Using the barcode system for Automatic Attendance

CW5

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Table of content

Introduction

Project description: The idea of this project comes as a solution to the problem of attendance students in universities, and how it takes time and effort from the lecturer, and from the time of the lecture. Sometimes mistakes happen, such as forgetfulness or misunderstanding. Our idea is to solve these problems by creating a program that is linked with the university's .blackboard system and with a bar code reader to attends students automatically

Project Scope: The purpose of this report is to understand the idea more and discuss how to actually implement it

1.Project Description:

Our project is a process of taking student attendance automatically by scanning a bar code, each student will have their own barcode on their phone. Our project will facilitate the process of taking students' attendance to the lecturer and the student as well, which will save time and effort on the one hand, on the other hand, it will be linked to one of the university's systems to monitor attendance and absence and whether the student will be prevented from the course as well.

Interviews: Part 1

a. Evaluation of a User Request:

Nada, artificial intelligence student, +966504652902, Monday 14-9

b. Description of the problem:

1- How does the idea positively affect you as a student?
A good and beautiful idea, and it reduces the lecturer's forgetfulness to take our attendance as students, and saves time for the student and the lecturer.
2- In your opinion, what is the best way to deal with an application like this, to be separate or linked to university applications such as Blackboard and My Future?
I think I prefer that the application and the bar code be linked to the Blackboard, because the Blackboard includes our grades as students and our complete information, and thus it will be easier for the student to see the number of her absences.
3- Is it necessary to add a field that allows the student to delivery excuses for her absence?
Yes, I hope so to facilitate communication with the deanship and lecturers and to delivery our excuses.
4- Do you need help while using the app?
No, with the current development, everyone knows the use of bar codes.
5- What could be the obstacle to your use application like this?
Maybe that there will be crowding in front of the class door, and it is also possible that the device malfunctions.

c. Analyst comments:

We believe that this interview with the student has helped us to see the students' point of view on this program, and how the program will able to help the students. Our idea is starting to become clear, for example, with which program will we link it? What features will we add? How familiar are the students with the use of bar codes? What obstacles will we face? We see that these interviews helped define what the idea is more.

Part 2

a. Evaluation of a User Request:

Dr. Noura Alotaibi , Faculty member at the University of Jeddah , nmalotaibi@uj.edu.sa , Monday 14-9

b. Description of the problem:

1- What is the current method you are using to take attendance? How do you find this method?
Use a mobile application, its use is easy, but it takes a lot of lecture time (not less than 10 Minutes from the lecture time is wasted in taking attendance) until the number of students is completed
2- In your opinion, what is the most appropriate way to connect the device, is it through the blackboard system? Or by my future? Or maybe both? Or a separate app?
As I said at the beginning, we need at the end of the term a summary of the number of attendees, so it is better to link it through electronic services at the University of Jeddah, and a faculty member has full authority.
3- In your opinion, what can we add /develop for this idea other advantages?
It is possible to make statistics or a summary at the end of each term, such as: attendance and absence percentage, number of lectures out of the total number of lectures
4- Do you think that our idea can reduce that the student attends each other?
Yes of course because everyone will have a different bar code
5- What obstacles do you expect to face while using this device?
As a faculty member, I do not expect that I will face any problem

c. Analyst comments:

It was a wonderful interview in which we learned a different point of view. We concluded several points, the most prominent of which are as follows: It is preferable to use the systems associated with the electronic services at the university because of the speed of access to them (because all the student's information is available in them) and not losing time will lead to ease of use and not to be exposed to any problem.

2.The purpose of the project

a. The User Business or Background of the Project Effort:

Content

Attendance is currently registered in universities manually, i.e. either the signature of each of the students attending or the instructor registration of the students present. But our project provides a self-registration service, and attendees are automatically registered in the Blackboard system.

Motivation

Our goal is to facilitate the registration process for attendance at universities.

Considerations

Our project does not solve a serious problem, but only facilitates the process of registering attendance and may solve some of the problems facing registering attendance manually.

b. Goals of the Project:

- Switching from paper to electronic
- Activate the use of computer technologies
- Achieving the goals of Vision 2030 in developing technology
- Contribute to the activation of technology in all its forms.
- Urging the follow-up of technical developments with a broader horizon.
- Demonstrate the role of technology in facilitating the completion of tasks and documenting them
- Improve system performance
- Reduce used costs
- Reducing the time used
- Speed up the attendance process
- Access to the application to the largest possible segment
- To record student data and organize it within the system
- View information when you need it
- Ease of use of the system
- Save student data electronically, without the need to use papers
- Use an effective method of preparation
- Increasing the number of users of the application from students and faculty members
- Recognize the level of impact of the system in the advancement of technical awareness.
- Ease of uploading attachments to the system
- Providing students with the skills to deal with the system

3. Preliminary report

1- The problem:

The main problem with the attendance system is the time that could be spent on attending to the students especially if the number of students in the class is large let's say over 100 students if the teacher attends them one by one that could take half hour of the lecture time. While we can limit the waste of time by applying self-attendance.

2- Findings:

There are many problems that the present system has. Forgetting the doctor to attend to the students. The student's ignorance of the number of absences and lateness. When the number of students are large, students can attend to their friends and the doctor does not distinguish the student's voice. Sometimes the doctor may attend and the student does not hear, then the doctor thinks that the student is not present.

3- Recommendation or proposed solution:

The current regular system is in two ways, either by taking the attendance with paper and pen, and then submitting the data as reports to the university's websites, or by automatic student attendance on the blackboard, and this requires that the lecture be online. To improve and develop the status quo, we have combined these two ways in a way that saves time and effort, and is easy to use. We will use the barcode system for automatic student attendance, and it will be linked to the university's app such as Blackboard, just by scanning the student's barcode on the device, her attendance will be recorded and it will appear on the university's systems.

4- Cost and schedule estimates:

Phase	Description	Cost	Time
Specification	User Interfaces: The following user interfaces will be on the blackboard. For each division, there will be a special field for the barcode. It will appear when entering the university's systems, choosing the specific division, then choosing "Attendance System" and then scanning barcode with the device at the door of each class. Hardware Interfaces: the only hardware interface will be for the scanning of QR codes to take attendance at a venue. All that is necessary is a device that has a camera to scan the QR code on the screen of another mobile device. Any smartphone or tablet will most likely satisfy this requirement.	5000	3 weeks
Design	Our design is focused around strongly modeling our interfaces, and keeping the concerns separated, so that we have a very modular architecture, that allows modifying the design as our experiences dictate. It will be easy to handle and everyone can use it.	7000	a month
Evolution	The system as a whole will be evaluated and to determine if all the goals and requirements have been achieved or not.	1000	2 weeks
Total		13000	two months and a week

4-Report writing

1- Problem Definition:

Main problem:

The main problem with the attendance system is the time that could be spent on attending to the students

The sub problem:

There are many problems that the present system has.

Forgetting the doctor to attend to the students.

The student's ignorance of the number of absences and lateness.

the doctor may attend, and the student does not hear, then the doctor thinks that the student is not present.

2- Scope Objectives of "new system":

System for automatic student attendance, take attendance by scan

3- Alternative Solutions:

1- A Individual App on store that the instructor can use.

2-fingerprint system

4- Cost and benefits of Alternatives:

Phase	Description	Cost	Time
Specification	An Individual App on store that the instructor can use: It will be a program that displays the names of students and their data, and will be a box for attendance consisting of two options. If the student attends, the lecturer will press the Yes option, if the student is absent, the lecturer will press the No option, and this application will display the percentages of students' absence.	2000	a week
Design	The design will be based on foundations that allow it to be updated and add more features to it according to the changing requirements of users, but initially the design will be based on the most important requirements of users, which is to provide a program for attendance and absence.	3500	3 weeks
Evolution	It will be checked and evaluated whether the program requirements have been met at this point or not.	600	a week
Total		6100	a month and week

5- Software impacts:

- **Software is faster**
- **The user interface is easy to understand**
- **Connect the system with the database**
- **Complex system will get easier**
- **Availability of an electronic database**
- **Use it without the need for a network**
- **Make data available at any time when you need it**
- **Connect the system with the Excel program**
- **Possibility to use statistics from Excel**
- **Less time**
- **good architecture**
- **Ease of access to data**
- **Generate a barcode by time**
- **Notifications when the required limit is approached**
- **Fraud Reduction**
- **more secure**
- **data protection**
- **Ease of use**
- **Providing the necessary licenses and powers**
- **The ability to use it on more than one operating system**

6- Potential Changes in the Organization:

If our system is implemented, the organization will be better in terms of:

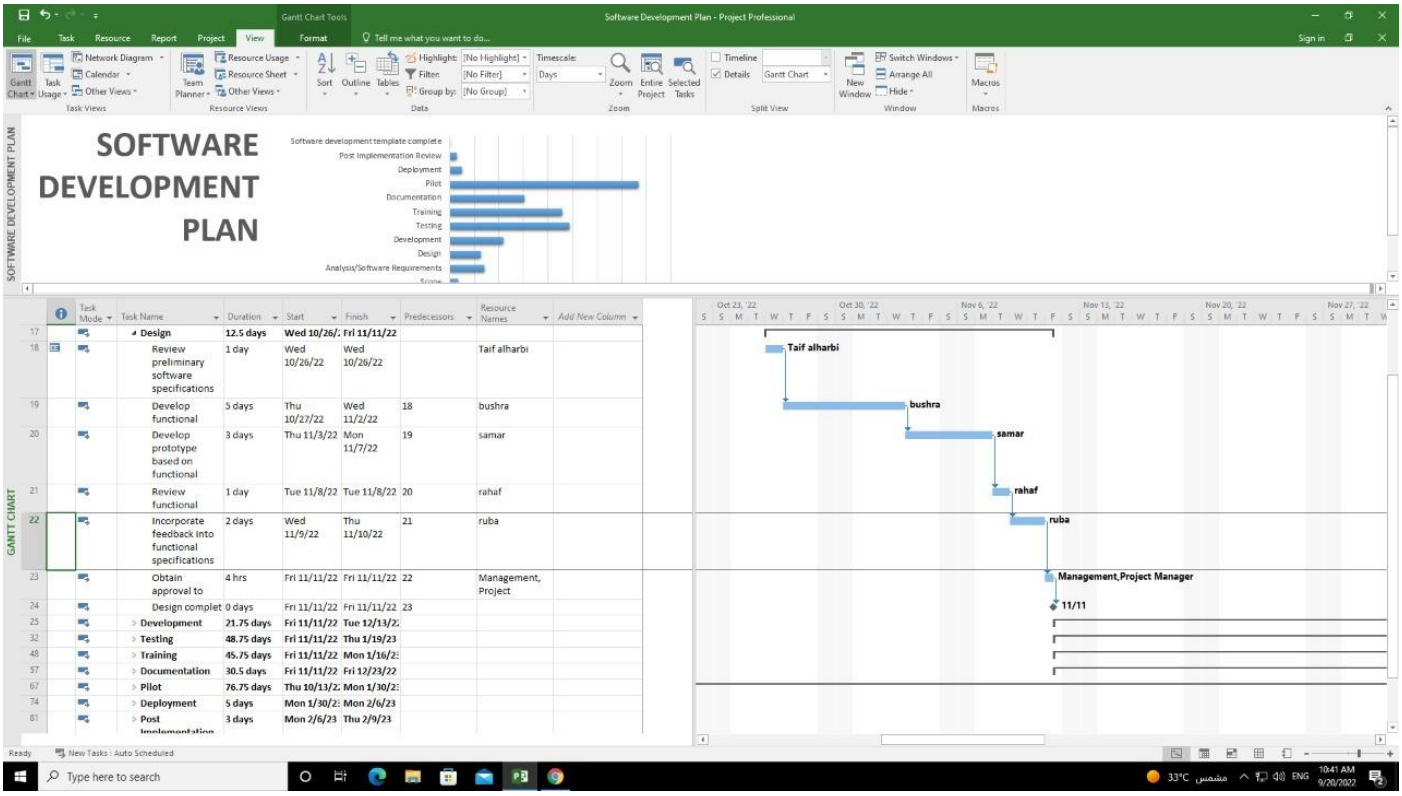
- There will be no delay in taking attendance, which could lead to a narrowing of the lecture time
- Students will not be able to prepare for each other, as each student will have her own barcode, and preparation will only take place with the barcode
- Save time for the doctors, as they will not need to record attendance more than once, on paper, and again on the Blackboard system, and again on the Odus system, as the system will do all this once the student scans his barcode.

All of these things help to organize time and provide credibilit

7- Recommended Alternative of the course of Action:

The best alternative solutions single application in the store that the teacher can use It is closer to our software, easier to use, and the cost is cheaper than the fingerprint system It is more complex and very expensive.

Project plan (By using Microsoft Project**)**



5.Context Diagram

Stockholder definition

a. The Client
   - The University of Jeddah.

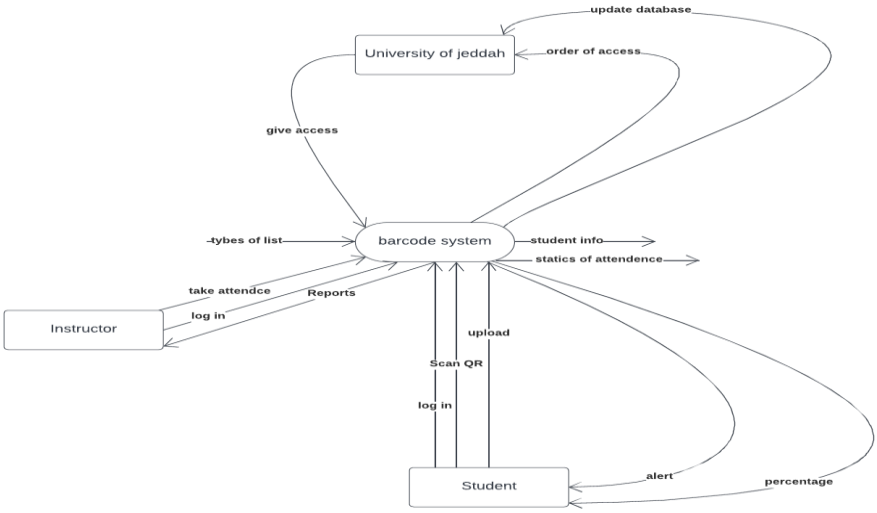
b. The Customer
   - The Students.

c. Other Stakeholder
   - University employees (the lecturers), programmers (who will translate the specifications into an effective program and website), the institutions of some applications that will be integrated with the program such as Blackboard.

The scope of the work

The scope of the work		
	Content	Motivation
The Current Situation	The current situation to take attendance is to take it manually by calling the students names or make them sign. This usually take time and sometimes	Our project provides a self-registration service, and attendees are automatically registered in the Blackboard system. Students will not be able to prepare for each other by signing to each other
The Context of the Work	The issue with the attendance system is the amount of time that might be used to attend to the students, especially if there are many students in the class, say over 100, as doing so could take a full half-hour out of the lecture period. While implementing self-attendance will help us to save time wasting.	Once our system is in place, there won't be any attendance delays that could result in the application of the lecture time. Since each student will have their own bar code and will only prepare using the bar code, students will be unable to prepare for one another. The technology will automatically record attendance once a student scans their bar code, eliminating the need for instructors to do it manually, twice on paper, once on Blackboard, and once on Odus.

Diagram



Business Event List

Event Name	Input/output	Summary
Report	Report(out)	The system sends a report to the instructor
Student info	Student info(out)	The system produces student information
Statics of attendance	Statics of attendance(out)	The system produces attendance Statics
Alert	Alert (out)	The system issues an alert to the student
Percentage	Percentage (out)	The system provides to student's their absence Percentage
Order of access	Order of access(out)	The system asks the university for access to info
Update database	Update database (out)	The system updates data and sends them to the university
Take attendance	Take attendance (in)	The instructor sees the attendance of students
Scan QR	Scan QR (in)	The student scans it from the bar code system
upload	Upload info (in)	The information about the student is uploaded to the bar code system
Log in	Log in student (in)	The student’s access to the system
Order of access	Order of access (in)	The system can access of university

Update database	Update database(in)	The system sends updated data to the university
Give access	Give access(in)	The university gives the system access to the information
Types of list	Types of list (in)	The system received the main list from a student or instructor
Log in	Log in instructor(in)	The instructor's access to the system

6.Functional requirement:

ID	Requirement Definition
FR1	**Log in**
FR1.1	The system allows all students and instructors to access it with an Id name and password.
FR2	**View Student information**
FR2.1	The system enables students and instructors to show information about the present and absent.
FR3	**Choose from the list**
FR3.1	The system display for student to choose display percentage for student or upload excuses
FR4	**Upload absence excuses**
1.4FR	The system enables the student to upload absence reports and excuses.
FR5	**Modify Attendance**
FR5.1	The system enables the instructors to modify the absence for the students who have excuses
FR6	**Check attendance percent**
FR6.1	The system enables the instructors and students to chick the attendance percentage
FR7	**Scan QR**
FR7.1	The system enables the students to scan the barcode
FR8	**Display ban warning**
FR8.1	The system will send an automatic warning message of the possibility of being banned from the course to the student if the number of her absences exceeds the upper limit.
FR9	**Confirm**
FR9.1	The system should check about warning
FR10	**Log out**
FR10.1	Naturally, the system allows everyone who can access it to log out.

- Non-Functional requirement:

- **User Interface**

UI1: The system shall provide certain functionalities in the user interface according to the user authorization. The user interface will have language options, Arabic and English, and also the barcode that is the basis of the program will be included in the main user interface.

UI2: The interface will be easy to use and understandable to all users, uses clear terminology and supports user needs.

UI3: The user interface shall be as GUI and it will take less effort and time.

- **Hardware Interface**

HI1: The system must employ a hardware USB host interface. It is incredibly basic, efficient, and straightforward to use.

HI2: the system should have large memory to absorb all students' information.

HI3: the system also should support intel Core i5-12600K to be capable with the memory.

- **Software Interface**

SI1: The scanning device needs to Utilize Mac and Windows drivers to turn on peripherals.

SI2: The system will be website or features supports My future application.

SI3: The system sends the updated data for University database.

- **Security Requirements**

SE1: The system must provide a login page.

SE1.2: The system must ask the users to make a very strong password.

SE2: The system must allow students to access only the information they are authorized to access.

SE2.1: The system must enable only instructors to modify the attendance information

7. Use Case Model:

UC1: Login:

Scope Students, instructors, university of Jeddah.

Level: primitive.

Primary Actor: bar code system
Precondition:. After all students and instructors have an account

Stakeholders and Interests:
Students
instructors
university of Jeddah.

Scenario of UC1:

1-After all students and instructors have an account.

2-They can access on the system with an Id number and password.

UC2: Choose from list

Scope: students.

Level: scan the bar code.

Primary Actor: the bar code system.

Precondition: each student should have their own bar code.

Stakeholders and Interests:

Students

Instructors

Scenario of UC2:

1-the student or instructor log in .

2- the system display list .

3- The system asks the student whether they want to see their percentage displayed or upload justifications.

UC3: Scan QR:

Scope: the bar code system.

Level: select item from a list.

Primary Actor: student .

Precondition: after user log in to the system.

Stakeholders and Interests:

Students

Instructors

Scenario of UC3:

1-the students scan their bar codes.

2- the system attends them automated.

UC4: Upload absence excuses :

Scope: Student and Instructor

Level: upload absence reports to the system

Primary Actor: Student

Precondition: If the student has an absence

Stakeholders and Interests:

Student

Instructor

Scenario of UC4:

1-log in to the system.

2-go to the absence section.

3-Upload the reports.

UC5: Check attendance percent:

Scope: the instructors and students.

Level: check the percentage of attendance.

Primary Actor: the system.

Precondition: after recording the attendance in the system.

Stakeholders and Interests:

Instructors.

Students.

Scenario of UC5:

1-after recording the attendance.

2- It is saved in the system.

3-the system view the percent to instructor and Students

UC6: view student information:

Scope Students, instructors.

Level: Conclusion of verify.

Primary Actor: bar code system
Precondition:. after the system produces student information

Stakeholders and Interests:
Students.

instructors.

scenario of UC6:

1- after the system produces student information

2- They students and instructors can show information about the present and absent.

UC7: display ban warning:

Scope: University Jeddah System, Instructors.

Level: University send warning to student.

Primary actor: The UJ system.

Precondition: The student has exceeded the allowed absence limit.

Stakeholders and Interests: UJ system, Students, Instructors.

Scenario UC7:

1- When a student is close to exceeding the allowed limit for absence in the course.

2- A warning is sent from the university automatically or from the lecturer.

UC8: confirm:

Scope: University Jeddah System, students.

Level: verify.

Primary Actor: student.

Precondition: if the system have give the student warning.

Stakeholders and Interests:

Students

Instructors

Scenario of UC8:

1-When he gets close to his absence limit.

2- A message will be sent to the instructor.

3- Then it is confirmed by him.

4-sends a warning for student.

UC9: Modify Attendance

Scope: Instructor

Level: Modify and change absence.

Primary Actor: Instructors.
Precondition: If an excuse from a student has been accepted.

Stakeholders and Interests:
Instructor.

Scenario of UC9:

1-log in to the system.

2-go to the Modify attendance and absence section.

3- Modify the attendance.

UC10: log out:

Scope: Students, Instructors.

Level: End of use.

Primary actor: The system.

Precondition: The user has finished using the program.

Stakeholders and Interests: UJ system, Students, Instructors.

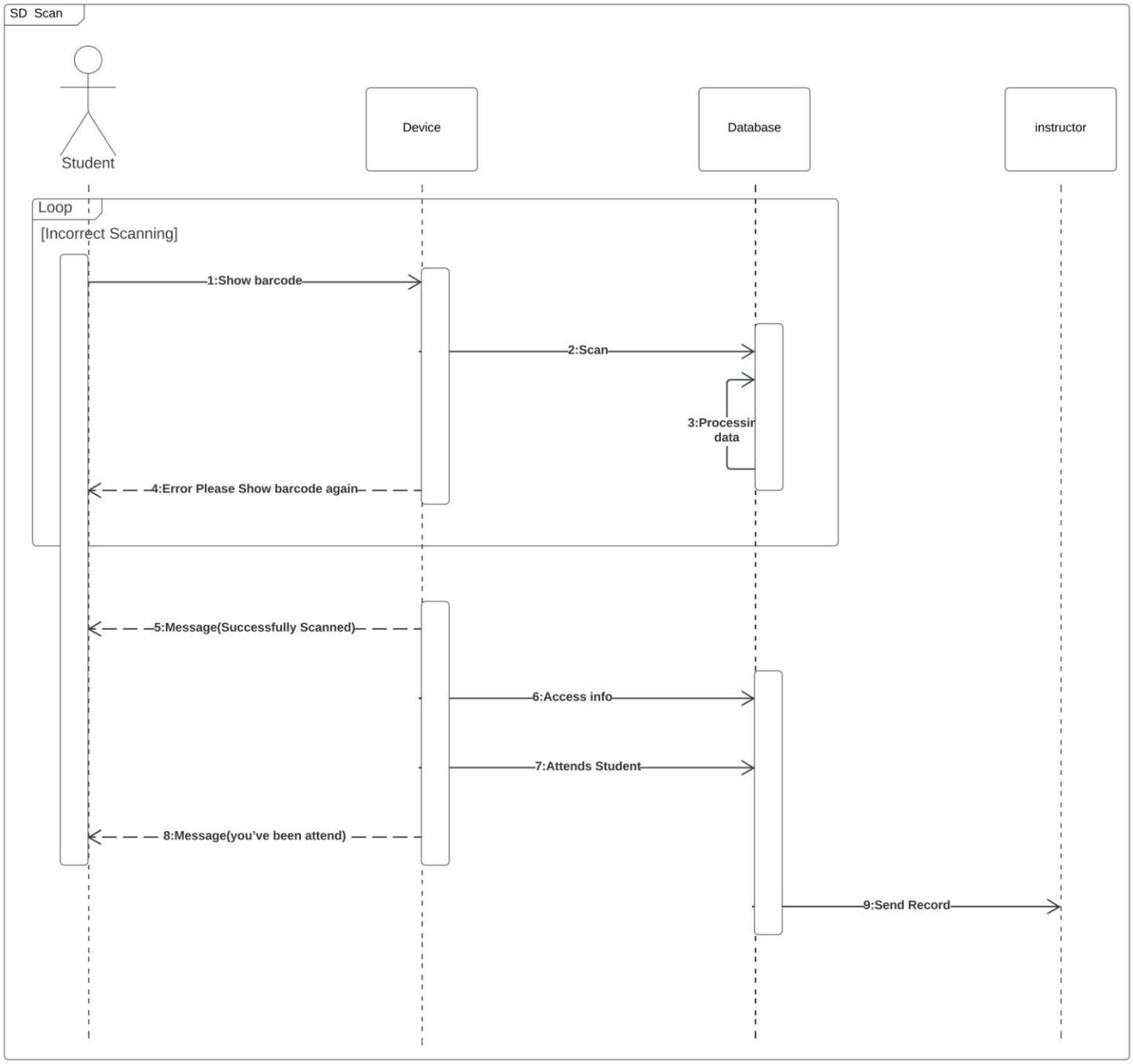
Scenario UC10:

1- The user has finished using the program.

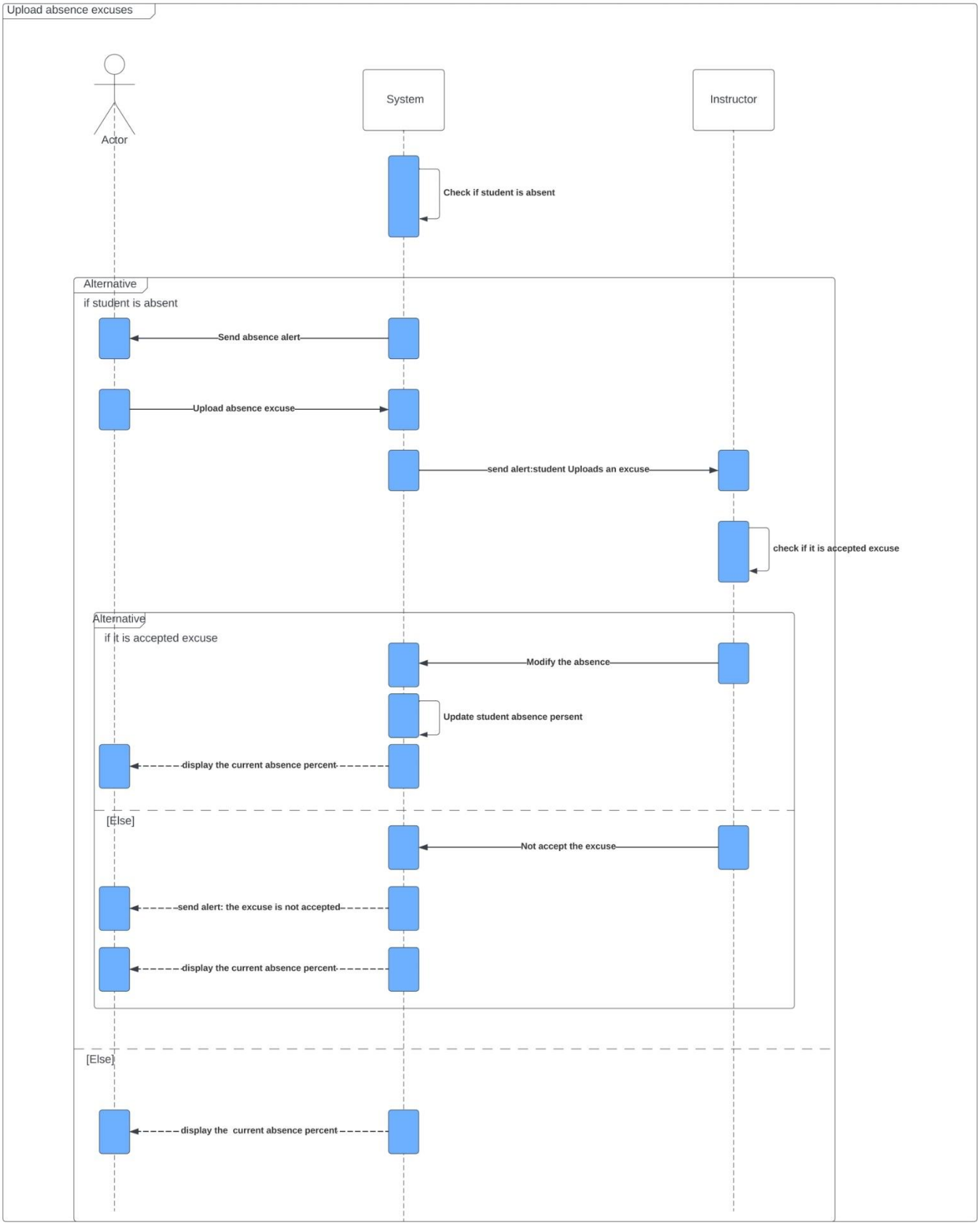
2- The user needs to log out of the app.

8.Sequences Diagrams

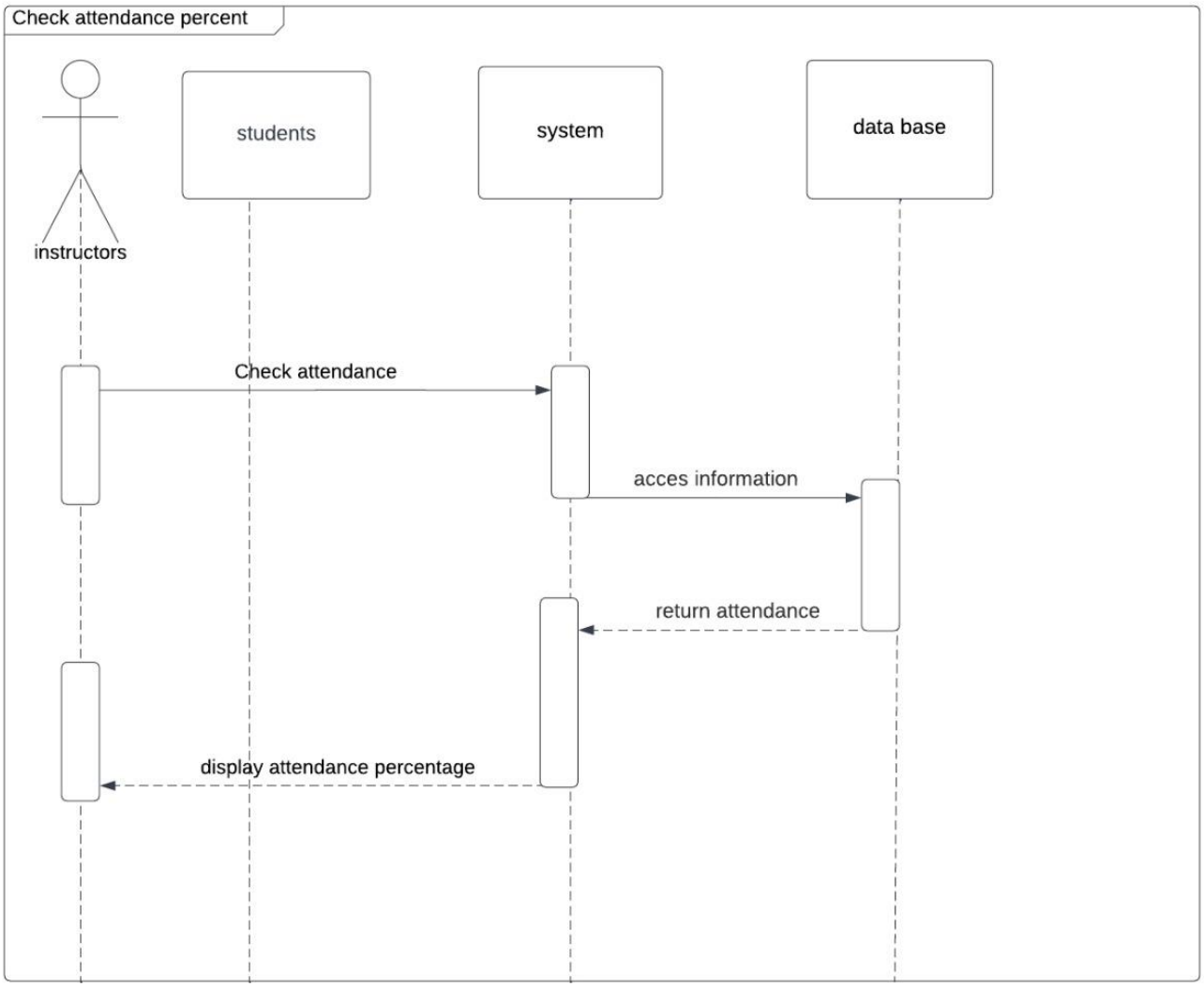
8.1:



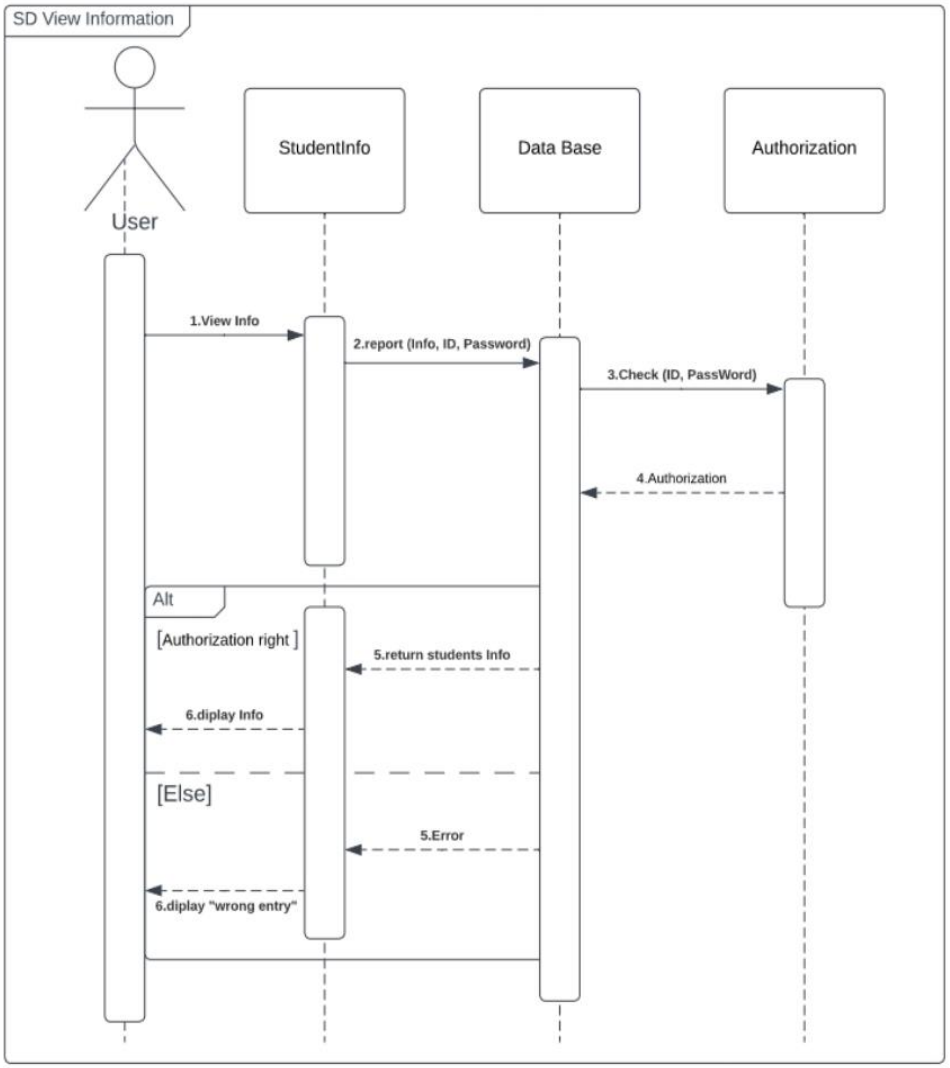
8.2:


Upload absence excuses
Actor
System
Instructor
Check if student is absent
Alternative
if student is absent
Send absence alert
Upload absence excuse
send alert:student Uploads an excuse
check if it is accepted excuse
Alternative
if it is accepted excuse
Modify the absence
Update student absence persent
display the current absence percent
[Else]
Not accept the excuse
send alert: the excuse is not accepted
display the current absence percent
[Else]
display the current absence percent

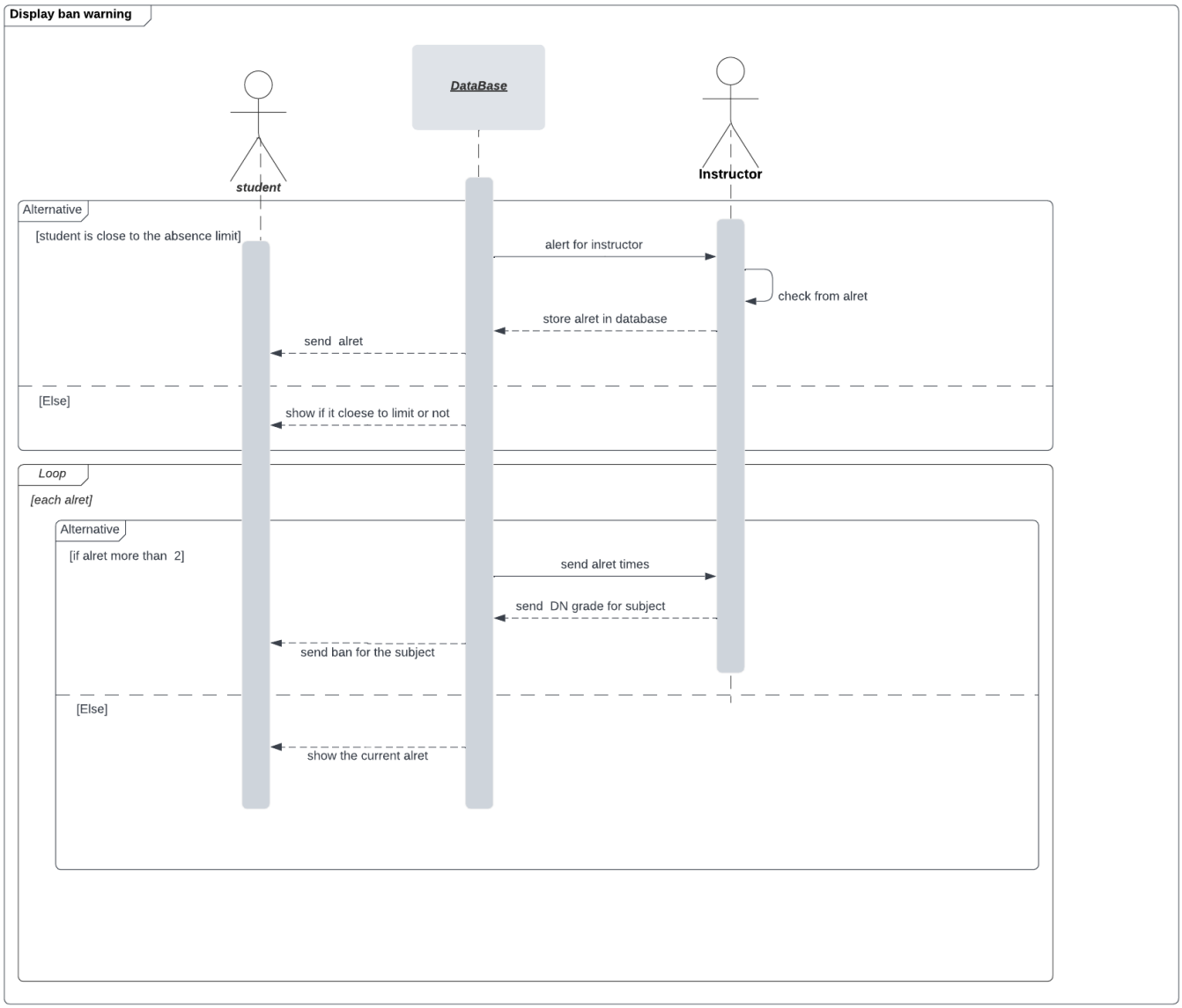
8.3:


Check attendance percent
instructors
students
system
data base
Check attendance
acces information
return attendance
display attendance percentage

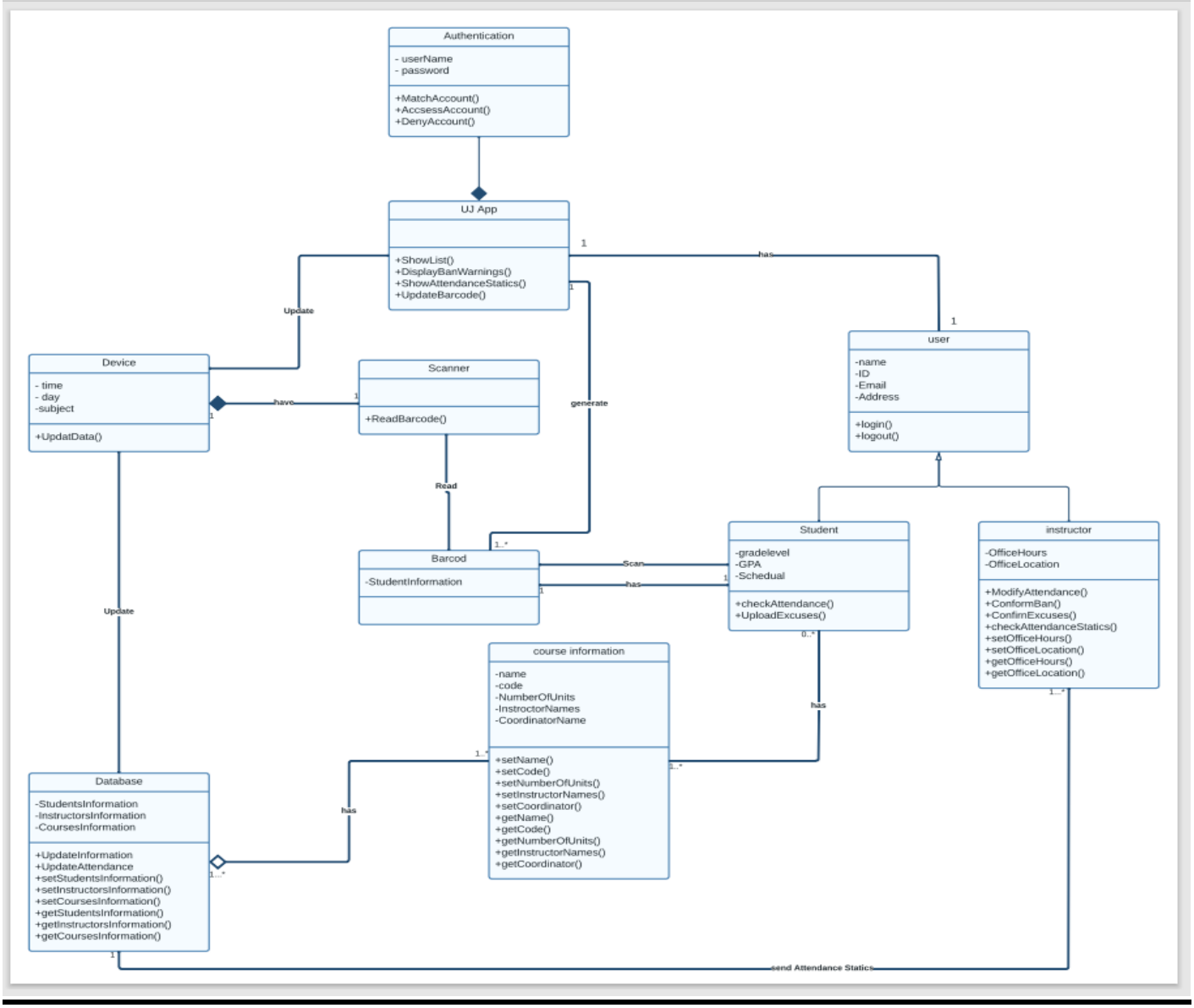
8.4:


SD View Information
User
StudentInfo
Data Base
Authorization
1.View Info
2.report (Info, ID, Password)
3.Check (ID, PassWord)
4.Authorization
Alt
[Authorization right]
5.return students Info
6.diplay Info
[Else]
5.Error
6.diplay "wrong entry"

8.5:


Display ban warning
DataBase
student
Instructor
Alternative
[student is close to the absence limit]
alert for instructor
check from alret
store alret in database
send alret
[Else]
show if it cloese to limit or not
Loop
[each alret]
Alternative
[if alret more than 2]
send alret times
send DN grade for subject
send ban for the subject
[Else]
show the current alret

9.Class Diagram:



Conclusion and suggestion

Conclusions: In general, as stated in the report, based on what was collected from interviews and information about the idea and how to implement it, and based on posing potential problems and the possibilities of solving them, it becomes clear that the idea will be convenient and help in facilitating the attendance students in universities, as it uses technology, and in our opinion, this the most important point is linking technology to facilitate some transactions at the university. The expected costs and the time required to :implement this idea, as well as possible and proposed alternatives to the responsible party .University of Jeddah, have been identified

Recommendations:These recommendations and ideas announced in the report are written to the University of Jeddah, to improve and facilitate the general situation in transactions, and to link them to advanced technology. Our idea is suggest that Incorporating the current methods of preparation into one method that uses technology. which will be easy to use and .flexible for all, and save time and effort for the two parties concerned

Tasks

Bushra Dajam (2110054)	Coordination and translation, Goals of the Project, Software impacts, The Context of the Work. 2 function requirements, software interface, draw context, choose from list, confirm, displays ban warning sequences, class diagram.
Ruba Hameed (2110692)	Coordination and translation, Recommendation or proposed solution, Schedule of Cost & schedule estimates, Cost and benefits of Alternatives, Stakeholder. 2 function requirements, user interface, Display ban warning, log out, view student information sequences, class diagram.
Rahaf Alfudhayl (2111658)	Interview with Dr. Noura, The User Business or Background of the Project Effort, Potential Changes in the Organization, The Current Situation,2 function requirements, security requirements, Modify attendance, Upload absence excuses, Upload absence excuses sequences, class diagram.
Taif Suliman (2110200)	Interview with Dr. Noura, The problem, Alternative Solutions, Business Event List, 2 function requirements ,hardware interface, Check attendance percent, Scan QR,SD scan sequences, class diagram**.**
Samar Mohammed (2116922)	Interview with student, Findings, Recommended Alternative of the course of Action, Business Event List, 2 function requirements, hardware and software interface, View Student information , Log in, check attendance percentage, class diagram**.**