

# **THE FINGERPRINT DATABASE SYSTEM**

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To my beloved parents, family, fellow friends and supervisor, thanks for all supports in successfully producing this projects.

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## ABSTRACT

The project is to recognize fingerprint images and match within the database. The database system will be created using a Microsoft Visual Studio (VB.Net) together with Microsoft Access. A connection need to be established between the fingerprint devices with the database system. The database will contain the information of the students likes a name, matrix number, IC number, course and the year of studies The connection between device and system will require a programming code and a third particular software which is called Software Development Kit (SDK).The objective of the project is to create a database system and link the database to the fingerprint device. This project is basically to enhance the security in attendance system. It will be used to overcome the falsify signature between the student. This project will use a Microsoft Fingerprint Reader that is manufactured from Microsoft Company. The successful of this project is when the exactly information of the student appear during the fingerprint scanning process.

## ABSTRAK

Projek ini adalah untuk mengenalpasti gambar cap jari dan padankan cap jari tersebut dengan pangkalan data. Sistem Pangkalan Data akan dibina dengan menggunakan program Microsoft Visual Studio (VB.NET) bersama-sama dengan program Microsoft Access. Alat pengesan cap jari akan dihubungkan dengan sistem pangkalan data yang telah direka. Sistem pangkalan data mengandungi maklumat seperti nama pelajar, nombor matrik, nombor kad pengenalan, kursus yang di ambil dan tahun pengajian. Proses menghubungkan pangkalan data dengan alat pengesan cap jari akan memerlukan sistem program dan juga perlu menggunakan program bantuan ketiga iaitu Software Development Kit (SDK). Objektif projek ini adalah untuk membuat sistem pangkalan data dan hubungannya dengan alat pengesan cap jari. Projek ini dijalankan untuk meningkatkan sistem keselamatan dalam kehadiran pelajar. Projek ini akan menangani masalah penipuan tandatangan di kalangan pelajar. Projek ini akan menggunakan alat pegesan jap jari jenis Microsoft Fingerprint Reader yang dicipta dan dikeluarkan oleh syarikat Microsoft. Projek ini akan dikatakan berjaya sekiranya informasi yang tepat tentang pelajar tersebut yang disimpan dalam sistem pangkalan data dipaparkan semasa proses pegesanan cap jari dijalankan.



## TABLE OF CONTENT

CHAPTER	TOPIC	PAGE
	PROJECT TITLE	i
	PSM II REPORT STATUS	ii
	DECLARATION	iii
	SUPERVISOR APPROVAL	iv
	DEDICATION	v
	ACKNOWLEDGEMENT	vi
	ABSTRACT	vii
	ABSTRAK	viii
	TABLE OF CONTENT	ix
	LIST OF TABLE	xii
	LIST OF FIGURE	xiii
	LIST OF APPENDIX	xv
<b>I</b>	<b>INTRODUCTION</b>	
	1.1 Project overview	1
	1.2 Objectives	2
	1.3 Problem statement	2
	1.4 Scope of work	3
	1.4.1 Software	4
	1.4.2 Hardware	5
	1.5 Methodology introduction	5
	1.6 Structure of report	6

## **II LITERATURE REVIEW**

<b>2.1</b>	<b>Microsoft Visual Studio 2005</b>	<b>8</b>
<b>2.2</b>	<b>Software Development Kit (SDK)</b>	<b>11</b>
	<b>2.2.1 Key features</b>	<b>12</b>
<b>2.3</b>	<b>Microsoft Fingerprint Reader</b>	<b>13</b>
	<b>2.3.1 Functionality</b>	<b>14</b>
<b>2.4</b>	<b>Fingerprint</b>	<b>14</b>
	<b>2.4.1 Fingerprint used for identification</b>	<b>15</b>
	<b>2.4.2 Fingerprint classification</b>	<b>17</b>
	<b>2.4.3 Process of Fingerprint Identification</b>	<b>18</b>
<b>2.5</b>	<b>Example of Attendance Management System</b>	<b>20</b>
	<b>2.5.1 System features</b>	<b>20</b>
	<b>2.5.2 Development of Attendance System</b>	<b>24</b>

## **III PROJECT METHODOLOGY**

<b>3.1</b>	<b>Project methodology</b>	<b>25</b>
	<b>3.1.1 Research about the project</b>	<b>26</b>
	<b>3.1.2 Develop interface</b>	<b>27</b>
	<b>3.1.2.1 Making a database</b>	<b>30</b>
	<b>3.1.3 Find suitable fingerprint device</b>	<b>33</b>
	<b>3.1.4 Establish connection</b>	<b>33</b>
	<b>3.1.4.1 Coding application</b>	<b>33</b>
	<b>3.1.5 Testing result</b>	<b>37</b>

<b>IV</b>	<b>RESULT AND DISCUSSION</b>	
4.1	GUI (Graphic User Interface)	39
4.1.2	Login Form	39
4.1.3	Menu option	41
4.1.4	Attendance form	42
4.2	Database	48
4.3	Log files	50
4.4	Discussion	51
<b>V</b>	<b>CONCLUSION AND RECOMMENDATION</b>	
5.1	Conclusion	53
5.2	Recommendation	54
	<b>REFERENCES</b>	<b>56</b>
	<b>APPENDIXES</b>	<b>57</b>

**LIST OF TABLES**

<b>NO</b>	<b>TITLE</b>	<b>PAGE</b>
Table 2.1	Feature for Fingerprint SDK	13
Table 2.2	Process of identification	18

**LIST OF FIGURES**

<b>NO</b>	<b>TITLE</b>	<b>PAGE</b>
Figure 1.1	Microsoft Fingerprint Readers	5
Figure 2.1	The relationship of various Visual Studio Editions	9
Figure 2.2	Microsoft Visual Studio 2005	10
Figure 2.3	The SDK Logo	11
Figure 2.4	Microsoft Fingerprint Reader	13
Figure 2.5	Pattern of fingerprint	15
Figure 2.6	Image Processing	16
Figure 2.7	Identification of Fingerprint	16
Figure 2.8	Classifying fingerprints	17
Figure 2.9	FingerFlex	20
Figure 2.10	Form of excuses	21
Figure 2.11	Friendly User Interface	21
Figure 2.12	Flexible scheduling time	22
Figure 2.13	Monitoring Attendance	22
Figure 2.14	Print the attendance	23

Figure 3.1	Project flow charts	25
Figure 3.2	Window Application	27
Figure 3.3	Toolbox	28
Figure 3.4	Login Form	28
Figure 3.5	Menu Form	29
Figure 3.6	Registration form	29
Figure 3.7	Enroll table	30
Figure 3.8	Information in database	30
Figure 3.9	Create database and converting	31
Figure 3.10	Data source configuration wizard	31
Figure 3.11	Adding the source file (Microsoft Access file)	32
Figure 3.12	Database added as source form	32
Figure 3.13	Adding the GrFingerXCtrl	34
Figure 3.14	Adding libraries	34
Figure 3.15	Log files (CSV)	35
Figure 3.16	Programming flow chart	37
Figure 4.1	Login Form GUI	40
Figure 4.2	Login Form Failed	40
Figure 4.3	Login Form Successful	41
Figure 4.4	Main Menu Option GUI	42
Figure 4.5	The Attendance Form	43
Figure 4.6	User's fingerprint are not found in database	44
Figure 4.7	Fill the information needed	45
Figure 4.8	User added successfully message	46
Figure 4.9	Clear display after storing process	47
Figure 4.10	Fingerprint Recognition	48
Figure 4.11	Example of Database	49
Figure 4.12	Database of the Attendance system	49
Figure 4.13	Log scanning status	50

**LIST OF APPENDIX**

<b>NO</b>	<b>TITLE</b>	<b>PAGE</b>
Appendix A	Util.vb coding	57
Appendix B	DB.vb coding	63
Appendix C	Application /Attendance Form	67
Appendix D	Login form coding	73
Appendix E	Menu option form	74

## CHAPTER 1

### INTRODUCTION

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

#### 1.1 Project overview

Biometric is the science and technology of authentication (i.e. establishing the identity of an individual) by measuring the person's physiological or behavioral features. The term is derived from the Greek words "*bios*" for life and "*metron*" for degree. In Information Technology (IT), biometrics usually refers to technologies for measuring and analyzing human physiological characteristics such as fingerprints, eye retina and irises, voice patterns, facial patterns and hand measurements especially for authentication purpose. Examples of behavioral characteristic which can be measured include signature recognition, iris recognition, face recognition and voice recognition.

The Fingerprint Database System is also one of the project that using this biometric technology for authentication purpose. This project is a combination of software and hardware. The hardware is referring of the device that is using for fingerprint recognition while the software here is referring for a system that is built for some application.



The application that is build for this project is an *Attendance System*. The application will required to create a database first where all the information are stored within it. Name, matrix number and the course of the student is the information that will be stored in database. In order creating the system, a programming codes is needed and the software that been use for this project is Microsoft Visual Studio, while the database is created by using Microsoft Access. The system must be a friendly user and not to difficult in handle the system.

The system will do two main tasks which are the first ones is to store the information in the database together with the fingerprint of the user. And the second task is the system must be able to retrieve the information from the database and show it correctly. The fingerprint must match accurately with the information of the user and must recognize it. The hardware that represent for this project is the Fingerprint Images Scanner Device. The device will utilize with the system that are created. There will be a program to be design to link the hardware with the system. The program also required a software development kit (SDK) to make the connection established with the hardware.

The project is basically a simple of Attendance System in order to show the system that required the database. There are many other application system that are using the database system and mostly for authentication purpose. The system is not limited for the students only but also can be applied for company security system.

## **1.2 Objectives**

The objective of this project is to develop a database system using Microsoft Visual Studio (.NET) and Microsoft Access. The connection will be established between the database and device (Fingerprint Images Scanner Devices).The connection between the device and database system will be accomplices by using Software Development Kit (SDK).The system matched the information that store in database with the particular fingerprint when the student using the device.

### **1.3 Problem statement**

The universities still using a signature for attendance and this is not very efficient. This is because the students still faking the signature and sign for their friend. This is frequently happen and this kind of method also wasting time. Therefore, the attendance system needs to be improved in other to solve this problem.

The fingerprint recognition is more efficient than the current security, passwords and authorization features. The fingerprint recognition already applied in many state for an official task such as a driving school license, bank security system and many more. In addition, the application of this project can also been applied for student's class attendance. This fingerprint system is still considered as inexpensive and the effective ones because easy to apply and systematic.

Using this fingerprint method will make sure that students attend the class and there will be no more falsify of the signature. This Fingerprint Database System also can be applied during the final exam. This technique is more efficient in order to check the list of students that going to take the test. The database is an ideal way because its will provide with all the information of the student. Furthermore, this database can be add and delete information easily under an authorized person only.

### **1.4 Scope of work**

The scope of this project is to develop the Attendance Management Systems using Fingerprint Scanner by using Microsoft Visual Studio 2005 software integrated with 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. Through this project, the research of biometric fingerprint algorithm will be explored widely. Besides that, Microsoft Visual Studio 2005 programming language with extended GUI will be use as an interface for design program. The design program includes the basic personal information database.

The scope of the project is to create a database system and utilize with the Fingerprint Image Scanner Device. The database will be create using Microsoft visual Studio and connected with the device using a software development kit (SDK).

The scope of the project is definitely for the chosen brand of Fingerprint device. The manufacturer of the fingerprint device is limited for Microsoft Fingerprint Reader. The database is cannot be claims as universal and cannot be used with the different brand of fingerprint device. The system is basically a direct identification and cannot be done via wireless. The scope of the project can be divided into software and hardware.

#### **1.4.1 Software**

Software development includes design the graphic user interface (GUI) using Microsoft Visual Basic. The GUI that needs to be developed was the login form, main menu, registration menu and other related menu to make the system a user friendly. 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.

Visual Basic is designed to allow the program run under the windows without the complexity generally associated with windows programming. The design screen can holds standard windows button such as command buttons, check boxes, option buttons, and text boxes and so on. Each of these windows object, operates as expected, producing a “standard” windows user interface. Visual Basic that recently appears as one of the most popular programming language is chose. It provided standard windows object and graphic user interface that will make the program become user friendly.

### 1.4.2 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 toolbox provided by Griaule can be used as a key to retrieve the user IDs and passwords for logging into these systems.



Figure 1.1: Microsoft Fingerprint Reader

### 1.5 Methodology Introduction

There are many phase in order to finish the project and achieve all the objectives. The first phase is focusing in software development, where there will be need in create a database system. The database system that contain the information of the students whether its will be a name, matrix number, year and course been taken. The database is needed to be creating using a program.

For the second phase, the project will proceed in configuration the device. The device which is a fingerprint image scanner device is been used. The problem that might occur during the process is whether the database can utilize with the device. If there are something error within the database that make it cannot work with the device. The process will move to the previous step by checking the programming if there any error and try to fix it.

The last phase after the connection between the database and the device has already established. The first time will be a set for the information which means to match the record in database with the right fingerprint. Then, the Identification Number will be set based of the fingerprint and for the next time when using the fingerprint, the database will match with the right database.

## **1.6 Structure of report**

Generally, this report contains of five main chapters. Those five chapters are start with Introduction, Literature Review, Methodology, Results & Discussion and end with Conclusion & Suggestion. In first chapter, the report is about the overview of the whole project and what is the benefit of this project. There also consist of the main objective in doing this project and how to implement this project.

The second chapter is more about research that have been conducted to the topic that related with this project. Its will include about the software and hardware that is been used for this project. Every facts and information which are found from any source will be compared and the better method will be chosen based from the information.

The third chapter is about the process in making this project. Its will start from studying of the project and process in doing this project whether in coding a program or utilize the hardware. The Result and Discussion will consist of the progress for the project. There will be two phase for the project and this chapter will state the progress of the project.

The last chapter is going to be a conclusion and recommendation. This chapter is contains a suggestion for the project. The upgrading for the project will also been state in this chapter. There will also a project planning for the project that been discuss in this chapter. All this chapters will be separated in sequences in order to give view for readers.

## CHAPTER 2

### LITERATURE REVIEW

#### 2.1 Microsoft Visual Studio 2005

Microsoft Visual Studio is the main Integrated Development Environment (IDE) from Microsoft. It can be used to develop console and Graphical user interface applications along with Windows Forms applications, web sites, web applications, and web services in both native code as well as managed code for all platforms supported by:

- Microsoft Windows
- Windows Mobile
- NET Framework
- .NET Compact Framework
- Microsoft Silverlight

Visual Studio includes a code editor supporting IntelliSense as well as code refectory. The integrated debugger works both as a source-level debugger and a machine-level debugger. Other built-in tools include a forms designer for building GUI applications, web designer, class designer, and database schema designer. It allows plug-ins to be added that enhance the functionality at almost every level including adding support for source control systems to adding new toolsets like editors and visual designers for specific languages.

Visual Studio supports languages by means of language services, which allow any programming language to be supported by the code editor and debugger. Its also provided a language-specific service has been authored include:

- C/C++ (via Visual C++)
- VB.NET (via Visual Basic .NET)
- C# (via Visual C#).

It also supports XML/XSLT, HTML/XHTML, JavaScript and CSS. Language-specific versions of Visual Studio also exist which provide more limited language services to the user. These individual packages are called Microsoft Visual Basic, Visual J#, Visual C#, and Visual C++.

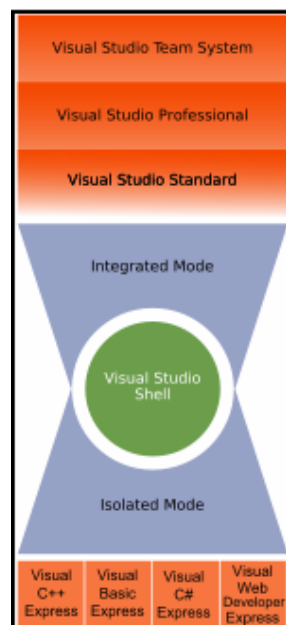


Figure 2.1: The relationship of various Visual Studio Editions

Visual Studio .NET can be used to make applications targeting Windows (using Windows Forms, part of the .NET Framework), Web (using ASP.NET and Web Services) and, with an add-in, portable devices (using the .NET Compact Framework).