Software Requirements Specification

for

SMART ATTENDANCE

Version 1.0 approved

Prepared by:

Kunal Agarwal

Paras Upadhyay

Shashank Mittal

Shivam Singhal

GLA UNIVERSITY MATHURA

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1. Introduction

1.1 Purpose

The purpose of this document is to present a detailed description of the Smart Attendance System. It will explain the purpose and features of the software, the interfaces of the software, what the software will do, the constraints under which it must operates and how the software will react to external stimuli. This document is intended for both the end users and the developers of the software.

1.2 Document Conventions

While writing this SRS "Arial" fonts have been used and Heading font size 18,Sub Headings are 16 and paragraphs are of 14 font size.

1.3 Intended Audience and Reading Suggestions

The audience of this system will be:
a. Students
b. Faculty members
c. Administrator

This project will be managed by administrator of the organization, created and developed by the IT staff and other specialized people in the technology, such as programming, web design and others.

1.4 Product Scope

Conventional methodology for taking attendance is by calling the name or roll number of the student and the attendance is recorded. But this process is very time consuming. So, an automatic process is used in this project which is based on face recognition. Smart Attendance is a web-based system made for the automation mode to mark up the attendance based on face recognition. In future, the whole world will be automated and this project will be a little contribution to transform the traditional attendance marking system of academic institutions to automated and error free attendance marking system.

1.5 References

Software Engineering a Practitioner's Approach – Roger S Pressman
An Integrated Approach to Software Engineering Approach – Pankaj Jalote

2. Overall Description

2.1 Product Perspective

Attendance of the student is very important for every college, universities and school. Conventional methodology for taking attendance is by calling the name or roll number of the student and the attendance is recorded. But this process is very time consuming. So, an automatic process is used in this project which is based on face recognition. Smart Attendance is a web-based system made for the automation mode to mark up the attendance based on face recognition .Details of the students is stored in the database and then image of the whole class is taken by a camera. After that, with the help of recognizing faces of currently present students, it marks up their attendance and generates an excel file.

2.2 Product Functions

Our System has two types of accessing modes:

- *Administrator*
- *Faculty members*

2.3 User Classes and Characteristics

This software gives access to two kinds of users:

- *Administrator: Administrator can add, delete and modify information of faculty members and students which is stored in the database.*
- *Authorized User: Faculty staff will take the class image and generate the attendance sheet.*

2.4 Operating Environment

- *This system is work on windows platform.*
- *A High-Resolution Camera is required to capture the images.*
- *Hardware Requirements:*
  - ➢ *RAM – 4GB or above*
  - ➢ *Hard Drive – 10GB or more*
  - ➢ *Processor – Intel i3 or higher version*

2.5 Design and Implementation Constraints

- *The time allotted for this project will be limited to the end of this semester.*
- *The language for the project will be Python and the development environment will be the PyCharm.*
- *Programming is done in Python and SQL.*

2.6 User Documentation

The system will provide an online user manual in HTML that describe the functionality and

options available to the user and a hard copy of the user manual is also provided with the system.

3. External Interface Requirements

3.1 User Interfaces

- *A Web based user interface is being used to connect user with the system which will be best seen at 1024x768 and 800x600 pixel resolution settings.*
- *Window contains textfields for UserID and Password to verify the user.*
- *Details will be entered by user (teacher) of the class to mark up the attendance and it leads to open a camera to capture photo of the class.*
- *Error message "wrong ID or password" will be displayed if either ID or password is wrong.*
- *Error message "please try again" will be displayed if camera is unable to take a clean shot.*
- *After getting the attendance marked teacher will be asked to lock the final attendance.*

3.2 Hardware Interfaces

Following hardware interfaces are being used for this model :-

- *System with 4GB RAM or above.*
- *Processor Intel.*
- *High resolution camera.*

High resolution camera will capture image of the class with clarity and a system with mentioned requirements above will make the processing smooth.

3.3 Software Interfaces

Python 3.x is being used as programming language for this project. We are using windows as operating system. To create an interactive Front-end HTML,CSS are used.
Faces from a group picture has to be extracted and recognized, so that attendance of each student can be marked properly. OpenCV library is providing this work here.
OS library is used here to create separate directories to save data regarding different students and classes.
NumPY is being used here to to represent images as multi-dimensional arrays so the images can be processed further by system.

Communications Interfaces
The system which must be connected with LAN of the college or a working internet connection to access college database and update information.

4. System Features

4.1 Automation of attendance

4.1.1 Description and Priority

This system is a conversion of manual attendance system to automated system.

4.1.2 Stimulus/Response Sequences

User i.e teacher just has to take a group picture of class and system will automatically detect all the students present in photo and accordingly their day wise attendance will be updated.

4.1.3 Functional Requirements

- Camera to capture group picture of the class.
- Details of the user (teacher) to get allowed to update attendance\
- Connection to database for student details.

5. Other Nonfunctional Requirements

5.1 Performance Requirements

- *This model must be able to run by multiple users at same time, as many teachers will be using it together.*
- *Camera needs to be adjusted in such a way so each student's face is captured by it.*
- *Database queries needs to run as fast as possible.*
- *This model should work properly with a class size upto 30.*

5.2 Safety Requirements

Model will be password protected. User needs to enter password to mark up the attendance. Also the system it is running on must have Antivirus or anti-threat protection.

5.3 Security Requirements

- *Teacher is required to enter correct user id and password in order to take attendance of a class.*
- *All information of student and teacher will be saved in database and will be verified upon each session.*
- *Teacher is allowed to change his password by giving existing password.*

5.4 Software Quality Attributes

Availability
System is able to be used on working hours.

Reliability
Reliability of the system depends on process of manipulation of database.

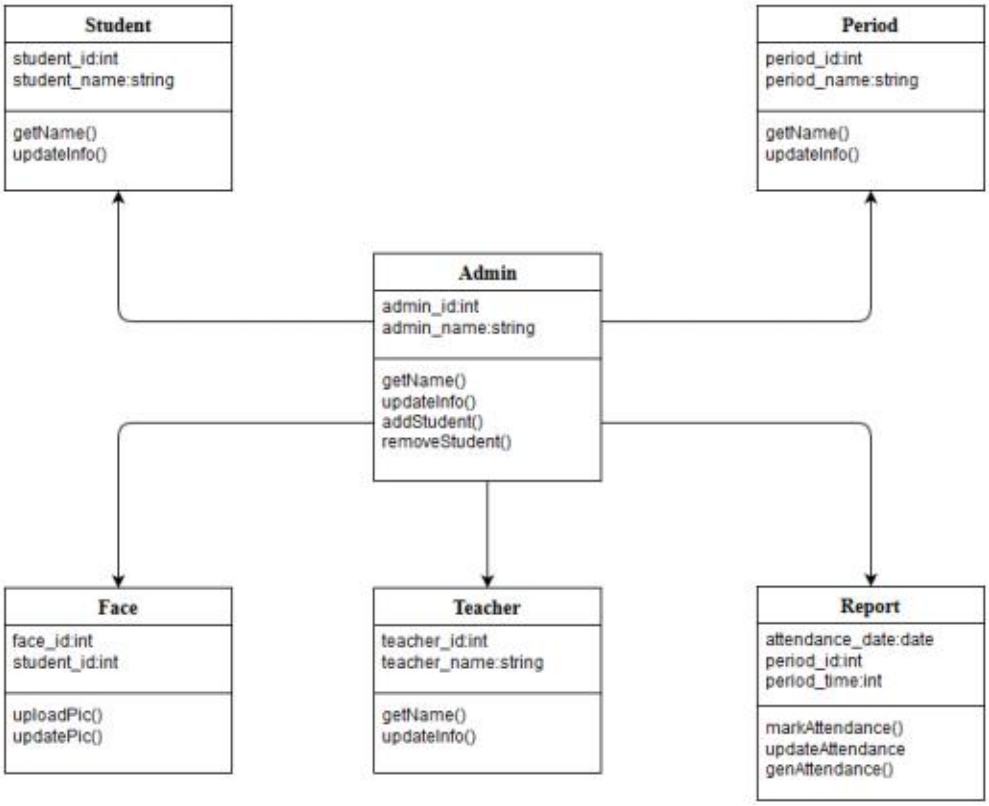
Reusability
System is reusable after every session/semester of college.

Robustness
If connection loses during attendance or there is no internet connection at the time of attendance in present, then system is able to fill attendance by taking picture for later marking.

Usability
Usability will be achieved through a web based GUI.

Appendix B: Analysis Models

CLASS DIAGRAM



USE CASE

DFD (LEVEL-0)

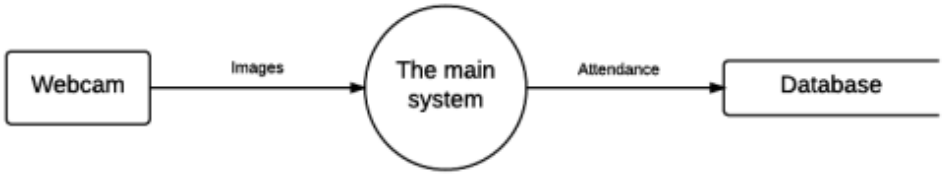


Figure 4.4: DFD Level 0

DFD (LEVEL-1)

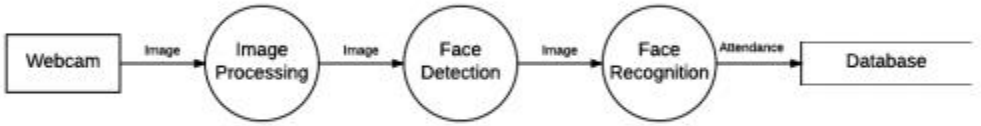


Figure 4.5: DFD Level 1

DFD (LEVEL-2)

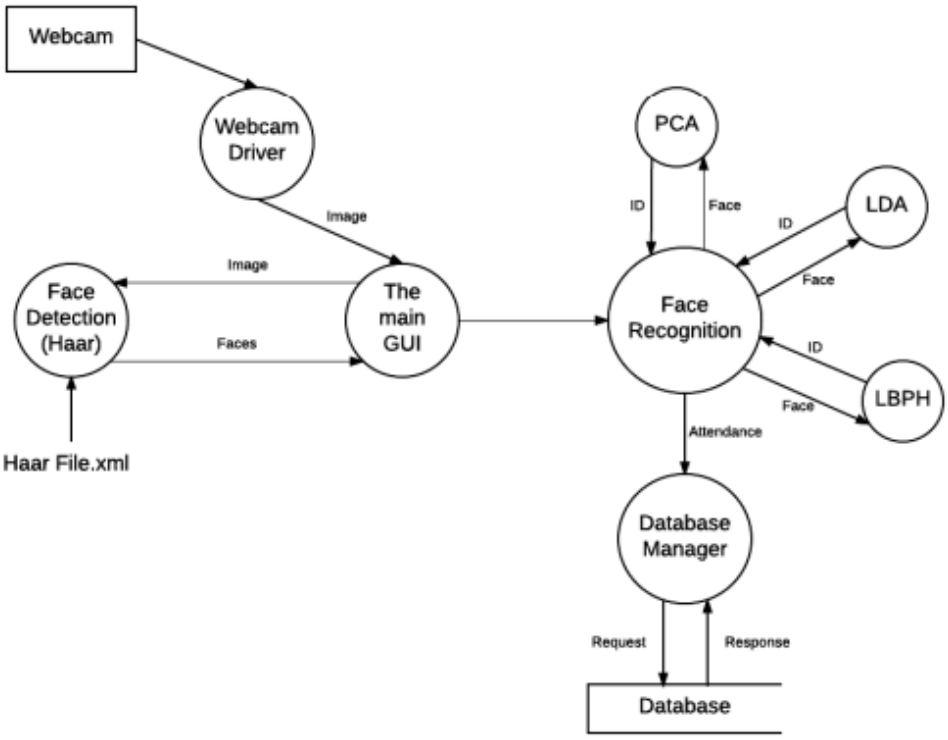
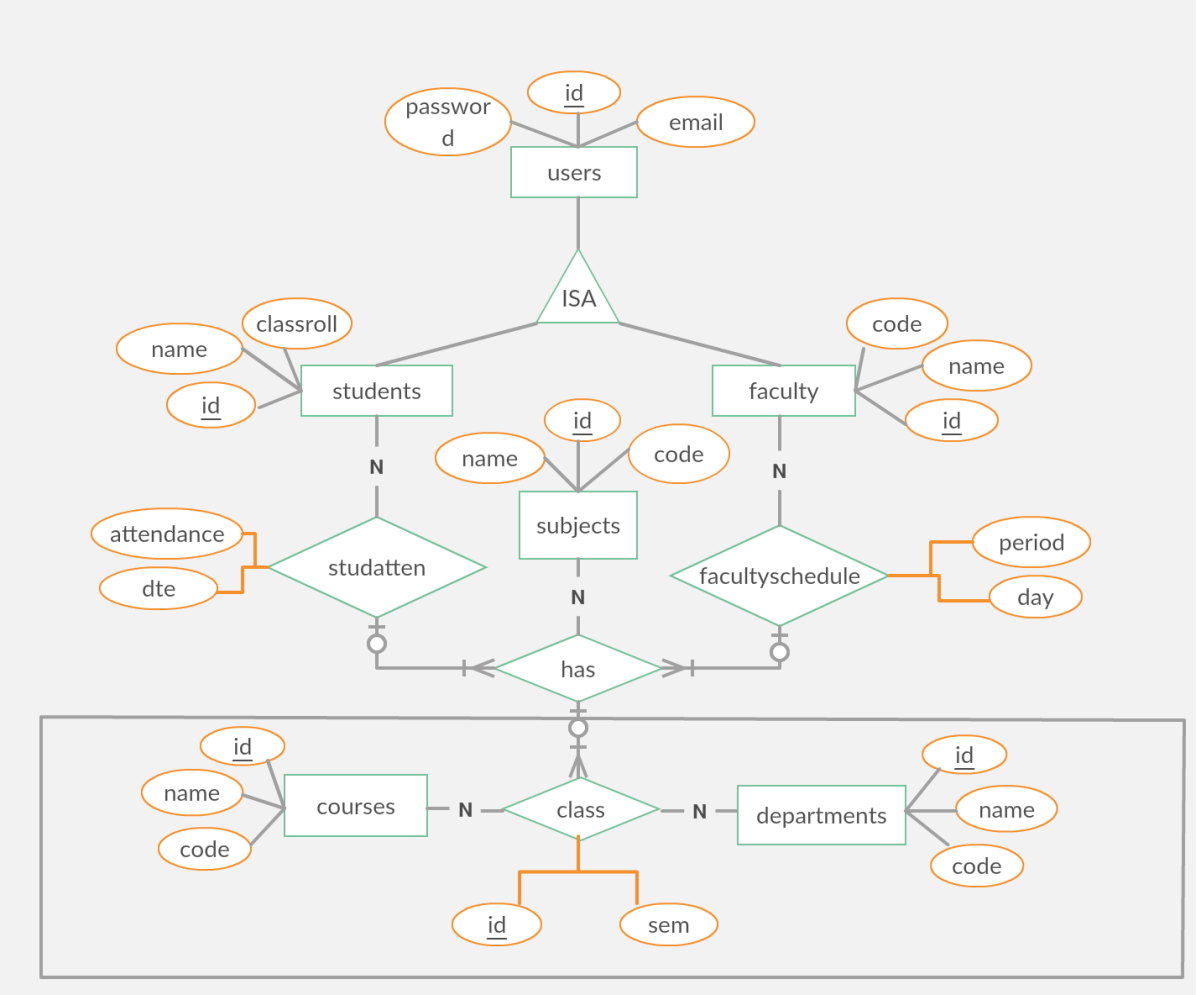


Figure 4.6: DFD Level 2

ER DIAGRAM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