“I declare that I have read the thesis and approve that this thesis has fulfilled the scope and quality criteria for the Degree of Bachelor in Computer Science”

Signature : ____________________

Name : Miss Marina Binti Arshad

Date : 3 July 2009
A report submitted to the Faculty of Computer Science and Information System in partial fulfilment of the requirement for the award of Bachelor Degree in Computer Science.
“I declare that the content of this thesis is my original work with the exclusion of references that has been appropriately acknowledge/cited”

Signature : __________________

Name      : Vijay S/O Vasanthakumaran

Date      : July, 2009
Dedicated to my beloved father and mother.
I would always cherish the love and support you have shown to me.
ACKNOWLEDGEMENTS

In preparing this report, I was in contact with many people, researches, academicians, and practitioners. They have contributed towards my understanding and thoughts. As a token of appreciation, I would like to dedicate this page to them.

Firstly, I would like to acknowledge the guidance and support from the project supervisor, MISS MARINA MD. ARSHAD and also MR. NOH throughout the process.

I would like to express my deep gratitude to the research team, post graduate students, staffs and technicians for their assistance and willingness to impart knowledge. The effort of those who were directly or indirectly involved in contributing the successfulness of this project is also gratefully acknowledged.

Lastly, a special thanks to family and friends, especially for all the care and support given during the course of my report.
ABSTRAK

Projek yang bertajuk “STAFF PANEL CLINIC REGISTRATION SYSTEM USING FINGERPRINT AUTHENTICATION” ini merupakan sistem yang dibangunkan untuk kesemua staf di FSKSM. Projek ini dibangunkan untuk menyelesaikan masalah untuk mendaftar and menyimpan rekod berkenaan dengan klinik panel staf di FSKSM yang dijalankan secara manual sebelum ini dan untuk menyelesaikan masalah yang timbul akibat kehilangan rekod staf. Tujuan utama projek ini dicadangkan untuk membantu pengguna untuk menyimpan rekod mengenai klinik panel mereka dan dapat mengubah panel klinik mereka dengan cepat dan mudah. Selain daripada itu, sistem ini juga memudahkan pengguna untuk menyimpan segala informasi mereka dengan selamat kerana sistem ini menggunakan pengesanan cap jari sebagai katalaluan ke sistem ini. Bagi pihak pengurusan juga, sistem dapat menyimpan kesemua rekod tentang kesemua staf yang menggunakan sistem ini. Metodologi pembangunan prototaip evolusi telah dipilih untuk membangunkan projek ini. Alatan pembangunan projek yang digunakan pula adalah *Microsoft Windows XP Profesional, Adobe Photoshop, Internet Explorer, My SQL, Macromedia Dreamweaver MX dan alat pengesanan cap jari UPEK*. Bahasa pengaturcaraan yang dipilih adalah *ASP.NET* di mana ia dapat menyokong alatan pembangunan yang telah dinyatakan. Diharapkan dengan pembangunan sistem ini dapat memenuhi kehendak pengguna dan seterusnya menjadi alternatif terbaru kepada pihak organisasi dalam menangani masalah penyimpanan rekod.
ABSTRACT

This “STAFF PANEL CLINIC REGISTRATION SYSTEM USING FINGERPRINT AUTHENTICATION” (SPCRS) is developed for all FSKSM staffs. The Staff Panel Clinic Registration System is a project proposed to solve the difficulties faced by the staffs in FSKSM to keep track on their panel clinics information. The lecturers find it inconvenient to keep the information manually through a card given to them. The main objective of the SPCRS is to provide the users with an easy way to maintain their panel clinic information. Besides that, the system also provides the administrator the means to keep track of their users personal records. Regarding to the management department, the system could help them in such a way that it could contain all the users’ record in it. The methodology chosen for developing the system is the evolitional prototyping approach. The recommended project development tools are Microsoft Windows XP Professional, Adobe Photoshop, Internet Explorer, My SQL, Macromedia Dreamweaver MX and UPEK fingerprint scanner. The programming language used is ASP.NET where it can support the use of the distinct tools. Hopefully, the development of this system, it could satisfy the needs of the FSKSM staff and it could be a new alternative for them to keep track on their records.
<table>
<thead>
<tr>
<th>CHAPTER</th>
<th>CONTENT</th>
<th>PAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACKNOWLEDGEMENTS</td>
<td>ii</td>
<td></td>
</tr>
<tr>
<td>ABSTRAK</td>
<td>iii</td>
<td></td>
</tr>
<tr>
<td>ABSTRACT</td>
<td>iv</td>
<td></td>
</tr>
<tr>
<td>CONTENT</td>
<td>v</td>
<td></td>
</tr>
<tr>
<td>LIST OF TABLES</td>
<td>ix</td>
<td></td>
</tr>
<tr>
<td>LIST OF FIGURES</td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>LIST OF SYMBOL/ABBREVIATION/NOTATION/TERMS</td>
<td>xi</td>
<td></td>
</tr>
<tr>
<td>LIST OF APPENDICES</td>
<td>xii</td>
<td></td>
</tr>
</tbody>
</table>

1 INTRODUCTION 1

1.1 Introduction 1
1.2 Problem Bacground 2
1.3 Aim 3
1.4 The Importance of the Project 3
1.5 Objective 4
1.6 Scope 4
1.7 Summary 4

2 LITERATUTE REVIEW 5

2.1 Introduction 5
2.2 Research on the Existing System 5
2.3 Current Technology

2.3.1 Internet

2.4 New Technology to Apply

2.4.1 Biometric

2.4.2 USB Fingerprint Reader

2.4.3 Purpose of Biometric

2.5 Research on the Software and Programming Language

2.5.1 Microsoft Visual Studio.NET 2005

2.5.2 VB.NET Programming Language

2.5.3 Microsoft SQL Server 2005

2.7 Summary

3 METHODOLOGY

3.1 Introduction

3.2 Project Methodology

3.2.1 Initial Analysis Phase

3.2.2 System Analysis Phase

3.2.3 Design Phase

3.2.4 System Developing Phase

3.2.5 System Testing Phase

3.3 Methodology Justification

3.4 Hardware and Software Requirement

3.4.1 Hardware Requirement

3.4.1.1 Hardware Justification

3.4.2 Software Requirement

3.4.2.1 Software Justification

3.5 Work Schedule

3.6 Summary
4  INITIAL DESIGN

4.1 Introduction 24
4.2 Application System Design 25
4.3 System Design Model 26
  4.3.1 Use Case Diagram 29
  4.3.2 Flow Chart 29
4.4 System Sequence Diagram 31
4.5 Database Design 34
4.6 User Interface Design 36
  4.6.1 Fingerprint Interface 37
4.7 Summary 37

5  SYSTEM IMPLEMENTATION 38

5.1 Introduction 38
5.2 Implementation 38
  5.2.1 Login Component 39
  5.2.2 Clinic Component 40
  5.2.3 Add and Remove Clinic 40
  5.2.4 Database 41
  5.2.5 Fingerprint Enroll 42
    5.2.5.1 Fingerprint Verify 43
5.3 Testing 45
  5.3.1 White Box testing 46
  5.3.2 Black Box Testing 46
  5.3.3 SPCR Testing 47
5.4 Summary 48
1.1 Introduction

Currently there a lot of stories about the difficulties of keeping information or data on track in a lot of organizations. Nowadays there is a lot of hot news about finger print sensors. Now most of the organizations are using these technologies to keep their personal information and their database. There are many more other technologies like voice sensor and eye sensor. As for now, finger print sensor is being widely used compared to the other technologies that being stated up there because it is still new, but for the time being, finger print sensor is the widely used technology. By using finger print sensor, the user can be assured that the users information or data is secured because only the user can access their information or data and only his or her fingerprint can be used to access it. Fingerprint recognition or fingerprint authentication refers to the automated method of verifying a match between two human fingerprints. Fingerprints are one of many forms of biometrics used to identify an individual and verify their identity.

A biometric sensor, fingerprint sensor to be specific, also known as the fingerprint reader, is a fingerprint image capture device, the very front end of the biometric fingerprint
identification/verification module. The fingerprint sensor captures the fingerprint images, matches the uniqueness of each print read by the sensor and compares it to the one stored in its module or local system database. Types of fingerprint sensors are Static Capacitive Type 1, Static Capacitive Type 2, Dynamic Capacitive, Optic Reflexive, Optic Transmissive with Fiber Optic Plate, Acoustic (Ultrasound), Pressure Sensitive, Thermal Line, and Capacitive and Optical Line. All the types of the fingerprint sensors are generally known as optical, semiconductor, and ultrasound sensors. Among all the sensors, semiconductor sensors are considered to be low cost, optical sensors are considered to have a high degree of stability and reliability, while ultrasound sensors are very precise and fraud-free though expensive to implement.

1.2 Problem Background

Nowadays most of the organizations are having problems on keeping track of their information flow. Besides that, more and more organizations are having problems to update their database and keeping it up to the date. These problems mainly occur when the database is being input with new data. As for the problem, the discussion focused on the problems faced by the staffs in FSKSM. Most of the staffs working in FSKSM have their own panel clinic and they will have to choose three clinics out of hundreds of clinic to be their panel clinic. The problem arises when the staff needs to carry a medical card provided to them each and every time they go for a checkup in the clinic.

Besides that, there will be a big problem if the staff lost the medical card and it’s hard for them to keep track on their panel clinic information. So to solve the problem, there must be system developed to discard the medical card and to provide an easy solution for the staff to keep their information in a system.
As the technology is growing day by day the use of manual cards must be eliminated and we must provide an easy solution for the users to keep track on their personal records and it must be in a safe and secured environment.

1.3 Aim

Consequently, the purpose of this project is to implement new technology as biometric or fingerprint reader. To develop a fully functional SPCRS that will help the staff in FSKSM in registering their panel clinics. Besides that, the aim of this project is to decrease the usage of passwords and replace it with biometric devices.

1.4 Objective

There are several objectives of this particular project and that can be expected from the output of this project. The main objectives are as follows:

i. To design and develop the complete SPCRS with an easily understood user interface than can interact with the users well.

ii. To provide an alternative mode to register panel clinics which will eliminate the use of manual registration through a medical card provided to the staffs.

iii. To test the SPCRS with dummy inputs and data to correctly define the outputs.
1.4 Importance of the Project

The Staff Panel Clinic Registration System will be built for the staffs of FSKSM. It is hoped that it will bring ease and flexibility for the users. Below lists a few of the benefits of this system:

i. Easier for the staffs to register their panel clinics through web
ii. Prevent the use of manual card registration
iii. Prevent data loss
iv. Implement of new technology as biometric.

1.5 Scope

In this project, the main scope will be the fingerprint usage to enrol the users data. This fingerprint usage involves few categories of users where their information will be the main input of this project. The users will be the staffs in FSKSM, UTM. The data input for this project will be the data which will be used to develop the system in FSKSM, UTM. All the system development and analysis will be done in normal windows environment. There are some assumptions made such as the analysis is only specified to details of the staffs only. Another assumption is that even though in general there are a lot of functions that can be developed in this particular system, I will only implement the functions to update the database with new data and also to input the staffs personal information in the database as mentioned in section 1.2 earlier in this Chapter.
1.6 Summary

Fingerprint usage is being widely used in many sectors. The exact result of characteristics of users can be determined by using their fingerprints. Other information about literature review and methodology of project is in Chapter 2 and Chapter 3 respectively. Then, information on the initial design and conclusion of this project will be explained in Chapter 4 and Chapter 5 respectively.