

Portal m-Da'wah using Wireless Application Protocol

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Abstract— Information and technology develop quickly, cannot be controlled. This development has an impact on almost all sectors of human life, ranging from the academic sector, government, economy, military, to the household order. Technological developments also reach human affairs in religion. In every religion, there is guidance to remind one another and invite others to the good. This is often known as da'wah. Da'wah for Muslims is one of the obligations that must be carried out. This study aims to build a mobile application as a propaganda media by implementing wireless protocols. The study method used in this study is system development, which is an experiment for the design of the m-da'wah portal that can be accessed via a cellphone or PDA. Da'wah mobile applications are built with the PHP programming language, HTML tags, and WML tags, as well as utilizing the MySQL database as a database server, and implemented through the GPRS network (General Pocket Radio System), so we need a mobile phone or PDA equipped with WAP facilities to access the application. The m-da'wah application has the ability to make it easy for users to obtain Islamic articles that can be easily understood by readers and is equipped with a zakat counter facility that can be accessed via a cellphone or PDA. The test results show that the application meets the functionality requirements and is suitable for use.

Keywords—Da'wah; GPRS; mobile; PHP; portal; WAP.

I. INTRODUCTION

Da'wah is one of the obligations imposed by Allah on Muslims. Da'wah has become the duty of Muslims because Muslims are born as the best creatures for mankind to call on the good and prevent evil [1]. Besides these obligations, Da'wah is a very noble act. In the Qur'an, Allah has explained that there is nothing better than a person who calls on Allah and does good deeds [1].

On the other hand, the flow of information and technology flows and cannot be controlled anymore. Almost in all sectors of human life, ranging from the academic sector, government, economy, military, until the household uses the development of information technology. Even some functions of the human brain can be replaced by machines. The use of information technology in various fields is indeed very pronounced. Unwittingly, human life began to depend on this technology.

In line with the development of information technology, cellular technology marks the rise of lifestyle that enables people to carry out various communication activities, either through voice, images, or data wherever and whenever. The development of telecommunications technology itself has become a trend and has evolved for generations.

As a consequence of the development of these technologies, people are increasingly busy doing activities with their computers or cellphones, such as finding new information or just playing and exploring the cyber world. So they do not have time to go to the mosque just to listen to the recitation or sermon.

One of the problems in society is public awareness of the rules in the calculation of zakat. Questions often arise about whether their assets have reached the limit for the issuance of zakat or how to calculate zakat. Many people, especially Muslims, do not understand the calculation of zakat, so they have difficulty in calculating the zakat. Even some of them do not know that the property they have is obligatory to pay their zakat.

Islam is a religion of revelation that is always dealing with a changing era. Muslims are supposed to address this reality in renewing methods of da'wah. Traditional methods of Da'wah do not have to be abandoned. But there is nothing wrong if in da'wah is done by using technologies that are very advanced and can be accepted by the community quickly and easily.

II. METHOD

The method used in this study is system development, which is an experiment to design the m-da'wah portal that can be accessed via a cellphone or PDA. This study was carried out with the following flow: Literature Study, data collection, identification of needs, Design, Implementation, and testing and evaluation. As for the system artist and data modeling will be presented in the following explanation:

A. System Architecture

Da'wah mobile application is built based on the three-tier model. The basic part of this system is the database module. The database module is used to store all news information, zakat information, user information, as well as some data used in making da'wah mobile applications. This missionary mobile application uses a MySQL database as a database server which is a type of database management system (DBMS).

MySQL consists of a MySQL server, several utility programs that help administer MySQL databases, and several supporting libraries. MySQL server handles database instructions, such as creating a database and manipulating it. The MySQL server then creates a directory and places the necessary files into the directory.

The second part is the administrator module. This module is used to control web servers. This section is designed to create, change, and delete data that is needed in making da'wah mobile applications, such as data articles, news topics, alms, users, and so forth. The data is then sent to the database, and vice versa data from the database is sent to customers through the database connector. The Da'wah mobile application architecture can be seen in Figure 1.

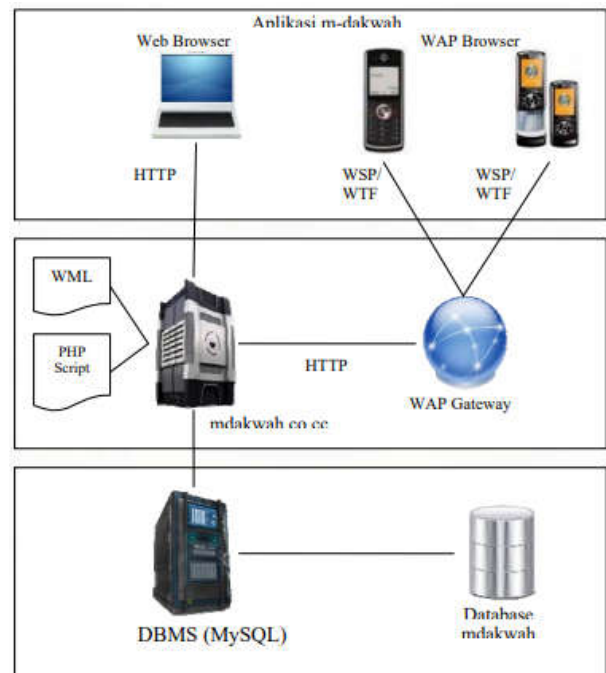


Figure 1. Da'wah mobile application architecture

The third part is the user module. This module is used as a user interface for Da'wah mobile applications by displaying WAP pages to users. WAP (Wireless Application Protocol) is a world standard for applications through wireless communication network media [2]. WAP Protocol is a standard that is used in



C. Interface Design

This layout and navigation design is used to determine the position of menus and content on web pages. In this Da'wah mobile portal application, layout design and navigation are performed on an administrator module that runs on a PC and a user module that runs on a cellphone or PDA.

The layout design on the administrator page consists of 4 main parts, namely the header, navigation, content, and footer. The layout design of the administrator module can be seen in Figure 5.

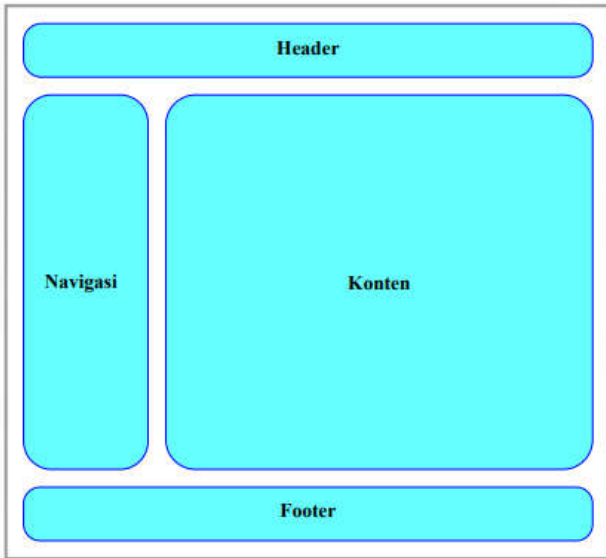


Figure 5. Design and layout of the administrator module

The same as the administrator module, the layout design in the user module also has four main parts, namely the header, navigation, content, and footer. Layout design and navigation on the user module can be seen in Figure 6.

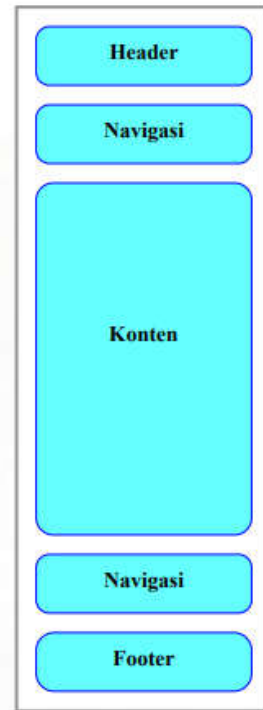


Figure 6. Layout design and navigation on user modules

III. IMPLEMENTATION

This Da'wah mobile application design is implemented using the WML and PHP programming languages for applications in mobile phones, and the HTML and PHP programming languages for application administrators. The WML language is used to create or build a page that can be displayed on a micro browser. The page in WML is usually called DECK, which is a collection of CARD [3]. WML is based on XML (eXtensible Markup Language). WML has four main functions [2]:

- a. Text and layout presentations, including text and images;
- b. Deck/ Card organizational metaphors (all information in WML is organized into a collection of cards and decks);
- c. Navigation and relationships between cards;
- d. String parameterization and status management, all WML decks can be parameterized.

Communication is done by using the GPRS channel so that to be able to access the mobile application, this mobile phone needs to be equipped with WAP facilities. This application utilizes Apache as a web service and MySQL as a database.

To run the application for the administrator used a web browser that can access web pages. In this study, the web browser used is Mozilla Firefox 3.0.1. In this study also used



XAMPP applications which have integrated Apache web server, PHP, and MySQL. After installing XAMPP the Apache, MySQL, and PHP integrated into it are also installed. To find out if PHP is active it can be opened via a web browser by typing `Http://localhost/xampp` in the address bar.

As for checking MySQL, it can be seen in the directory where MySQL is installed, in this case, the `C:\xampp\mysql\bin` directory. Then the WinMySQLAdmin file is double-clicked so that the window appears as in Figure 7.

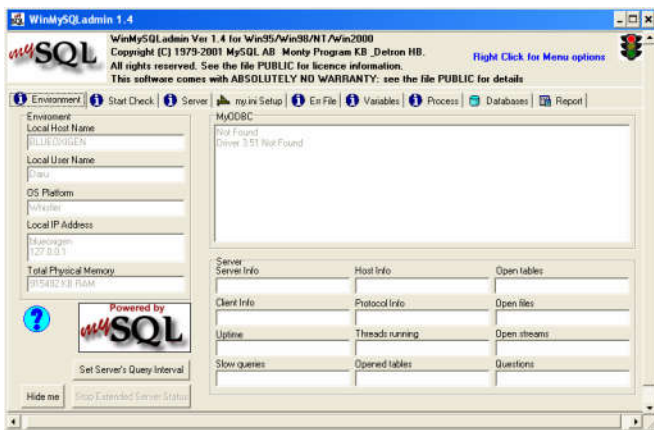


Figure 7. MySQL is active

There are three-step implementations; database, administrator and user:

A. Implementation of Database and The Connection

There are eight tables used in the m-da'wah portal application: `menu_ref`, `submenu`, `user_ref`, `hak_access`, `topic`, `article`, `unit_nishab`, and `zakat`. Each of the tables is implemented with SQL as follows:

```
CREATE TABLE `artikel` (  
  `id` int(11) NOT NULL auto_increment,  
  `judul` varchar(100) NOT NULL,  
  `konten` text NOT NULL, `tgl` varchar(14) NOT  
  NULL, `id topik` tinyint(11) NOT NULL default '0',  
  PRIMARY KEY(`id`)  
);  
  
CREATE TABLE `hak akses` (  
  `id_hak` int(5) NOT NULL auto_increment, `id_menu`  
  int(5) NOT NULL, `id_user` int(5) NOT NULL, PRIMARY  
  KEY(`id_hak`)  
);  
  
CREATE TABLE `lab_ref` (  
  `id_lab` int(5) NOT NULL auto_increment, `nama`  
  varchar(30) NOT NULL, `ket` text NOT NULL, PRIMARY  
  KEY(`id_lab`)  
);  
  
CREATE TABLE `menu_ref` (  
  `id_menu` int(5) NOT NULL auto_increment,  
  `menu` varchar(30) collate latin1_general_ci NOT  
  NULL, `ket` varchar(60) collate latin1_general_ci
```

```
NOT NULL, `mod` varchar(40) collate  
latin1_general_ci NOT NULL, `sub` varchar(40)  
collate latin1_general_ci NOT NULL, `idurut` int(5)  
default NULL, `menuurut` varchar(40) collate  
latin1_general_ci NOT NULL, PRIMARY KEY (`id_menu`)  
);  
  
CREATE TABLE `submenu` (  
  `id_submenu` int(5) NOT NULL auto_increment,  
  `id_menu` int(5) NOT NULL, `mod` varchar(40)  
collate latin1_general_ci NOT NULL, `sub`  
  varchar(40) collate latin1_general_ci NOT NULL,  
  PRIMARY KEY (`id_submenu`)  
);  
  
CREATE TABLE `topik` (  
  `id` tinyint(11) NOT NULL auto_increment, `topik`  
  varchar(60) NOT NULL default '', `keterangan`  
  varchar(30) NOT NULL, PRIMARY KEY (`id`)  
);  
  
CREATE TABLE `user_ref` (  
  `id_user` int(5) NOT NULL auto_increment, `nama`  
  varchar(30) collate latin1_general_ci NOT NULL,  
  `ket` varchar(30) collate latin1_general_ci NOT  
  NULL, `password` varchar(40) collate  
  latin1_general_ci NOT NULL, PRIMARY KEY (`id_user`)  
);  
  
CREATE TABLE `satuan_nishab` (  
  `id_nishab` int(11) NOT NULL auto_increment,  
  `satuan_nishab` varchar(15) NOT NULL, `harga`  
  int(11) NOT NULL, PRIMARY KEY(`id_nishab`)  
);  
  
CREATE TABLE `zakat` (  
  `id_zakat` int(11) NOT NULL auto_increment,  
  `nama_zakat` varchar(30) NOT NULL, `nishab` int(11)  
  NOT NULL, `id_nishab` int(11) default NULL,  
  `modul` varchar(30) NOT NULL, PRIMARY KEY  
  (`id_zakat`)  
);
```

Accessing from the database above requires a script that connects MySQL with PHP. so that it can be accessed through a web browser or WAP browser. To connect to the database you need the `config.php` file in the `".modul/main/config.php"` directory. In the `config.php` file, there is the `mysql_connect()` function with the hostname, username and password parameters which must be initialized first. The `config.php` file created is as follows:

```
<?  
$host ="localhost";  
$user ="root";  
$pass="";  
$database="mdakwah"; // database name  
  
$koneksi=mysql_connect($host,$user,$pass);  
$db=mysql_select_db($database,$koneksi);  
  
if (!$koneksi) {  
  exit();  
}
```



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```
$judul situs="Portal Mobile Dakwah";
$maxkonten=10;
$maxadmindata = 20;
$maxdata = 5;
$max_size = '50000';
$allowed_exts = 'gif jpg png';
$allowed_mime = 'image/gif image/jpeg image/pjpeg
image/png';
```

B. Implementation of the administrator module

The administrator module is used to manage data that is on the Da'wah mobile application, such as user data, access rights, article data, zakat data, and so on. The arrangement of PHP files in the administrator module can be seen in Figure 8.

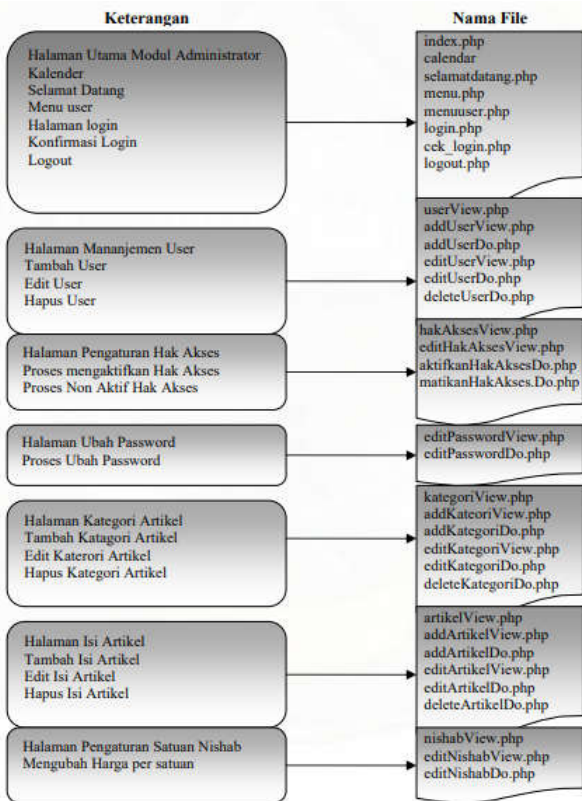


Figure 8. Composition of PHP files in the Administrator module

The administrator module main page is implemented by the index.php file. This page displays the calendar and login form. To run the main page the administrator module can be run by typing `Http://localhost/mdakwah/` or `Http://localhost/mdakwah/index.php` on the address bar so that the administrator module main page appears as in figure 9.

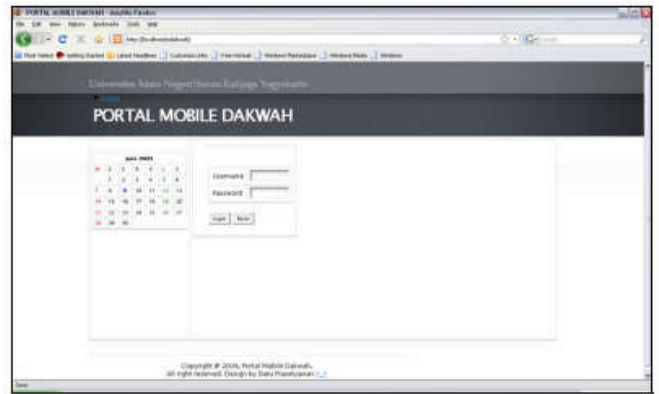


Figure 9. Display the main page of the mobile application user module Da'wah

The login form on the index page is implemented by the login.php file so the login.php file must be included in the index.php page. When the user presses the login button, the action will be handled by the check_login.php file with the following code:

```
<form method="post"
action="modul/main/cek_login.php">
```

The cek_login.php file will take the valid_user function inside the function.php file. If the username or password form has not been filled in, the browser will display a javascript message asking for the username and password to be filled. To perform this action the following code is used:

```
if ($nip_admin == ""){ echo"<SCRIPT>
alert('Username tolong diisi !');
window.history.go(-1);
</SCRIPT>\n";
exit;
}
if ($password_admin == ""){ echo"<SCRIPT>
alert('Password tolong diisi !');
window.history.go(-1);
</SCRIPT>\n";
exit;
}
```

The program code above will display a message asking to fill in your username or password as validation to login to the system. If the username and password entered are correct, PHP will create a session for the username with the session_start () function. Then the browser will display a welcome page that contains menus that can be accessed by the user.

If the login is successful, the admin can perform user management processes, such as adding, editing, and deleting users. In addition, the admin can also set permissions from users, manage published article categories, manipulate article content, set zakat calculation units, and configure passwords.



C. Implementation of user modules

The user module implementation has the ability to view articles and calculate zakat. The data used in this module is retrieved from the m-da'wah database stored on the MySQL server via the webserver. To display the Da'wah mobile application on a computer, the WAP Browser Openwave TM Simulator 7.0 is used which can be downloaded from <http://openwave.com> to simulate Da'wah mobile applications using a mobile phone. The arrangement of PHP files in the user module can be seen in Figure 10.

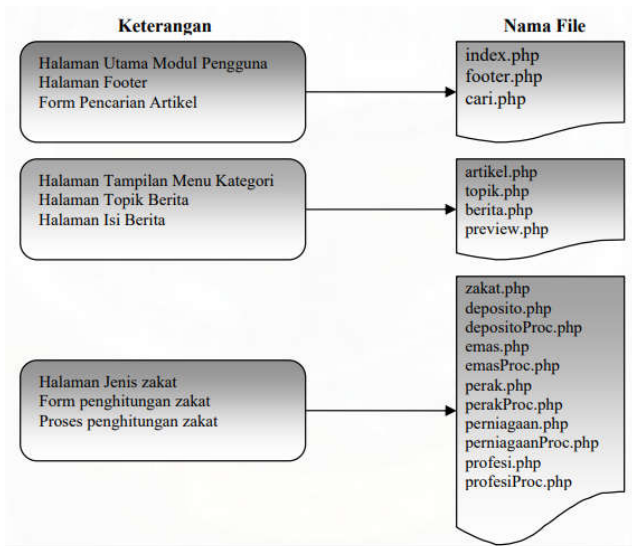


Figure 10. Composition of PHP files in the user module

To enter to the application, the user can type `Http: // localhost/mdakwah/wap` in the address bar so that the display will appear as shown in figure 11.



Figure 11. Display the main page of the mobile application user module Da'wah

After logging in, the user can view the article and configure its appearance. Users can also do zakat calculations with various calculation categories, namely gold-silver zakat, profession, deposits, and commerce. The results will be displayed on the screen of the device being used.

D. Testing

System testing aims to design a series of tests that systematically reveal some errors that may occur when operating applications. In addition, testing on the Da'wah mobile application aims to show that the Da'wah mobile application function has worked in accordance with the specifications and needs to be achieved.

Data collected when testing the Da'wah mobile application is carried out will provide an indication of good application reliability and an indication of overall application quality. Da'wah mobile application is tested by the method of black-box testing and alpha testing.

The black box testing method is used to find faults and demonstrate the functional mobile application Da'wah when operated, whether the input is received correctly and the resulting output is appropriate, and to maintain the integrity of external information maintained. This test examines aspects of the system, but only a little about the internal logical structure.

This test is carried out on the main page, the login process, user management, setting access rights, changing passwords, article category management, article content management, nishab unit price settings, and the zakat calculation process. The test results of all indicators show that the system is running as it should, which gives the right response when the input is correct and gives a warning when something goes wrong.



Alpha testing is done by the user by accessing the application both via mobile and computer. Then the user fills in the questionnaire form. Tests carried out on the functional system as well as interfaces and accesses. The test was carried out by 20 testers with different background preferences. There are students, employees, students, and the general public. System functional test results can be seen in Table I, while the interface and access test results can be seen in Table II.

TABLE I. SYSTEM FUNCTIONAL TEST RESULTS

No	Statement	VA	A	D	VD
1	On the Zakat data input form, the application will display an error message if what is entered is not a number.	2	18	-	-
2	If the zakat value that will be calculated has not reached nishab (minimum amount), then the application will display that message not yet reached Nishab.	1	12	7	-
3	Zakat calculation is in accordance with the existing formula.	1	13	5	1
4	Zakat calculation is adjusted to the unit price of nishab.	-	15	3	2

TABLE II. INTERFACE AND ACCESS TEST RESULTS

No	Statement	VA	A	D	VD
1	Content provided simple, making it easier to use the application.	2	14	4	-
2	Articles are divided into several categories, making it easier to find articles.	4	16	-	-
3	The application has easy navigation.	-	12	8	-
4	Relatively fast loading time.	-	10	9	1

*) VA: Very Agree, A: Agree, D: Disagree, VD: Very disagree

From Table I and Table II, the results show that some users agree with the application that has been made. From this data shows that 6.25% strongly agree; 68.75% agreed. 22.5% stated they did not agree, and 2.5% stated strongly disagree. Some

users agree with the application that has been made, but not a few also users who find it difficult with the application.

IV. CONCLUSION

Based on the activities that have been carried out during the design up to the implementation of the Da'wah mobile application, a number of conclusions can be drawn: Da'wah mobile application has the ability to provide Islamic articles that are brief but can be easily understood by readers and provide facilities for calculating Zakat easily. This application is implemented through the GPRS network (General Pocket Radio System) so that to access the page requires a mobile phone that has WAP facilities. The test results show that the application can run well according to functionality and needs.

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