PROJECT PART II REPORT

HOME ACCESS CONTROL AND SURVEILLANCE SYSTEM

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ABSTRACT

Home Access Control and Surveillance System is a new system to overcome the weaknesses of using keys or password to access the house. Generally this system is designed for home usage in monitoring house entrance and unique access control for authorised user. It is a whole integrated system which authorises users' access by using biometric (fingerprint) recognition and includes video surveillance to monitor and record on people that approach the house. This new proposes system can keep track on the owner in and out of house. System will auto interact with the incoming visitors through microphone and speaker, and allow them to leave the voice message to the owner while he/her is not inside the house. However, owner can also leave a voice message to the visitors. System will interact with visitor through voice command interaction where asking visitor certain limited question and recognised the right visitor on the leaving voice message by owner. Beside, system provided a reminder features to allow owner have a notify message in specific date and time to somebody. With an enhanced reminder, owner will be reminded for important events such as friends' birthday, important meeting, appointments, interviews, sport events, etc. For the security purpose, this system able to keep tracks the visitors' history such as voice and video records. In addition, this system provides powerful tool for owner to manage his/her own or family member profile and their friend lists. This new proposed system does not only overcome the house safety access problems but also adds convenient and useful features to help user in daily activity. This report includes analysis of current system, analysis of new system, object-oriented design diagram, and system design of new system.

CHAPTER 1
INTRODUCTION

1.1. Background of Contents / Organisation

In Malaysia's houses, bolt locks are very common on all exterior doors and windows. This provides basic security for houses with a lot of disadvantages such as possibility of duplication of lock keys and losing keys. And the locks also can be unlocked without the key and / or broken by someone.

Biometrics is the ability to automatically recognise a person using distinguishing traits such as fingerprints, retina or iris from eye, voice, or hand geometry. Each of these methods of recognition has advantages and disadvantages. The World Book Multimedia Encyclopaedia article on fingerprinting contains the following: "Fingerprints provide the most reliable method of identification because no person's print are identical to those of another individual. Even identical twins have different fingerprints. In almost all cases, fingerprints remain the same throughout a person's lifetime. The ridges on the fingertips change only as a result of surgery, disease, or an accident." Fingerprint scanning is one of the oldest biometrics techniques still in use today; using ultrasonic can identify the fingerprint. Most fingerprint scanners not only detect the print of the person, but can also detect whether or not the finger is actually dead or alive based on the body temperature and pulse rate.

I will implement biometrics fingerprint as identification tool to improve home security. The system will verify whether the person has an authorised access to the house. This system will also work together with other hardware such as camera, speaker, and microphone to increase the home security. User interaction with the system is done with the help of microphone or voice command and putting their finger in the reader for scanning. With the modern technology of security, we can leave in the safety life and protect your home from being robbed or entered by unexpected person.

1.2. Objectives

There are several objectives for this project but the main goal is to improve home access control with unique finger print identification and integrate with few devices such as web camera, finger print scanner, speaker and microphone.

- **Unique Entrance Access**

  Each human have own fingerprint and it is different from each other, which is no duplicated fingerprint for one people in the world.

- **Entrance Monitoring**

  All entrance record will be recorded by system while user goes in and goes out from the house included number of access attempt either success and failure. This allows user to trace back the record of home access.

- **Avoid Face To Face Communication Between Owner And Visitor**

  Owner able to know visitor instead to directly meet to unknown visitor with web camera surveillance that installed at entrance and owner can choose to communicate with visitor by microphone and speaker.

In this system it consists of:

- **Fingerprint Recognition**

  Access authorization is done by verifying the fingerprint on the reader and comparing it with the fingerprint record that has been enrolled in the database

- **Peer to Peer Communication**

  User can avoid face-to-face communication with the visitor by talking to them through microphone and speaker

- **Voice interaction** – To change the trend of interaction between system and user where allow user to control or interact with system via voice instead to use mouse or keyboard for input or selection; System able to pass information to user via voice instead to display the information on monitor's screen.

- **Camera Surveillance**– To maintain access entrance and visitor visit record for tracing purpose. Beside, to know more about visitor before communicate and outside situations before meet.

1.3. Functional and Technical Requirement of the System

Programming Languages for Front-End & Back-End Interfaces and System Engines

- Visual Basic .NET
- MySQL

Hardware Requirement

This new system will require three (3) units of PCs; one PC will be configured as server and two PCs as client.

- Microsoft Fingerprint Reader
- Microphone
- Speaker
- Web camera
- Network Interface Card
- Switch

Software Requirement

Development	Client
Microsoft Windows XP Professional SP2	
Microsoft Visual Studio .NET	.NET Framework
MySQL 1.4	
EMS MySQL Manager 3 Professional	
Griaule Fingerprint Recognition SDK	
MSDN Library Visual Studio .NET 2003	
Microsoft Office 2002 SP3	
Microsoft Project 2002	
Microsoft Visio 2002	
Microsoft Speech SDK version 5.1	