

SMART ATTENDANCE SYSTEM VIA BLUETOOTH

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SMART ATTENDANCE SYSTEM VIA BLUETOOTH

SUMATHI A/P SELVADURA

This report is submitted in partial fulfillment of the requirements for the
Bachelor of Computer Science (Computer Networking)

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DEDICATION

This project is dedicated to my Parents who have never failed to give me financial and moral support, for giving all my need during the time me developed my project. Nevertheless, it is also dedicated to Mrs. Syarul Naziah Binti Anawar, my supervisor and Mrs Marliza Binti Ramly my evaluator in honour of fulfilling requirements for Final Year Project of Bachelor of Computer Science majoring Computer Networking.

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ABSTRACT

Now days, almost every individual or organizations, companies, education department and more are use wireless technologies. This is because it supports mobility and also it not required any wired support. The example of wireless technologies that widely used is like infrared, microwave, Bluetooth and so on.

Bluetooth is one of the wireless technologies which are works in short range distance, low cost and using low power consumption. The Bluetooth device become a basic specification in newest electronic devices likes laptop computer, mobile phone and even the head unit in car entertainment. This make over 1 billion Bluetooth device sold each year. This gives the opportunities to the developer to develop the application for the Bluetooth wireless connection.

This project Smart Attendance System via Bluetooth is about taking attendance of the students by detected their Bluetooth devices. This system will allow the lecturer to take attendance of the students that are entering the class by using Bluetooth. Once, the lecture click on the button search devices in the system, the system will detect the active Bluetooth devices that the students have such as mobile phone or laptop. After detect, the system will compare the detected Bluetooth address with the Bluetooth address list in the database which has been register before, if both address are same the system will mark at the students name as present to class.

ABSTRAK

Pada era teknologi moden ini, hampir setiap individu atau organisasi, syarikat, dalam bidang pendidikan lebih cenderung menggunakan teknologi komunikasi tanpa wayar. Hal ini kerana ia menyokong mobiliti dan juga ia tidak perlu menggunakan kabel. Contoh teknologi komunikasi tanpa wayar adalah seperti Infrared, microwave, Bluetooth dan sebagainya.

Bluetooth adalah salah satu teknologi dalam bidang komunikasi tanpa wayar yang berfungsi dalam jarak pendek, menggunakan kos rendah dan penggunaan kuasa yang rendah. Hal ini membuat lebih dari 1 bilion bahan – bahan yang ada Bluetooth dijual setiap tahun. Hal ini memberikan dorongan kepada pemaju untuk membangunkan aplikasi yang berkaitan dengan teknologi Bluetooth ini.

Projek mengambil kehadiran melalui Bluetooth ini adalah tentang mengambil kehadiran pelajar dengan mengesan Bluetooth. Sistem ini akan membolehkan pensyarah untuk mengambil kehadiran pelajar yang masuk kelas dengan menggunakan Bluetooth. Dalam system ini terdapat sebuah butang untuk mengesan peranti Bluetooth. Setelah menekan butang itu, sistem akan mengesan peranti Bluetooth yang aktif yang ada pada pelajar seperti telefon bimbit atau komputer riba. Setelah mengesan, sistem akan membandingkan alamat Bluetooth yang dikesan dengan senarai alamat Bluetooth di *database* yang telah mendaftar sebelum ini, jika alamat keduanya sama, sistem akan menandakan nama pelajar tersebut bahawa pelajar itu hadir ke kelas.

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CHAPTER I

INTRODUCTION

1.1 Project Background

In a manual system, to take the attendance of the students the lecturers have to print the attendance sheets and they have to carry the attendance sheets to the class they teach, in order to take attendance of the students who are present to the particular subject or class. Then, the lecturer will pass around the name list to the students to sign the attendance or some of the lecturer will mark the attendance list by calling the students name. It will take some time and contributes to waste of time.

There is possibility where the students will sign for their friends who didn't attend to the particular class and also this will encourage the students to skipping class every time because the friends can sign in attendance on behalf of them. In additional, in case the lecturer lost the attendance sheet they won't have another copy of attendance sheet which students are already sign and they have to re-print and get signature back from the students. All the above are loopholes in the current attendance system.

Hence, to avoid this kind of problems in it is suggested to create Smart Attendance System via Bluetooth. This system will install into the lecturer computer and

when the students are enter the class; the system will detect the active Bluetooth devices that the students have such as mobile phone or laptop. After detect, the system will compare the detected Bluetooth address with the Bluetooth address list in the database, if both address are same the system will mark at the students name as present.

1.2 Problem Statements

- **Lecturers have to carry the attendance sheet to the class.** In order to take the attendance of the student the lecturers have to print and carry along the attendance sheet to the class.
- **Waste of time.** The lecturer will pass around the name list to the students to sign the attendance or some of the lecturer will mark the attendance list own by calling students name which will contribute to waste of time.
- **Lost of data or attendance sheet.** In case the attendance sheet lost, it will make difficulty to lecturers where the lecturer won't have another copy of it and have to re-print and get re-signature from the students.
- **There will be blind signatures among students.** Sometimes, the students will sign for their friends who never attend to the class and also this will encourage them to skipping class every time because their friends can sign behalf of them.

1.3 Objective

The objectives of developing the Attendance System via Bluetooth are:

- To analyse and design and develop a system, in for facilitating the lecturers to take the attendance of the students.
- To develop a system to avoid the blind signatures among students.
- To evaluate the time taken of lecturer and students to take the attendance.
- To implement secured system which keep the data more secured.

1.4 Scope

1.4.1 Users

- Lecturers use the system to take the attendance of the student in the class or lab session.
- Students who has Bluetooth devices such as mobile phone or laptop will use this system where the system will take their attendance if their Bluetooth if turn on.

1.4.2 Software

1.4.2.1 NetBeans IDE 6.9.1

- To design the interface and to develop a system based on java programming. NetBeans is a platform framework for Java desktop applications, and an integrated development environment (IDE) for developing with Java.

1.4.2.2 Java SE

- Java Platform, Standard Edition or Java SE is a widely used platform for programming in the Java language. It is used to develop Java programming to make establish connection with Bluetooth devices.

1.4.2.3 Microsoft Office Access 2007

- This is used for create a database for this system. It contains tables which contains the data that will be used in this system. It helps to track data easily and safely.

1.4.2.4 Microsoft Office Visio 2007

- This is GUI based software used for draw state diagram, Entity Relationship Diagram (ERD), Flow chart and sequence diagram about system.

1.4.2.5 Windows 7 Operating system(OS)

- This system was develop in windows 7 Operating System is a line of operating systems produced by Microsoft for use on personal computers, including home and business desktops, notebook computers, and media centers.

1.4.3 Hardware

1.4.3.1 Bluetooth devices (Mobile Phones, laptop and etc)

- It is used to take attendance from the students when the students enter the class. However, these devices must have Bluetooth capability to making sure it can connecting with computer.

1.4.3.2 Computer/Laptop (System)

- Systems are able to run and perform in a perfect condition if it meets the requirements. This system will detect the Bluetooth devices belongs to students and verify the Bluetooth address in the system if both address are same this system will mark them as present to the class.

1.4.4 Environment

- Normal: In a lecture room where the distance between system and the Bluetooth devices within 10 meters range operate at 2.45GHz and speed of 1Mbps for Version 1.2; Up to 3 Mbps supported for Version 2.0 EDR, and up to 24 Mbps supported for Version 3.0 HS
- In interference: Interference can only occur when both Bluetooth and 802.11b devices transmit at the same time share the 2.4GHz radio frequency. To avoid interfering with other protocols that use the 2.45 GHz band, the Bluetooth protocol divides the band into 79 channels (each 1 MHz wide) and changes channels up to 1600 times per second. The speed of the data rate in interference is 1Mbps.

- Obstacle: Bluetooth connection or communication in between two devices does not effected from the obstacles such as walls or furniture's.

1.5 Project Significant

The Attendance System via Bluetooth will bring a lot of benefits to the user. This system helps lecturers to take the attendance easier where the students just have to register the details, and turn on their Bluetooth when came to class. Lecturers no need to worry if they lost or forget to bring the attendance sheet, and this will give more convenience in secure way and save much time to the user.

1.6 Expected Output

The main expected output of the project is to understand how Bluetooth details can be extracted from Bluetooth devices and how to communicate between two Bluetooth devices. Besides that, this system is also to simplify all the process that is occurred in manual system and create computerized system.

1.7 Conclusion

A project success usually starts with a good research about the project domain. In overall this chapter discuss about overview of the project. Hopefully, when the new system is fully implemented it will definitely help the users and will avoid all the problems that the manual system faced before. Next chapter will discuss about the literature review and project methodology which means the selected approach for methodology has to be select.

CHAPTER II

LITERATURE REVIEW AND PROJECT METHODOLOGY

2.1 Introduction

After discussing the project preview in previous chapter, in this chapter, it will be focuses on literature review and project methodology. The literature review is focused on the research of the current system that have been developed and the new system that will develop. The main purpose of a literature review is to convey the reader about the knowledge and also to establish the ideas have been on a topic and what are the strengths and weakness. Literature fact can be find via access the online journal, conference paper or books which is related with our project. This is important because through the researches or reviews, we can make consideration decision and deliverable toward to be the project more effective.

Project methodology is a combination of step-by-step methods and techniques for successful planning and delivery of projects. It will discuss detail about type of methodology, techniques, hardware or software requirements and project planning to develop the project, so that the planning for the project proposed to meet project objectives, scopes and requirements.

2.2 Literature Review

In this section, a lot of researches have been done to collect information related to this project. The literature facts can be found by access the online journals, conference paper or books which are related with our project.

2.2.1 Domain

The one of the related domain for this project is the open wireless technology Bluetooth. This will elaborate in details about the Bluetooth technology, its performance and its network topology. The development of the application will explore the more about the Bluetooth performance. Then the second domain will be the attendance system which will be explain more about the system.

2.2.2 Keyword

2.2.2.1 Bluetooth Technology

Bluetooth wireless technology is a short-range communications technology intended to replace cables by taking the information normally carried by the cable, and transmitting it at a special frequency to a receiver Bluetooth chip, which will then give the information received to the computer or other Bluetooth devices while maintaining high levels of security. Bluetooth technology is a wireless protocol that connects electronic devices between computers laptops, mobile phones, printers, digital camera, headsets, and more while they are close to each another. The key features of Bluetooth technology are robustness, low power, low cost, secure and globally available radio

frequency. The Bluetooth specification defines a uniform structure for a wide range of devices to connect and communicate with each other.

Bluetooth devices intended for use in short-range personal area networks operate from 2.4 to 2.4835 GHz. To avoid interfering with other protocols that use the 2.45 GHz band, the Bluetooth protocol divides the band into 79 channels (each 1 MHz wide) and changes channels up to 1600 times per second. Newer Bluetooth versions also feature Adaptive Frequency Hopping which attempts to detect existing signals in the ISM band, such as Wi-Fi channels, and avoid them by negotiating a channel map between the communicating Bluetooth devices.

Beside that compared to Wi-Fi, Bluetooth networking is much slower, a bit more limited in range, and supports many fewer devices. Bluetooth networks feature a dynamic topology called a piconet or PAN. Piconets contain a minimum of two and a maximum of eight Bluetooth peer devices. Devices communicate using protocols that are part of the Bluetooth Specification. Wireless signals transmitted with Bluetooth cover short distances, typically up to 30 feet (10 meters). Bluetooth devices generally communicate at less than 1Mbps.

2.2.2.2 Bluetooth Performance

Bluetooth can connect two to eight devices within the range simultaneously with all of those devices within 10 meter or 32 feet. The speed of the data rate is 1Mbps for low technology or for Bluetooth version 1.0. Besides that for Bluetooth Version 2.0 +EDR (Enhanced Data Rate) it has faster data transmission where the speed of data rate is 3Mbps. Bluetooth uses a technique called spread-spectrum frequency hopping that makes it rare for more than one device to be transmitting on the same frequency at the same time. In this technique, a Bluetooth device will use 79 individual, randomly chosen