

# SPIRITUAL MOBILE APPLICATIONS DESIGN GUIDELINES FOR OLDER ADULTS: A MALAY MUSLIM PERSPECTIVE

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## Abstract

Nowadays, mobile technologies are becoming increasingly useful and continuing to develop at the cutting edge of technological innovation, including spiritual mobile applications. Besides assisting to fulfill the Islamic obligations, mobile Quran applications as one of spiritual mobile apps example, were also considered as one of the convenient ways to learn and improve the Quran recitation skills for the Muslim users. However, there is still a lack of providing guidelines for the design of spiritual mobile applications and the need to have the certification and authentication of these digital apps must be considered especially for digital Quran. This paper presents a set of spiritual mobile application guidelines for older adults in order to provide a guidance in the development of spiritual mobile apps. This study focuses on the interviewing method in order to understand the problems in using spiritual mobile apps amongst older adults in their daily routine activities. The results of this kind of qualitative research provided a set of designing guidelines for spiritual mobile applications in an older Malay Muslim perspective. This study also revealed the significant lessons learnt while conducting the interviewing method. These data, along with specific comments from interview participants, provide the basis for designing spiritual mobile apps guidelines to support positive emotional well-being in older adults. This study is useful for designers, application developers and researchers.

*Keywords:* Design, interviews, mobile applications, older adults, spiritual

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## 1 INTRODUCTION

The worldwide phenomenon of religious technologies is known as techno-spiritual (Bell, 2006). Bell (2006) highlighted those technologies in which delivering religious experiences represent the leading edge of a much larger re-purposing of the internet in particular and of computational technologies more broadly. However, rapid development in mobile technology recently shows the changing trend of using computer to mobile technology (Plaza, Martín, Martín, & Medrano, 2011) to support people's daily activities including religious activity. According to a study being done by Buie & Blythe (2013), Apple mobile phones through iTunes App Store contains over 6,000 applications related to spirituality and religion. Nevertheless, designing spiritual mobile applications that could actively support users in achieving a positive emotional well-being, especially in older adults' daily activities including religious activities are quite challenging.

In contemporary societies, the world's population is ageing rapidly with the rise of an ageing population throughout the world. In Asia's ageing population, China and India will be the countries with the largest population of older adults in absolute terms (United Nations, 2010). In Malaysia, the government came up with the National Policy for Older Persons that follow the definition by the United Nations World Assembly on Ageing in Vienna, 1982 which defined 'elderly' or 'older adults' as citizens with age of 60 years and over (Oriol, 1982). In this study, older adults are defined as people from 60 years of age and older; the age most Malaysian employees retire. According to the Department of Statistics (Department of Statistics, 2011), in

the Asia region, Malaysia will be an ageing population by 2030 when 15% of its population will be 60 and above. Besides this scenario, there is a lacking in design recommendations that have been produced focusing on the older adults' generation-specific knowledge and experience (Liu & Joines, 2012).

As an indicator of overall health in older adults, positive emotional well-being could be achieved by maintaining a good social life (Doyle, O'Mullane, McGee, & Knapp, 2012). In order to deliver technology solutions to support emotional well-being, mobile applications need to avoid unnecessary complex interfaces and interaction techniques that make it difficult for older adults to benefit from such technology.

Nowadays, mobile phone applications have created a new industry within the world. There are a growing number of applications geared towards specific industries and professionals, including for spiritual purposes. Spirituality and religion have been found to play an important part in many older people's lives. The relationship between religion and spirituality and health is not necessarily a direct one, but perhaps is more complicated (Kirby, Coleman, & Daley, 2004). Thus, designing spiritual mobile application guidelines is a need to facilitate an appropriate technology for everyday spiritual and religious activities amongst older adults.

This research will explore the use of spiritual mobile applications by older adults. The focus of the study was to identify design factors that need to be considered when designing culturally sensitive spiritual mobile applications. Specifically, our research aimed to understand a Malay Muslim older adult's opinions of using a spiritual mobile

app. Therefore, qualitative research is a need to explore older adults' reactions, feelings, experiences, emotions, and perceptions towards Islamic mobile applications with the goal of investigating to obtain understanding and inspiration for the design of spiritual mobile applications. This study will finally revise a set of guidelines for spiritual mobile applications to support positive emotional well-being in older adults.

## 2 RELATED WORK

### 2.1 Review of Design Guidelines

According to Ayob, Hussin & Dahlan (2009), there are four existing guidelines for mobile application which is the Shneiderman's Golden Rules of Interface Design, Seven Usability Guideline for Mobile Device, Human-Centred Design (ISO Standard 13407) and W3C Mobile Web Best Practices. Kurniawan and Zaphiris (2005) presented a set of web design guidelines for older people. A set of 38 guidelines, which were grouped under 11 distinct categories were developed for designing ageing-friendly websites. However, Loureiro & Rodrigues (2014), enhanced the previous category headings for a website guidelines into a new set of design guidelines of multi-touch interfaces for elders, as illustrated in Figure 1.

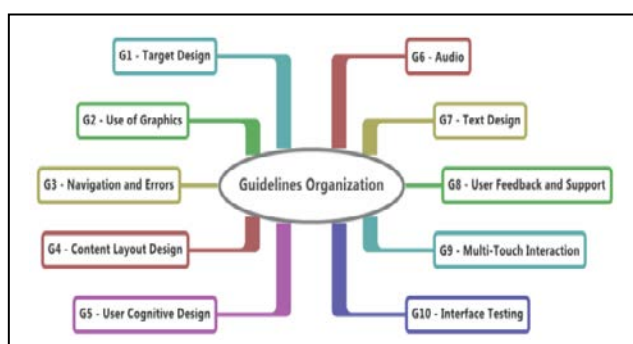
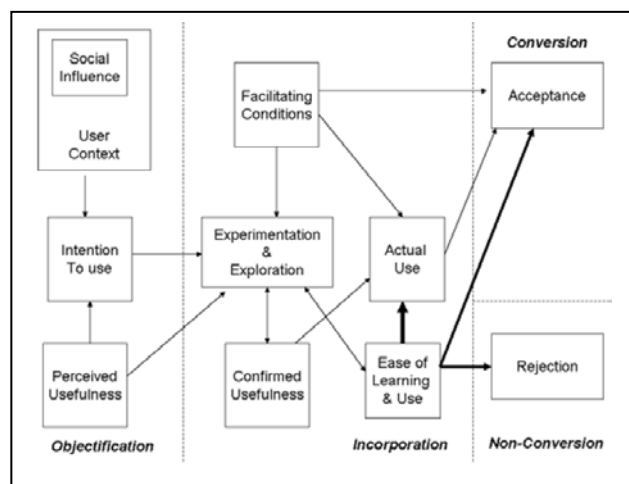


FIGURE 1. Guidelines Categories  
 (Loureiro & Rodrigues, 2014)

### 2.2 Senior Technology Acceptance & Adoption Model (STAM)

Renaud and van Biljon (2008) created the STAM model (Senior Technology Acceptance and Adoption Model) which provides a systematic process of technology acceptance in older adults (Barnard, Bradley, Hodgson, & Lloyd, 2013). In STAM model, they are divided into three phases: Objectification, incorporation, and acceptance. Incorporation phase is the most important part to be implemented since in this phase, further exploration and experimentation with the technology will take place, in order to give the older adults a better understanding of how useful the technology will be for them. It play a large role in the final acceptance or rejection of the technology amongst older adult users. See Figure 2 for the STAM model.



2.3 A Framework of Guiding Interface Design for Older Adults

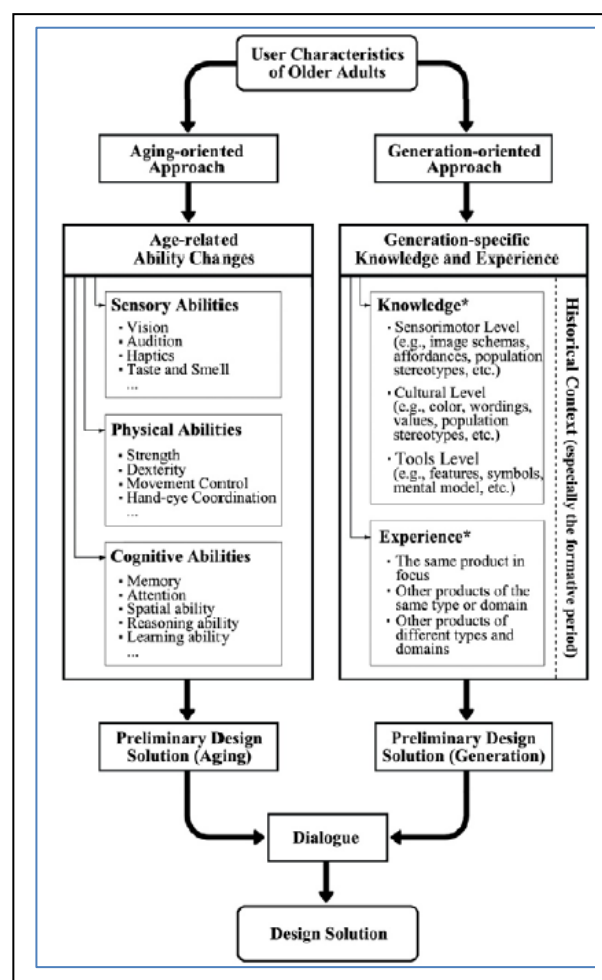


FIGURE 3. Design Framework for Older Adults  
 (Adopted from: Liu & Joines, 2012))

There is a growing ageing phenomena which is presented with both challenges and opportunities. The challenge is to address the growing needs of the older adults; taking into account the aging does affect their general changes (declines). Meanwhile, there are opportunities in generation-specific knowledge and experience (Liu & Joines, 2012) from the generation perspective. The framework in Figure 3

was created with the aim to assist developing user interfaces for maximum usability and accessibility for older adults.

In Malaysia, older adults' age are within the range from 60 years old and above, parallel with the employee's retirement age in Malaysia. As Malaysia's richest and most developed state, Selangor has the largest population in Malaysia (Department of Statistics, 2011) and there are many potential older adult participants to be selected in any research study. Despite its ethnic and religious diversity, Muslims make up the largest group in the population. Nearly 60% of the population in Malaysia are Malay Muslim. Plaza et al. (2011) highlighted that religion and spirituality is the main criteria in older adults' quality of life. Merriam and Mohamad (2000) stated that the nature of learning among older Malaysians were communal and mostly related to religious or spirituality. There is a need to design an application to support positive emotional well-being in older adults (Doyle et al., 2012).

### 3 METHODOLOGY

The paper will provide an Islamic overview on the use of spiritual mobile apps amongst older Malay Muslims in Malaysia. This qualitative approach is interpretive, in conducting a study of how older adults learn and use spiritual mobile applications. We employed interviewing method (Liamputtong, 2006) in the study and the Malay Language Quran application was selected to be used by older adults as spiritual mobile apps for tablet PC with Android software. As the most downloaded and dominant sample of reference in religious apps category (Campbell, Altenhofen, Bellar, & Cho, 2014), the Malay language Quran application with Malay translations of Quran was used for this study.

The research procedure was divided into two parts that can be described as follows:

- A literature study on the design of mobile applications and the design of mobile technology for older adult users.
- The expansion and verification of the spiritual mobile app design guidelines for older adults based on the data captured for this study. The data was collected over a period of four months.

#### 3.1 Participants

Our research design is qualitative and involves a study with 12 participants aged 61 to 74 years old. Using a combination of interview and observation, we gathered information regarding each participant's experience with, and attitude towards the use of Malay Language Quran Mobile. As recommended by Renaud & Biljon (2008), this study using the STAM model, which captures the context of the elderly mobile phone user. Participants were taught on how to use the Malay Language Quran Mobile in the provided tablet and they can use it at home for a week's time, before proceeding to the interview sessions.

For this study, participants were recruited at a community of "K" senior center in Peninsular Malaysia by using purposive sampling (Patton, 1990). A class of Quran study had been selected for this research. All of the participants

were Malay Muslims. Table 1 reported that a total of 12 elder participants had been interviewed, included: 5 males and 7 females. Each participant's age must be in the range of 60-74 years old and owns a handphone. All participants were rewarded with a gift incentive, with food and drinks provided, for their efforts and commitment in the study. This kind of non-monetary gifts can lead in motivating knowledge-sharing amongst participants.

TABLE 1. A Demographic Profile

ID	Age	Gender	Background	Mobile Phone
P1	74	Female	Retiree	Hand phone-Nokia
P2	68	Male	Retiree	Hand phone-Nokia
P3	61	Female	House wife	Smart phone-Samsung
P4	68	Female	House wife	Smart phone-Lenovo
P5	71	Female	House wife	Smart phone-Samsung
P6	74	Male	Retiree	Smart phone-Samsung
P7	61	Male	Working (Part time as taxi driver)	Smart phone-Samsung
P8	65	Male	Working (Full time as executive)	Smart phone-Samsung
P9	68	Female	Retiree	Smart phone-Samsung
P10	61	Female	House wife	Smart phone-Samsung
P11	63	Male	Retiree	Hand phone-Nokia
P12	61	Female	Retiree	Smart phone-Samsung

#### 3.2 Procedure

Before conducting the study, two of the researchers went to the center manager's office for a field visit in order to gain access to the center and obtain more information about the daily routines and weekend activities held including the facilities provided at the center. After getting consent from the manager, the first author joined a study of Quran class on a weekend session to build a relationship and rapport with them and at the same time, tried to recruit any volunteer participants that meet certain criteria and conditions. After joining the study of Quran class, a brief announcement about the interviewing sessions to be done for the following week had been made at the end of the class session. With positive response, a list of suitable participants had been selected and a piece of brochure was included. The information about the research objectives, date, time and venue had been distributed to all volunteer participants. The day before the interviewing session, all potential participants had been contacted through phone call and text message (via SMS) as a reminder of the interviewing session, as guided by Damodaran, Olphert and Sandhu (2012).

The study was an opportunity for the authors to investigate elder participants' experience with the use of Malay Language Quran Mobile in their routine lives. Mobile Quran app in the context of this study is an Android application that runs on smart phone or tablet platforms (Talib, Mahmud, Abd Rahman, Suraya, & Abubakar, 2015). In order to support data collection process, field notes, video, audio, and photograph recorded were fully utilized in the study. Prolonged engagement with participants is recommended in order to acquire sufficient and in-depth data for the study.

### 3.3 Interviewing method

For the use of the interviewing method as guided by Liamputtong (2006) for this study, all participants had been interviewed during pre-interview and post-interview sessions. To assess participants' experience with spiritual mobile apps, we administered to provide all participants with a set of probe kit, to be used at home within one week. After the first interviewing session, all participants were asked to use the tablet with the installed Malay Language Quran Mobile at home. A week after, an appointment had been made with the participants to return all probe kits and share their experience of their usage through the post-interview sessions.

#### 3.3.1 Pre-interview:

The aim of the pre-interview was to collect participants' background information in detail and feedback about the demo session. Before the interview, the participants had been trained through the demonstration by the facilitator on how to use a tablet PC and Malay Language Quran Mobile. Each participant was then interviewed individually for 30 to 60 minutes of semi-structured interview design. The contact number of the facilitator was also given to each participant for any inquiry or assistance in using the tablet PC or mobile Quran app during the one-week period study.

#### 3.3.2 Post-interview:



FIGURE 4. Face-to-face Individual Interviewing Session with Older Adults

After one-week, the post-interview was conducted with 12 older adults in order to further explore the in-depth information about the participants' experiences of using the Malay Language Quran Mobile. Prior to the post-interview, an appointment had been made through phone calls with

their chosen time and place to meet (either at the senior center place or at a participant's home). The aim of the interviews was to broaden our understanding in the use of spiritual mobile apps in the participants' lives. With an interview guide (Fisk et al., 2004; Alaszewski, 2006; Liamputtong, 2006; Goodman et al., 2013), each interview lasted in the range of 60 to 90 minutes, which aimed to obtain information deeply into any related topic (See Figure 4).

## 4 RESULTS

As an exploratory study, this research presents rich data when all older adult participants gave positive responses to share and discuss their experience in the use of the Malay Language Quran Mobile. This paper reports that older adults in Malaysia are beginning to use the internet to access spiritual and religious information, especially through any of the spiritual mobile apps directly through their mobile phone. It is important to pay attention to the religion-focused design of mobile apps to enable older adults to be more productive.

The interviews started with questions such as "Did you find any problem while using the Malay Language Quran Mobile?"

The following were the problems the participants faced when using the Malay Language Quran:

- No color for sentences writing in the mobile Quran app. The use of color is important, especially to highlight *Tajweed* and look more attractive.
- The tablet PC screen is too sensitive. While reciting the mobile Quran apps, the *ayaat* just simply jumps to the next *ayaat* which causes the participant to easily lose track to recite again.
- Some buttons are too small to be used comfortably.
- Should have an option which enables the resizing of the font that is suitable for older adult users, especially for those who have short or long-sightedness.
- For mobile Quran apps, better to use the Malay language compared to other languages as it is easier to understand.
- Sometimes, the notification for virus appears on the screen so suddenly and participants find it too annoying.
- It is good to provide a video of the Qari reciting the Quran as the user can see the correct pronunciation of the reciter in every mobile Quran app.
- It is unnecessary to have so many options which are too difficult to understand by the older adult users as it will only confuse them.
- There is no cursor function and this affects the older participant's performance in using the Quran mobile app due to the familiarity of using cursor in laptops or personal computers.
- It is better to have the reciter's picture to identify the reciter's face.
- Put together all the important applications of spiritual mobile apps into one group, and make its usage accessible with only a single click.
- The search *ayaat* function is good but difficult to use.

- Due to the familiarity in the use of paper-based Holy Quran, there is a need to have notification of page number, rather than just by the number of Quran *ayat*. Most people like to be able to know where they have stopped reading by identifying how many pages they have read based on the paper-based Holy Quran.

## 5 DISCUSSION

### 5.1 Reviews of Findings

In this section, we report on some of the significant lessons learnt while conducting an interviewing method in this research. Sensitive questions like personal religious practice experiences are private to be discussed in the public. For example, when interviewing, an interviewer might ask, "Could you tell us if you doing a routine of any other religious practices after reading the Quran through the Malay Language Quran Mobile?". Most of the older adults will feel uncomfortable to answer this question. It is important for researchers to be aware that sometimes religious practices can be too sensitive to be asked in public. If there was still a need to ask sensitive questions, plan the question structure and ask the sensitive questions, especially when regarding the relationship between human and God, in the middle of the interview, once a rapport has been established.

### 5.2 Final Design Guidelines

The results of the interviews produced a set of 45 distinct spiritual mobile application guidelines which were grouped under 10 distinct category headings. The categories used in the grouping of guidelines were based on the classification used by Loureiro & Rodrigues (2014), Ayob et al (2009) and Abdul Razak, Haminudin, Wan Adnan, Rahman, & Abdul Rahman (2014).

#### G1 – Target Design

- Ensure the user can easily resize the font, buttons or icons suitable for the elderly that usually have short-sighted and long-sighted vision.
- Avoid having so many functions.
- Easy access of the shortcuts from their mobile. The shortcuts should locate on the first page of their mobile device, not hidden in the folder or located on the second page of the device.
- There should be clear differences on every selected button or icon, to avoid older adult to do double click.
- Provide items with some spiritual experience are one of a value added attribute.

#### G2 – Use of Graphics

- Use large buttons and icons.
- Use simple and meaningful icons along with labels.
- Use high contrast color between the elements of the user interface.
- Choose an appropriate image. (For example, show the Quran reciter image for each audio of Surah reciting).

#### G3 – Navigation and Errors

- Provide clear navigation on every page.
- Easy-to-understand navigation cues should be provided.
- Try to prevent errors.
- Make it easy for users to correct any errors. Design error messages by notifying that the user is not the cause of the error.
- Design for good recovery.
- Avoid the use of pop-up virus notifications or any pop-up advertisements (distractions for the elderly).
- Permit easy reversal of actions (for example: provide undo button).

#### G4 – Content Layout Design

- Design for top-down interaction.
- Provide an organized and simple content.
- Avoid the use of scrolling.
- Provide an updated and trusted content.
- Provide consistency to make sure it is easy to use and understand.

#### G5 – User Cognitive Design

- Give the user ample time to read and understand.
- Be able to attract older adults who refuse to learn. Try to make it more interesting such as; the apps could cater the rewards (pahala) the user had gained while reciting the Quran, to motivate them.
- Reduce short-term memory load. For example, visual chart is useful for the older adult on what he or she had done in that Quran app to help them with their memory load.
- Design dialogs to yield closure.
- For mobile Quran apps, allow user to search Qur'an by selecting page of the Qur'an (based on hardcopy on Al-Qur'an page) and any words or *ayaat* (like in *Google*).

#### G6 – Audio

- The user can easily adjust the volume. Most of the older adults prefer loud and clear-sounding speakers.
- Provide a good recitation audio.
- Consider the use of video, especially for Quran applications which, a video of Qari reciting Quran can help the user to see the reciter with correct pronunciation (learning the right way and with Tajweed in reciting Quran).

#### G7 – Text Design

- Use a large size font type and try to make it adjustable.
- Use an easy-to-read font family.
- Consider using medium or boldface type.
- Use of text color is important (especially to highlight *Tajweed* in the Arabic text of the Quran and look more attractive).

- Ensure that the users can read Arabic fonts along with Malay language translation.
- It is better to use simple words and provide a mother tongue language.
- Ensure the Arabic text in the Mobile Quran was written based on the same number of pages in the Holy Quran. Provide the indicator to highlight the page number.

#### G8 – User Feedback and Support

- Can offer informative feedback.
- Consider accessibility issues (for example: group all selected four important spiritual mobile applications in one click.)
- Provide the search and fast view function.

#### G9 – Islamic Identity and Traits

- Use features that present the Islamic identity (for example; color, audio, etc.) as well as Islamic traits (for example; the Arabic language as the standard version to represent the content of the Quran). For example; it is good to start the apps with "bismillahirrahmanirrohimi", of any hadith quote of the day as a reminder.
- Consider providing extra Islamic applications such as prayer schedule, Islamic calendar, visual chart and etc. to be added on the spiritual mobile apps as a value added attributes while using the apps.

#### G10 – Interface and Content Testing

- Inform the older adult of the goal of the project.
- Keep the test short and make use of breaks.
- Respect the opinions of the test participants.
- Test the reliability of the spiritual mobile apps to ensure the credibility, authority, relevancy, accuracy and trusted of the developed mobile apps product.

## 6 CONCLUSIONS

The study described in this paper has achieved to develop a set of guidelines for designing spiritual mobile applications. This is a first step in better understanding spiritual mobile apps in order to make a useful and acceptable software product.

In summary, there is much potential for spiritual mobile apps to support positive emotional well-being in older adults. The older adults that had been interviewed were quite open to share the idea and give a positive response, for certain tasks. However, it is important to plan the interviewing question structure properly before conducting a study, especially when the questions relate to religious practices. All the users' needs, opinions, and concerns will provide the best guidance in designing the usable mobile apps especially for an aging population. Not just focussing on the limitations of the current mobile technology, the participants were encouraged to focus their discussion on the spiritual mobile app's potential to provide useful design recommendations for the future development of spiritual

mobile apps. As part of an ongoing process to evaluate and further refine our design guidelines, the preliminary guidelines will be regularly presented and discussed during interview sessions with Human-Computer Interaction (HCI) experts. Future work is needed for designing methods and creating tools that designers and HCI researchers may implement in any mobile apps project or study.

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