BIOMETRIC FINGERPRINT ATTENDANCE SYSTEM

A Project-II Report

Submitted in partial fulfillment of requirement of the

Degree of

BACHELOR OF TECHNOLOGY in COMPUTER SCIENCE & ENGINEERING

BY

Arwa Saifee

EN16CS301049

Under the Guidance of

Mrs. Priyanka Dhasal

Assistant Professor

Department of Computer Science & Engineering

Faculty of Engineering

MEDI-CAPS UNIVERSITY, INDORE- 453331

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Report Approval

The project work **"Biometric Fingerprint Attendance System"** is hereby approved as a creditable study of an engineering/computer application subject carried out and presented in a manner satisfactory to warrant its acceptance as prerequisite for the Degree for which it has been submitted.

It is to be understood that by this approval the undersigned do not endorse or approved any statement made, opinion expressed, or conclusion drawn there in; but approve the "Project Report" only for the purpose for which it has been submitted.

Internal Examiner

Name: Mrs Priyanka Dhasal

Designation

Affiliation

External Examiner

Name:

Designation

Affiliation

Declaration

I/We hereby declare that the project entitled **"Biometric Fingerprint Attendance System"** submitted in partial fulfillment for the award of the degree of Bachelor of Technology in 'Computer Science' completed under the supervision of **Mr Krishna Kumar Ajmera HOD of Engineering Department in IPCA Laboratories pvt. Ltd., Ratlam** is an authentic work.

Further, I declare that the content of this Project work, in full or in parts, have neither been taken from any other source nor have been submitted to any other Institute or University for the award of any degree or diploma.

Arwa Saifee

EN16CS301049

15/05/2020

Certificate

I, **Mrs. Priyanka Dhasal** certify that the project entitled **"Biometric Fingerprint Attendance System"** submitted in partial fulfillment for the award of the degree of Bachelor of Technology by **Arwa Saifee** is the record carried out by him/them under my/our guidance and that the work has not formed the basis of award of any other degree elsewhere.

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Without their support this report would not have been possible.

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Abstract

Institutions, companies and organisations where security and net productivity is vital, access to certain areas must be controlled and monitored through an automated system of attendance. Managing people is a difficult task for most of the organizations and maintaining the attendance record is an important factor in people management. When considering the academic institute, taking the attendance of non-academic staff on daily basis and maintaining the records is a major task. Manually taking attendance and maintaining it for a long time adds to the difficulty of this task as well as wastes a lot of time. For this reason, an efficient system is proposed in this paper to solve the problem of manual attendance. This system takes attendance electronically with the help of a fingerprint recognition system, and all the records are saved for subsequent operations. Staff biometric attendance system employs an automated system to calculate attendance of staff in an organization and do further calculations of monthly attendance summary in order to reduce human errors during calculations. In essence, the proposed system can be employed in curbing the problems of lateness, buddy punching and truancy in any institution, organization or establishment. The proposed system will also improve the productivity of any organization if properly implemented.

Keywords: Institution, Attendance, Biometric, Fingerprint

Table of Contents

List of Figures

List of Tables

Overview of IPCA Laboratories

For quite sixty years, Ipca has been controbuting attention globally in over one hundred twenty countries and in markets as numerous as Africa, Asia, Australia, Europe and also the US.

Ipca could be a fully-integrated Indian pharma producing over 350 formulations and eighty arthropod genus for varied therapeutic segments and additional.

IPCA is one amongst the world's largest makers and suppliers of over a dozen arthropod genus. These area unit made right from the fundamental stage at producing facilities inspected by the world's most discerning drug regulative authorities like US-FDA, UK-MHRA, EDQM-Europe, WHO-Geneva etc.

Ipca could be a medical care leader in Asian country for anti-malarials with a market-share of over 34% with a quick increasing presence within the international market. IPCA conjointly lead in DMARDs (Disease Modifying Anti-Rheumatic Drugs) treatment for autoimmune disease. IPCA have leading brands in five therapeutic areas, with three of our branded formulations being hierarchic among the Top-300 Indian brands by ORG-IMS. Our international consumer list includes world pharmaceutical giants like AstraZeneca, GlaxoSmithKline, Merck, Roche and Sanofi Aventis; most of whom they need been partnering over the years. At Ipca, quality assurance is Associate in Nursing angle of seeking property betterment in each side of their work.

APIs

Ipca has emerged collectively of India's prime exporters of arthropod genus with nearly twenty fifth of the turnover returning from arthropod genus. Regulated markets just like the USA, Canada, Europe and Australia conjointly account for seventy fifth of our API exports.

IPCA is one amongst the world's largest makers of arthropod genus like Tenormin (anti-hypertensive), antimalarial Phosphate (anti-malarial), diuretic (diuretic), anti-inflammatory salt (NSAID), Lopressor Succinate (anti-hypertensive), Lopressor salt (anti-hypertensive) and Pyrantel Salts (anthelmintic) - besides being one amongst the biggest suppliers of those arthropod genus worldwide.

For over twenty years, Ipca has been taking part in a lead role within the Indian arthropod genus market, each within the anti-malarial and anti-hypertensive therapeutic segments. IPCA is that the 1st manufacturer in Asian country for arthropod genus like Tenormin, Hydroxycholoquine salt, Morantel turn, PyrantelPamoate and Zaltoprofen.

IPCA’s domestic pharmaceutical customers embody pharmaceutical majors like Abbott, AstraZeneca, Bayer, Cipla, Dr. Reddy's, Merck, Pfizer, Ranbaxy, and Wockhardt.

Chapter-1
Introduction

1.1 Project Background

Employees attendance is very important since it will affect the employees working hours and salary. This project has related about the employees attendance system through the matching of their fingerprint to confirm their attendance. The main purpose of carrying out this project is to develop a hybrid employee attendance system for which desktop-based application is developed to obtain the attendance of employee by fingerprint and post/review the attendance results using web-based employee attendance system. As we know, there is one and only one fingerprint occurs in the world for each person which will never has duplication. So, fingerprint attendance system can be known as the best authentication to detect the individual student attendance record. In addition, according to the technology nowadays, it is not unusual anymore to take the attendance of students through their fingerprint.

Nowadays, most of the companies are still using the traditional attendance system which requires employee to sign on a piece of paper every time they came to the office. Using the traditional attendance system, we can obviously see that there are few problems such as it will be no backup for the attendance records once they accidentally lost the attendance sheet, hard in analyzing and tracking employee performances based on attendance factor. Hence, the purpose of carrying out this project is to prevent unwanted situation occur and to find out the problems that causes these problems as well as find the solutions to overcome these problems.

As a conclusion, using an electronicbased system is better than using a paper-based system in order to collect, process, store, and produce the attendance results and perform long-term analysis.

1.2 Motivation and Problem Statement

1.2.1 Motivation

The motivation to develop this project is to solve some problems that are currently occurring in every organization. This project purpose is to improve the current paper-based traditional attendance management system that is still in use by many companies, colleges and universities. From the observation, most of the problems found are normally caused by the use of traditional attendance system in these organizations. Therefore, a fingerprint-based employee attendance management system will be developed in order to solve these problems. The system is believed will be needed in order to improve the ways the organizations in managing their employee's attendance. Since most of the organizations still using the traditional attendance system, so, a bold assumption is made which most of the problems faced by these organizations are almost same. In addition, this project will be able to reduce the workload of every receptionist in key-in the employee's attendance records to the system at

every end of month since this system will record all employees' attendance accurately and automatically every day.

1.2.2 Problem Statement

- No backup for the attendance records once the receptionist accidentally lost the attendance sheet.
- Hard in analyzing and tracking employee performances based on attendance factor.

1.3 Project Objectives

In developing this system, some project objectives had been specified. The main purpose of this project is to improve the current existing employee attendance system that in use by most of the organization by develop a fingerprint-based employee attendance management system. Some objectives of this project had been identified and listed below.

- To replace the current existing employee attendance system process to fully computerized and automated employee attendance system.
- To develop a desktop-based application that obtains the employee fingerprint every time they attend the classes for attendance marking purpose.
- To develop a web-based employee attendance system in displaying every employee attendance results effectively.
- To generate reports regarding to the employee attendance in order to assist the staff in analyze and tracking the employee attendance for their salary.
- To provide easier method in evaluate and analyze the employee performance based on their attendance since the system will record the attendance more accurately and efficiently with minimum possible error.

1.4 Project Scope

The project scope of this project is to develop a hybrid employee attendance management system through the fingerprint scanning. In this project, desktop-based employee attendance system will be developed for a purpose just to obtain the fingerprint of employees who came to the office. In addition, web-based employee attendance system will be developed for purposes to display the attendance status/condition of every employee, generate reports related to the employee attendance, and etc. Besides that, proper planning will be carry on in order to perform this project by using the project methodology that had been chosen. Next, the employee attendance management system will only developed for managing the employee attendance status and allow staffs to easily analyze the information regarding the employee attendance. In other words, it means that this attendance system will only cover the functions related to employee attendance but not any others function related to another thing. So at the end of the project, a system will be developed which used for record the attendance of students more efficiently and effectively through the fingerprint scanning. The purpose to carry out this system is to overcome the current problems in their current attendance system facing by the organization, school, college, and university.

1.5 Project Module

a. Employee Module:

In the employee module, it allows the user to enter the information of all employee in a organizations. There is some functionality provided in the employee module which includes view employee records, enter new employee records, and update employee records. In this module, users will be allowed to set the status of the student to “Withdrawn”, “workers”, and “engineering department”. It is for the purpose to identify whether the employee is a withdrawn employee, workers, or engineering department employee. Information of employee will not be remove/delete and will be kept into the system as a employee history for future references.

b. Fingerprint Module :

In the fingerprint module, it is used to store the fingerprint of all the employee into the system for future matching . First of all, employee will require to registers their fingerprint into the system while first coming to the organization after successfully applies as a employee in that organization. Then, every time they came to the office, they will need to scan their fingerprint through the hardware provided within a department in order to do fingerprint matching with the fingerprint record that had been stored in the system. Attendance will be automatically signed by the system once the employees’ fingerprint match the fingerprint record in the system. If the fingerprint of the employee does not exist in the system while doing matching, system will prompt out message showing “Invalid fingerprint” whereas once the matching successful, system will also prompt out successful message showing “Attendance taken” to let the employee know.

c. Attendance Module :

In the attendance module, it is used to take the attendance of the employee who came to the organization. First of all, for those employees who late to office more than 15 minutes will be automatically deduct the salary by the system. It is because due to the organization’s policy, employees are considered late. So same to this system if following the employee’s policy, employee’s attendance will not be taken for those who late for more than 15 minutes. However, if the employee coming late with a reason and it is accepted by the head, the head will have the right to manually change the attendance status of the employee through the website provided.

Chapter-2

Proposed Method/Approach

2.1 Design Specification

Firstly, the methodology chosen in carry out this project is Evolutionary Prototyping which is one of the prototyping methodologies. Evolutionary prototyping can be referred to as a form of software development method in which an initial prototype is developed and refined through a number of cycles and lastly to the final complete system. The reason to implement the evolutionary prototyping methodology in this project is because it allows the developer continuously getting feedbacks and suggestions for system improvements of the prototype that had been presented to the user until the final system is delivered. Evolutionary prototyping had consist of four phases which includes initial concept, design and implement initial prototype, refine prototype, and deliver complete system.

There is some strength that can be found from the evolutionary prototyping methodology. Evolutionary prototyping can help developers to speed up their system development. In addition, evolutionary prototyping help in improve the quality of final product since it needs to undergo few prototypes and lastly to the final version after the overall functionalities and requirements met. Besides that, chances to increase the satisfaction of end-users in using the system will be high since every generated prototype is based on the requirement specified by the end-users.

However, there are some weaknesses that can be found from the evolutionary prototyping methodology. First of all, it is hard to predict the completion date and the cost of the project since requirement can be change from time to time based on the end-users requirement. In addition, if there is any uncertainty, it can cause the developer to feel frustrated due to the money, time, and effort sacrificed previously. Besides that, the behind code of the software may occur high chances to be damaged or poorly structured due to the frequent changes make to meet the requirement specified by the end-users from time-to-time.

2.2 Methodologies and General Work Procedures

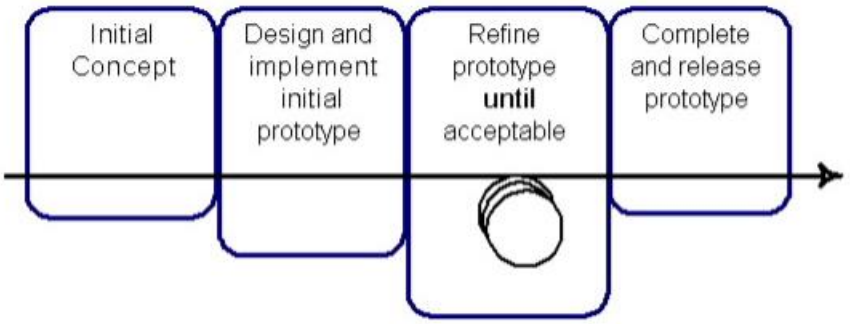

Figure 1: Evolutionary Prototyping Model

2.2.1 Initial Concept

During the first phase, there is a need to identify the all basic requirements in developing the system. The developer will come out with the creation of initial concept and identify the required materials that related to the project in this phase. Thus, the developer may need to gather the requirements by conducting survey to those who seem likely will involve in the system development such as lecturer, student, and etc. From the result obtained from the survey, the developer will identify the business plan as an initial input from the user in developing this system. Through the business plan, the developer will be able to specify and create the project plan regarding to the project. In addition, the established project plan will provide information to the developer which includes the schedule of the project, clear description of the project, and etc. At the end of this phase, the developer will need to come out with business plan, project plan, and a list of initial requirements from the users as an output for this phase. Therefore, the initial concept to replace the current existing student attendance system process to fully-computerized and automated student attendance system had been stated. So, one of the objectives had been stated in this phase.

2.2.2 Design and implement initial concept

In the previous phase, the developer had identified all the basic information which includes the business plan, project plan, and a list of initial requirements from the users. So, in this phase, the developer will perform the design activities and implement the initial concept in developing the system. First of all, the development of prototyping of the basic user interface will be established for a purpose to show to the users as to make sure that the development is moving toward the right direction. The established basic user interfaces will includes the interface of fingerprint student attendance system in order to provide the clear images to the users what the system will look like. At the same time, the developer will perform the initial system design analysis based on the listed requirements in this phase. After developing the interface and identified the initial system design, the user interface is created and show to the users for a purpose to let the users evaluate the prototypes of the interface of the system. Next, the developer will then record the feedback from the users after the evaluation and modify the requirements according to the information provided by the users in this phase. After all, the basic user interfaces developed in this phase are archived and will not be use anymore. At the end of this phase, the developer will need to come out with a list of validated requirements, system design, and evaluation and feedback from the users about the missing requirements and etc.

2.2.3 Refine prototype until acceptable

In the previous phase, the developer had come out with a list of validated requirements, system design, and evaluation and feedback from the users about the missing requirements. So, in this phase, the developer will modify the system design through the feedback and evaluation from the users at the previous phase. In the development of the first prototype, the developer will ensure that the development of the system has fulfilled the validated requirements and system design obtained from the users. In addition, the developer will also consider about the quality

of the system while developing it as well as perform operations such as program the system, perform debug activities, and test the system. Hence, the first prototype of the fingerprint attendance system is created. After that, the established first prototype of the system in this phase will be shown to the users for them to perform evaluation. After the evaluation of the first prototype, the developer will record down the new or modified requirements that stated by the users for a purpose as a review for next prototype development. This phase will be repeating again and again until the final set of requirements stated by the users is established. At the end of this phase, the developer will need to come out with a validated final set of requirements.

2.2.4 Complete and release prototype

In this phase, the developer will develop a complete student attendance system based on the validated final set of requirements obtained from the users. Then, the developer will implement the system and perform testing to the final system. After all the requirements met, the system will be delivers to the final users as the approved system with the needed functionality and quality built-in. Hence, the overall objectives/sub-objectives of the system will be met at the end of this phase. The current attendance system will be replaced by fully-automated and computerized student attendance system at the end of this phase. The hybrid fingerprint student attendance system will be achieved in the end of this phase. The report generation regarding to the student attendance will be available at the end of this phase.

Chapter-3

System Requirement Analysis

3.1 Information Gathering

3.1.1 Functional Requirements

- **Adding a new Employee:**

Function: Sign up a new employee to the system.
Requirements: To add a new user to the system, all of them have to registered in the admission office . On the first day, all the employees must scan their thumbs in their input device for only one time to save the fingerprint data in the registration office to sign up.

- **Use the system when employee came to the office:**

Function: Employee came to the office.
Requirements: When employees cme to the office, they must scan their thumbs in the fingerprint input device. If the scan matches, employees can enter the department.

- **Report Employees:**

Functions: The user will look at their reports for the current status.
Requirements: When the employees have enrolled in the office, they are able to check on their current attendance situation. In the system, they will be shown a page that gives them the whole attendance status in the month.

3.1.2 Non Functional Requirements

Non functional are properties and qualities the software system must possess providing its intended functional requirements.

- **Operational Requirements:** These requirements specify the environment in which the software will be running, including, hardware platforms, external interfaces and operating systems. This project is done using VB.NET and SQL Server in XP environment.
- **Performance Requirements**: These requirements specify possibly lower and upper bounds on speed, calculation of time and storage characteristics of the software. The attendance and payroll calculation time is minimized.
- Maintainability Requirements: These requirements specify the expected response time for dealing with various maintenance activities. The maintenance of the fingerprint attendance system is good.
- Security Requirements: These requirements specify the levels and types of security mechanisms that need to be specified during the operations of the system. The attendance system is highly securable as we use thumb impression.

3.2 Platform Specification

The Platform Specification is a specification published that describes the internal interfaces between different parts of computer software platform . This allows for more interoperability between firmware components from different sources.

3.2.1 Hardware Specification

The hardware environment in this system will use the Biometric Fingerprint Scanners. These scanners will play a role in the system. This device must be available in every department in the organization. Also, it must be in the registration office. The interfaces for the hardware part are the same in the registration office interfaces. This part of the interface has also other component such as Employees information, department information and other related information. All of these data are stored in the database and end with the device screen and web pages.

3.2.2 Software Specification

The system will use:

- Operating system : window 10
- IDE : Netbeans IDE7.2.1 for java and Mysql query browser
- Frontend: Java
- Back end : My - sql
- Server : SQL server
- Development kit : jdk - 6
- Browsers : Internet Explorer, Mozilla Firefox, Google Chrome, Safari.

Chapter 4
System Analysis and Design

To model a system, the most important aspect is to capture the dynamic behaviour. Dynamic behaviour means the behaviour of the system when it is running /operating**.**

Only static behaviour is not sufficient to model a system rather dynamic behaviour is more important than static behaviour

4.1 Use -Case Diagram

A UML use case diagram is the primary form of system/software requirements for a new software program underdeveloped. Use cases specify the expected behavior (what), and not the exact method of making it happen (how). Use cases once specified can be denoted both textual and visual representation (i.e. use case diagram). A key concept of use case modeling is that it helps us design a system from the end user's perspective. It is an effective technique for communicating system behavior in the user's terms by specifying all externally visible system behavior.

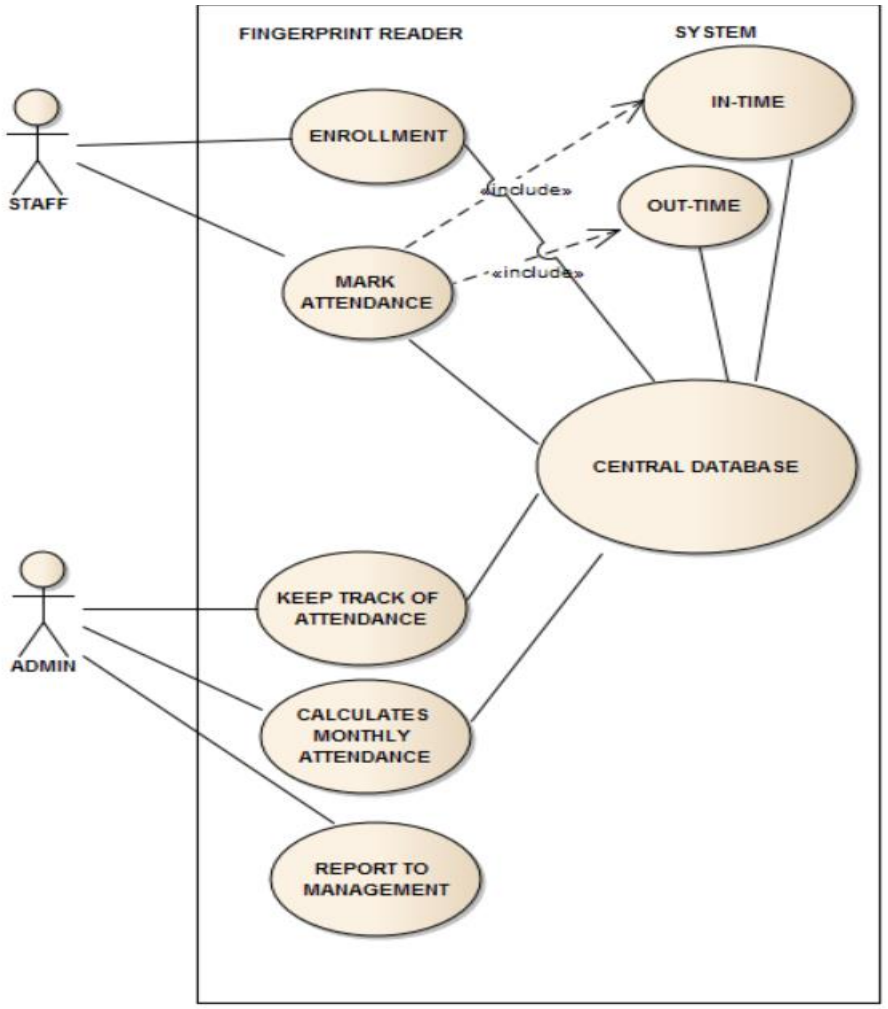

Figure 2: use case diagram

4.2 Sequence Diagram

A sequence diagram shows interaction among objects in terms of exchanges of messages arranged in time.

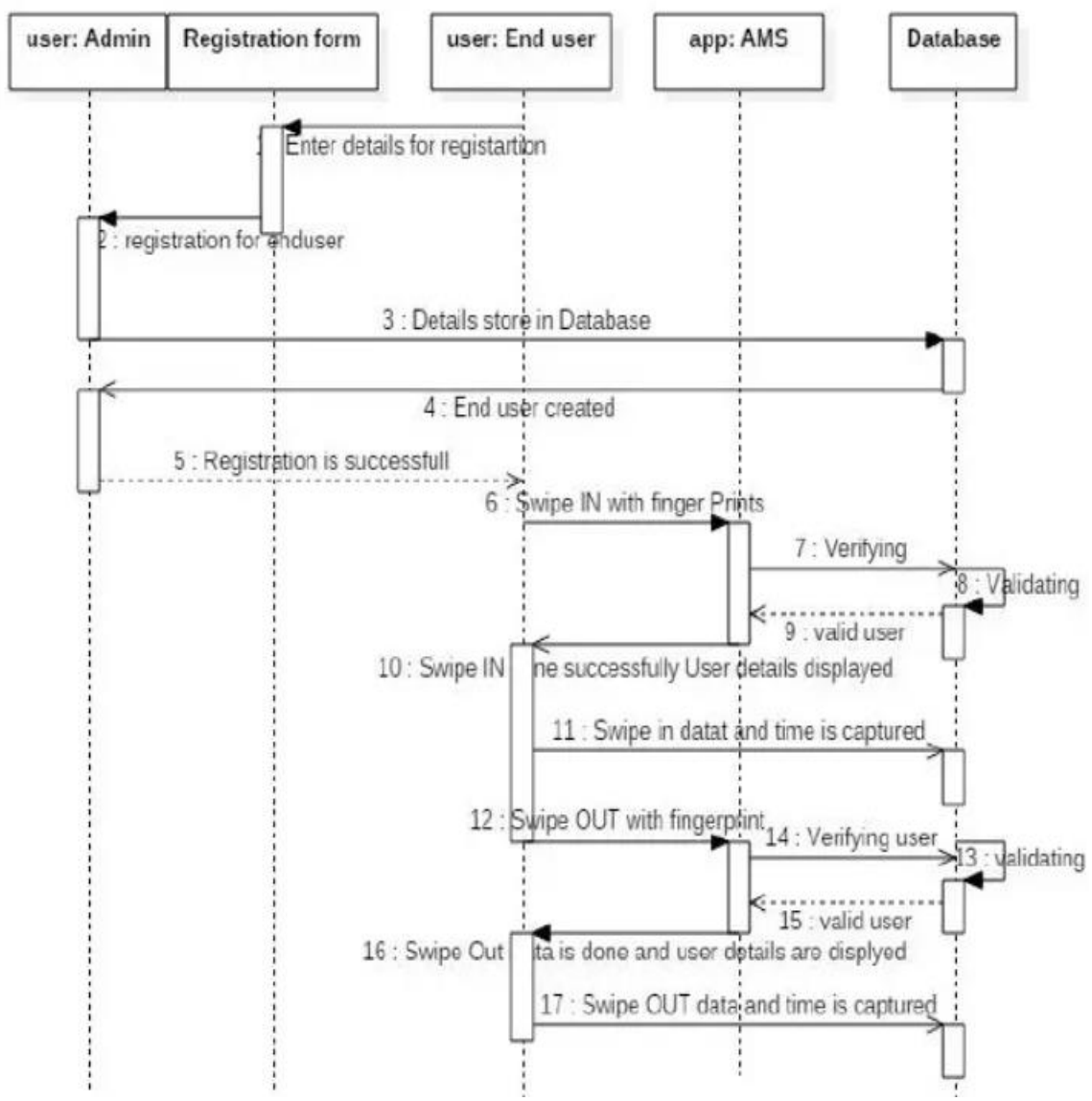

Figure 3: Sequence diagram

4.3 Class Diagram

A Class diagram is a UML diagram that describes the static structure of a system. It describes a system's classes, their attributes, operations, and the relationships among objects. We have two classes : User and Source Information, Image and Description as sub classes. Through the arrows the flow is mentioned.

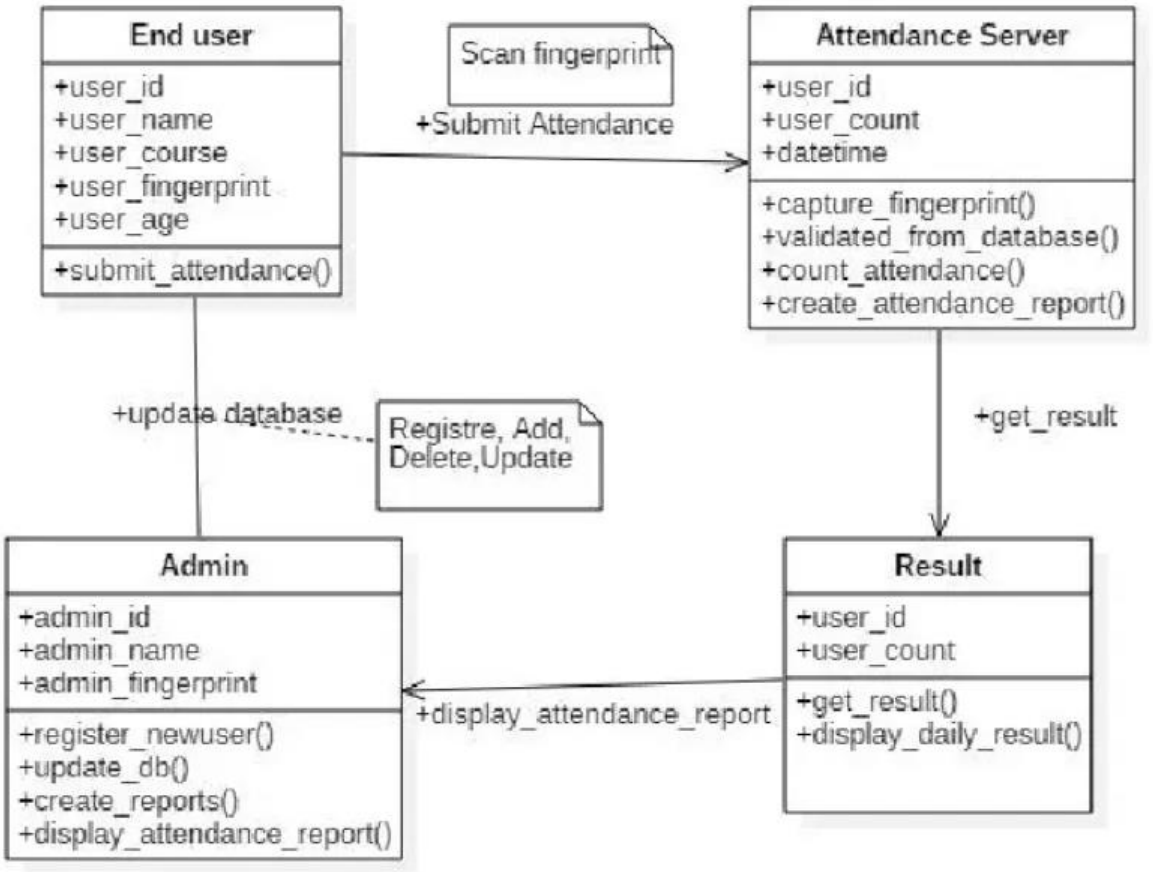

Figure 4: class diagram

4.4 Activity Diagram

Activity diagram is another important diagram in UML describing the dynamic aspects of the system.

Activity diagram is representing the flow from one activity to another activity. The activity can be described as an operation of the system. The start and ending of the diagram is represented through respective symbols.

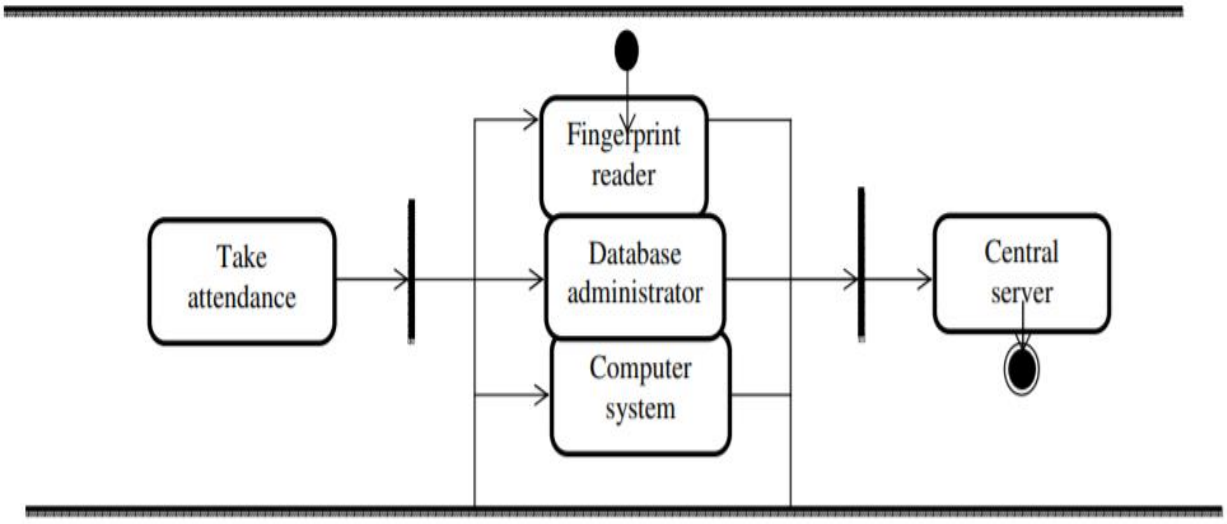

Figure 5: Activity diagram

Chapter 5
Testing

5.1 System Testing

After the system developed, process of system testing must be carry on in order to test if the system is free of bugs. If during the system testing, there are bugs or errors detected, the developer may need to correct and fix the bugs immediately. There are few types of system testing that must be performed which include the unit testing, integration testing, system testing, and acceptance testing. System testing is not a testing that limited only to the development team but it also require the help from specific outsider (beta-tester) to test on the system acceptance.

First of all, unit testing is a testing which requires the developer to test on every single part or component in the system. Unit testing can be kind of time consuming testing since the tester will need to go through every single component to make sure no bugs or errors occur before the deployment. Every single step of unit testing will be recorded to the test plan for later testing review purposes. In the unit testing, the testing only involves members from the development team which mean beta-tester is not required.

Besides that, the integration testing is a testing that must be conduct in order to test the integration between multiple pages of the system. The purpose of the integration testing is to make sure that there are no defects during the integration of multiple pages or modules. It is usually conducted after the unit testing. During the unit testing, the tester might not found any of the errors but it does not mean that the system will totally free of bugs since the system might not properly integrated which causes errors.

Other than that, the system testing is a testing that must be conduct in order to test the complete system as a whole. The purpose of system testing is to test the whole application after it is considered completed. System testing is a very important testing since it requires the system to meets the requirements and quality set by the users. Last but not least, the final testing is the acceptance testing which will involve the outsider to test the system in order to find out if the system meets their requirements from all perspectives. Once the system successfully goes through all the testing, the system will more likely to be delivered to the real world for use.

5.1.1 Unit Testing

Unit Testing 1: Login as Users

Testing Objective: To make sure the login process functioning well.

No.	Test Cases	Attribute and Values	Expected Result	Result
1	Verify the login ID and password entered by users after click on “Login” button with correct data provided.	User ID: 15L00002 Password: abc123	Login successfully.	Pass

2	Verify the login ID and password entered by users after click on “Login” button with null value.	User ID: Password:	Required Validator validation shown and require users to key-in ID and password.	Pass
3	Verify the login ID and password entered by users after click on “Login” button with invalid data provided.	User ID: 15L02 Password: 123	Login failed. Error message prompt out showing invalid login.	Pass

Table 1: Table of Login as Users

Unit Testing 2: User Personal Profile.
Testing Objective: To make sure data successfully read from database and display to web control.

No	Test Case	Attribute and Values	Expected Result	Result
1	Display data to web control based on query string / session.	Query string: lectID Session(“lectID”)	Personal details successfully displayed on web control.	Pass
2	Direct users to login page when no query string / session found.	Navigate to specific pages without login.	Redirect back to login page.	Pass
3	Retrieve correct details of the users based on query string / session.	Query string: lectID Session(“lectID”)	Successfully display details of specific users based on query string / session	Pass

Table 2: Table of User Personal Profile

Unit Testing 3: Edit Personal Profile.
Testing Objective: To make sure users successfully edit their personal details.

No	Test Case	Attribute And Value	Expected Result	Result
1	Edit all personal details with correct data provided.	Example: Phone No: 0161564817	Personal details successfully edited and saved to database.	Pass
2	Edit all personal details	Example: Phone No:	Personal details	Pass

	with invalid data provided.	016abc4817	amendment failed and validation message shown.	
3	Edit all personal details with null data provided.	Example: Phone No:	Personal details amendment failed and required field validation message shown.	Pass

Table 3: Table of Edit Personal Profile

Chapter 6
Results and Discussion

The proposed staff biometric attendance system is a system that takes attendance electronically. This system was implemented using Microsoft Visual Basic .Net programming language. It involves the interaction with the central database which contains all records of non-academic staff of the faculty or institution as well as records of monthly attendance taken. In implementing this system, certain criteria are considered. These criteria includes: Only eligible non-academic staff of the faculty can enrol and take attendance. Similarly, no one can take attendance for another. The records of each attendance taken can be retrieved as well as the monthly summary attendance for all staff can be generated and viewed. Furthermore, there is a period of grace within which IN and OUT timings can be taken. The design requirements are met through the use of a fingerprint reader which captures the fingerprint of users and desirable results are achieved, some of which are discussed in this section.

Chapter 7
Conclusion and Summary

Traditionally, staff attendance is taken using the manual method, which involves pen, and paper registers. The implementation of an electronic biometric-based method of attendance management system will greatly assist institutions or any organization and thereby prevents time-consuming processes. Staff biometric attendance system provides the administrator with easy access to staff attendance information as well as easy monitoring of monthly attendance summary. This will improve the net productivity of institutions or any organization. The proposed system is reliable, secure, efficient, and capable of replacing the traditional manual and unreliable method of attendance management. This system ensures security of staff's records; eradicate fake attendance record, saves time as well as reducing the amount of work done by the administrator in gathering staff attendance records. The proposed system can be improved through the integration of multimodal biometric technologies to provide more security for the staff attendance management system.

In conclusion, fingerprint recognition attendance system will be developed to replace the traditional attendance system that are currently widely using by many orgnizations. This project will be considered succeed once hybrid mployee attendance is developed. This system is designed to make the whole attendance taking process to become more reliable, convenient, efficient, and accurate. Besides that, with the implementation of biometric technology will help in reduce errors and attendance data will be able to compile in easier way.

This project is designed to aim in eliminating spotted problems during the initial analysis. The problems spotted are includes buddy-signing, loss of attendance sheet, skip meeting issue, and hard in analyzing employee attendance record from time-to time. These problems are the major problems faced by most organizations. If view from the Pareto analysis side which also known as 80-20 rule, 80 percent of the problems are always caused by the 20 percent problems. In short, it means that most of the problems faced are mostly because of the usage of traditional employee attendance system.

On the other hand, from the survey questionnaire data, most of the participants are agree that employee attendance in a office to increase their knowledge is very important. Last but not least, organization with good academy employees is also very important as it will affect that organizations reputation.

Chapter 8
Future Scope

The Fingerprint Recognition Employee Attendance Management System is only developed for the use of single department. In future, it is assumed that this system will be enhanced to be used by all department in a organizations. Other than that, the system developed is more focus on admin role as well as head of the department role which result in fewer features provided to the employee role. Employee only allowed viewing if they had been barred from certain day. Therefore, employee has very limited feature to use in this system.

In future work, student should be able to appeal through the system directly without needing to go to find that receptionist who barred them. Other than that, the report generated will only be in the PDF format. There is no other available option for receptionist to generate the report. Besides that, the system developed only can be used on desktop or laptop but smartphone is not recommended for this system. Therefore, in future work, this system should focus more on smartphone development to ease the attendance process.

Last but not least, Fingerprint Recognition Employee Attendance Management System will still have a lot to improve in order to meet every roles requirement. However, current version is good enough to be implemented to the real life to be used.

Chapter 9
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