

Software Project Management Plan

Group 1 : Attendance Management System using Facial Recognition

1 Introduction

1.1 Project Overview

Our Main Aim is to automate the tradition way of attendance management. We intend to reduce time required by the manual approach. Our system provides a modern approach, hence making it viable perennially. it also removes manual labour thereby increasing the efficiency of the model as a whole. Our model also provides a reminder system which would help in improving attendance of students in class. Our main target for developing this tool is to save efforts of teachers in maintaining records of attendance and hence allowing them to spend their time more efficiently making tedious practice of transferring records from hard copies into excel sheet obsolete. At the moment, most of the attendance systems that are being used in universities still are written a piece of paper. For classes, tutorial and laboratory session the student still have to sign the signature on the attendance sheet. This method is not flexible because the risk of losing the attendance data is very high. Other than that,unethical problem may be occurring such as proxy in signature. It will also help in evaluating attendance eligibility criteria of a student and send the students necessary reminders in order to fulfill the criteria. This system is proposed to overcome these problems.

1.2 Project Deliverables

- Software Project Management Plan - 06/10/2019
- User Registration/ Login - 09/10/2019
- Facial Images database for every user - 09/10/2019
- User Interface - 28/10/2019
- Attendance Management System - 15/11/2019
- Integration of the different modules - 30/11/2019

2 Project Organization

2.1 Software Process:

We will use the iterative spiral model approach. This model allows us to iterate through each process framework ie Communication, Planning, Modelling, Construction and Delivery. While reviewing at every step, we will be testing the new feature added on the project at each build. We will also be looking out for bugs at every step of development.

2.2 Roles And Responsibilities

Team Member	Role	Description
Ankita Patil	Project Manager	Project Manager is responsible for the timely execution and completion of the project. He will work with all the group members and will see that every group member is performing his/her task. He will communicate with the Faculty and inform him/her about the development of the project. He can schedule group meetings to look over the development of the project.
Manasi Patil	Designer	Designer deals with the look and feel of the software. Designer's task will be to work hand-in-hand with the developer and help him with creative styling ideas, improving frameworks to make the project more user-friendly.
Sameer Patel	Developer	Developer will code for applications and programs for backend processing systems to build a working project as proposed by the manager and team. Once the core of the software is developed, the software is passed on to the next Team member that is to the Tester.
Sanskar Shah	Tester	Tester's role will perform checks on the services provided by the software, to see if they are functioning properly or are bugged for a given condition, will inform the developer about such bugs and will help him to resolve them. Tester will also check for the maximum amount of data which can be stored in the database and processed by the software. He will set the data- limit accordingly.

2.3 Tools and Techniques

The front-end of the web application will be developed using HTML, CSS, Bootstrap and JavaScript. Python would be used for developing the application.

Database used would be Firebase (Realtime database). For developing demo UI / Wireframes, Bootstrap UI would be used.

For development synchronization purposes, version control system would be used. Git will be as version control system as it can be easily used and is simple to understand.

3 PROJECT MANAGEMENT PLAN

3.1 Tasks

3.1.1 Requirement Analysis

3.1.1.1 Description

Requirement Analysis would be done to know the exact expectations of the client from the product. The functionalities and working of the product would also be clear by doing sufficient and effective requirement analysis.

3.1.1.2 Deliverables and Milestones

Effectively communicate with all the actors involved in the working of the Web-App. By the end of this process, the design and development team will be sure of the functioning of the Web-App.

3.1.1.3 Resources Needed

For effective requirements analysis, multiple meetings would have to be conducted with the stakeholders of the Web-App. Brainstorming sessions of Joint discussions must be organised for effective communication and information gathering.

3.1.1.4 Dependencies and Constraints

Task cannot be completed without conducting meetings with the stakeholders and knowing the expectations from the Web-App.

3.1.1.5 Risks and Contingencies

The risk involved would be only failure to communicate with the organisations involved and users. Another issue could be miscommunication between the stakeholders and developers/designers, but this can be tackled by having multiple sessions and creating well defined SRS and getting it approved by the client.

3.1.2 Software Requirement Specification

3.1.2.1 Description

The users and the client get a brief idea about the software while in the initial stages. The purposes and intentions as well as the expected results are properly defined. It hence lays the outline for software design. The desired goals are defined thereby easing off the efforts of the developers in terms of time and cost. It forms a basis for the agreement between the client and the developer. It becomes easier while transferring and using the solution elsewhere or with new customers as the basis of functioning of the software is mentioned. It acts as a material for reference at a later stage. It acts as a basis for reviews.

3.1.2.2 Deliverables and Milestones

The document focuses on briefing all the member of the team as well as the client about the specifications and functionalities of the software project.

3.1.2.3 Resources Needed

Meetings with stake-holders and Brainstorming sessions of Joint discussions must be organised for requirement gathering.

3.1.2.4 Dependencies and Constraints

Task cannot be completed without conducting meetings with the stakeholders and knowing the expectations from the Web-App.

3.1.2.5 Risks and Contingencies

Matter of risk mainly revolves around communication and necessary documentation. If the SRS isn't well defined and well - addressing each and every aspect of the project , then major miscommunication and false information transfer could take place. Client may face issues on being on the same page as the developing team. The expectations and deliverables would have explosive differences between them.

3.1.3 Software Project Management Plan

3.1.3.1 Description

Once project designing is complete, project managers document their plans during a Software Project Management(SPMP) document. The SPMP document ought to discuss an inventory of various things that are mentioned below. This list will be used as a doable organization of the SPMP document.

3.1.3.2 Deliverables and Milestones

●Introduction :

- 1.Objectives
- 2.Major Functions
- 3.Performance Issues
- 4.Management and Technical Constraints

●Project Estimates :

- 1.Historical Data Used
- 2.Estimation Techniques Used

- 3.Effort, Resource, Cost, and Project Duration Estimates

●Schedule :

Gantt Chart Representation

●Project Resources :

- 1.People
- 2.Hardware and Software
- 3.Special Resources

●Tasks :

- 1.Requirement Analysis
- 2.SRS Document
- 3.SPMP
- 4.Registration/Login
- 5.Development of web application
- 6.Attendance management system using facial recognition
- 7.Testing and Integration

●Staff Organization :

- 1.Team Structure
- 2.Management Reporting

3.1.3.3 Resources Needed

For developing SPMP document we would need Completed SRS Document,Sharelatex.

3.1.3.4 Dependencies and Constraints

This document may or may not be final.So it's necessary that whenever there is change in requirement analysis,design etc we need to update our plans in this document accordingly.

3.1.3.5 Risks and Contingencies

It is important to note that for a project manager to develop this document he/she should clearly know what should be the tasks and outcome of that particular task after each iteration else this document will lead to ambiguity.

3.1.4 Student Registration/Login

3.1.4.1 Description

In this section, the User registration and authentication module will be developed and deployed at the user side so as to enable them to use this Attendance Management System and also manage their attendance effectively.

3.1.4.2 Deliverables and Milestones

To deploy prototype module for registration process done by user and the flow of data to the database for verification.

3.1.4.3 Resources Needed

Resources required would be Visual Studio Code(preferred) so as to develop the front end of the Web Application, python module and a corresponding editor to connect it with the back-end and the database to control the data.

3.1.4.4 Dependencies and Constraints

In order to use the services provided by the Attendance Management System, the student/faculty must register with our system with basic details being Name of the Student/Faculty, Their facial features etc. After registering he can login to the system and use the services.

3.1.4.5 Risks and Contingencies

One of the risks associated with this module is Connection with Database. Data insertion and retrieval problems may affect the system. It should be fast and efficient.

3.1.5 Attendance Management Portal

3.1.5.1 Description

The web portal will have three types of accounts that is of students, teachers and admin. The students will be able to access their attendance records and the study content provided by the teachers. The teachers will be able to view the daily lecture's attendance percentage and upload their study content.

3.1.5.2 Deliverables and Milestones

The web-app must be able to show attendance of students at every instant of time as per the students choice. There shouldn't be any performance issues as well.

3.1.5.3 Resources Needed

Resources required would be Visual Studio Code(preferred) so as to develop the front end of the Web Application, python module and a corresponding editor to connect it with the back-end and the database to control the data.

3.1.5.4 Dependencies and Constraints

In order to use the services provided by the Attendance Management System, the student/faculty must register with our system with basic details being Name of the Student/Faculty, Their facial features etc. After registering he can login to the system and use the services.

3.1.5.5 Risks and Contingencies

The risk here is that the software may fail to run the request requested by the user ,display the outdated attendance or the system may take too long to load.

3.1.6 Attendance using Facial Recognition

3.1.6.1 Description

- Face Detection : Capture face images via webcam or external USB camera. Faces on an image must be detected. The faces must be detected in bounding boxes. Compute the total attendance based on detected faces. Crop the total number of faces detected. Resize the cropped faces to match faces the size required for recognition.

- Face Recognition : Train faces for recognition. Perform recognition for faces stored on database. Compute recognition rate of the system. Perform recognition one after the other for each face cropped by Face Detector. Display the name of the output image above the image in the plot area.

3.1.6.2 Deliverables and Milestones

This module must be able to detect and recognize the faces of students present during the lecture and based on that data make the corresponding changes in the attendance in the database rather than the traditional way of marking attendance.

3.1.6.3 Resources Needed

Python modules and a runtime environment(GPU) so that we can train the Machine learning model of facial recognition enabling it to detect facial features with at least 98% accuracy.

3.1.6.4 Dependencies and Constraints

The students/faculty will have to provide a huge data-set of their facial features in order for the system to be more accurate .

3.1.6.5 Risks and Contingencies

The machine learning model is not 100% accurate, hence after the recognition, the faculty will have to check the data.

3.1.7 Testing

3.1.7.1 Description

Once the design and final software is developed, the application goes for testing. Testing is based on different criterias related to efficiency, bugs, performance, response time, correct functionality etc.

3.1.7.2 Deliverables and Milestones

Final product after this task is released for colleges/schools to include this in their daily system for managing attendance.

3.1.7.3 Resources Needed

For testing purposes we would need Performance test tools, database test tools, functional test tools etc.

3.1.7.4 Dependencies and Constraints

In this, each module needs to be checked and made sure that the integration is successful on the basis of performance and correctability.

3.1.7.5 Risks and Contingencies

The risk factor here would be the proper integration of different modules and their proper functionality. If any one module fails the entire system will fall.

3.2 Assignments

Task 1 - Requirement Analysis - Sameer, Sanskar

Task 2 - Software Requirement Specification - Manasi, Sameer, Ankita

Task 3 - Software Project Management Plan - Sanskar, Sameer

Task 4- Designing

SubTask 1 - Student Registration and Login Module - Ankita, Manasi

SubTask 2 - Facial database for individual students - Sanskar

SubTask 3 - User interface - Manasi, Sameer

Task 5- Development

SubTask 1 - Student Registration and Login Module - Sameer, Sanskar

SubTask 2 - Facial database for individual students - Manasi, Ankita
 SubTask 3 - User interface - Ankita, Sanskar
 SubTask 4 - Facial Detection Module - Sameer, Sanskar
 SubTask 5 - Facial Recognition Module - Ankita, Manasi

Task 6-Testing
 SubTask 1 - Performance Testing - Sameer, Manasi
 SubTask 2 - Database Testing - Sanskar, Ankita
 SubTask 3 - Security Testing - Ankita, Manasi

3.3 Timetable

