Interactive Islamic digital display system for television program in mosque

Razulainie Binti Mohd Radzuan[1], Md Razak Bin Daud[2],
Adiani Binti Ab Rahman[3]

[123]*(Jabatan Kejuruteraan Mekanikal/ Politeknik Tuanku Sultanah Bahiyah, Malaysia)*

ABSTRACT: *The mosque is an important institution in Islam not only as a place of worship but also as a place of education and community centre. Bilal need to check the schedule (Taqwim) prepared by JAKIM everyday to confirm the prayer time before performing Azan. The information about activities or events in mosque normally delivered verbally, notice on whiteboard, flyers and banner. In Internet of Things (IoT) era, digital display is a kind of electronic signage that can be used to present videos, images, menus, text, and more in attractive approach. IoT has wider market and potential to create economic impact. The Islamic Digital Display system is developed using Raspberry Pi 3. The main source in developing the system is based on the client feedback. To use the system just plug in the device at the television HDMI pot. By connecting smart phone or computer with WIFI, user can login to web page to setting main menu, slide menu, scroll text menu, device setting menu, prayer time and hijr calendar setting menu and system update menu easily. The layout is designed in two selection. The use of this system allows television to display Iqamah countdown, hijr date and day, Masehi date and prayer time besides the real time and information in the form of image, video and running text. The Islamic Digital Display device for television program is a commercialization innovation that suitable to be used in mosque especially in Malaysia.*

KEYWORDS - *Islamic Digital Display, Prayer Time Clock, Television program, mosque*

1. INTRODUCTION

The mosque is not only as a place of worship but also as an important institution in Islam for education and community development centre [1]. A common situation Bilal will Azan regarding to the analogue clock. Prayer time is checked from the taqwim prepared by Jabatan Kemajuan Islam Malaysia, JAKIM. Normally, all activities or events will announce by Imam or sometime by flyer or write on notice board in mosque. This traditional method somehow looks static and not attractive.

There are devices such as LED electronic clock and digital prayer clock that have been used to display prayer times. For example the digital prayer clock produced by PTime company. This clock is equipped with automatic function for calendar, prayer time, azan, dhikr and Al-Quran reading. Besides this product uses Real Time Clock (RTC) technology which has a timeframe specification ± 1 minute in a year with current time. The Digital Prayer Clock works automatically reciting the verses of Al-Quran every 10 minutes before entering prayer time. It also automatically calls the azan right at prayer time. The Fig. 1 shows an example of Digital Prayer Clock.

Figure 1: An example of digital prayer clock [2]

However it was unable to fulfil the needs of an attractive device that can display information in different ways. Delivering effective information in an organization is very important in delivering accurate and true

information to every member of the organization to achieve vision and mission. Although the management has submitted the required information but sometimes the recipient of the information is still receiving misinformation for misinterpreting the information it receives. According to Ishak Mad Shah in the book titled *Kepimpinan dan hubungan interpersonal dalam organisasi* states that the recipient of the information need to understand clearly the contents as well as the actions to take [3]. To meet the needs of today, publicizing displays have involved from old-style bulletin board to digital signage. These technologies have facilitated innovations and improved new display, such as digital signage. Digital signage is one of the electronic media that is often used for information and education. Compared to old-style bulletin board, digital display is capable of displaying on-demand multimedia content such as video feeds, images, text and etc. These technological developments accomplish the need for a more rapid transmission of a various range of information in today's commercial environment. Digital display is a kind of electronic signage that can be used to make life easier for citizens [4]. These digital displays use LED, LCD, e-paper, or other technology to display images, text, menus, videos, and more. While many private companies have invested in using this technology, its implementation in smart cities has proved to be very useful, especially when combined with the Internet of Things (IoT) [5]. Today the use of digital display on television is widespread as in shopping mall, airport, Cinema ticketing area, government office's counter, bank and also exhibition centre. The used of digital signage able to grab the attention of audience and they more likely to receive the message and act on it.

As we can see in mosque also have television that is used to display live lecture and play video. With the combination of digital prayer clock and digital signage concept then we come out with the idea of developing this system. The development of Islamic Digital Display device for television program is a commercialization innovation that suitable to be used in mosque especially in Malaysia. With the use of this system can maximize the function of television at the mosque.

2. METHODOLOGY

Flowchart development of Islamic Digital Display system as shown in Fig. 2:

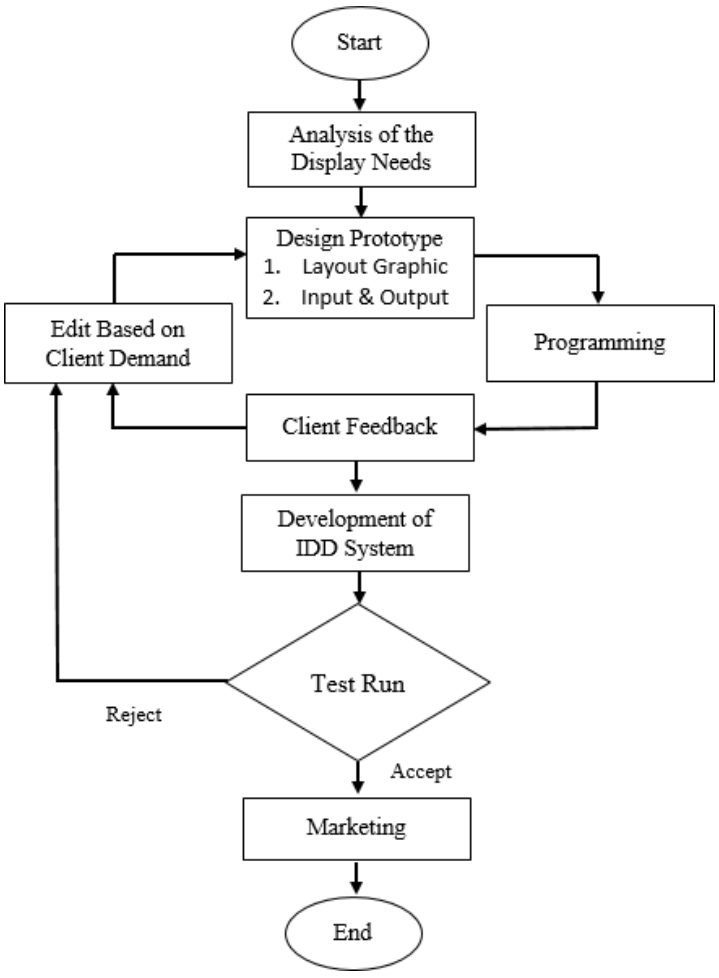

Figure 2: Flowchart development of Islamic Digital Display system

This digital display system is easy to change and user-friendly. It is a dynamic display of text, video content and graphic on television. To use the Islamic Digital Display system just plug in the device at the television HDMI pot. To setting or update the television program, connect smart phone or computer with WIFI. Open Google Chrome, Mozilla Firefox, Internet Explorer or any other internet browser to access the web page using the given IP address and password to login.

As shown in Fig. 3 through the Main Menu allows users to update the name and mosque address, setting Iqamah and prayer duration in minutes and setting zone for prayer time. To upload figure, video, setting for event countdown and template design selection can be setting in Slide Menu. For running text, just insert text to display in Scroll Text Menu. By click the Device Setting Menu will allows to update display in television, time synchronize, to restart or shutdown the system. System update menu will be able to update system version. As the taqwim prepared by JAKIM just valid for one year so the prayer time must be update before the New Year for every year. This can be update through Prayer Times and Hijr Calendar Menu.

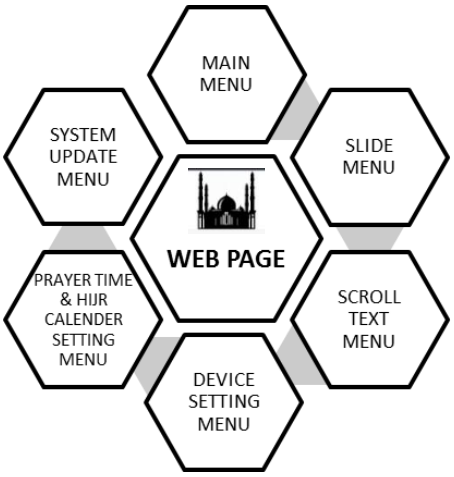

Figure 3: Setting menus in Islamic Digital Display web page

The graphic design of the Islamic Digital Display is very important in ensuring that the system can be seen clearly, beautiful and attractive. There are two layout options in which each layout consists of the same number of menus but in different layouts. The following figure shows the design of the menus in Layout 1.

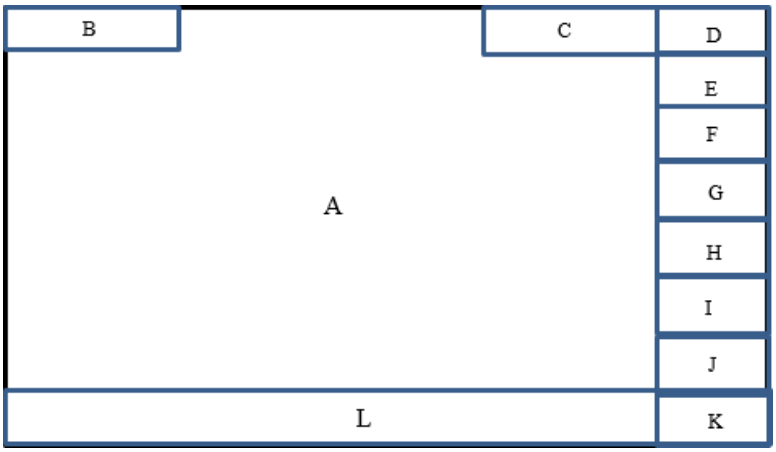

Figure 4: Design of frame layout 1

Caption:

A. Main display including:
   i. Image display – program poster, Hadith and Al-Quran quotes, general information, Organisation chart, mosque picture, mosque fund;
   ii. Video display – advertisement, motivation, mosque building; and
   iii. Text display – program schedule, reminder, mosque information
   iv. Iqamah countdown
B. Display of hijr date and day

C. Display of Masehi date
D. D up to J in a row at Imsyak, Subuh, Syuruk, Zuhr, Asar, Maghrib and Isyak prayer times.
K. Display of real time
L. Running text display

2.1 Step by step to setting powerpoint slide before upload to the system

i. Step 1 (create slide)

Create slide in powerpoint then save as in JPeG format. Choose current slide only when to export every slide in the presentation.

ii. Step 2 (How to resize the slide image)

Open the file saved in paint format. Click resize the choose pixels. Change the ratio of horizontal to 1280 and vertical to 720. Tick the box of maintain aspect ratio and click ok. Save the change made. Fig. 5 shows the step 2.

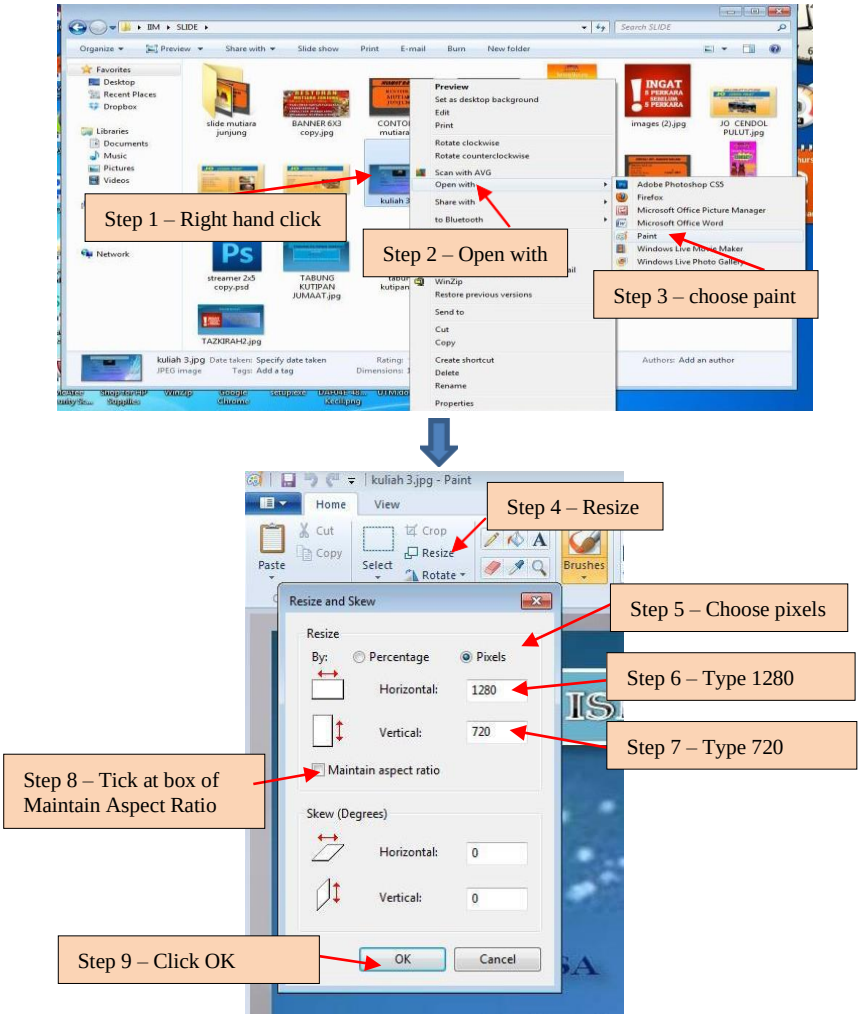

Figure 5: The step by step on how to resize the slide image

3. RESULTS AND DISCUSSION

3.1 Islamic Digital Display system's device

The Fig. 6 shows the Islamic Digital Display's device. This device is equipped with an HDMI cable and adaptor.

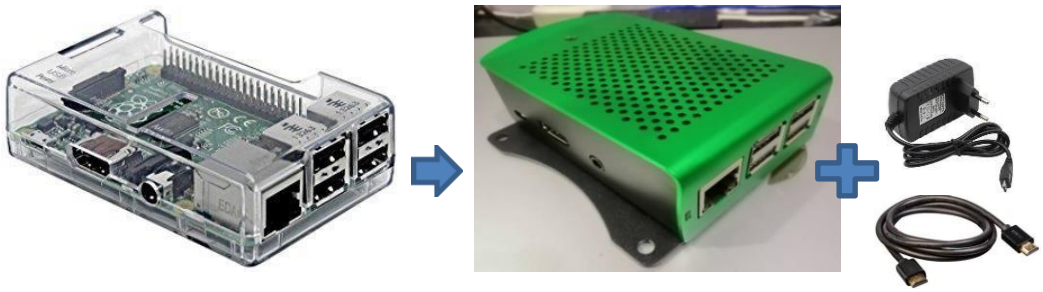

Figure 6: The Islamic Digital Display system's device

3.2 The system's display layout and functions

The Interactive Islamic Digital Display system is developed to be used in mosque especially in Malaysia. Fig. 7 shows the display of the Islamic Digital Display in two layout.

Figure 7: Results of the design of Islamic Digital Display

Table below shows system functions as expected:

Table 1: System functions result

System functions	Result	
	Yes	No
Real time	√	
Prayer time follow Taqwim by JAKIM	√	
Day, date in Masehi and Hijr	√	
Running text	√	

Iqamah countdown display as per setting	√	
Slide display during performing prayer	√	
Background change automatically (video/image/text)	√	
Event countdown display as per setting	√	

4. CONCLUSION

Recently, digital display is a kind of electronic signage that can be used to make life easier for citizens. This interactive Islamic Digital Display system is very useful to the mosque because of the advantages as list down as below:

i. Calendar hours – countdown Azan and Iqamah and prayer screen / khutbah on Friday
ii. Two layout – user can choose any one of two layout options in this one program
iii. Display media - running text, image slide, video display is easily be written by user and allows public to be get remind
iv. Easy system setting – setting and updating slide, video, text are scrolled by the user using WIFI computer or smartphone
v. System update – prayer schedule and program version can be made update by the user easily

The Islamic Digital Display System can be interactive and dynamically change to meet the demographics of audience. It also cost-effective because indirectly eliminate the need to print and distribute static signs each time your information, message, campaign or event changes saves on costly printing and distribution fee.

REFERENCES

[1] Khalit, N. A. (2011). *Revitalizing roles and functions of mosques in Kuala Lumpur* (Doctoral dissertation, Universiti Teknologi MARA).
[2] www.ptime.com.my
[3] Ishak, Mad Shah (2012). Kepimpinan dan Hubungan Interpersonal Dalam Organisasi. Penerbit UTM, Skudai, Johor.
[4] She, J., Crowcroft, J., Fu, H., & Ho, P. H. (2013, August). Smart signage: An interactive signage system with multiple displays. In *2013 IEEE International Conference on Green Computing and Communications and IEEE Internet of Things and IEEE Cyber, Physical and Social Computing* (pp. 737-742). IEEE.
[5] *Smart Cities Improving Digital Signage with IoT – IoT Innovation.* retrieved from McKinsey & Company [ONLINE] Available: https://internet-of-things-innovation.com/insights/the-blog/smart-cities-improving-digital-signage