Islamic Zakah Application for Mobile Devices

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ABSTRACT

This paper involves designing and implementing an application using the J2ME (Java 2 Micro Edition) for mobile devices with GPRS connections. The application was implemented to allow the calculation of Islamic Zakah (obligatory charity) for mobile phone users. The application will ask the user to fill an application with the required information such as the school of jurisdiction required (e.g. majority, Shafii, Hanbali, etc.), Year (Hawl) type (a full owning year e.g. lunar year or solar year) and the gold price. The application of Zakah was implemented to calculate the Zakah of money, gold, silver, stocks, fruits and crops and cattle. After the user enters all his/her Zakah items they will be saved in the application's Record Management Systems (RMS). The application will then calculate the amount of Zakah for each type of holdings based on some information stored in the record management systems (RMS) in the mobile. The application can obtain some information from the internet such as the prices of stocks, gold and sliver. The amount of Zakah will then be calculated for the user on the day of Zakah is due. The application has the ability also to get quotes of prices for shares from the internet upon user request. Not only that but also the user can request the closing price of a share at a specific date to calculate the amount of Zakah. Moreover the application has the ability to be used offline or online.

Key Words: Mobile applications, Java 2 Micro Edition (J2ME), GPRS, Islamic Zakah.

1. INTRODUCTION

Nowadays, communications industry has seen rapid growth in the past several years. This has made wireless communication one of the fastest growing technology areas in the world. The total number of cellular phone subscribers worldwide exceeded one billion in 2002, and it has been estimated that there will be over 1.5 billion wireless subscribers in the world by 2005. This far exceeds the number of personal computer users in the world, which was estimated to be about 500 million in 2002. The total annual sales of cell phones in the world is expected to grow from about 423 million phones sold in 2002 to nearly 600 million phones sold in 2006 [1-2]. At the same time, the rapid emergence of the mobile phone has changed the landscape of modern computing. People have become more and more dependent on the information that is available on the hand, and they will increasingly want to get information not only from their personal computers and office workstations but also from mobile, wireless devices. Consequently, the rapid and efficient deployment of new wireless data and mobile internet services has become a high priority for communication equipment manufacturers and telecommunication operators.

Zakah is the third of the Five Pillars of Islam. It is mentioned in the Qur'an more than once. The Qur'an says, "And be steadfast in prayer; practice regular charity; and bow down your heads with those who bow down (in worship)". (Surah Al-Baqarah, 2:43). Zakah is indispensable for the Muslim community as it achieves reform, both financially and spiritually [3]. Most Muslims nowadays ignored this pillar or it was forgotten in the last decades. It is hoped that this application will help Muslims understand Zakah calculation methods and harness science to serve the community and religion. Moreover, the

technological development entered the entire life fields and it is a must that we benefit from this development in serving the religion.

1.1 Mobile Zakah Calculation against other Zakah applications

Recently many Zakah applications have been developed due to the high demands on such Islamic applications. By analysing such applications, it has been found that there are two main categories for such applications. The first type is a wed-based Zakah application and the second type is a desktop-based Zakah applications.

### 1.1.1 Web-based Zakah applications

These types of applications are widely used in Charity Authorities such as Abu Dhabi Zakah Fund, Kuwait Zakah House and Qatar Zakah Fund. Basically these applications are limited to one school of jurisdiction. However, the user has to be fully aware of Zakah and not many services are provided to users such providing the user with the gold price.

1.1.2 Desktop-based Zakah application

These types of applications are the most used. Most of them are poorly implemented with limited calculation Categories. Although, Maknoon website [4] has a good Zakah application but the application is not recommended from any official authority so far. Also the application is basically a Zakah Calculator with no services (e.g. online share price or gold price) as well as the web-based Zakah application.

2. SYSTEM DESCRIPTION

The Zakah application system is a client/server application. However the server side is just various web pages to get the prices of gold, silver and stocks. On the other hand the Zakah application in the mobile side is very important module since it is what the clients will use as shown in Fig.1
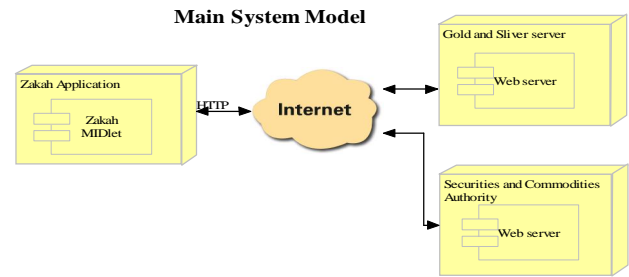
Fig. 1: Main system model

The main functionality in the mobile device side is to allow the client to set the Zakah configuration and to add all Zakah items he/she has. These added Zakah items will be stored in the record management system (RMS) [2], such that all user data will be persistent and can be used later. In addition to that, it will provide the user with the ability to get some information from the internet by just requesting to get the price. Also the Zakah application will provide a simple and easy interface so that users with different education levels can use it. Moreover, it handles any error cases such as trying to save any Zakah item with empty field or incorrect data. All the other error cases will be shown later in the implementation and testing.

On the other hand, the system will be accessible and usable even if there is no server. The application has the power to be used offline or online as the user request. In other words, if the user cannot connect to the server due to connection problems or server problems the application will still work. However, the user will miss some services such "get online price". So the user will have to enter the price manually.

2.1 USER INTERFACE DESIGN

First the user of the Mobile Zakah application should download the application into his mobile phone. This can be done in a number ways like [5]:

§ Wireless through the access of a webpage and downloading the application or by sending an SMS message to a specific number to get download link for the application.

§ Wireless through Bluetooth connection or infrared port.

§ By using cable connection between the mobile device and the PC.

The general design of the Mobile Zakah application follows the diagram below:
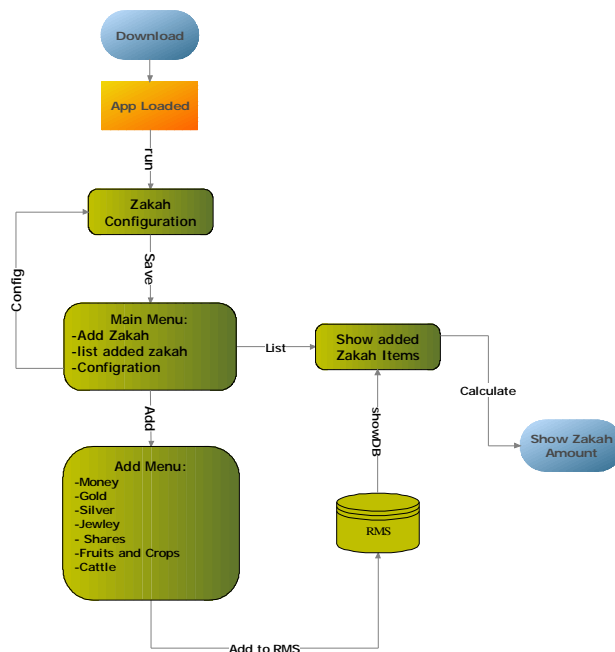
Fig. 2: General diagram of Zakah application

Once the application is loaded, the user will run the application on the mobile device and the Zakah configuration form will be displayed on the mobile device screen as shown in Fig.2. After the user saves the configuration, the application displays the application main menu to the user. The Zakah Application main menu consists of a list with three choices as shown in Fig.2. Basically, it is the guide to use the application. From the main menu the user can select *add Zakah items* to add a Zakah item or List *Added Zakah items* to list the saved Zakah items in the Record Management System. Moreover, the user can modify the application configuration by choosing *Zakah Configuration*.

## 3. SYSTEM IMPLEMENTATION

3.1. GETTING ONLINE PRICES
Implementing the functions to get some information from the internet is really a challenging task.

3.1.1   Gold and Silver
The request to get online price calls a function that accesses a web page: http://online.kitco.com/scripts/cgi-bin/texten.pl. This web page offers the gold and sliver prices from different markets. However, to make the Zakah calculation accurate; the price in Asia/Europe Spot Price must be taken. Based on the web pattern a search algorithm was implemented to get the gold and sliver price.

3.1.2 Stocks
Basically when the user selects a stock name from the stock list as shown in Fig.3, the symbol of the company selected and the date will be passed to a function to get the stock price requested.
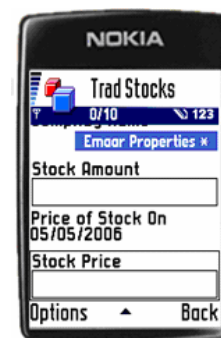
Fig. 3: Stock form

The company symbol will be appended to http://sca-wb1.sca.ae/arabic/th.asp?sym= symbol. The new URL will be an excel sheet of the selected company. For example if the user selects Emaar the URL will be http://scawb1.sca.ae/arabic/th.asp?sym=EMAAR.DFM. This webpage is from the UAE Securities and Commodities Authority web server. It offers all companies registered in Dubai Financial Market (DFM) or Abu Dhabi Stock Market (ADSM). After requesting the web page, a source code of the page will be received and a search algorithm was developed to read only dates and closing prices. The search algorithm is done by GetStockPrice(date, symbol) function. This function reads the source code then filters it and saves the stock's dates and prices in a global arrays. Finally it

will check the requested date and will then return the closing price of that date.

3.2 ZAKAH CALCULATION

Zakah calculation was implemented in the readDB() function. The readDB() has three main functions. First it reads the Zakah record. Then it parses each record and displays it in *added Zakah items* list. Finally it calculates the amount of Zakah that has to be paid.

Based on the read records and "Hawl" type, the readDB() will calculate Zakah for:
§ Money based on total amount of money added.
§ Gold based on the pure gold weight.
§ Silver based on the total silver weight.
§ Stock based on the total stock prices.
§ Crops.
§ Cattles.

4. TESTING

Wireless applications written in the Java programming language (wireless Java applications), like all other types of software, must be tested to ensure functionality and usability under all working conditions. Testing is even more important in the wireless world because working conditions vary a lot more than they do for most software. During the implementation phase it has been ensured that the application does what it is supposed to. Part of the validation process was done in an emulator environment such as J2ME Wireless Toolkit, which provides several phone skins and standard input mechanisms. The toolkit's emulator environment does not support all devices and platform extensions, but it makes sure that the application looks appealing and offers a user-friendly interface on a wide range of devices. Once the application has been tested on an emulator, it can be moved on to the next step and testing it on a real device, and in a live network.

4.1 ERROR HANDLING

Mainly there are two types of error handling. The first type is trying to save the data without completing the required fields will display an alert informing (Error) on the screen telling the user to enter the missing data as shown in Fig.4.

Fig. 4: Empty Field Error

The second type of errors is the information alert. If the user wants to save a Zakah item that has no Zakah on it. In other words, it is below Nissab. For example, if the user wants to save 650 KG, which is below Nissab, an information message will be displayed on the screen as shown in Fig.5.

Fig. 5: info. alert for Nissab

4.2 OUTPUT TESTING

Many testing scenarios were applied to the application in order to check the obtained Zakah calculated and compare it with manually calculated result. These results were approved by the Zakah Fund, UAE, and the application was given a certification that it follows the Shariah laws to calculate the Zakah used in the UAE.
§ Fig. 6a shows a case where the added Zakah items are below Nissab [3] (Money 2000, Gold 15g 22 Karat)
§ Fig. 6b shows a case where the added Zakah items are above Nissab [3] (Money 5000, Gold 50g 24 K + Gold 100g 18K, Silver 200g, Emaar 1000

shares on 6/5/2006, Sheep 300 and Camels 40).

Fig. 6: a) Result below Nissab   b) Result above Nissab

5. CONCLUSION

An application that calculates the Islamic Zakah (obligatory charity) for mobile phone users with a GPRS connection has been described. The application is user friendly and allows users to store Zakah items on the move and with ease. These items can be added, updated, or deleted when required and the Zakah can easily be calculated at the end of the year on the day the user specifies. The lack of such applications makes the task of calculating Zakah for normal Muslims tedious .The application has the ability to obtain online prices for various Zakah items such as gold (also used to calculate the personal allowance (Nissab), silver, and stocks (in the UAE stock markets). The application also allows the user to change the school of jurisdiction and year (Hawl) type. The following main criteria were specified at the outset to define successful completion of the application. Also the application can be used in offline mode in case a GPRS connection is not available but in this case the user should provide the required prices. The application has been built using the J2ME package which makes it a highly portable application.

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