IT314: Software Engineering
Lab Session III - Specifying Functional and Non-Functional Requirements

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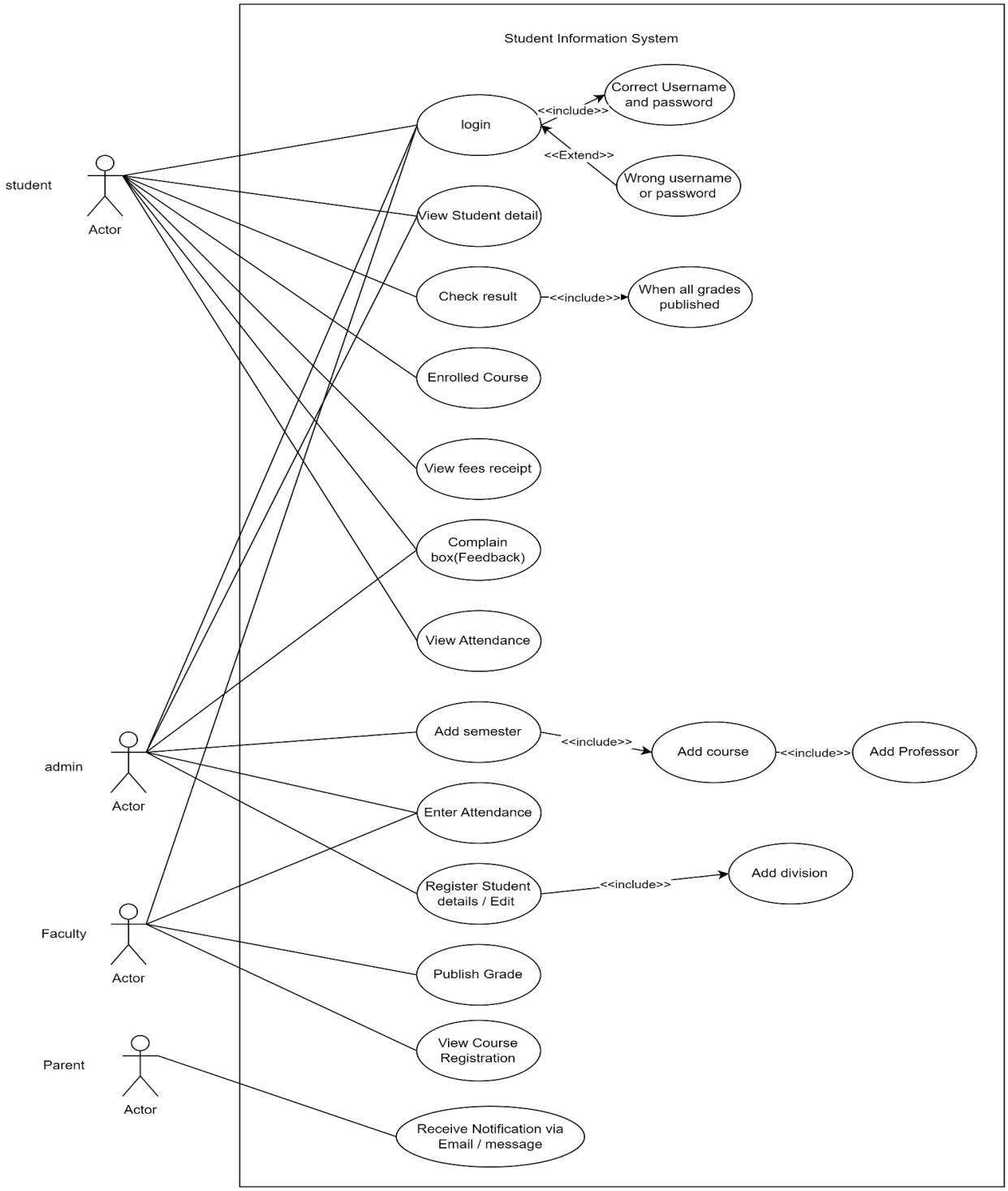
Use Case Diagram



1) **Write down the set of user stories (both front and back of the card) stating functional and non-functional requirements.**

- **Functional Requirements:**

1. Login:

➔ **As a** student,
I want to be able to login to the student information system using my student ID and password,
So that I can access my academic records and other important information.

➔ **As an** admin,
I want to be able to login to the system using my credentials,
So that I can manage the system including student and faculty accounts, security settings and other tasks.

➔ **As a** faculty,
I want to be able to login to the student information system using my credentials,
So that I can access and update student records including grades, attendance and other information.

- **Confirmation:**
Success: All the actors (Student, admin and faculty) are able to login successfully and are referred to the home page.
Failure: Display message
  a) "Incorrect username or password."
  b) "Unrecognized username, please try again."
  c) "Service unavailable, please try again."
  d) "Account has expired."

2. View Student details:

➔ **As a** student,
I want to be able to access my personal information such as grade card, registered course, and attendance,

So that I can track my progress, identify areas of improvement and stay informed.

➔ **As a** student,
I want a digital identity card where all personal details of myself show,
So that I can present it in any emergency if I don't have any physical ID card.

➔ **As a** admin,
I want to be able to access student's personal and academic details
So that I can manage all the registered student data.

➔ **As a** faculty,
I want to be able to view academic information of all enrolled student in their respective course
So that I can analyze their academic progress and suggest improvement.

- **Confirmation:**
  Success: All Registered and verified students can see all personal and his/her academic details.
  Failure:
  If admin/faculty are entering the wrong search key to access student details it will show an error message "No such student exists".

3. Enrolled Course:

➔ **As a** student,
I want enroll course Option,
So that The system should display important information about the course, such as the course description, instructor and I can Enroll for a particular course without any confusion.

- **Confirmation:**
  Success: All the students are able to enroll in the course for the current semester successfully.
  Failure: Display message

a) “We're sorry, your enrollment request for [Course Name] has been denied because you do not meet the prerequisites or requirements for the course.”

b) “We were unable to enroll you in [Course Name] due to an error in the system. Please try again later or contact support for assistance.”

4. Fees Receipt:

➔ **As an** Admin**,**

I want to upload the verified invoice of the fees that has been paid by the particular student,

So that Students can see their Fees Receipt and can download Fees Receipt.

Confirmation:

Success:Shows the message that “the receipt has been uploaded successfully”

Failure: Shows the message that “ the receipt could not be uploaded” if he enters the wrong search key.

➔ **As a** student**,**

I want to view the invoice of each semester’s fees completed till now

So that I can track my fees for the entire Academic year and get an invoice of fees .

- **Confirmation:**

  Success: Shows the message that “Your receipt has been successfully displayed”

  Failure: Shows the message that “ The system is facing some issue while displaying the receipt”

5. Complain - Box:

➔ **As a** student,

I want to be able to complain about any issue

So that complaint can be raised to the admin and resolved by them.

➔ **As a** Student,

I want to receive a confirmation email when I submit a complaint to the complaint box,
So that I know that my complaint has been received and is being addressed.

- **Confirmation :**
  Success - display message.
  a) "Message delivered successfully".
  Failure- display message
  a) "Message is not delivered successfully, your network is too slow".

6. Check Results

➔ **As a** student,
I want to be able to view my course grades and exam scores in the SIS,
So that I can monitor my academic performance and identify areas where I need to improve.

- **Confirmation -**
  Success - Registered student has logged in all the grades are uploaded by instructors
  Failure - If all grades aren't uploaded, student cannot download the result

7. View Attendance

➔ **As a** student,
I want to be able to view my attendance record in the attendance system
So that I can keep track of my attendance and ensure that I am meeting the requirements of my courses.

- **Confirmation:**
  Success: All the registered students are able to view their attendance.
  Failure: If a student entered wrong details, display the message "Incorrect Details.

8. Enter Attendance

➔ **As a** system administrator,
I want to be able to enter the attendance data of the student into the system,
So that I can accurately track and monitor student attendance.

- **Confirmation:**
  Success: Successfully able to enter the attendance and display the message "Attendance entered successfully."
  Failure: Display message "Unable to enter the attendance, please try again."

9. **Add Semester**

➔ **As an** admin,
I want to be able to add a new semester to the system and also professor and related course,
So that students can enroll in classes for the upcoming semester.

- **Confirmation:**
  Success: "The new semester has been saved to the system and is ready for students to enroll."
  Failure: Display Message
  a) "Error: A semester with this name already exists in the system. Please provide a unique semester name."
  b) "Sorry, something went wrong while adding the new semester. Please try again later."

10. Publish Grade:

➔ **As a** Faculty**,**
I need to Publish Grade for students at the end of the each semester
So that they can view their final grades and progress in the course.

- **Confirmation:**
  Success: New grades are Published and available for the students.
  Failure: If actor entering wrong search key to publish grade card for particular students it will show error that " Grade card can't be publish for this student due to wrong details"

11. Register Student Details:

➔ **As an** Admin,
I can Register new Student in to the system,

So that I can add a new Student in the database who gets an admission in Institute.

- **Confirmation:**
- **Success:** Display message “New Student Registered Successfully.”
- **Failure:** Display message “Student Registration failed due to invalid details.”

- **Non functional Requirements:**

➔ **As a** system administrator,
I want to ensure that the system has the following non functional requirements,
So that it is efficient, secure and reliable.

1. **Performance :**

➔ **As an** administrator,
I want the system to be able to manage the traffic of 100 users at the same time,
So that system can handle a large number of users at single time.

2. **Scalability :**

➔ **As a** user,
I want the system to be scalable so that it can handle increasing amounts of data as the number of students and users grow.
So that In future if the system requires a large number of users we can scale this system.

3. **Security :**

➔ **As an** administrator,
I want the student information system to have a high level of security so that sensitive information such as student records, grades and personal information are protected from unauthorized access.

4. **User-friendly** :

➔ **As a** user,

I want the system to be interactive so that I can track my activity.
So that I can easily access a system.

5. **Reliability:**

➔ **As a** user,
I want the system to be highly reliable
So that I can trust that my data will not be lost or corrupted.

6. **Maintainability:**

➔ **As an** administrator,
I want the system to be easily maintainable
So that I can restore the system from any failure.

7. **Portability:**

➔ **As a** user,
I want the system to be portable,
So that I can access the system from any location without experiencing significant downtime or slow response times.

8. **Availability:**

➔ **As a** user,
I want the system to be highly available
So that I can access it at any time without experiencing significant downtime or slow response times.

9. **Compatibility:**

➔ **As a** user,
I want the system to be compatible with all types of devices.
So that all users can use this system on all devices.

10. **Usability:**

➔ **As a** user,
I want the system to be easy to use
So that I can quickly and easily navigate and find the information I need.

11. **Database Consistency:**

➔ **As a** user,
I want the system to be consistent with my data
So that there is no ambiguity in my data.

2) Create the sprints from the product backlog.

The product backlog for a student information system (SIS) is divided into following 5 sprints according to the priorities of the functionalities and designing:

Sprint 1:

1. Set up the basic system architecture and database schema.
2. Implement user authentication and authorization mechanisms.
3. Create user interface for login and registration pages.
4. Build the login and registration pages with basic functionality.

Sprint 2:

1. Implement course creation and deletion functionality for administrators.
2. Build student enrollment and add-drop courses functionality.
3. Create the course enrollment page and implement basic display functionality.
4. Implement a basic student profile page with editable fields.
5.

Sprint 3:

1. Implement faculty functionality for adding and editing grades for students for their respective courses.
2. Add functionality for viewing student grades and attendance.
3. Implementing the feature of viewing the current and previous fee payment status and downloading fee receipt.

Sprint 4:

1. Implement a search feature to allow users to find specific courses or students.
2. Add more detailed fields to the student profile page.
3. Creating a complain box feature where students can submit complaints.

Sprint 5:

1. Begin implementing a one way communication system from institute to parents side for providing student progress.

2. Finish implementing the messaging system with real-time notifications.
3. Build out additional reporting and analytics features for teachers and administrators.
4. Improve the overall user experience and user interface design.
5. Conduct extensive testing and debugging to ensure the system is stable and reliable.