

Development of Web Application for Muslim Traveller with Emphasis on Social Networking

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Abstract— In this global world, travelling to another country is becoming a necessity, especially for a Muslim. When travelling to non-Muslim country, the unfamiliar place, situation, and condition will create several problems to uphold the Islamic principles, such as finding the mosque to pray, praying time, *qibla* direction or *halal* food. Therefore, the objective of this paper is to develop a web application to solve such problems, in which the online application will verify the user's current location and provide the required information such as the nearest mosque, available Halal restaurants in the area, prayer time, and also suitable accommodation. First, the authors identified the needs of the Muslim traveller by accessing the religious literature and conducting interviews. Secondly, the design of the application will be optimized using UML (Unified Modelling Language) diagram. Next, Wordpress will be utilized as the front end application because of its open source, modularity, high availability, robust, secure, and reliable. Furthermore, many additional plugins can be added to enhance the features, such as social network bookmarking, Facebook page, live Facebook commenting, and Facebook connect. Online visitors with Facebook account can provide feedback and recommendation to ensure that the information provided in the website will always up to date. Informal evaluation shows the effectiveness of the proposed system. It is expected that the developed system accessible at www.imantraveller.com can be benefited to the Muslim traveller.

Keywords—Muslim traveler; *halal* food; prayer time; *qibla* direction; social network

I. INTRODUCTION

Nowadays, travelling to other countries becomes easier due to the advancement of tourism, transportation and low cost carrier. For Muslim, there are Islamic rules and regulations applied specifically when they are travelling. In 2010, the world's Muslim population is around 1.6 billion accounted for 23.4% of the total population and is projected to increase up to 26.4% in 2030 [1]. Moreover, the numbers of Muslim traveller for work or leisure, both domestic and outbound, has also increased tremendously [2]. Although there is no available quantitative information on how many Muslim travel to other countries, but due to the significant number of Muslim, safeguarding the interest of Muslim will be the focus of this research.

Islam is a complete code of life and it provides guidance that should be followed by Muslims in all aspects of life. For

example, *halal* (permissible) food is a crucial aspect of Islamic life and it is obligatory for all Muslims to eat only *halal* food and avoid *haram* (prohibited) food. In [3], it is mentioned that although New Zealand has significant market share in providing *halal* meat around the world, the majority of Muslim tourists did not have easy access to it. Hence, it is reasonable to assume that the relationship of providing *halal* food with hospitality and tourism industry has been ignored. However, due to increasing number of Muslim tourists and migrant workers, the demand for *halal* food is growing, even in non-Muslim countries. Beside dietary obligation, many other religious obligations should be observed during travel, for example, pray at the designated time according to its location, face *qibla* (directed towards Ka'abah in the holy city of Makkah), and also a good accommodation [4].

The number of internet users in the world has been growing significantly. World internet users and population statistics showed that more than 2 billion internet users by March 2011 [5]. Asia countries, which accounted for 60% of Muslim population, contributed around 44% of worldwide internet users. India and Indonesia, which has around 204 million and 177 million Muslim, contributed to 140 million internet users. Moreover, China and Malaysia, which has significant number of Muslim populations, are among the top ten of internet users in Asia. Muslim internet users also have produced many Islamic websites catering for various needs, including religious knowledge, online *quran*, online *hadith*, discussion forums, etc.

Although many Islamic websites have been developed over the years, however, there is currently no specific website devoted to the Muslim traveller. The objective of this paper is to develop a web application for Muslim traveller that can verify user's current location and provide the required information, such as the nearest mosque, available *halal* restaurants in the region, prayer time, related local Muslim news, and also recommendation for suitable accommodation for the users and their family. Moreover, the use of social network [6] has been included and emphasize in the implementation. Online visitors using their Facebook account can submit their feedback and recommendation, as highlighted in [7], about the related information to ensure that this online application will always up to date. Lastly, our web application will be evaluated based on the evaluation framework proposed by [8] which includes Islamic identity, Islamic traits, usability, and information architecture.

II. DESIGN OF MUSLIM TRAVELLER WEBSITE

In this section, we will briefly discuss the rules and obligations of a Muslim traveller (*fiqh*), social network emphasize, and the website design. *Fiqh* is the rule and guide for a Muslim when he or she is practicing Islam in their daily lives. As a traveller, there are several necessary *fiqh* that should be known to help them in doing prayer to Allah. In [4], Sayid Saabiq explains several related *fiqh* for Muslims while travelling for some distance. Some important information includes shortening the prayers that consist of four rak'aat and the minimum distance one must travel before one entitles for shortening one's prayer.

A. Qibla Direction

Qibla is referring to the direction where all Muslims direct their prayer to which is to the Ka'aba in the holy city of Makkah in Saudi Arabia. Every place has its own unique direction pointing to Ka'aba and only a local Muslim will be familiar to the *qibla* direction. All scholars agree that one must face the Masjid al-Haram during every prayer. For a Muslim travelling to a foreign place, it may be difficult for them to find the correct direction unless they bring some apparatus to point them to correct direction. In our website, we tried to locate the current user position using the identified IP address or entered location information, i.e. GPS coordinates or user pointed in the Google's Map. In this case, Google's Map API will be used to determine the correct *qibla* direction. Note that, a compass might still be required to aligned user with the correct direction.

B. Prayer Time

Besides knowing the direction of the *qibla* according to the user current location, a Muslim also needs to offer five obligatory prayers in the time period specified according to the *syariah*. The prayer times are dynamic based on the geographical position relative to the sun. In the Muslim Traveller application, the prayer time system is implemented directly from several calculation methods such as the Muslim World League (MWL) and Umm al-Qura, Makkah, Saudi Arabia. This integration is directly based on the coding available from the online application at <http://praytime.info>.

C. Halal Food

In Islam, Muslims are only permitted to consume *halal* food and drinks. A start system is implemented in our proposed website to provide some degree of *halal*. For example, in an ideal situation, the *Halal Accreditation Body* in each country, such as Majlis Ulama Indonesia (MUI) and Jabatan Kemajuan Islam Malaysia (JAKIM), is the only organization who can certify food or drink to be *halal* indicated by the *halal* logo. In our star system, this condition will receive three stars (full star). Sometimes the owner of the restaurant is Muslim, so normally we can trust the owner to cook only the *halal* food. In this case, it will receive two stars. One star will be provided to some shops which is not only selling the *halal* items but also non *halal* items. For example, normal fruits, vegetables, eggs, fishes, by default are *halal* food. Nevertheless, the system proposes an active participation from Muslim user who has

visited the place, shop, or restaurant to provide their valuable feedback to the system.

D. Social Network

Google and Facebook were the two most accessed website according to the Alexa Ranking. It shows the influence of both search and social network to the internet users. Moreover, the advance of modern telecommunication and internet technologies unite people around the world to form a wide-area social network. We may communicate with our family members, relatives, friends, colleagues, and also find new friends. In [7], the authors focused on building a social recommender system. While in [9], the author proposed Dunbar number which predicted that the maximum number of friends in a social network that we can have is 150. As social network becomes trend in recent years, the use of social network, i.e. Facebook, in our website was highlighted. Facebook users are allowed to login to our system, provide comments, news, recommendations, etc.

III. SYSTEM DEVELOPMENT AND IMPLEMENTATION

In this section, the system design using UML diagram, content management system (CMS) used, and Facebook connection and utilization will be discussed in more details. Our proposed website has been implemented at <http://www.imantraveller.com>.

A. UML Diagram

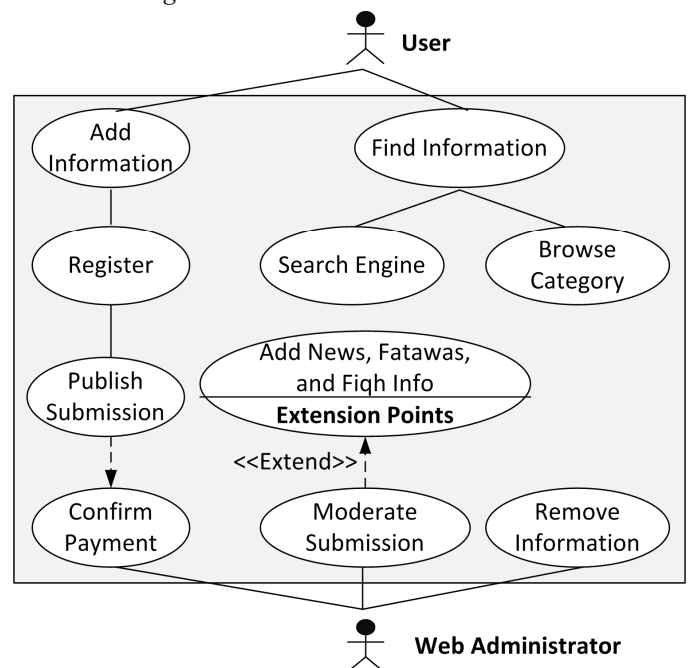


Figure 1. UML Use Case Diagram for Muslim Traveller Website

UML has been used in the web application development as in [10]. Figure 1 shows the Use Case diagram showing two main actors which is the user and the web administrator. Basically the web administrator is the one who moderate the listings, manage the comments, news, new information, recommendations, and articles submitted to the system. The

administrator also administers the database, website template, and plug-ins. On the other hand, user is a visitor to the website which is either looking for information or adding information. In our implementation, the user can find information by two means which is to use the search engine or to browse categories. User can also add new information by first register and contribute a \$1 payment to avoid scammer and spammer before it can be published in the front page.

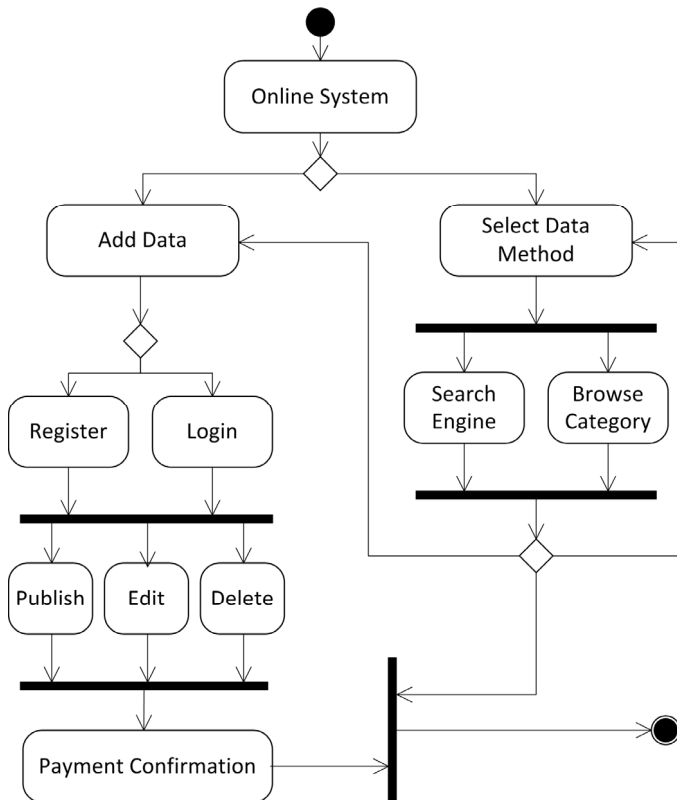


Figure 2. UML Activity Diagram for Muslim Traveller Website

Figure 2 shows the UML activity diagram in which initially a user accesses the website and then chooses either to add new data or to find available data using two methods, e.g. search engine or browse category. To add or submit new information, user is required to login or register. After that, user has the authority to edit or publish new information. To avoid or minimize scammer or spammer, user requires paying some minimal fee so that his submitted data can be approved by site administrator.

B. Search Engine Optimization

To compete with other websites, our proposed system needs to be optimized so that it will occupy the high rank in the search engine. Search Engine Optimization (SEO) is the method used to optimize our website so that it will become preferable to a search engine's ranking algorithm. This is an important aspect that should be known to all webmaster and web developers to ensure traffic will come from search engine. Note that, search engine like Google.com, Bing.com, and Yahoo.com contribute the most traffic to any website compared to other traffic sources.

In [11], it is stated that Webvisible and Nielsen produced a 2007 report on local search revealing that 74% of respondents used search engines to find local business information vs 65% who turned to print yellow pages, 50% who used Internet yellow pages, and 44% who used traditional newspapers. Considering that search engine traffic is natural and free, most webmasters tend to rely most on search engines in order to get traffic. Thus, making SEO is an important aspect to be considered whenever a website is being developed.

Google.com is currently the top accessed website and search engines according to Alexa ranks. Therefore, our implementation on SEO algorithm will be focused on Google, such as the basic Title, Keywords and URL system. Wordpress which will be used as the content management system (CMS) for Muslim Traveller has several popular SEO plugins such as All SEO in One and SEO Platinum which tends to cater those needs. Every post is customized and highlighted making it easier for the search engines to rank the website better.

C. Wordpress Implementation

Wordpress was chosen as our CMS because of its ease to design and implement due to its modularity. Wordpress was originally better known as blogging software before it rapidly developed to be full-fledged CMS. Based on market research in [12], Wordpress has the largest CMS market shares of 54%, compare to Joomla, Drupal, vBulletin which accounted for 9.5%, 6.5%, and 4.5%, respectively.

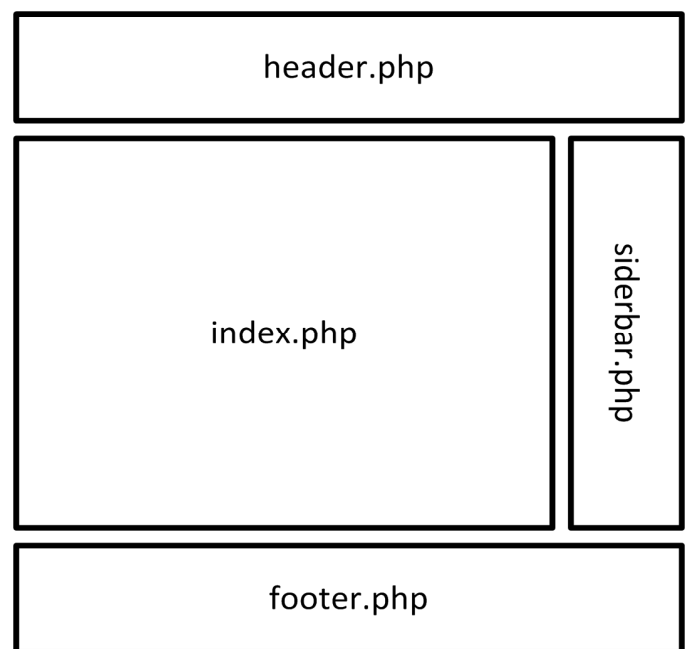


Figure 3. Wordpress Implementation

As shown in Figure 3, Wordpress consists of basic modules that are enjoined together. Beside the index.php, sidebar.php, header.php and footer.php, it also has the codex files of functions.php, search.php, single.php and the CSS files. Wordpress plugins is another aspect that has to be taken into consideration. With more than 17,000 plugins [13], most basic features are easy to implement.

The default anti-spam plugin Akismet for example is an effective solution to counter spam comments. Some popular SEO plugins, such as All SEO in One and SEO Platinum, can be utilized to improve the website rank. Moreover, W3 Cache Total plugin can be used to fasten website loads and increase the page loading speed which can be the determinant factor to user itself or Google's point of view.

D. Social Networking Interface

In Muslim Traveller application, several features are added to integrate the online application with social networks, mainly Facebook. These features are important to promote and facilitate ease of participation from online social network users. Facebook being the current major social network with more than 800 million users plays a major role in this integration. Muslim Traveller thrives on user participation as only with the help of thousands of online Muslim users can it grow to an active updated database helping travelling Muslims to adhere to *syariah*. The features that have been implemented in our website including social network bookmarking, Facebook page/application, live Facebook commenting, and Facebook connect.

1) Social Network Bookmarking

This feature is the most basic but an important tool as it enables people to share the website and its information to their friends easily. This feature displays the bookmark buttons in the developed website and shows the variety of service that can be used to share the website with other peoples, such as Facebook, StumbleUpon, Yahoo, Friendster, Blooger, Tweeter, Email, Orkut, and Google+. This feature has been implemented in the main page and the post page by using AddThis plugins (freely available at www.addthis.com). The generated code was implemented in Muslim Traveller website at modules: `index.php` (main page) and `post.php` (post page).

2) Facebook Page/Application

This feature is the most important aspect to promote the application using Facebook. A Facebook page is a service provided by Facebook to enable people to share and promote their brand/product, local business, company, public figure, entertainment or community. To create such page, first a Facebook account needed to build an application in Facebook using the Facebook Developer section. This is crucial as the API key and the app secret code from the application created are required to connect the website with Facebook as all applications are added using these details.

Figure 5 shows the official Facebook fan page used by the website. To ensure maximum exposure to our visitors, a "Like" box is added to the website by using the like box code from the like box application page and adding it to the `header.php` file in the developed website.

3) Live Facebook Commenting

Other important feature implemented is the Facebook live commenting system. As shows in Figure 6, this system is implemented to encourage reaction and comments from Facebook users. The Facebook live commentating is using the Facebook Comments for Wordpress plugin from the official Wordpress plugin directory. The plugin is activated by adding

the plugin in the website path and activating it from the Wordpress backend. The settings are customized to fit the website properly.

4) Facebook Connect

Last feature that will be implemented in imantraveller.com is Facebook Connect. This feature enables faster participation from Facebook users to immediately participate in the discussions and also to add information to the database. All Facebook log on users will be automatically created an account using this feature. Wordpress user system is divided into several authorities including *Administrator*, *Editor*, *Author*, *Contributor* and *Subscriber*. In the website, all registered users are added as Subscriber from a backend point of view but in the frontend, they are able to post directly to the database which requires administration control. This is to ensure a tight security posting environment but with a flexibility for the user to participate with minimum hassle.

The Facebook Connect is powered by an additional plugins from Wordpress called Facebook Connect. The system requires Facebook Application API ID and the Application secret before it can use the Facebook API. The PHP code shown in Figure 4 is implemented in `header.php` to show the Facebook Connect button across all pages.

```
<?php do_shortcode("[fb_login size='xlarge'
login_text='Connect'
logout text='Connect']"); ?>
```

Figure 4. PHP Code for Facebook Connect

E. Submission of New Information to the Database

Adding new information into the database in the Muslim Traveller application is simply a matter of registering an account and then pressing **ADD NEW ENTRY** link in the main page. A user can easily register an account by using either their email or register directly using the Facebook Connect function. At the New Entry page, the user will have to enter the details as required before publishing it into the web application. Most of the posts are reviewed from time to time to ensure spam posts are not published into the database. With the ease participation from Facebook users, information submission can easily be populated and promoted to the connected Muslims network at the social network. All feeds are automatically updated and posted at the Facebook wall to ensure better coverage and feedback.

The implemented website, <http://www.imantraveller.com>, requires real people to participate and contribute to make it relevant all times. Therefore, we believe that social network is the fastest way to ensure this happens by using viral marketing [7]. Internet user will also tend to trust the system if they can see real people involved in updating the database.

IV. DISCUSSIONS AND EVALUATIONS

In this section, the front end and back end of the website will be presented and discussed. Moreover, the developed website will be evaluated using the framework proposed by [8]. Currently, the website is developed for research purpose only which can be possibly extended for business later on.

A. Front End

The front end of the Muslim traveller application can be accessed at imantraveller.com. The front end was created as simple and effective as possible to provide a decent first impression to the visitor that this application is modern and not an out dated website. From the front page, the visitor will be able to register or login using their Facebook account. After login into the system, user can browse the posts more effectively as it allows them to provide comments or select the favourite articles. In addition, user can publish their post into the database directly. The website administrator will then evaluate the content whether it is appropriate to publish in the front page or not.

B. Back End

The back end is the interface in which the web administrator can control all the posts and comments, do configuration to ensure that the site is running smoothly. The administrator is authorized to setup and set the theme of the website, conduct advance customization, and manage plugins. The social network integration was done in this backend by activating various plugins. Moreover, search engine optimization was also configured using back end.

C. Evaluation

TABLE I. PRELIMINARY EVALUATION OF THE DEVELOPED WEBSITE

Attribute	Evaluation Description
Islamic identity	The website uses some Islamic identity such halal logo, Islamic symbol, etc.
Islamic traits	The usage of real photos and animation were complied with the Islamic guidelines. Currently, no sounds were published in the website, but some quranic recitation will be implemented in the future. Significant Islamic applications are currently being implemented such prayer time schedule, qibla direction, halal food identifier, etc. Moreover, Islamic basic communication words are used whenever possible.
Usability	The average accessing time for T1 connection was 17.5 seconds, with the average page size of 280 Kbytes. Moreover, there are currently two broken links found.
Information architecture	The website has sitemap, and it has two options to access information, such as search and browse category.

The developed web is evaluated using the framework proposed by [8], which has four components, including Islamic identity, Islamic traits, usability, and information architecture. The two web tools were used in this evaluation for usability test. First, Website Optimization was used [14] to check the page size and accessing time. Next, dead links checker [15] was conducted to check for any broken links in the website. As

the developed website is still at the early stage, Table 1 shows the preliminary evaluation of the website. The long accessing time might be due to time taken to connect to Facebook. As the website will be emphasized on the use of social network, some other method to improve accessing time will be implemented, such as plugins and content optimization. It can be concluded that the developed website although at the early stage has fulfilled the evaluation framework as proposed in [8].

V. CONCLUSION

The website development for Muslim traveller has been presented. The website has been designed using UML diagram and implemented at www.imantraveller.com. Muslim visitor of this website can access various information that will help their journey to other countries, such as *halal* food, mosque location, prayer time schedules, *qibla* direction, proper accommodation, etc. The social networking, especially Facebook, has been integrated to the website providing features such as social network bookmarking, Facebook page, live Facebook commenting, and Facebook connect. Further research will enhance the social network integration with some geographic location awareness using Google Map API.

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