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SOFTWARE REQUIREMENT SPECIFICATION
ATTENDANCE MANAGEMENT SYSTEM USING FACE RECOGNITION

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Version 1.0

Monday, December 14, 2020

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1. Introduction

This project involves building an attendance system which utilizes facial recognition to mark the presence, time-in, and time-out of employees. It covers areas such as facial detection, alignment, and recognition, along with the development of a web application to cater to various use cases of the system such as registration of new employees, addition of photos to the training dataset, viewing attendance reports, etc. This project intends to serve as an efficient substitute for traditional manual attendance systems. It can be used in corporate offices, schools, and organizations where security is essential.

1.1 Purpose

The purpose of this SRS document is to specify software requirements of the Attendance Management System Using Face Recognition. It is intended to be a complete specification of what functionality the Attendance Management System provides.

This project aims to automate the traditional attendance system where the attendance is marked manually. It also enables an organization to maintain its records like in-time, out time, break time and attendance digitally. Digitalization of the system would also help in better visualization of the data using graphs to display the no. of employees present today, total work hours of each employee and their break time. Its added features serve as an efficient upgrade and replacement over the traditional attendance system.

1.2 Document Conventions

No specific user document conventions are used this time. All the sections and points are written in simpler words with utmost clarity.

1.3 Intended Audience and Reading Suggestions

This document is intended for developers, project managers, marketing stuff, users, testers and documentation writers of the system.

Preference to read the document is in the sequence of table of contents only. Document is organized in a manner to understand the need and implementation details of the system.

1.4 Product Scope

Facial recognition is becoming more prominent in out society. It has made major progress in the field of security. It is a very effective tool that can help low enforcers to recognize criminals and software companies are leveraging the technology to help users access the technology. This technology can be further developed to be used in other avenues such as ATMs, accessing confidential files, or other sensitive materials.

This project servers as a foundation for future projects based on facial detection and recognition. This project also convers web development and database management with a user-friendly UI. Using this system any corporate offices, school and organization can replace their traditional way of maintaining attendance of the employees and can also generate their availability(presence) report throughout the month.

1.5 References

This document refers to the IEEE standards SRS

2. Overall Description

2.1 Product Perspective

The proposed Attendance Management System will take care of the employee attendance in any organization at any point of time. The system can keep a track of the employee's presence, time-in and time-out. It can automatically generate reports and graphs of their availability which can be monitored by the higher authority of the respective organization.

2.2 Product Functions

- The main objective of this project is to reduce the manual work.
- The system is capable of managing employee's presence, time-in and time-out. It can generate reports of their availability.

2.3 User Classes and Characteristics

We have 2 types of users of the system.

1. Employee
2. Admin

Following functionalities can be performed by the admin:

- Login
- Register new employees to the system
- Add employee photos to the training data set
- Train the model
- View attendance report of all employees. Attendance can be filtered by date or employee.

Following functionalities can be performed by the employee:

- Login
- Mark his/her time-in and time-out by scanning their face
- View attendance report of self

2.4 Operating Environment

The server-side components of the system can have running windows or Linux OS with the necessary library supports of the system.

The client-side components of the software system must operate within common web browser environments using Secure Sockets Layer (SSL) / Transport Layer Security (TLS) cryptographic protocols at a minimum encryption level of 128 bits. The minimum set of browsers that must be supported is

- Google Chrome 44+
- Mozilla Firefox.

2.5 Design and Implementation Constrains

As the system is using face recognition feature to identify each employee of the organization, it must be able to identify each of them individually. According to this, system must be capable to mark their presence for the day and it should convey the same message to the employee as well.

2.6 User Documentation

No specific user documentation is considered this time.

2.7 Assumptions and Dependencies

No specific assumptions or dependencies are considered at this time.

3. External Interface Requirements:

The following sections will introduce the numerous requirements of the system from the point of view of different users and will introduce a number of decisions that have been made regarding implementation.

3.1 User Interface

❖ The user interface for this system will be simple and clear. Most importantly, the ages must be easy to read, easy to understand and accessible. The color scheme should be appropriate to provide familiarity with the university and there should be no contrast issues.

3.2 Hardware Interfaces

- ❖ I3 processor-based computer or higher
- ❖ Memory: 3GB RAM
- ❖ Hard drive
- ❖ Working Web camera with clear image

3.3 Software Interfaces

- ❖ Windows or Linux Operating System
- ❖ Client-side Browser Support
- ❖ Server-side Django + SQLITE Database Support

3.4 Communications Interfaces

- ❖ Communication Standard: HTTPS
- ❖ Network Server: Localhost
- ❖ Chrome / Mozilla Web Browser

4. System Features

The features of the system are mainly divided into 3 modules.

1. **Registration and Login Module**

   This module mainly deals with the functionalities related to the registration of any new employee to the organization, Log into the system and managing employee's profile details. Using features provided by this module admin can register new employee to the system and admin / employee both can log into the system using their credentials.

2. **Manage Attendance Details**

   This module mainly deals with the features related to the employee's attendance. Using this employee can mark their presence, time-in and time-out in the system. Admin can see the availability report of each employee, employee can see his/her attendance report along with some possible filters such as filter by employee and filter by date.

3. **Manage Employee Details**

   This module mainly deals with the features related to the employee's profile. Using this admin can add a photo of the newly registered employee during registration. Admin can also command the system explicitly to train the model and system will make necessary calculation and will generate some data which will be used internally to identify each employee uniquely.

4.1 Manage Registration and Login

4.1.1 Register new employee

Description: Admin can register new

Input: Employee Details

Output: success message displaying the user has been created.

4.1.2 Log-In to the system

Input: User credentials

Output: If the credentials are correct, user will be redirected to the dashboard of the system

Exception Flow: If the entered credentials are incorrect then user will be redirected to the login page again displaying an error message.

4.2Manage Attendance Details

4.2.1 Mark your attendance-in

Input: User will scan his/her face using the external web camera.

Output: system will identify the user uniquely and will mark his/her in-time to the database. The same success message will be transmitted to the user.

4.2.2 Mark your attendance-out

Input: User will scan his/her face using the external web camera.

Output: system will identify the user uniquely and will mark his/her out-time to the database. The same success message will be transmitted to the user.

4.2.3 View my attendance report

Description: Employee may often need to see his / her attendance record throughout the month or year. Using this feature one can see his / her attendance record till the date.

Input: User selection

Output: Statistical analytics of the particular employee who is currently logged into the system will be displayed.

4.2.4 View employee's attendance report

Description: This feature is for admin. Admin can monitor the availability of each employee till the date. i.e., how many employees are present today out of total employees etc. can be monitored.

Input: user selection

Output: Attendance record of each employee including how many employees are present today out of total along with the availability graph.

4.3 Manage Employee Details

4.3.1 Add photo of the employee

Description: Admin only can access this feature. Admin can add a photo of an employee during the registration process.

Input: Username of an employee

Output: Success message record has been added.

Process: System will process an image and will generate necessary system data to identify each employee uniquely.

4.3.2 Train the system

Input: user selection

Output: system will process all the available records of the employees and will generate necessary system data to identify each employee uniquely.

5. Other Nonfunctional Requirements

5.1 Performance Requirements

Some Performance requirements identified is listed below:

- The performance of the system should be fast and accurate.
- The system should be able to handle large amount of data. Thus, it should accommodate high details without any fault.

There are no other specific performance requirements that will affect development.

5.2 Safety Requirements

As a part of the safety requirement, we prefer to keep a backup of the system generated data in any external device.

5.3 Security Requirements

- Utilize certain cryptographic technique
- Keep specific log or history data sets
- Assign certain functions to different modules
- Restrict communications between some areas of the program

5.4 Software Quality Attributes

- **Portability**: The system is developed for secured purpose, so it is can't be portable.
- **Availability**: This system will available only until the system on which it is install, is running.
- **Scalability:** Applicable.

5.5 Business Rules

No specific business rules were taken into an account at this time.

References

1. *The document in this file is adopted from the IEEE* Guide to Software Requirements Specifications *(Std 830-1993).*