

STUDENT ATTENDANCE THROUGH RFID AND BLUETOOTH

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STUDENT ATTENDANCE THROUGH RFID AND BLUETOOTH

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

FACULTY OF INFORMATION AND COMMUNICATION TECHNOLOGY
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2011

DECLARATION

I hereby declare that this project report entitled
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ABSTRACT

Student Attendance System is a project based on Bluetooth and RFID reader application. This project been developed to record the attendance of the student during the learning sessions in the classes with more efficient and systematic. On the other hand, this system will save time because of all the process involved in recording the student's attendance are not done by the lecturers anymore, instead, this system will handle all the processes. In this project, RFID readers will record the student information by student matric card. After that, information will be sent to computers in the classroom or laboratory. After that, users which consist of lecturers, staff and student need to connect their Mobile Phone with the computer via Bluetooth to enable them to view the attendance list in the class.

ABSTRAK

Sistem Kehadiran Pelajar merupakan sebuah projek yang berasaskan aplikasi Bluetooth dan pembaca RFID. Projek ini di bangunkan bertujuan untuk merekodkan kehadiran pelajar semasa sesi pembelajaran di dalam kelas atau di dalam bengkel berasaskan sistem dengan lebih cekap dan sistematik. Pada masa yang sama, sistem ini dapat menjimatkan masa kerana segala proses merekodkan kehadiran pelajar bukan lagi dilakukan oleh para pensyarah tetapi dilakukan oleh sistem. Dalam projek ini, pembaca RFID akan merekodkan maklumat pelajar melalui kad matrik pelajar. Selepas itu, maklumat tersebut akan dihantar kepada komputer di dalam kelas atau bengkel. Kemudian pengguna yang terdiri daripada pensyarah, kakitangan dan pelajar perlu menyambungkan telefon bimbitnya dengan komputer melalui Bluetooth untuk membolehkan beliau melihat senarai kehadiran pelajar dalam kelas tersebut.

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CHAPTER I

INTRODUCTION

This chapter is the early reviews for this project, explain is Student Attendance System through RFID and Bluetooth. Sub-chapters that will be discussed in this chapter including project background, problem that related to this project, objectives of this project, scopes of the project, project significance, expected output of this project and the conclusion of this chapter.

1.1 Project Background

Radio frequency identification (RFID) is the electromagnetic or electrostatic coupling in the RF portion of the electromagnetic spectrum is used to transmit signals. An RFID system consists of an antenna and a transceiver, which read the radio frequency and transfer the information to a processing device, and a transponder, or tag, which is an integrated circuit containing the RF circuitry and information to be transmitted.

Bluetooth is a short-range wireless technology that lets you connect computers, mobile phones, and handheld devices to each other and to the Internet. Bluetooth

technology eliminates the need for the cables that connect devices together. Bluetooth-enabled devices connect wirelessly within a 10 m range.

Bluetooth and Wi-Fi have many applications setting up networks, printing, or transferring files. Wi-Fi is intended for resident equipment and its applications. The category of applications is outlined as WLAN, the wireless local area networks. Wi-Fi is intended as a replacement for cabling for general local area network access in work areas.

Bluetooth was intended for non-resident equipment and its applications. The category of applications is outlined as the wireless personal area network (WPAN). Bluetooth is a replacement for cabling in a variety of personally carried applications in any ambiance and can also support fixed location applications such as smart energy functionality in the home.

Wi-Fi uses the same radio frequencies as Bluetooth, but with higher power, resulting in a faster connection and better range from the base station. The nearest equivalents in Bluetooth are the DUN profile, which allows devices to act as modem interfaces, and the PAN profile, which allows for ad-hoc networking.

1.2 Problem Statement

With attendance system at this time, student's attendance is taken manually and is not a system. It is taken manually by using attendance sheet given by lecturer in class. If student's attendance is taken manually, there are some cases that student can cheat by asking their friends to tick or sign for them. This occurs because the students just want to fulfill the 80% of the attendance so that they can seat for the final examination at the end

of the semester. Lecturer can't monitor for all students in the class and it is difficult for lecturer to record the attendance of students accurately and efficiently.

Lecturers are not able to keep track with the student's attendance during the class session. So, with this system, lecturers will be notifying by email or mobile phone via Bluetooth. The attendance list will be generated after the student swaps their matrix card to the RFID Reader which is attached in every classes. In addition, manual attendance may not be reliable as email. It can be lost or torn up.

1.3 Objective

The main objectives of this project are summarized as below:

- i. To develop a student attendance.
- ii. This system uses Bluetooth and RFID technology to transmit data.
- iii. Developing an application in the mobile phone to receive data from a computer via Bluetooth.
- iv. To record the attendance of students in real time.
- v. This system can generate the report for attendance of students and send it via email to the lecturers after each lesson or lab session.

1.4 Scope

The scope of this project is to implement RFID and Bluetooth connection at the class room and laboratory. The system will be creating using vb.net and Net Beans IDE. Before that, the matrix card of the student will be registered first in the system. This system is use to record attendance of students by RFID and the data in computer will be send to mobile phone. In this system, the mobile phone can be used is the Nokia and Sony Ericsson with the support of JSR 82 API for Bluetooth and suitable to install the J2ME application.

1.5 Project Significance

These projects are system that integrated with RFID and Bluetooth. It helps students and the lecturer in the class. The student does need to do the records manually while the lecturer don't need to watch every time student fills in the record. This system benefits the lecturer when they want to check attendance list. They just have to connect mobile phone with the computer via Bluetooth and the data in computer will be sent to mobile phone. In addition, lecturers can check attendance list of students via email and print class attendance sheets when need.

1.6 Expected Output

The expected output is that the system will run smoothly. It also must working according to what have expected. The system should benefits the students and also the lecturer.

1.7 Conclusion

In conclusion, this chapter describes the background of this project. This system is use to take students attendance by RFID and the data will be sent to mobile phone using Bluetooth. The purpose of this system development is to take student attendance more efficient.

Next chapter will be discussing about the literature review and project methodology that will be used to implement this project.

CHAPTER II

LITERATURE REVIEW AND PROJECT METHODOLOGY

2.1 Introduction

This chapter explains about the technology to be used in this project. The technology used to develop this system is RFID and Bluetooth. RFID is an automatic identification that carries information around using radio wave. This technology is a tool to help supply chain automation. It makes reading a data with easier and accurate. It also saves time, energy and manpower. Bluetooth is a wireless technology for creating personal networks operating in the 2.4 GHz unlicensed band, with a range of 10 meters. Networks are usually formed ad-hoc from portable devices such as mobile phone and laptops. This technology will be discussed further in this chapter.

2.2 Literature Review

2.2.1 Domain

I. Introduction of RFID

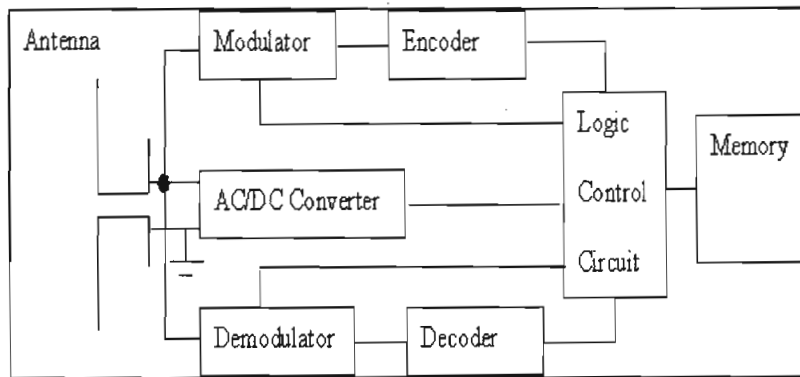


Figure 2.1 : Operation of the RFID.

Radio frequency identification (RFID) is a generic term that is used to describe a system that transmits the identity (in the form of a unique serial number) of an object or person wirelessly, using radio waves. It's grouped under the broad category of automatic identification technologies.

RFID is a method of remotely storing and retrieving data using devices called RFID tags. An RFID tag is a small object, such as a student card. RFID tags contain antennae to enable them to receive and respond to radio-frequency queries from an RFID transceiver.

RFID is in use all around us. If you have ever chipped your pet with an ID tag, used SmartTag through a toll booth, or paid for LRT using Touch 'n' GO, you've used RFID. In addition, RFID is increasingly used with biometric technologies for securities.

Unlike ubiquitous UPC bar-code technology, RFID technology does not require contact or line of sight for communication. RFID data can be read through the human body, clothing and non-metallic materials.

II. Introduction of Bluetooth

Bluetooth is to provide a universal short-range wireless capability. Using the 2.4 GHz band, available globally for unlicensed low-power uses, two Bluetooth devices within 10 m of each other can share up to 720 Kbps of capacity. Bluetooth is intended to support an open-ended list of applications, including data (such as schedules and telephone numbers), audio, graphics, and even video. Bluetooth is designed to operate in an environment of many users. Up to eight devices can communicate in a small network called a piconet. Ten of these piconets can coexist in the same coverage range of the Bluetooth radio. To provide security, each link is encoded and protected against eavesdropping and interference.

i. Using the Java APIs for Bluetooth Wireless technology

The Java APIs for Bluetooth is a Java ME specification for APIs that allow Java midlets to use Bluetooth on supporting devices. The specification was developed under the Java Community Process as JSR 82.

This specification was produced by the Expert Group formed to define the Java APIs for Bluetooth wireless technology. The following companies, listed in alphabetical order, are members of this expert group is Extended Systems, IBM, Mitsubishi Electric, Motorola (specification lead), Newbury Networks, Nokia, Parthus Technologies, Research in Motion, Rococo Software, Sharp Laboratories of America, Sony Ericsson

Mobile Communications, Smart Fusion, Smart Network Devices, Sun Microsystems, Symbian, Telecordin, Vaultus, Zucotto.

The Bluetooth stack comprises a software stack that interfaces with a firmware stack, as Figure 2.2 illustrates:

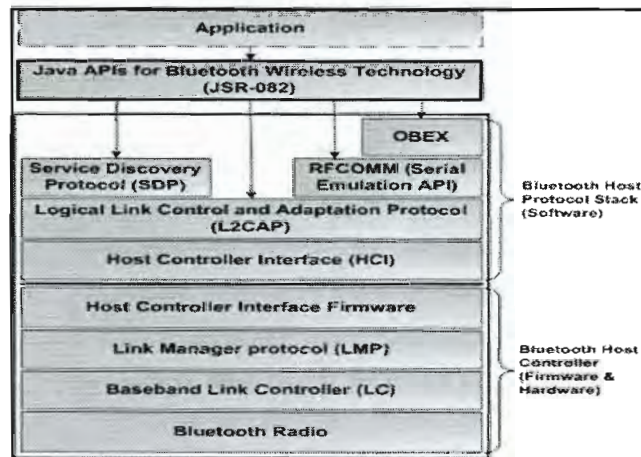


Figure 2.2: The Bluetooth stack

A Bluetooth-enabled application can be either a server or a client a producer of services or a consumer or it can behave as a true peer-to-peer endpoint by exposing both server and client behavior. Figure 2.3 illustrates an application's Bluetooth-specific use cases:

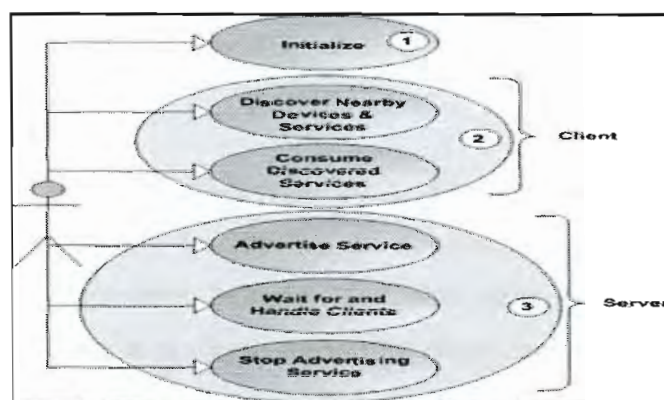


Figure 2.3: Bluetooth-specific