

**ATTENDANCE MANAGEMENT SYSTEM USING FINGERPRINT
SCANNER**

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This report is submitted in partial fulfillment of the requirements for the award of Bachelor of Electronic Engineering (Telecommunication Electronics) With Honours.

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SCANNER
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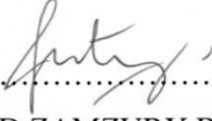
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To my beloved father, Abdullah Sani Bin Din and beloved mother, Latifah Binti
Hamzah.

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ABSTRAK

Projek ini adalah mengenai merekabentuk serta membangunkan sistem merekod dan mengesan kehadiran pelajar berasaskan pengenalanpastian cap jari yang membolehkan memantau kehadiran pelajar secara elektronik. Ia sekaligus dapat mengurangkan banyak masalah serta menggantikan sistem manual sedia ada yang menggunakan kertas. Sistem ini akan dibangunkan dengan menggunakan antaramuka bergrafik yang lengkap dengan menggunakan program aturcara *Microsoft Visual Studio 2005*. Ia akan diintegrasikan dengan *Microsoft Fingerprint Reader*.

ABSTRACT

This project is about the design and develops a reliable attendance tracking and recording system based on biometric fingerprint identification that can be used to monitor attendance of student. It will eliminate much of the problems and manual work associated with paper based systems. This system will be developed with extended GUI by using Microsoft Visual Studio 2005 and integrate with Microsoft Fingerprint Reader.

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LIST OF ABBREVIATION

ADO	-	ActiveX Data Objects
ASP	-	Active Server Pages
ATL	-	Active Template Library
ATM	-	Automated Teller Machine
CCD	-	Charge Coupled Devices
CLI	-	Common Language Infrastructure
COM	-	Component Object Model
CSV	-	Comma-Separated Values
DLL	-	Dynamic Link Library
FTP	-	File Transfer Protocol
GUI	-	Graphical User Interface
ID	-	Identification
IDE	-	Integrated Development Environment
IIS	-	Internet Information Services
MFC	-	Microsoft Foundation Classes
MDI	-	Multiple Document Interface
PC	-	Personal Computer
SDK	-	Software Development Kit
SMKP	-	<i>Sistem Maklumat Kedatangan Pintar</i>

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CHAPTER I

INTRODUCTION

This chapter will explain about the introduction of the project, the objectives of the project, problem statement and also the scope of the work.

1.1 Introduction

The aim of this project is to develop a reliable attendance tracking and recording system based on biometric fingerprint identification that can be used to monitor attendance of student. The system can automatically acquire, store and calculate the student's data and attendance into a personal computer, PC or laptop. The main purpose of this project is to monitor the student attendance in lecture, tutorial and laboratory sessions in more efficient way. This project will only involve the development of the software. This system will integrate with Microsoft Fingerprint Reader or other fingerprint reader that available in the market. It will be developed with extended graphical user interface, GUI by using Microsoft Visual Studio 2005 with user-friendly interface so that every lecturer will use this system without many problems.

1.2 Objective

The objective of this project is to design and develop user-friendly attendance management system that can be implemented in this universities' student attendance. It can record the students' basic personal information and monitor the students' attendance. This will prevent cheat in students' attendance. This system will be able to print the attendance report and analyze the percentage of attendance.

1.3 Problem Statement

At the moment, the current system in lecture or lab session, lecturer will hand out the student's name list to sign in for student who attends that class. Cheat in student attendance is frequently and easily happened. For example, another student signed his/her friend's attendance. So, to prevent this problem, it is ideal to develop the attendance management system using biometric fingerprint recognition that will monitor and record the attendance of every student in class. The barcode is easy to produce and duplicate, but fingerprint is unique for everyone. So, this system is not developed based on current barcode system in student's smart card.

1.4 Scopes of Work

Generally, all projects have their own scope or limitation as a guideline.

Table 1.1 below shows the project scope for implementation this project.

Table1.1: Scope of Work

Research:	Research on biometric fingerprint algorithm.
	Get familiar with Microsoft Visual Studio 2005 software.
Design:	Design the user-friendly interface with extended GUI using Microsoft Visual Studio 2005 [1] programming language.
	Include the basic personal information database i.e. full name, matrix number, course, section, group etc.
Develop:	Develop the fully functional software that can work on Microsoft Windows platform.
	Test the flexibility and performance of the system.

1.4.1 Hardware

Basically this project does not involve the development of hardware. The software is integrated with Microsoft Fingerprint Reader through USB interface. Using the Microsoft Fingerprint Reader, the GrFinger Software Development Kit (SDK) toolbox provided by the Griaule (will explain the detail later) can be used as a key to retrieve the user IDs and passwords for logging into these system. Figure 1.1 shows the picture of Microsoft Fingerprint Reader that had used to integrate with this system.



Figure 1.1: Microsoft Fingerprint Reader

1.4.2 Software Development

Software development includes design the GUI using Microsoft Visual Basic 2005. This programming language is used to integrate with the Microsoft Fingerprint Reader as an input. To make this reader to communicate with Microsoft's .NET Framework, the *GrFingerXCtrl Class* toolbox provided by Griaule is used. This SDK are get by downloading from Griaule official website.

CHAPTER II

LITERATURE REVIEW

Every project has a literature review and background study of the project. This chapter will explain about the platform and all tools that have been used to build this project. That is included Microsoft Visual Studio 2005 as a system development platform, Microsoft Fingerprint Reader as a hardware used, the explanations about fingerprint itself and also an example of attendance system that already had been used in real time.

2.1 Background Study

As explained earlier, this project only involves the development of software only. This chapter contains the literature review of the project. It consists of the review of the programming language that have used and how it can integrate with the hardware (Microsoft Fingerprint Reader), the GrFinger Software Development Kit (SDK), and the assessment of fingerprint

2.2 Literature Review

This literature review includes the review of Microsoft Visual Studio 2005, GrFinger Software Development Kit (SDK), ActiveX control, fingerprint, Optical Scanner and Capacitive Scanner.

2.2.1 Microsoft Visual Studio 2005

Microsoft Visual Studio is Microsoft's flagship software development product for computer programmers. It centers on an integrated development environment which lets programmers create standalone applications, web sites, web applications, and web services that run on any platforms supported by Microsoft's .NET Framework (for all versions after Visual Studio 6). Supported platforms include Microsoft Windows servers and workstations, PocketPC, Smartphones, and World Wide Web browsers [2]. Visual Studio includes the following:

- Visual Basic (.NET)
- Visual C++
- Visual C#
- Visual J#
- ASP.NET

Express editions of Visual Studio have been released by Microsoft for lightweight streamlined development and novice developers. The Express editions include:

- Visual Basic (.NET) 2005 Express Edition
- Visual C# 2005 Express Edition
- Visual C++ 2005 Express Edition
- Visual J# 2005 Express Edition
- Visual Web Developer 2005 Express Edition

Visual Studio 2005, codenamed Whidbey (a reference to Whidbey Island in Puget Sound), was released online in October 2005 and hit the stores a couple of weeks later. Microsoft removed the ".NET" moniker from Visual Studio 2005 (as well as every other product with .NET in its name), but it still primarily targets the .NET Framework, which was upgraded to version 2.0. Visual Studio 2005's internal version number is 8.0 while the file format version is 9.0. Microsoft released service Pack 1 for Visual Studio 2005 on 14 December 2006 [3].

Visual Studio 2005 was upgraded to support all the new features introduced in .NET Framework 2.0, including generics and ASP.NET 2.0. The IntelliSense feature in Visual Studio was upgraded for generics and new project types were added to support ASP.NET web services. Visual Studio 2005 also includes a local web server, separate from IIS, that can be used to host ASP.NET applications during development and testing. It also supports all SQL Server 2005 databases. Database designers were upgraded to support the ADO.NET 2.0, which is included with .NET Framework 2.0. C++ also got a similar upgrade with the addition of C++/CLI which is slated to replace the use of Managed C++.

Other new features of Visual Studio 2005 include the "Deployment Designer" which allows application designs to be validated before deployments, an improved environment for web publishing when combined with ASP.NET 2.0 and load testing to see application performance under various sorts of user loads.

Figure 2.1 shows the splash screen when loading the Microsoft Visual Studio 2005 Professional Edition.

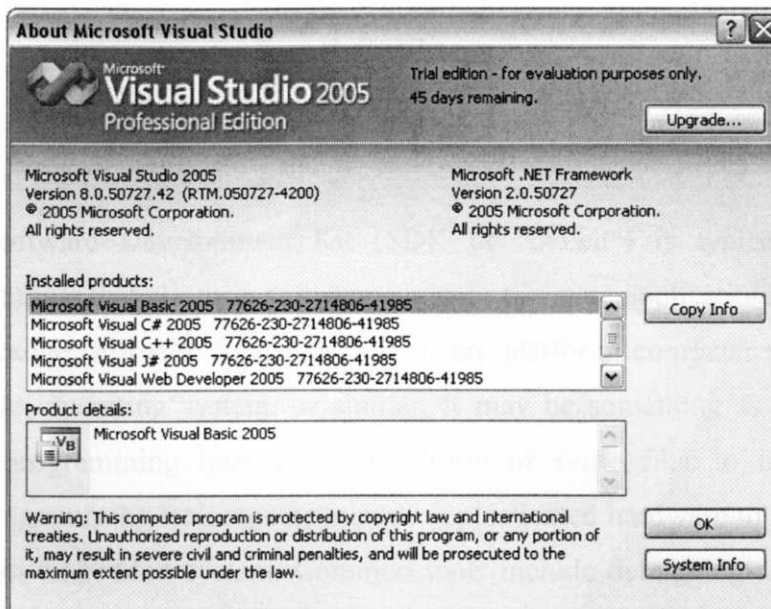


Figure 2.1: Microsoft Visual Studio 2005

2.2.2 GrFinger SDK

Biometric recognition is one of the most reliable ways to confirm the identity of an individual. And by now, many people are undoubtedly familiar with the Microsoft Fingerprint Reader. Besides logging into a computer using a fingerprint scan from the reader, you can also use the application provided by the Fingerprint Reader to save your user IDs and passwords for web sites that require them. You can then use your fingerprint as a key to retrieve the authentication information to log in securely, thereby eliminating the hassle of remembering different sets of passwords for different sites.

Griaule [4] provides the GrFinger Suite (Figure 2.2), a fingerprint recognition suite that comes with an SDK for integrating fingerprint readers into the applications. It works with Microsoft Fingerprint Reader, Digital Persona U.are.U 4000, SecuGen Hamster FDU02, Geomok (Testech) Bio-I, and Crossmatch USB Fingerprint Readers. GrFinger also provide outstanding matching speed: with a blazing fast matching speed of 35,000 fingerprints per second. GrFinger also supports multiple programming languages including Java, Delphi, Visual Basic, C++, .NET, FoxPro and many others. Both ActiveX and DLL components are available to use.