Software Requirements Specification

For

Attendance management system

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LUAWMS Computer Science

July 25, 2022

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Revision History

Name	Date	Reason For Changes	Version

1. Introduction

1.1 Purpose

The main purpose of this specification is to help people who will work on this system to maintain the objectives and get started working in this project. This specification will direct people who will work on this project step by step through the process until they finish it successfully. This statement will describe specific details into every step of this project that workers will immediately locate the needs of this system to understand the purpose of doing any of the following steps into the system.

1.2 Intended Audience

The audience of this system will be:
1. Students
2. Faculty members
3. Registration office.

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

1.3 Project Scope

The scope of the system is to have a high-tech environment in the Dominican university community. That means by using the automatic attendance system, the community will transfer to the technical environment that they already have the AlphaReg system to help them manage the courses they have in the whole semester. This system will add some features in the automatic attendance system to AlphaReg by using Webcams/Camera device in every classroom at Dominican University.

That will help the community use the technology in effective ways:
1. Make the attendee process easier and effective.
2. Help faculty in the attendance process every time.
3. Mange and organize the attendance page through AlphaReg.

1.4 References

<List any other documents or Web addresses to which this SRS refers. These may include user interface style guides, contracts, standards, system requirements specifications, use case documents, or a vision and scope document. Provide enough information so that the reader could access a copy of each reference, including title, author, version number, date, and source or location.>

2. Overall Description

2.1 Product Perspective

At Dominican University, instructors manually take attendance in every class each day. They spend time to do that during class time. The Automatic Attendance System will help them do this process in an easy way. The main scope of this project is to make attendance process more organized in every class. This project will help instructors take the attendance automatically without spending some time during the class. It will provide the instructor who is/isn't present an early-warning of high levels of non-attendance through the software/csv file. They will also know the current grade in their reports. It makes it easier to have a clear picture of every student's attendance throughout the academic year.
The system is about to modify an existing system to develop the project. This system comes from Instructure. Instructure is a new company that has 200 employees. This company is an educational origination that works with technology to help the education community in an effective way. This company developed Canvas. The Canvas system is about a website page, which contains classes managed by instructors. It has management tools for courses. These tools play a significant role in the educational models these days, which are to organize the educational level using technology to achieve the educational goals easily. Instructors have the control panel for every class they have. The control panels allow them to create and develop the course's page that all students can see. They may have a Home Page, Syllabus, Discussion, Grade, Assignments, People, Files, and more. All of these components are available and controlled by the faculty member to make any changes.

Definitions:

Users: This means students who will get the most befits of the system.

Faculty: Also, who has the top priority to get benefit for the system and they are the target actors of the system.

The Registration Office: This is for the system management, and it will be presented by the employees.

2.2 Project Plan

This project has six phases to be completed within the time line. They are initiating, project plan, components, process model, testing, and feedback. The expected time for the project will take around three months.

2.3 Product Features

There are two kinds of process models for this system. There is the overview process model and the conditional process model. Starting with the first one. The first step of this process is to have a Webcam/Camera device. That will do the following steps:
1- Take 100 pictures of the students.
2- Every picture has a special code number for every recode. This code number takes the other step, which is matching.
3- The system checks on the picture and sends to the server and the student database.
4- In this database file, the system checks this picture for the identification. If the code number for the picture is in databases, the code number will continue for other steps. And if the code is not there, it will give you a false/“Unknown Person” result. Then, it will send you to the database for the identification and look for your record to modify it if there is any issue. Then, students will try again.
There is another step after the general identification.
5- Checkpoint, which will check if the student data is enrolled in the particular class or not. If yes, the process will continue, and if not, the system will send you to the registration office to check.
After that, the system now has access to the AplhaReg system. The system will access the student’s attendance page where it can take the attendance through the Webcam/Camera automatically. The last step of this process is to send a notification message to students and faculty. Faculty will have all students’ attendance reports, and they know who is attending and who is not.

Future Plans

There is also another process for this project that if a student missed a class, the system would make a decision. The aim of this process is to contain every student’s status and make sure the attendance for all students has already been taken. After ten minutes of the class time, the system will run automatically to check on the attendance page. If all students attended in that class, the system will send a report to them and stop.
However, if there are students who missed the class, the system would start some process. The system will check for who is missing the class and make a list of them. Every student of this list will receive a message that asks them for the reason of the missing the class. In this step, the system will wait for getting a response from each student separately. If the student answers with yes, and writes a note for it, the system will send this message to the faculty member. The faculty member has all the right to accept the excuse or not. If a student does not have a reason for the missed class, and checks on no, the system will count the missed class and send a report. Furthermore, if the student has an acceptable reason that he/she provides to faculty, the system will automatically report them, and the system will be done.

2.4 User Classes and Characteristics

There are three types of user classes in this community:
1) Students
2) Faculty
3) Registration Office

2.5 Operating Environment

This project will go through two steps:
The first step is to have the automatic attendance device in every classroom in the university. These devices will be connected to the computer and its system. Admin have to put students' details on the database and call students in the registration office on their first day for pictures sambals save their pictures in the database.
The second step is to train the software and convert the pictures in to machine understanding format. That is to convert the pictures into binary for the recognition of the user's picture. This step would complete the work, and the project will do its work, what it was made for? The system will recognize the image from camera start matching it with the database images and mark attendance of the students.
This system has some requirements to be accomplished. It needs hardware and software.

Hardware requirements:
1) High quality Webcam/Camera.
2) Cables for the device
3) A machine for the software

The current system work is already in existence. However, we need some system requirements:
1) Create new databases and indexes for students and class list by using MySQL
2) Make connation to the current database
3) Programing using Python.

3. System Features

Functional Requirements

3.1 Adding a New student:

Function: Sign up a new student to the system.
Priority: Top (Required for first release)
Requirements: To add a new user to the system, all of them should have registered in the admission office before they can register in their classes. On the orientation day, all students must take their photos in the input device for only one time to save the pictures data in the registration office to sign up.

3.2 Use the system to attend to classes

Function: Attend to classes
Priority: Top (Required for every class attended)
Requirements: When students have a class, they must be present during that class, to get marked present. If the images matches, students can enter the class, and they will be checked on the database/csv file. If the images does not match, the student must check with the registration office to figure out the checking device.

3.3 Report students

Function: The user will look at their reports for the current status.
Priority: Top (Required for first release)
Requirements: When the students have enrolled in the class, they are now able to check on their current attendance situation through the faculty/administrator office. In the system, they will be shown a database that gives them the whole attendance status in the semester.

3.4 Faculty receive a report

Function: Faculty receives a current report every class.
Priority: Top
Requirements: The system will send a message after ten minutes of the class time to the faculty. Faculty will have the all students' attendance reports in the particular class. Faculty can modify some of the attendance grades if he/she needs.

3.5 Students missed classes

Function: Students receive a message for missing class and have to submit a form.
Priority: High (Required for second release)
Requirements: When a student misses a class, he/she will receive a message via email and phone. Students must visit the admin/faculty to write the reason for missing the class. Students have to submit the form to wait for the response of the faculty's decision.

3.6 Students missed two classes and more

Function: Students receive a warning message for missing class for the second time.
Priority: High (Required for second release)
Requirements: When students miss more than one class, students will receive a warning message for missing two classes or more. The warning message should be for the missed classes for the whole semester and their status in a danger level.

3.7 Faculty check the report and the attendance control panel page

Function: Users can provide feedback about search terms.
Priority: Medium (Second release if possible, mandatory for third release)
Requirements: Faculty has to check on the report and give the final submission. Faculty has full control of modifying any grades and looking at students who have excuses to modify their grades. Faculty receive messages from the system about students who missed classes. For students who submit the note for the missed class, faculty members could look at the note and give a decision on the student's grades.

4. External Interface Requirements

4.1 Admin Interfaces

Login Display:
This is the main login in the system which appears in the after installation process.
This interface designed to be in the software for authorized person.
If there is a new user it needs to be signup or the user have already an account it will ask Username and password for login.

Welcome View page:
This view will be also in the device screen. This page means the device accepts the username and password and identify the person. So, it will show the eight function (Student details, Face Recognition, Attendance, Train data, Photos, Developer, Exit, and Help).

4.2 Hardware Interfaces

The hardware environment in this system will use the Webcam/Camera. These Webcam/Camera will play a role in the system. This device must be available in every classroom in the university. Also, it must be in the registration office. The interfaces for the hardware part are the same in the registration office's interface. This part of the interface has also other components, such as student's information, faculty information, class's information, and other related information. All of these data are stored in the database and end with the device screen.

4.3 Software Interfaces

The system will use:
1) Webcam/Camera Devices display software
2) Server
3) Programing using Python
4) Database uses with MySQL.

5. Other Nonfunctional Requirements

5.1 Security Requirements

The Current System Security

The current system, which is automatic attendance system, has its policy on its software. The current system builds upon a user name and password access. Authorized persons can access the software, and they can control it.

The system now has its own policy and security; however, the new feature we will add to the system will need some security requirements to the system. The new feature in the system will add some values to the current policy to maintain the security in the right way. It also provides proof of compliance.

The new policy in the system will deal with the security in many cases. The security will have more components on the system in a high control panel. The plan is to secure the outsider and insider community of misused the system (e.g. identification theft). Strong security is part of the policy's purpose.

User Access

Inside the community, there are students, faculty, and registration office staff who are going to use the system. The main actor of the users in the entity is students. Students will use the entity everyday by showing their faces by the beginning of each class. Faculties/Authorized persons will only use the system through software, and they can access to student information. The faculty member will use the entity to control the attendance page. Faculty's job is to add, edit, update and delete any record. Furthermore, registration office staff will check on every student's identification for security purposes. They check on students for identification in person before they add, edit, update and delete any information from their image records in the system. The staff will ask students for ID for identification and print their image in the device if needed to make sure the person is identified.

Threats to the system security

This system may face many threats. Sometimes, it comes from a community insider. This could be someone who discloses the data form the database where it located, in the registration office. Another type of deception is false identification, such as a fake ID, when students present in the registration office. The system will reduce this kind of misuse because the picture identification is more secure. However, staff in the faculties/registration office should check on the identification carefully before initiating any processes in the system. These records will be the official record for all students, since they begin university and until they graduate.

Levels of security:

1) **Hardware**: The Webcam/camera devices must be located in a secure location in every class. It should be behind the entrance that everyone can see the device inside and outside the class if the door is open.

2) **The operating system**: the security in this case will be in the same level of the software security.

3) **The network**: it is part of the current system security.

4) **The data management system**:

1. Students can access to their classes to the system check by reaching office.

2. Faculty access to software would be the same as we have now, and they will control the attendance page/report.

3. The purpose of the registration office is to make sure every student has the right image record and right information in the system on a consistent basis.

Level of access

Subject:

People level:

1) Faculty (Control on software).

2) Registration office (control the system).

Computer level:

1) Hardware (Webcam/camera)

2) Software (the system)

Access request (operation)

The operation will be presented in the security matrix that provides every task in the system and everybody in all task responses.

Reference Monitor

The authorization and the access control present in the security matrix below:
Faculty can create, read, update and delete the “Report student,” “Report faculty,” and only read “process student check.”
Registration office can create, read, update and delete the “add a new record,” “Process student’s check,” and they can only read the “Check-in.”
Student are able to create and read the “Check-in,” and they can only read the “Receive student check” and “report student”.

5.2 System Architecture

A system architecture is the ideational model that defines the structure, behavior, technology and other views of any system. In the face recognition system, we have the whole structure to build the system. In this architecture, we will describe the formal definition and the representation of the system. This description is a high level that can show the relationship between the components induces software, hardware and the communication between them. The first level of this architecture is the hardware component. The hardware here is the webcam/camera which will be connected to the system and other components. Then, it will check with security level. The security level here has database for the security purposes. Next, the architecture level will go to the process task, which has four components in the software. They are chick in for every class when student scan his/her faces, check on image, this is kind of the security and to check into every class. Then check into the class, which is the class chick list to make sure the student in the right class. Finally, notify step, this step is to report everyone involves in the system to receive a notification.
The last two level of this architecture are the access data and the databases. There are three databases for this step which are for the classes, students, and images records. This architecture is the whole structure for the Automatic Attendance System. So, all process here will complete the communication between all the components.

Appendix A: Use Case model

Develop a system that can help the Dominican university community to take the attendance automatically.
The target actors are:
1. Students
2. Faculty
3. Registration Office

All the data will be gathered by the Webcam/camera and Readers that will help faculty, students and, registration to reach the end user by the software
We will install the software create an authorized account to take the attendance. Fortunately, we do not need to create the login page, as we already have the login into the system, starting with the students, faculty, and the registration office staff.
1. Students:
a. For the first time, students go to the registration office for his/her images sambals.
b. In the beginning of each class, student's face will be automatically scanned and their attendance will be marked.
c. Each student, receive the automatic attendance grad on his/her email or throught text.
d. Students will receive the notification on his/her email or throught text for the attendance.
e. Students can reached at office for his current attendance report and the final report.
f. Student would receive a warning message if they miss more than two classes.

2. Faculty:
a. To know who is in attendance automatically.
b. On the class time, faculty will receive a report for this particular time.
c. Faculty could know who is in attendance or missing that class.
d. On the software, they have every student's report and grades.
e. They have the percentage of the attendance for the whole semester.
f. They can print the final attendance report for the class by the end of the semester.

3. Registration:
a. Registration office has all the students' records with images.
b. They check the identification for every student.
c. They use these records for any student who will come by the office as the identifier.
d. They connect this information with the classes.
e. Students would have a hold if he/she does not have image record in the registration office.

References:

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