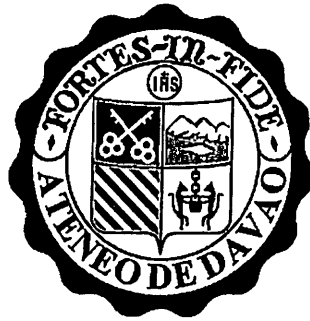


**DEVELOPING AN AUTOMATED ATTENDANCE CHECKING  
VIA BLUETOOTH**



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**DEVELOPING AN AUTOMATED ATTENDANCE CHECKING  
VIA BLUETOOTH**

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## **ABSTRACT**

The growth of students enrolling in a subject accentuates the need for the recording of class attendance to be automated. This study discusses a scheme how the development of an automated attendance checking using a Bluetooth enabled mobile device has been done for the improvement of class attendance recording. As mentioned, this project used Bluetooth technology in checking attendances as well as sending the attendance details to the pc server, a desktop application that holds all information and generates report, of the instructor. Therefore, the study sets criteria to evaluate the developed automated attendance checking via Bluetooth and how it enhanced the current manual class attendance system.

***Keywords:***

*Bluetooth, mobile phone*

# CHAPTER 1

## INTRODUCTION

### 1.1 Background of the Study

Nowadays, the population of students enrolling in a subject is arising. Consequently, since the numbers of students in a subject has increased the efficiency class attendance monitoring has decremented. In order cope up with this, we have developed a project, an automated attendance checking that uses Bluetooth technology. As mentioned, this project uses Bluetooth technology on mobile phones to search for Bluetooth device of a student and to send the details to the pc server of the instructor. The project includes a pc server where the transferred data from the mobile phone is stored and the reports are generated. This project, automated attendance checking using Bluetooth technology, has been developed so that it can aid instructors in recording the attendance of the students in their class. It will make the attendance checking and monitoring faster and easier. Also this project can help in fully implementing school policy with regards to class attendances.

In view of the fact that Bluetooth connection is wireless and automatic and has a number of interesting features that simplifies tasks in our daily lives, we used Bluetooth technology as a means that helped us in achieving our the purpose of this project through using its capabilities and features.

### 1.2 Technology Application Context

Our project, automated attendance via Bluetooth is designed to make the classical attendance monitoring system a lot easier and faster. Attendance checking via Bluetooth is much more convenient than other automated attendance checking that uses biometrics or RFID in terms of financial or resources considerations. Hence, since almost phones nowadays are capable of Bluetooth connection we implemented an automated Attendance Checking via Bluetooth.

### 1.3 Objectives of the Study

The general objective of this study is to develop an automated attendance checking by means of Bluetooth technology on mobile device to improve class attendance checking.

The specific objectives are:

- To identify and review existing attendance applications
- To research on capabilities and features of Bluetooth technology
- To overcome a Bluetooth technology restriction, a master device can only connect with seven (7) slave devices concurrently.
- To develop a framework on automated attendance checking via Bluetooth technology
- To implement the developed framework

#### **1.4 Significance of the Study**

This study is significant to the school especially to the instructors. This is built for benefit the teachers and to lessen their burden in checking and monitoring class attendance. Basically the implication of our study lies on the capability Bluetooth Technology. As we all know Bluetooth technology nowadays are often used; also because of its close range limitation it is therefore suitable for implementing an attendance monitoring system via mobile phone. Additionally, it is easier to use than other existing class attendance monitoring system because a student will only turn on its Bluetooth and the Bluetooth enabled mobile phone of the teacher automatically detects the presence of the enabled Bluetooth of the student. Besides, almost all phones today have built in Bluetooth; it would not cost much unlike RFID or Biometrics which is using certain equipments. Through automated attendance checking the school policy on class attendance will be strictly followed. Also it will be easier for the teacher to monitor and verify each student's class attendance standing.

#### **1.5 Scope and Limitations of the Study**

The study basically used Bluetooth technology on mobile devices in automating the checking of attendance. Therefore only students who have Bluetooth enabled on their mobiles can be recognized by the mobile server of the teacher. The basis in detecting and recognizing the student's phone is its Bluetooth MAC address; at the same time the student's network name must only be plaintext, that does not contain any special characters (e.g. !, @, #, \$, %, &, etc.), should also be registered to the server to have its record. Consequently every time the mobile server detects the student phone's Bluetooth MAC Address, it is then recognized and the student is marked as present. In addition, it prevents the student to cheat on the attendance knowing that MAC address is unique in every mobile phone. Hence, the teacher must assign a beadle to check

the students who are not around and if students try to cheat on their attendance. For some instances, if the student will change their network name, he/she should inform the teacher to update the network name. Also, it shall be implemented in the Ateneo de Davao University Computer Studies Division.

The project has several limitations; first, the Bluetooth technology is only used in detecting students Bluetooth devices and in sending the text file to the pc server. Due to this limitation the recording of students' information as well as students' Bluetooth addresses will be done manually by the instructor. Also another limitation of Bluetooth which is it can only search and detect other Bluetooth devices for a certain period of time, the project is designed to perform two scans, first and second, per period. Another limitation of this project is, the students that have been already detected during the first scan of the teacher must turn off the their Bluetooth so that during the second scan, which is intended for the late comers, their devices will not be detected anymore so that it will not be marked as late.

## 1.6 Definition of Terms

**API** – Application Programming Interface

**Web Server** - a computer program that delivers (serves) content, such as web pages, using the Hypertext Transfer Protocol. The term web server can also refer to the computer or virtual machine running the program

**Transceiver** - device that has both a transmitter and a receiver which are combined and share common circuitry or a single housing. If no circuitry is common between transmit and receive functions, the device is a transmitter-receiver

**RF (Radio Frequency)** - radiation is a subset of electromagnetic radiation with a wavelength of 100km to 1mm, which is a frequency of 3 KHz to 300 GHz,<sup>[1]</sup> respectively

**Database** - is an integrated collection of logically-related records or files consolidated into a common pool that provides data for one or more multiple uses

**Mac Address** – Media Access Control address, a hardware address that uniquely identifies each node of a network.

**Symbian OS** – is one of Nokia's mobile operating systems for mobile devices and smartphones, with associated libraries, user interface, frameworks and reference implementations of common tools, originally developed by Symbian Ltd.

**JSR 82 API** - The JSR-82 is the official Java Bluetooth API, which was standardized by the Java Community Process in 2002. It is an open and non-proprietary standard for developing Bluetooth

applications. The JSR-82 API hides the complexity of the Bluetooth protocol stack, by exposing a simple set of Java API's.

**CLDC** - Is a specification of a framework for Java ME applications describing the basic set of libraries and virtual-machine features that must be present in an implementation. The CLDC is combined with one or more profiles to give developers a platform for building applications on embedded devices with very limited resources such as pagers and mobile phones.

**MIDP** - is a specification published for the use of Java on embedded devices such as mobile phones and PDAs. MIDP is part of the Java Platform, Micro Edition (Java ME) framework and sits on top of Connected Limited Device Configuration (CLDC), a set of lower level programming interfaces.

**Adobe Flex** - is a software development kit (SDK) released by Adobe Systems for the development and deployment of cross-platform rich Internet applications based on the Adobe Flash platform. Flex applications can be written using Adobe Flash Builder or by using the freely available Flex compiler from Adobe.

**WAMP** - are packages of independently-created programs installed on computers that use a Microsoft Windows operating system.