotic icon design application. The prototyping steps consists of four steps namely define prototype, identify prototype functions, prototype development and prototype evaluation. The first steps define prototype objective involved defining objective of semiotic icon design application (SIDAQ) to visualize the Surah genre to motivate the youth in reciting Quran. The details of SIDAQ prototyping plan are discussed in chapter three and four. The second steps define prototype functionality involved process to decide the SIDAQ interface, features, and functionalities for visualize genre of Surah using semiotic icon. The details of the stage are discussed in chapter three and four. The third steps develop prototype involved the illustration of SIDAQ storyboards for twenty-eight (28) semiotic icons design as the foundation of the prototype and Surah content screens were designed to complete the application concept (see Appendix 3). The semiotic icons were inserted in the SIDAQ mobile user interface, and the actual design was implemented and made clickable. The details of this stage are discussed in Chapter 3 and 4. The fourth (4) steps evaluate prototype involved the evaluation of the SIDAQ prototype by youth and experts to collect the feedback through pilot study and evaluation.

Overall, the application applied the four steps in prototyping the Semiotic Icon Design Application for Reciting Quran (SIDAQ). The application was consequently installed on Android devices and tested for functionality in a real environment. The detailed prototyping steps are discussed in Chapter 3 and 4. The application storyboards were illustrated (see Appendix 3) to provide a roadmap for a clear picture of the

arrangement and the content, connection between the screens, and how users could navigate through the application.

Next, the design and development of the application screens were performed using Adobe Photoshop and Adobe Flash software. When the screen designs and concept were completed and implemented, all the twenty-eight (28) semiotic icon designs were inserted into the application with the Surah verses and genres. The actual design was implemented and made a clickable application. The output from this stage produced a mobile application named Semiotic Icon Design Application for reciting Quran (SIDAQ). This application was subsequently tested and evaluated in phase three. The result of the semiotic icon design application development was the direction to answer the fourth and fifth research questions of this study.

In phase 3, Evaluation phase, evaluation of the application (SIDAQ) on the aspect of icon design, the usability of the application, motivation, and acceptance were evaluated using the experimental post method and random sampling. The evaluation stage employed icon design elements (Kamarulzaman et al., 2020), PACMAD Usability model (Harrison et al., 2013), ARCS Model of Motivational Design (Keller, 2000) and, Theory of Acceptance (Davis, 1989). The evaluation of the application involved icon design elements (recognizable, simple, color, semantic, familiarity, consistency), usability (effectiveness, satisfaction), motivation (attention, relevance, consistency, satisfaction), and acceptance (perceived ease of use, perceived ease of usefulness, actual use). The satisfaction elements in usability focused to evaluate on how the users are subjectively satisfied during the use of the application (Nielsen 1993) in a specified context for SIDAQ. The satisfaction elements in motivation focused to evaluate on how learners obtain some type of satisfaction or reward from a learning experience for

SIDAQ. Satisfaction is based upon motivation, which can be intrinsic or extrinsic. (Khaleel et al., 2018).

The implementation stage involved pilot testing with thirty-seven (37) youth while the evaluation stage involved seventy-four (74) youth respondents and three (3) experts in IT for evaluation of the application design. The data analysis of this study was performed using SPSS 26.0 through descriptive and correlation analysis. The results of the evaluation of semiotic icon design application and the hypothesis were the direction to answer the sixth, seventh and eighth research questions of this study.

Overall, this study has successfully contributed by incorporating the semiotic icon design elements for reciting Quran, the fidelity of Semiotic Icon Design for reciting Quran (SIDQ) and the validation study, a prototype of Semiotic Icon Design application for reciting Quran (SIDAQ), and the responses of evaluation in the aspect of icon design, the usability of the application, motivation, and acceptance. It is hoped that the proposed SIDQ and SIDAQ as a supportive tool and technique in reciting Quran using icon can assist youth in visualizing the genre of Surah thus motivating them in reciting Quran. The result for the three phases is discussed in detail in chapter five. Figure 1.3 details the research framework for this study.

1.11 Operational Definition

Several key terms used in this study will now be defined. These include an icon, semiotic icon, icon design, mobile application, youth, and reciting Quran.

1.11.1 Semiotic Icon Design

Based on the Peirce Theory of Semiotics (1931-1958), Peirce classified semiotic as a study of signs that concern with meaning and classified sign into three (3) aspects: what is represented (object), how it is represented (representamen), and how it is interpreted (interpretant) (Chandler, 2007; Sendera et al., 2014). The semiotic icon focuses on what is represented and how it interpreted as a visual sign to represent an object, action, or idea. It provides better visual perception with the ability to communicate meaning (Batista et al., 2019; Chandler, 2007; Landa, 2014; Lin & Lin, 2014; Qiang & Fei, 2016).

Semiotic icon design is the process of generating a visual icon to convey a particular meaning. Icons must be designed appropriately to be recognizable, or else ambiguity would be increased (Salman et al., 2007). In this study, the semiotic icon design was applied in the Quranic field to visualize the genre of Surah that can assist in understanding the idea of Surah thus assist in motivating in reciting Quran.

1.11.2 Mobile Application

A mobile application, most often referred to as an app, is a type of application software designed to run on a mobile device, such as a smartphone or tablet computer. Mobile applications often serve to provide users with related services to those accessed on computers. Mobile applications are specifically a program purposely for mobile

devices. Nowadays, people frequently interact via their mobile devices for business and daily activities (M. Wang & Li, 2016). The market for mobile application has emerged nowadays. The mobile applications make the icons faster and effective informational tools. This mobile technology produces a more meaningful icon that can recognize the icon faster and make it meaningful to the user.

In this study, the mobile application is referred as the application that can be downloaded through the play store of the user's mobile devices. This application can be used to recite Quran with the icon technique. While reciting the Quran, the icon will show the indicator of the genre to be followed and understood by the user throughout the reciting process. This semiotic icon design for Quran is developed as a mobile application using the android platform. This application produced a more meaningful icon for the Surah genre that can enable faster recognition of icon and make it more meaningful to the user when reciting Quran.

1.11.3 Youth

The National Youth Development Policy defines youth as an individual aged between the ages of 15 and 30 years (Youth, 2019; Malaysia, 2019). Those born after 1995 are known as teenagers of Gen Z. Due to the significant effect of technology on their behavior, Gen Z is distinct from previous generations. Students of Generation Z are more attentive to intrapersonal discovering (Seemiller & Clayton, 2019). Gen Z also enjoy video-based learning and practical learning where they can see a presentation of activity they are required to do online or individually. Generation Z is determined to be highly connected, living in an age of high-tech communication, a lifestyle powered by technology and a widespread use of social media (Gaidhani et al., 2019).

This research focused on youth aged 15 to 30 years. This is because youth have high preferences on technology and the internet, flexible learning process, and are visual learners.

1.11.4 Reciting Quran

Reciting the Quran is the focus for Muslims in Malaysia. The goal is to improve the skills in reciting, comprehension, and realizing the teachings of the Quran. Quranic education is mandatory for all Muslims. Through Quranic study, it is the responsibility of parents and teachers to help the latest generation become true Muslims and better human beings (Che Noh et al., 2013). The Sarawak Deputy Chief Minister, Datuk Amar Abang Johari Tun Openg encourages Muslims to use alternative methods to impart the practice of reciting the Quran, besides using the conventional script (Jonathan Chia, 2016). Using the latest techniques such as apps downloaded into the smartphone was a practical development. This is a new substitute that can be installed into the smartphone and be read wherever at any time. Furthermore, the use of the Quran application in the smartphone is a constructive development that encourages the culture of reciting the Quran, particularly among the younger age group. Based on the shift in time, the culture of reciting the Quran now was distinct compared to before relatively due to the technological innovation that had transformed the method of reciting the holy book, making it easier and might be performed anywhere. Earlier we recited using the conventional Quran script but currently, the holy book can be acquired digitally (Jonathan Chia, 2016).

Today, it is becoming a new trend to recite the Quran via mobile application. Alternate methods for reciting Quran and attempts to improve those elements are

extremely valuable and considered as great deeds in Islam (Ibrahim et al., 2012). Getting the mobile application that enabled searching, reading, and listening to verses from the Quran would be a useful tool for people. In this study, the semiotic icon design for reciting was designed and developed to visualize the genre of Surah that can motivate youth in reciting Quran. The application was developed in Android application platform.

1.12 Thesis Structure

This thesis consists of six (6) chapters. Chapter 1 presents the synopsis of the thesis including the research background, problem statement, research objectives, research questions, hypotheses, significance of the study, scope of the study, research framework, and operational definitions. Chapter 2 reviews the relevant literature of the studies and develops the theoretical and conceptual framework. Chapter 3 elaborates on the research methodology adapted to develop Semiotic Icon Design (SIDQ) and Semiotic Icon Design Application for Reciting Quran (SIDAQ), comprising the model that underpinned the design and development. Chapter 4 elaborated on the fidelity of SIDQ design and prototype of SIDAQ development processes consisting of five (5) phases of ADDIE. This chapter also discusses the overall findings of the research. Chapter 5 explains the quantitative findings of the research and is supported by the qualitative data. Chapter 6 summarizes the research implication, discussion, provides recommendations for future research and the conclusions.

1.13 Chapter Summary

This chapter has discussed the background of the study, problem statement, research purpose and research objectives, research questions, hypothesis, the rationale of the study, the significance of the study, the scope of the study, research framework, operational definition, and conclusion. A brief review of literature about the problem was covered to highlight the deficiency in current literature and identify the gaps to be addressed by this study. Three (3) gaps were identified. One, limited studies on icon design elements relate to meaning and Islamic content were the major motivation of this study. Two, limited research on icon ease of use for various groups of users which need to focus on the specific area of study and specific user. Three, limited studies on icon design in the certain domain including Quranic field and limited studies conducted on tool and techniques in reciting Quran using the icon. This study explored the semiotic icon design for motivating youth in reciting Quran. This chapter also put forward the structure of the whole thesis which features six chapters. The subsequent chapter presents a literature review to relate to other icon design-related studies and paving the way towards filling in the knowledge gaps and establishing the research framework. The next chapter (Chapter 2) is the Literature Review.