Fingerprint Alert System:
A Solution for Effective Management System

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ABSTRACT

This document gives a write-up about the necessity of a device, one which is the Management System of employees. Nowadays, maintaining punctuality has become a tedious job for employees. We know that the presence of an employee in an office is collected from the fingerprint or biometric system, as per the technical reviews we are clear that it is a time bound machine.. A biometric device is a security identification and authentication device. Such devices use automated methods verifying or recognising the identity of a living person based on a physiological behavioral characteristic. These characteristics include fingerprints, or facial images, iris and voice recognition. In this report we are introducing a solution for this problem, a Fingerprint Alert System.

INTRODUCTION

Biometrics are being used to establish better and accessible records of the employee's work. With the increase in "Buddy Punching"(a case where employees clocked out coworkers and fraudulently inflated their work hours) employers have looked towards new technology like fingerprint recognition to reduce such fraud. Additionally, employers are also faced with the task of proper collection of data such as entry and exit times. Biometric devices make for largely fool proof and reliable ways of enabling to collect data as employees have to be present to enter biometric details which are unique to them.

The main objective of the system is to provide an automated alert system that is practical, reliable and eliminates disturbance and time loss in marking attendance in biometric devices. A further objective is to present a system that can accurately evaluate employees location and track down the employees.

Project Overview
FINGERPRINT ALERT SYSTEM Is a system which notifies the Employee about the time limit he has to reach the office to get his attendance on or before time. And also the employee can inform the admin if he can't reach the office due to any problems.

This is an android mobile application. Android mobile application mainly deals with informing and viewing notifications. This system provides access to two types of users, they are
1. Admin
2. Employee

➢ The administrator should be able to manage all the users and provide the notifications on time. The registration process is only done by the Admin.

➢ The employee needs to login with the username and password provided. The system will accept him if his username and password are the same as the ones saved in the database and a page will appear according to the Employee privileges.

• Scheduled Notifications: In this module we are going to maintain the time to send the notification

to the employees of a company using the details from the database. details in the database which include information like employee id, name, role, working time, contact number. These unique features are then stored in the database with a certain id of that employee.

- Post comment session: The employee will post the comments if he couldn't reach the office by any reason he can easily inform it through this comment session.

System Analysis
System analysis is the process of gathering and interpreting facts, diagnosing problems and using the facts to improve the system. System analysis deals with a detailed study of the various operations performed by the system and their relationship within and outside of the system. System analysis is the heart of the process. Analysis helps us to understand the present system. System analysis specifies what the system should do. A system is a set of components that interact to accomplish some purpose. This chapter explains the analysis process done for Fingerprint Alert System.
- Identifying the drawback of the existing system.
- Perform feasibility study.
- Identify hardware, software and database requirements.
- Create system definition that forms the foundation for subsequent work.

System analysis helped me to study the existing system and to get the needs of the proposed system.

A. The Existing System
SMS Alert:
Alert messaging (or alert notification) is machine-to-person communication that is important or time sensitive. An alert may be a calendar reminder or a notification of a new message.

Email:
Alert email to the employees of a company is done by linking the email address of the employee with the database of biometric punching machines.

- Disadvantages of Existing System:
SMS ALERT:-
*Nowadays the messages are common and not considered by the mobile users.

*There is a chance for unwanted spams.

EMAIL ALERT:-
*Normal users don't care about email messages.

B. Requirements of New System
- Hardware Specification

The selection of hardware is very important in the existence and proper working of any software. Then selecting hardware, the size and capacity requirements are also important.

Processor: Intel Pentium Core i3 and above

Primary Memory: 256MB RAM and above

Storage: 40 GB hard disk and above

Display: VGA Color Monitor

Key Board: Windows compatible

Mouse: Windows compatible

C. Proposed System
Our system provides an alert message along with a countdown display. We have a text area to post the reason for being late under this count down display. The office employee can evaluate the reason using the location of the user's mobile.

- Advantages of Proposed System:

Fingerprint alert system helps the employees
- To reach the office on time.
- Employees can easily inform the reason.
- Office head can easily review the reason.

D. Feasibility Study
A feasibility analysis involves a detailed assessment of the need, value and practically of a systems development. Feasibility analysis n forms the transparent decisions at crucial points during the developmental process as we determine whether it is operationally, economically and technically realistic to proceed with a particular course of action.

Types of Feasibility:
A feasibility analysis usually involves a thorough assessment of the financial (value), technical (practically), and operational (need) aspects of a proposal. From the initial studies it is clear that the Fingerprint Alert System is operationally, technically, behaviorally, economically feasible and socially feasible.

- Operational Feasibility:
A systems development project is likely to be operationally feasible if it meets the 'needs' and expectations of the organization. User acceptance is an important determinant of operational feasibility Fingerprint Alert System has the following functionalities, Search marking, and Viewing results. All functionalities work well as per the requirements of the scheme and deliver the required result in a fast and efficient manner. So the Fingerprint Alert System is operationally feasible.

➢ Technical Feasibility:

A systems development project may be regarded as technically feasible or practical if the organization has the necessary expertise and infrastructure to develop, install, operate and maintain the proposed system. Organization will need to make this assessment based on:

• Availability of technically qualified staff in-house for the duration of the project and subsequent maintenance phase.

• Availability of infrastructure in-house to support the development and maintenance of the proposed system.

• The capacity of the proposed system to meet initial performance expectations and accommodate new functionality over the medium term.

➢ Economic Feasibility:

This study is carried out to check the economic impact that the system will have on the organization. The amount of funds that the company can pour into the research and development of the system is limited. The expenditures must be justified and Fingerprint Alert System only needs a server system and laptop to work. Thus the developed system as well within the budget and the cost of the entire project will depend simply on the expenditure incurred for the hardware requirements. The software requirements can be easily fulfilled without any cost.

➢ Social Feasibility:

The acceptance of study is to check the level of acceptance of the system by the user. This includes the process of training the user to use the system efficiently. The user must not feel threatened by the system, instead must accept it as a necessity. The level of acceptance by the users solely depends on the methods that are employed to educate the user about the system and to make him familiar with it. His level of confidence must be raised so that he is also able to make constructive criticism, which is welcomed, as he is the final user of the system.

3. Software Requirement Specification (SRS)

➢ Introduction

Proposed system provides a username and password for the user to login to the app for the user. The user will get notified with a counter providing 10 minutes to reach the office. The Admin can evaluate the employee details and provide the notifications on time. The employee can post if he couldn't reach the office on time through this app. The goal is to maintain the details of the employee and inform them at time.

• Purpose

This project is aimed for implementing a system that is capable of informing the employees about the time bound and punctuality. This reduces or helps to consume the time of the employee in the office. Any alterations required to be done in the final report can be done respectively.

• Scope

This system aimed to be a notification system for the Employees. Current system methods are monotonous & time consuming. Fingerprint alert System helps the employee to maintain their punctuality. Hence this system tackles all these issues.

• Definitions

SRS- Software Requirement Specification
Android studio
FireBase

• Overview

➢ Our system provides alert messages along with a countdown display.

➢ The office employee can evaluate the reason using the location of the user's mobile.

▪ General Description

The system provides access to 2 types of users.
1. Admin
2. Employee

All the users need to go through a login process to use the system with a username and password. System also maintains an account for each user. Admin is responsible for the registration of employees. Some of the major terms in this system are,

Registration: The user is given a username and password to login to the app so that it is easy for the admin to recognize if there is a code for each person. The user can login to the app then the Admin will collect the user sign in details and send the notification on time.

➢ Module Description

This section provides a requirement overview of the system. Various functionalities implemented by the system will be,

Admin:
• Create Employee details
• Check for login details
• Send notification
• Review Employee reason

Employee:
• Login
• Password
• Check Notification
• Posting the reason

➢ Hardware Interface

The selection of hardware is very important in the existence and proper working of any software. Then selecting hardware, the size and capacity requirements are also important.

- Android version: Android version 8 and above are compatible
- Primary Memory: 1GB RAM and above
- Storage: 1GB Internal Storage
- Display: Android smartphone

➢ Software Interface

One of the most difficult tasks is selecting software for the system, once the system requirements are found out then we have to determine whether a particular software package fits those system requirements.

The application requirement:

- Front end: Java, XML
- Back end: Firebase
- Operating system: windows 7 and above
- IDE: Android Studio

TECHNOLOGIES

- Coding: Java
- Design: XML
- Connection: Java
- Database: Firebase

➢ Design Constraints

The system shall be built using a standard standalone development tool that conforms to Microsoft's GUI standards.

➢ Availability

The system should be available at all times, as needed.

➢ Speed

This system provides a notification system that is practical, reliable and eliminates disturbance and time loss, money loss by late attending the office. This system provides best results within a short time.

➢ Operational Scenario

Admin have the overall control of this system. Admin enters the system by entering a username and password, then they are able to control the system.

Users can use the system by logging in to the app with the code.

In this system the first step is to login into the app with the code provided so it will be convenient to use further. The registration will be saved in the database and it will be done by administrator only.

➢ External Interface Requirements
➢ User Interface:

This system works on a local area network, so that any company where internet connection is available can use the system. The User Interface should be neat and well organized and users can easily interact with it.

System Design and Development

➢ Input Design

Input design is the process of determining inputs to a particular project. Input design determines whether a user interacts with the computer in an efficient manner. Fingerprint Alert System uses the following different User Interfaces for inputting values or data to the system.

➢ Output Design

The output design has been done so that the results of processing should be communicated to the user. Effective output design will improve the clarity and performance of outputs. Following are some of the Output User Interfaces designed for the Fingerprint Alert System.

➢ Database Design

In this design process, the information domain model created during analysis is transformed to data structures that will implement the software for data and information storage. During the analysis process we used Role Based Process

Diagram for understanding the Process flow from one process to another. In the maximum level of Role Based Process Diagram for each section we can identify the data storages required for the system. After identifying all data storages the next step is to identify the proper entity sets from these data storages. After identifying all these entity sets the next step is to design an entity-relationship model for the database. This represents all entities and their relationships between the entities. The next step is to identify the primary keys, weak entities, strong entities, total participation, partial participation and cardinality in the ER diagram. After this process we have to convert all these entity and relationship sets to its corresponding table structure. We can generate tables from the ER diagram based on the cardinality on either side of a relation and participation of the entities in the relations. Then the next step is to normalize the tables to remove the redundancy of data. In this system most of the tables are in third normal form.

➢ Process Design

In process design, the overall structure of the process is checked out. The design is carried out using top-down design strategy. First the major modules are identified then they are divided into sub modules at the lowest level and they are addressed as a single function of a whole system.

There are different types of processes in the Fingerprint Alert System.

➤ Registration Management

This process includes employee Registration, Information of the employee.

➤ Login process

Using the given credentials user login is processed.

➤ Notification Management

We provide the notification message to the employees to inform them about the time limit.

System Implementation and Testing

➤ System Implementation

• Coding Standards Used

It is a set of standards and guidelines which are/should be used when writing the source code for a program. For the execution of query this system used the stored procedure calling mechanism. Naming convention: in computer programming, a naming convention is a set of rule for choosing the character sequence to be used for identifiers which denote variable, type, function and other entities.

▪ In the project the variables are declared as the abbreviation of the main process.

▪ Each of the content page is named by the use of underscore symbol after the name of the corresponding master page

• Coding Environment Used

Fingerprint Alert System uses:

▪ Front end: Java,XML
▪ Back end: Firebase
▪ Operating system: windows 7 and above
▪ IDE: Android Studio

• Hardware / Software used for implementation Hardware Specification

▪ Processor: Intel Pentium Core i3 and above
▪ Primary Memory: 4GB RAM and above
▪ Storage: 40 GB hard disk and above
▪ Display: VGA Color Monitor
▪ Key Board: Windows compatible
▪ Mouse: Windows compatible

Software Specification

▪ Front end: XML, Java
▪ Back end: FIREBASE
▪ Operating system: windows 7 and above
▪ IDE: Android Studio

TECHNOLOGIES

• Coding: Java
• Design: XML
• Connection: Java
• Database: FIREBASE

➤ System Testing

The following are the different types of testing techniques applied in the Fingerprint Alert

• Unit Testing

Every Single field in the design of the project is entered with different kinds of values to know the acceptance and each time make sure that the values are saving to the server system.

• White Box Testing

For this testing technique all possible test cases are generated for testing every statement of subroutines, functions and modules of a class. Using these test cases every statement of functions and subroutines of a class are executed at least once for finding errors. Here all conditional branching statements and loop statements are tested. These errors are corrected after white box testing process.

• Black Box Testing

For this testing technique all possible test cases are generated. These test cases are applied for every function and subroutine of a class and find out the result of these input test cases. In the Fingerprint Alert System, I found some errors after comparing these test cases with the test results and these errors were corrected.

• Integration Testing

Fingerprint Alert System uses bottom-up testing strategy. Here the low level components/ classes are integrated and some test cases are applied. Again some test cases are applied for interface testing which test the interface of an object and found errors. The interaction between various objects is tested here. These errors are corrected after this testing process.

• Validation Testing

Each input form is validated with a required field validator and makes sure that it will work only if the values are appropriate and as per the standard format. Otherwise it will generate error messages and warning messages.

System Security Measures

Fingerprint Alert System allows two types (administrator, Employee) of users for using the system. But unauthorized users cannot access system facilities. The Employee is provided with a code. This would require him to login using his username and password to the system. The admin will accept the user if his details are correct and password generated automatically then it is sent to the corresponding user's mail address.

Conclusion

Fingerprint Alert System has been envisioned for the purpose of informing the Employees about the time limit to reach the office in order to get his attendance. The aim is to automate and make a system that is useful to the organization such as an office. This efficient and accurate method of issuing alerts in the employees mobile can remake the employees to be punctual. This method is secure enough, reliable and available for use.

References

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