

**AUTOMATIC QIBLA FOR WINDOWS PHONE 8 APPLICATION**

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**This Report is submitted in Partial Fulfillment of Requirement for Award of  
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PROJEK SARJANA MUDA II

Tajuk Projek : AUTOMATIC QIBLA FOR WINDOWS PHONE 8  
APPLICATION  
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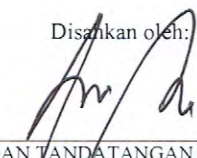
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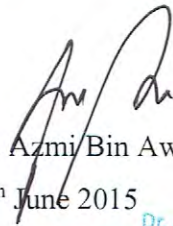
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## **DEDICATION**

Special dedication to my lovely parents, Sefian bin Ibrahim and Zaleha binti Yaacob, my siblings, my kind hearted supervisor Dr. Azmi Bin Awang Md Isa, all lectures in Faculty of Electronic and Computer Engineering and to my dearest friend.

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## Abstract

*Qibla* is the direction that should be faced when a Muslim prays. It is fixed as the direction of *Ka'abah* in Makkah. In other words, all Muslims pray in the same direction facing *Ka'abah* regardless where they are. The more important thing is, prayer is an obligatory for each Muslim as it is the second of the Five Pillars of Islam. Hence, finding the *Qiblat* accuracy for Muslims to face the correct direction to fulfil their worship of Allah is an important aspect. But, Muslims face difficulty to perform their duty when they are in an area without *Qiblat* direction indicator especially for travelers. They have to bring a magnetic compass (*Qiblat* pointer) as reference, which *Qiblat* direction is correct only when the user in a static state, but give inaccurate result when the user is moving because influence by the gravity. Because of the reason, this project namely Automatic *Qibla* Direction was developed to determine the *Qiblat* direction. The direction of *Qiblat* can be accurately determined automatically by using the latitude and longitude, which the information gets from the Global Positioning System (GPS). This project concentrates on using Windows Phone 8 as a platform to develop the application. Besides, the application is developed using mainly of Visual Studio Professional 2012 which the languages that be used is C# (sharp). An Emulator WVGA 512MB is used to simulate the software before synchronized with the mobile phone Nokia Lumia itself as a device. The system has an option to insert the coordinates or can run automatically without the need to choose current location for determining the *Qiblat* direction. The data sync with the device to make the whole system to be operated smoothly. It is hoped that this application will give beneficial to all Muslims in performing their duty.

## Abstrak

Kiblat adalah arah yang perlu di pandang semasa umat Islam melakukan solat. Ia adalah tetap seperti mana arah Ka'bah di Mekah. Dalam erti kata lain, semua umat Islam solat dalam arah yang sama menghadap Ka'abah tidak kira di mana saja mereka berada. Perkara yang lebih penting, solat adalah wajib bagi setiap Muslim kerana ia adalah rukun kedua dalam Rukun Islam. Oleh itu, mencari ketepatan Kiblat bagi umat Islam untuk menghadap arah yang betul untuk menunaikan ibadah mereka kepada Allah adalah satu aspek yang penting. Tetapi, umat Islam menghadapi kesukaran untuk melaksanakannya apabila mereka berada di kawasan tanpa penunjuk arah Qiblat terutama bagi pelancong. Mereka perlu membawa kompas magnet (Qiblat penunjuk) sebagai rujukan, yang arah Qiblatnya hanya betul apabila pengguna dalam keadaan statik tetapi memberikan hasil yang tidak tepat apabila pengguna bergerak kerana pengaruh oleh graviti. Oleh sebab itu, projek ini dinamakan Penunjuk Qibla Automatik telah dibangunkan untuk menentukan arah Qiblat itu. Arah Qiblat boleh ditentukan dengan tepat secara automatik dengan menggunakan latitud dan longitud di mana maklumat itu diperolehi daripada Sistem Kedudukan Global (GPS). Tumpuan projek ini adalah kepada penggunaan Windows Phone 8 sebagai platform untuk membina aplikasi ini. Selain itu, aplikasi ini dibangunkan dengan menggunakan Visual Studio Profesional 2012 yang mana Bahasa digunakan adalah C#. Satu Emulator WVGA 512MB digunakan untuk simulasi perisian sebelum disetarakan dengan telefon bimbit Nokia Lumia. Sistem ini mempunyai pilihan untuk memasukkan koordinat atau secara automatik tanpa perlu memilih lokasi semasa untuk menentukan arah Qiblat itu. Penyamarataan data dengan peranti untuk membuat keseluruhan sistem yang akan dikendalikan dengan lancar. Diharapkan bahawa aplikasi ini akan memberi manfaat kepada semua umat Islam dalam melaksanakan tugas mereka.



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## LIST OF ABBREVIATIONS

GPS	- Global Positioning System
GUI	- Graphical User Interface -
JAKIM	- Jabatan Kemajuan Islam Malaysia
INOTEK	- Innovation Technology
NAVSTAR	- Navigation Signal Timing and Ranging
OS	- Operating System
XAML	- Extensible Markup Language
NMEA	- National Marine Electronics Association
<i>Qiblat</i>	- Ka'bah in Makkah Saudi Arabia
<i>Solat</i>	- Muslims Prayers
API	- Application Programming Interface



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## CHAPTER I

### INTRODUCTION

This chapter will discuss about the project background, objectives, scope of the project, problem statement and project planning.

#### 1.1 Project Background

Prayer is one of the central elements of Islamic practice and worship. Indeed, it is the second of the Five Pillars of Islam and along with the testimony of faith, fasting the month of Ramadan, paying the poor tax and the pilgrimage to Mecca, forms the essential framework of religious life for Muslims.

The cube is the *Qiblat* the direction Muslims face during their prayers. It is important to note that though Muslims face the *Ka'bah* during prayers, they do not worship the *Ka'bah*. Muslims worship and bow to none but Allah. It is mentioned in Al-Quran:

*We see the turning of thy face (for guidance) to the heavens: now shall we turn thee to a Qiblat that shall please thee. Turn then thy face in the direction of the Sacred Mosque: wherever you are, turn your faces in that direction. (Al-Baqarah: 144)*

The significance of Muslims face *Ka'abah* while praying are as a test of our ability to obey the commands of God. Muslims, as servants of God, are required to submit to Him. Another aspect is the fact that the *Qiblat* is a sign of the spiritual unity of Muslims. At the time of prayer, Muslims all over the world are lined in circles big and small facing one direction and feeling belonging to this center and belonging to each other. This creates some kind of spiritual unity amongst all Muslims all over the world and leaves them with a sense of belonging to each other.

Thus, it is compulsory for Muslims to perform prayer, five a time a day regardless where they are. However, most Muslims have difficulty to perform their duty because nowadays, people included Muslims are commuting or travel from one place to another place. The fact that, it is extremely difficult to determine the direction of *Qiblat* due to its orientation and direction of travel.

The direction of *Qiblat* can determine by using a compass, through latitude and longitude. The *Qiblat* direction is important while perform solat and plays a part in various ceremonies. Hence, finding the *Qiblat* accuracy for Muslims to face the correct direction to fulfil their worship of Allah is an important aspect in legislation and it is a legal requirement between either pray the obligatory prayers and circumcision prayers.

Besides, funeral arrangements and other Muslims worship, it are circumcised facing towards the *Qiblat*. In prayer the whole body one must face towards the *Ka'bah*, which is located at *Makkaratul Mukarramah*. There are several laws related to it, namely, compulsory and circumcision. Compulsory, face towards the *Qiblat* when performing the obligatory prayers or circumcision, performed *Tawaf* in the Allah's house and put the corpse in the grave. Circumcision, face towards the *Qiblat* when reading al-Quran, prayer, chanting, sleep and other daily activities related.

Chief Assistant Director of the Astronomy Branch, Division of Research Jakim, Che Alias Che Ismail, said the exact determination of the direction is particularly important in the construction of mosques to ensure they do not miss. He stressed, accuracy *Qiblat* not something to be taken lightly, because even if it is only one degree of deviation, it is equivalent to approximately 125 kilometers strayed from the direction of the Kaaba. [1]

This Project is divided into two major parts; hardware and software. For hardware part, Windows Phone 8 with built-in Global Positioning System (GPS) is used with the software developed using Microsoft Visual Studio Professional 2012. The developmental program that done using Visual Studio C# (sharp) will synchronize with Windows Phone 8 with built-in GPS that give the information of the latitude, longitude and altitude. This project needs to study on how to develop GUI-based software, which can determine the current *Qiblat* direction with additional features that can be incorporated into portable devices such as Windows Phone 8 device with global positioning system (GPS) capabilities.

## **1.2 Objectives and Scopes of Project**

This part will discuss about the objectives of the project and the scope of work regarding this project.

### **1.2.1 Project Objectives**

This Project is carried out on the following objectives:-

- i. To learn and familiarize on how to make a program especially on mobile application using Microsoft Visual Studio.
- ii. To learn and understand the basics of finding out the correct direction of *Qiblat*.
- iii. To develop an Automatic *Qiblat* Direction for Windows Phone 8 Application.
- iv. To design the Graphical User Interfaces (GUI) based software to make it user friendly.

### 1.2.2 Scopes of Project

This project concentrates on determining a *Qiblat* direction using Windows Phone 8. The direction of *Qiblat* can be accurately determined by using the latitude and longitude of user location which the information gets from the Global Positioning System (GPS). The application of Automatic *Qiblat* for Windows Phone 8 is developing using mainly of Visual Studio Professional 2012 which the languages that would be used is C# (sharp). Windows Phone 8 Emulator is used to simulate the software before synchronized with the device. Hardware part in this project is the mobile Windows Phone 8 itself as a device.

This application should be able to show the following:

- i. Menu of Automatic *Qiblat*
- ii. Current location of user
- iii. *Qiblat* direction
- iv. Graphical User Interface (GUI) software

### 1.3 Problem Statements

Every Muslim has to perform the five times prayer wherever they are. Muslims face difficulty to perform their duty when they are in an area without *Qiblat* direction indicator. Have to bring a magnetic compass (*Qiblat* pointer) as reference, which *Qiblat* direction is correct only when the user in a static state, but give inaccurate result when the user is moving because influence by the gravity. Besides, application nowadays is not portable and self-generated rely on the service itself, that need user to have internet connections. Moreover, the standard practice of the existing conventional systems has a requirement that needs user to select the current location.

## 1.4 System Operations

Study about Global Positioning System (GPS) is part of the literature review in order to determine the accurate direction of *Qiblat* by using latitude and longitude of user location.

Besides, Falaq's knowledge is needed, especially in developing a formula for determining *Qiblat* direction. In this project, software development of Microsoft Visual Studio Professional are used to develop an application of Windows Phone 8 platform using visual C# (sharp) and in order to design user friendly of Graphical User Interface (GUI). Then, using Windows Phone 8 Emulator to run the program before interfacing between an applications with Windows Phone 8 device occur. Integrate the applications with Windows Phone 8 device, as a part in hardware development. Handheld devices and interfacing requirements were studied, especially on how to synchronize between Windows Phone 8 Emulator with the device.

Besides, setting up GPS receiver is needed to provide location data of the user of the device. The synchronization between both of this software and hardware as an integral part in this project. Lastly, when the integration process successful done, all must be tested with different specification and troubleshoot any problem that may occur.

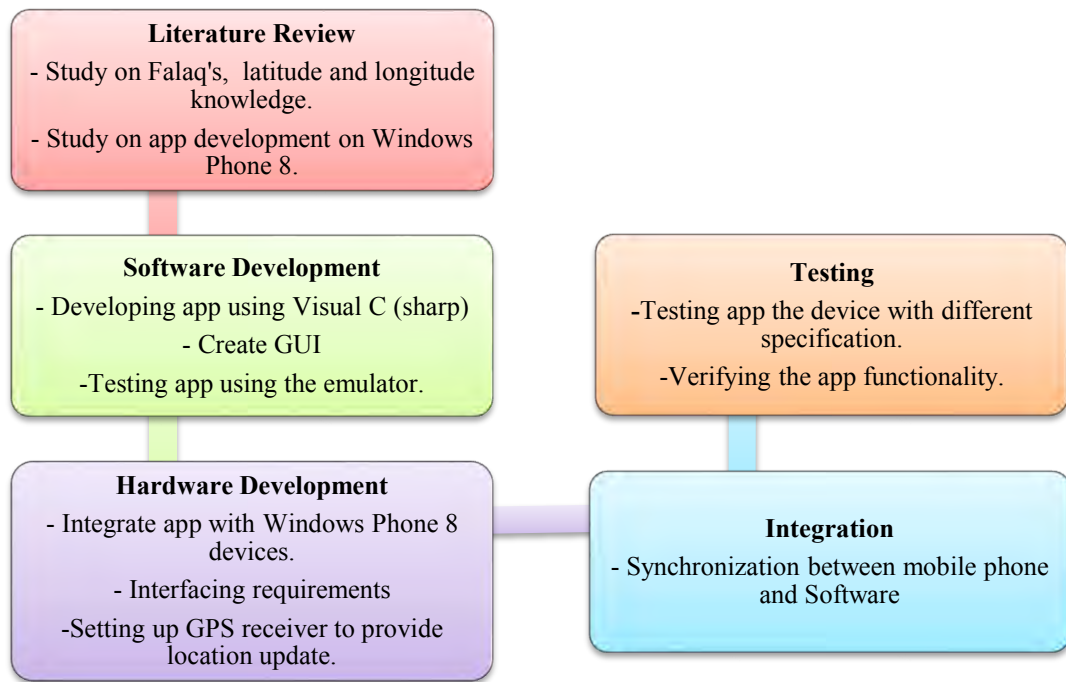


Figure 1.1: Overall Block Diagram of the Software Development with Windows Phone.

### 1.5 Organization of thesis

There are five chapters that will be contained in this thesis. In the first chapter, which is the introduction of this project, it explains about the background of the project, the objectives, scope of the project, problem statement and the system operations. In the second chapter, it narrates the literature review regarding the project, which includes the current knowledge including substantive findings. The third chapter is about methodology and approach that has been taken on how the project is done. It also discussed about software development that has been applied in this project. Chapter four will discuss more on the result and analysis of this project. Last chapter, which is chapter five is consists of conclusions, some improvements and suggestions.

## CHAPTER II

### LITERATURE REVIEW

A literature review is a text of a scholarly paper, which includes the current knowledge, including substantive findings, as well as theoretical and methodological contributions to this project. This chapter reviews of an articles, books and journals to understand about the concept that needs to know in order to complete this project such as for determining the *Qiblat* direction, about the Global Positioning System (GPS), analysis of Windows Phone 8 and theory regarding Visual Studio Professional 2012.

#### 2.1 *Qiblat* Direction

In performing the ritual prayers, Muslims from around the world will make the *Ka'bah* as a place of reference for facing *Qiblat*. This method has been used from time immemorial, which at the time of anbiya. No matter where it is a Muslim, he or she must face the Macca as a *Qiblat*. The direction of the *Kaa'bah* in Mecca is a constant which is the exact coordinate of the *Ka'bah* is 21°25'15.6" N Latitude and 39°49'29.1" E Longitude that has been authorized by Arab Saudi Legation, Kuala Lumpur. [2]