

An Intuitive Design Approach to Support User Experience(UX) in Determining Qibla Direction

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Abstract :

The qibla is the direction that should be faced when a muslim prays. Currently, there are many computer applications have been developed to assist the Muslims in determining accurate direction in non-mobile and mobile based applications. This paper initially addresses the design issues and problems that identified in mobile and non-mobile applications as well as the traditional method in finding qibla direction. Although mobile applications and compass provides a convenient and practical guidance to the users in finding qibla direction, some of them are still require up to certain level of knowledge from user before be able to use them, for instance, the uses of geographical notations and terms which are not convenient for the user with no geographical background. Furthermore, the qibla compass is very sensitive with other electromagnetic force and this result to inaccuracy in locating the qibla direction. Unlike mobile application and compass, the major drawback of non-mobile system is not be able provides a practical guidance to the user in finding qibla direction. Hence, this paper has investigated the potential of intuitive design approaches or intuitive features that could be implemented in designing the computer application for qibla determination. Intuitive features will allow the user to use the applications with less guidance by fulfilling the logical of its functionality and practically usable for the user to interact effectively and unconsciously use their previous knowledge. By implementing intuitive features, it will provides extra guidance for user to locate the qibla, speed-up the qibla determination as well as enhance the mental model design in non-mobile system. This is achieved by recognizing the intuitive subjects/objects in user environment that could enhance the instinct, knowledge, user experience (UX) as well the confidence in finding qibla direction. This approach will therefore reduce the effort how the user knows, perceives, make decisions and construct behaviour in a variety and complex environment especially in non-mobile qibla determination approach.

Keywords- *Intuitive Design, Qibla Determination, User Experience*

I. INTRODUCTION

The word of qibla is origins from Arabic language which means the direction that faced to Kaabah building located in Makkah, Saudi Arabia. This direction is used by the Muslims to perform prayer as well as other religious obligations such as an animal slaughtering procedure which is the head of an animal should be aligned to the qibla direction and the Muslims are buried with their heads are turned right towards qibla. It is

compulsory for a Muslim to face the qibla during their prayer as stated in the holy of Quran in Surah Al-Baqarah verse 149, ““So from wherever you go out [for prayer, O Muhammad] turn your face toward al-Masjid al-Haram, and indeed, it is the truth from your Lord. And Allah is not unaware of what you do”. Muslims should make a sincere attempt to face qibla as it is one of the conditions for the validity of prayer [1].

Prior to technological era, there are few conventional methods used to locate the qibla especially for those who far away from Makkah. Sun and stars are used as a base guideline and during these days, the Muslims that live far away from Makkah just face to any direction with confidence due no scientific way to locate qibla direction accurately [13]. As time goes by, there are few scientific approaches have been introduced to locate the qibla direction in more accurate way such as arithmetic method, trigonometry method, star sphere method, star disc method and Weris’ cone method [12]. These methods require specific computation to be performed and hence, involved some mathematical formulas.

Nowadays, qibla determination methods have evolved and being simplified, and finding the qibla is no longer complicated like in the early days due to many instruments have been invented and developed such as qibla compass, the mobile phone applications like ‘alQibla’, ‘MySolat’ and ‘Qibla Compass’ and many others, as well as non-mobile web-based application like e.qibla.com [17] and qibla direction [18]. All mobile applications are usually equipped with Location-Based Services (LBS) and Geographical Information System (GIS) technology, and this can help the Muslims to locate the qibla conveniently especially during travelling and when the mosque is not accessible.

This paper will address the design, reliability and usability issues in non-mobile, mobile-based applications, as well as traditional way which are currently used to determine the qibla. The uses of geographical notations and terminologies in these applications might slow down the user’s learnability as level of cognitive or mental effort from each users are difference [8]. Those who are not equipped with smart phones may use the web-based system to determine the qibla using desktop or laptop computer, this type of system might be designed intended to only provide the information about the qibla without provide a practical experience like what is offered in mobile applications. The information provided is not be able to fully guide the user to find the qibla. Therefore, investigations have been conducted to find potential design approach that could be used to address these problems. Intuitive design approach and feature has been studied, and being demonstrated to enhance the usability of qibla determination system.

II. ARGUMENTATIONS ON QIBLA DETERMINATION

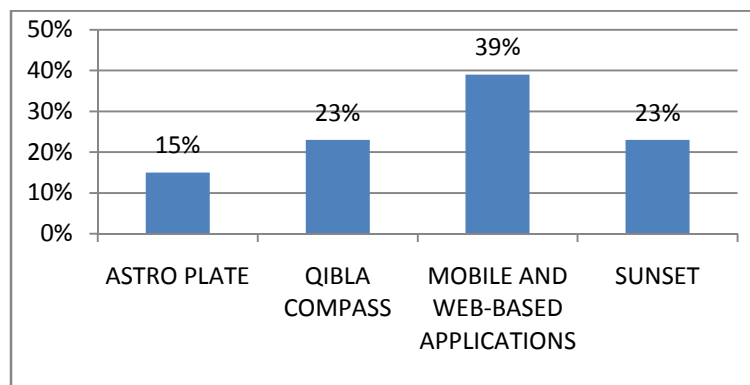


Figure 1. Methods to find qibla

Figure 1 shows the findings obtained from the preliminary study conducted to identify and to get know of how people around us find the qibla if qibla direction is not available or the mosque is not accessible or during travelling.

A. *Sunset*

Sunset direction is one of the conventional and popular ways to locate qibla. Sunset provides a general guidance to qibla, however, it is very important for people to be aware that this technique does not give 100% of accuracy because in Malaysia, the degree for Qibla is falls from 290° to 293°, but the sunset degree throughout the year falls from 235° to 295° [4]. In Malaysia, the sunset only perpendicular to the Qibla on every 28th May at 5.16PM and on 17th July at 5:28PM [15].

B. *Astro Plate*

In Malaysia, the rumors have been spread indicates that the Astro plate (Astro is the brand name of Malaysian direct broadcast satellite service) is faces the Qibla. Scientifically, Astro plate is not face to the Qibla but is face to the satellite in order to receive signals. Otherwise, it is just a coincident because there is Astro plate installed different from the qibla. In this context, people should be aware they could not rely on Astro plate to get an accurate Qibla direction but should refer to the more reliable sources or method to get the qibla information.

C. *Mobile and Web based applications*

Most of the respondents in this survey have used and are interested to use mobile phones and websites to guide them to find the Qibla. There are many applications that could be use freely not only to determine the qibla, but also to get the other information such as the prayer times. There are two major issues to be discussed which are reliability of mobile of mobile applications and usability of the applications.

1. *Reliability of Mobile Applications*

In this preliminary study, one mobile application that is used to find qibla has been tested to few prayer rooms around us. The sign of qibla direction is provided in every prayer rooms. The result from the testing has found the qibla sign in some of the prayer rooms were not matched with the qibla direction showed by the mobile application. Another finding is the prayer time showed in mobile application does not matched with the prayer time provided by the Malaysia Department of Islamic Development (JAKIM). In Malaysia, JAKIM is considered as a reliable source and reference on the Islamic matter. Furthermore, the development of mosque and prayer rooms in Malaysia has obtained an approval from Department of Survey and Mapping Malaysia (JUPEM) and others religious constitutional to ensure accurate qibla direction is determined [16].

Hence, further investigation is needed to justify the contradictions and the difference resulted from this testing in order to clarify the reliability of these mobile applications to determine the qibla as well as the reliability of the qibla signs that have been placed in the prayer rooms. The accuracy of qibla determination is very important and critical because slight inaccuracies will consequences a significant deviation, for example one degree is similar to 125 Kilometer from Kaabah [4]. A slight deviation in the qibla is permissible because those who are far away from Makkah are only required to seek the general direction of the Kaabah without having to face it precisely [14], but as technology becomes better and ease the human's life nowadays, every

muslims should be responsible to do the best in finding qibla direction as they can in order to show the actual effort and level of sincerity displayed in trying to figure out the right direction of the qibla.

2. Usability Issues

A good design is necessary for any software systems. An effective interaction between user and system could help user to navigate system and accomplish their tasks easily, as well as provides a good experience while using the systems. User interface design may not be the most important factor that determines the commercial success of products but it becomes a key differentiator among competing products [7].

Thus, usability is considered a key quality of a software [11]. The usability attribute is interrelated with the other quality attributes in software systems, for example the reliability of a system is determined by having a good usability and availability [5]. In Qibla system for instance, it should be able to determine a correct as well as an accurate direction of Qibla in order to be said as reliable system. At the same time, a good design and usability will effectively guides the users to use the system and prevent the user to interprets and understand the information presented wrongly which consequently affect the reliability of the system. In current qibla system, there are few design issues are identified.



Figure 1. Application A

Figure 1 shows one of the qibla system for mobile application. The red pointer indicates the qibla direction, but the user will have tendency to confuse from the uses of two pointers. The uses of compass terminologies such as 'N', 'S', 'E' and 'W' could be just another additional information that can guide user indirectly

to north from Kuala Lumpur, Malaysia, and the other places will have own specific degree of qibla direction. Therefore, user should understand the relations between the uses compass terms with qibla direction in this context. The system should be able to adapt with all types and categories of user from naïve, novice, and intermediate to expert users. The signs that are used in interface affects communicability, understandability, user satisfaction and usability [11].

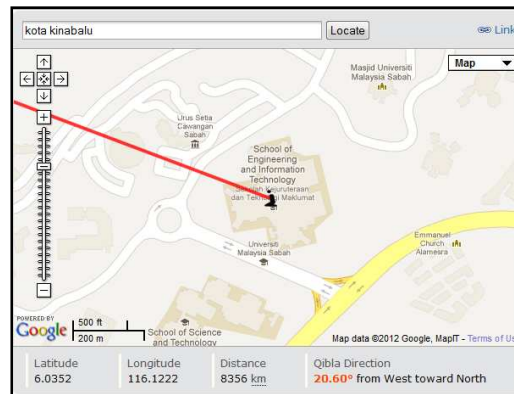


Figure 2. Application B

Figure 2 is a map-based feature to locate the qibla through mobile application and personal computer. If the user using smart phones or gadget to use this feature, the device will be automatically detect the current location of the user since it is equipped with Location-based service technology. Furthermore, using mobile application to locate qibla is more convenient and practical as using conventional compass to find the directions. However, user without smart phones might use personal computer to find qibla direction as only map-based feature is available to use. Unlike mobile application, user has to enter the location name manually in order to view the direction path as shown in Figure 2. In some other applications, user has to know the specific coordinate location such as longitude and latitude in order to get the qibla direction.

Prayer Time Schedule								
Location	Zon 1 - Sandakan, Bdr. Bkt. Garam, Semawang, Temangong, Tambisan							
Month/Year	Disember / 2012							
GMT	8							
Qiblat Direction	290° 44' 58"							
Qiblat Direction								
Date	Day	Imsak	Subuh	Syuruk	Zohor	Asar	Maghrib	Isyak
17-12-2012	Monday	4:37	4:47	6:10	12:06	15:28	17:59	19:14

Figure 3. Application C

In JAKIM website as shown in Figure 3 [6], user can get the information of prayer times and qibla direction as well in all places in Malaysia. The direction of qibla is displayed in text form and expecting any users knows and understands the terms and information been presented. In addition, even the user could understand that, this type of information representation would not be effective to guide the user in locating the qibla. Therefore, the design of this kind of system should be improved by researching the appropriate methods in Human Computer Interaction field that can be applied in qibla direction website.

III. INTUITIVE DESIGNS APPROACH FOR QIBLA DETERMINATION

The main concern in this paper is to study the approaches to improve the usability design of qibla system especially for the map-based feature and JAKIM website as shown in Figure 2 and Figure 3 for the user with no smart phone, device or compass and depend on personal computer or laptop to find qibla. It investigates

and looking for an idea on how these systems could practically assist the user to find the qibla, similar with the better user experience while using mobile application and compass. Thus, this paper suggests an Intuitive Design approach to improve the usability of these systems. Intuitive approach is more than providing a user-friendly or ease-of-use system as it could be considered as intelligent system. This technique will allow users to use their previous knowledge unconsciously, use the system through self-instinct and less guidance. Intuition is a cognitive process that utilizes knowledge gained from previous experience, for example intuitive use of products involves utilizing knowledge gained through other product experience [6].

According to Jared [10], the knowledge level of every users are varied and different, thus designer should assess the current user knowledge point and specify the target knowledge point required in order to use the system effectively. The design is so called intuitive if only if both the current knowledge point and the target knowledge point are identical or the current knowledge point and the target knowledge point are separate, but the user is completely unaware the design is helping them bridge the gap. The user is being trained, but in a way that seems natural. Intuitive is all about speedy, creative and subconscious process that can get to the truth of things without reasoning and analysis [9].

In web-based qibla system, intuitive feature may improve the information representation by making it more usable to guide and gives idea on the qibla direction. This can be done by identifying familiar building or mark around the user and this is called as intuitive subject. Intuitive subject should be something that easily recognized and can give the user the rough idea on Qibla direction.

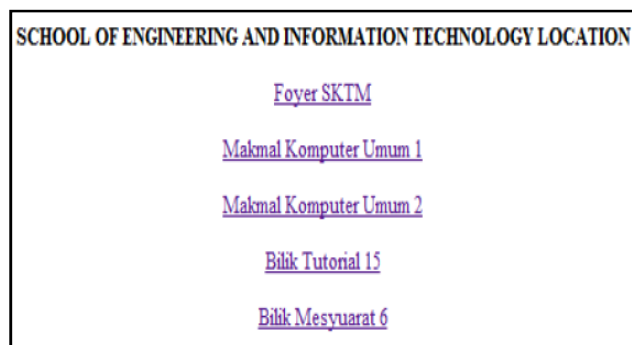


Figure 4. Specific Location

Personal computer or laptop is not equipped with Location-Based Service, thus it is not automatically detect the current location of the user. The current web-based qibla system could be improved by providing more detail information of the user's location as shown in Figure 4. User may select the specific current location, for example in School of Engineering and Information Technology, there will be many rooms and buildings that are situated in the same area.


You are here:	
Location Name:	Main Foyer, School of Engineering and Information Technology
Latitude:	6.0349
Longitude:	116.1212
Qibla Direction:	20.60 from west toward north
Qibla reference:	Chancellor Building

Figure 5. Intuitive Qibla Determination

Let 'Foyer SKTM' is selected as current location, the system will show the map to indicate the user's location as shown in Figure 5. User will be given little scientific information such as latitude, longitude and the degree of qibla direction. However, the most important thing now is how this system can tell, guide and give an idea to user on which direction should be faced by the user in order to perform their prayer. The system should be design to provide an intuition that can support the user's instinct and such correct instinct may guide the user to find the Qibla.

In this approach, the intuitive subject around the user should be initially identified. The intuitive subject could be any buildings, objects, area or places that are located around and near to the user's location. There are two main conditions to determine the intuitive subjects. The first condition is the location of intuitive subject should be within the qibla direction line or range. The second condition is the familiarity of intuitive subject. The intuitive subject should be something that is very common, familiar and well-known among the user and around the places, and user roughly know its location as well as its direction. As shown in Figure 5, Chancellor Building is selected as an intuitive subject if the user location is at the main foyer of School of Engineering and Information Technology. This is because Chancellor building is one of well-known location in this area and has a good visibility. At this point, user will get an idea and roughly know how to locate the right qibla without using any qibla compass tools and this approach may provide a better user experience. This approach may help users to find Qibla more quickly as intuition is a highly efficient way to process the information despite a user does not understand all the steps in using the systems. It is found that non-conscious processing is much faster as conscious reaction time is 100 times slower than the fastest potential firing rate of a neuron[2].

IV. DISCUSSIONS AND CONCLUSIONS

This paper has investigated some of the surrounding issues and problems that should be addressed on current qibla determination approach. It mainly concern on how the usability of Qibla applications in mobile and non-mobile platform could be improved. In mobile application or qibla compass, it would be better if the uses geographical terms and notations could be minimized in order to reduce the system's jargon or represents the information in more understandable and meaningful way. In non-mobile application like the JAKIM website, an extra feature is needed to assist the users to locate the qibla practically and thus, this research suggests an intuitive approach as a potential way that could be implemented. Intuitive technique in this case provides guidance by informing user the qibla through the identification of intuitive subject around the user that can

becomes a reference in finding the qibla. The main challenge in this technique is to identify the most suitable intuitive subject that can fit the knowledge of all users. Therefore, future research should address this issue through learning the current knowledge and the target knowledge points from the user as this may guide for a better selection of intuitive subjects. Other than this, more investigations should be conducted to identify the other possible ways and techniques to make the qibla system more intuitive due to lack of literature sources available to adequately define the intuitive concepts and there is little work done in this area[3]. In the other side, although intuition is a useful guide that rarely misleads but there is propensity of one's experience will sometimes mislead, for example one can learn the wrong lessons from experience. Therefore, a relevant experience and an expert intuition is necessary to make the them more reliable [2].

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