

Software Requirements Specification

For

STUDENT DETAILS VISUALIZATION SYSTEM

Version 2.0

Prepared by

Group No. : 3

1	Venkata Pranav Yeju	B221302CS
2	Sandeep Kharwar	B220509CS
3	Ashutosh Ranjan	B220736CS

Course : Software Engineering Lab

Date : 03-03-2025

Table of Contents

1. Introduction

- Document Purpose
- Product Scope
- Definitions, Acronyms, and Abbreviations
- References and Acknowledgments

2. Functional Requirements

- User Authentication
- Dashboard
- Placement Data
- Event Data
- Professional Society Membership Visualization
- Interactive Features

3. Non-Functional Requirements

- Performance Requirements
- Usability
- Scalability
- Security
- Reliability
- Maintainability

4. Class Diagrams

- System Class Diagram

5. Conclusion

1. Introduction

1.1 Purpose

This document outlines the functional and non-functional requirements for the Student Details Visualization System. The system aims to provide a user-friendly interface for managing, analyzing, and visualizing student placement, event participation, and professional society membership data.

The system will allow users to generate dynamic reports and visualizations based on various filters such as department, year, company, event type, and professional society.

1.2 Scope

The system will be used by system administrators, students, and faculty to manage and analyze student placement, event participation, and professional society membership data. It will provide tools for generating reports and visualizations, ensuring that users can easily access and interpret the data.

1.3 Definitions, Acronyms, and Abbreviations

SRS: Software Requirements Specification

UI: User Interface

NFRs: Non-Functional Requirements

FRs: Functional Requirements

IEEE: Institute of Electrical and Electronics Engineers

1.4 References

Functional and Non-Functional Requirements - With Examples

Link: <https://medium.com/@growsolutions/functional-and-non-functional-requirements-the-ultimate-checklist-with-examples-cde16aba33d7>

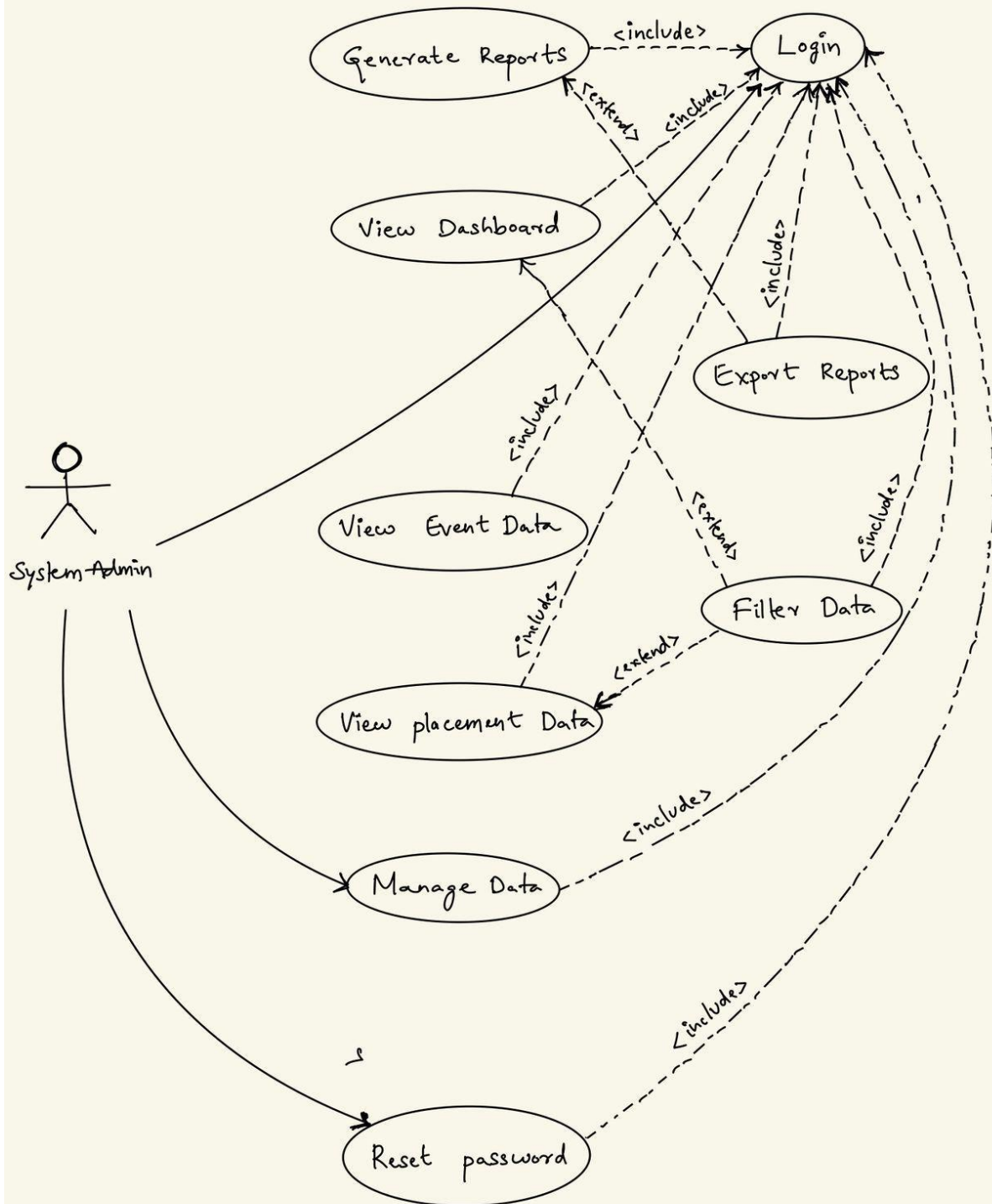
PDD Document, USER_INTERFACE.pdf

2. Functional Requirements

2.1 Use Case Diagram

Below is a simplified use case diagram that represents the interactions between the system admin and the system:

Student Details Visualisation System



2.2 Actors and Use Cases

Actors

System Admin: The primary actor responsible for managing user accounts, generating reports, and viewing visualizations.

Use Cases

Manage User Accounts: The system admin can create, update, and delete user accounts.

Generate Reports: The system admin can generate reports based on filters such as department, year, company, event type, and professional society memberships.

View Visualizations: The system admin can view visualizations such as bar charts and pie charts based on selected filters, including professional society memberships.

2.3 Detailed Functional Requirements

1. User Authentication

FR-1: Login Functionality

- **Description:** The system shall allow the system admin to log in using their email and password.
- **Input:** Email and password.
- **Process:**
 1. Validate the email and password against the database.
 2. If credentials are valid, grant access to the dashboard.
 3. If invalid, display an error message (e.g., "Invalid email or password").
- **Output:** Access to the dashboard or an error message.

FR-2: Forgot Password Feature

- **Description:** The system shall provide a "Forgot Password" feature to reset the password.
- **Input:** Email address.
- **Process:**
 1. Verify if the email exists in the database.
 2. Send a password reset link to the provided email.
 3. Allow the user to reset their password via the link.
- **Output:** Password reset link sent to the user's email.

FR-3: Manage User Accounts

- **Description:** The system shall allow the system admin to create, update, and delete user accounts.
- **Input:** User details (name, email, role, etc.).
- **Process:**

1. For **Create**: Add a new user record to the database.
 2. For **Update**: Modify an existing user record in the database.
 3. For **Delete**: Remove a user record from the database.
- **Output**: Updated user list displayed in the system.
-

2. Dashboard

FR-4: Display Key Metrics

- **Description**: The system shall display a dashboard with key metrics such as total placements, average package, total event participation, and professional society memberships.
- **Input**: None (automatically fetched from the database).
- **Process**:
 1. Aggregate data from the placement, event, and professional society tables.
 2. Calculate metrics (e.g., total placements, average package).
- **Output**: Display metrics in a visually appealing format (e.g., cards, charts).

FR-5: Filter Data

- **Description**: The system shall allow the system admin to filter data by department, year, company, event type, and professional society memberships.
- **Input**: Selected filters (e.g., department = "Computer Science", year = "2024").
- **Process**:
 1. Query the database based on the selected filters.
 2. Fetch relevant data from the placement, event, and professional society tables.
- **Output**: Display filtered data on the dashboard.

FR-6: Display Visualizations

- **Description**: The system shall display visualizations such as bar charts, pie charts, and heat maps based on the selected filters.
 - **Input**: Selected filters.
 - **Process**:
 1. Generate visualizations using a charting library (e.g., Chart.js).
 2. Render the visualizations on the dashboard.
 - **Output**: Visualizations displayed on the dashboard.
-

3. Placement Data Management

FR-7: Display Placement Data

- **Description**: The system shall display placement data in a tabular format with columns such as student name, department, company, position, status, and package.
- **Input**: None (automatically fetched from the database).
- **Process**:
 1. Query the placement table.
 2. Fetch all placement records.
- **Output**: Display data in a table.

FR-8: Export Placement Reports

- **Description**: The system shall allow the system admin to export placement reports in various formats (e.g., PDF, Excel).

- **Input:** Selected filters.
- **Process:**
 1. Generate a report based on the filters.
 2. Convert the report to the desired format (e.g., PDF, Excel).
- **Output:** Downloadable report file.

FR-9: Display Placement Statistics

- **Description:** The system shall display department-wise statistics, company-wise distribution, and package distribution.
- **Input:** None (automatically fetched from the database).
- **Process:**
 1. Aggregate data from the placement table.
 2. Calculate statistics (e.g., department-wise placements, company-wise distribution).
- **Output:** Display statistics in visual formats (e.g., bar charts, pie charts).

4. Event Data Management

FR-10: Display Event Participation Data

- **Description:** The system shall display event participation data in a tabular format.
- **Input:** None (automatically fetched from the database).
- **Process:**
 1. Query the event table.
 2. Fetch all event participation records.
- **Output:** Display data in a table.

FR-11: Generate Event Reports

- **Description:** The system shall allow the system admin to generate event reports based on selected filters.
- **Input:** Selected filters (e.g., event type = "Technical", year = "2024").
- **Process:**
 1. Query the event table based on the filters.
 2. Generate a report.
- **Output:** Downloadable report file.

5. Professional Society Membership Management

FR-12: Display Society Memberships

- **Description:** The system shall display a list of students with their professional society memberships (e.g., IEEE) in a tabular format.
- **Input:** None (automatically fetched from the database).
- **Process:**
 1. Query the professional society table.
 2. Fetch all society membership records.
- **Output:** Display data in a table.

FR-13: Filter and Visualize Society Memberships

- **Description:** The system shall allow the system admin to filter and visualize professional society memberships by department, year, and society name.
- **Input:** Selected filters (e.g., department = "Computer Science", society name = "IEEE").
- **Process:**
 1. Query the professional society table based on the filters.
 2. Fetch relevant data.
- **Output:** Display filtered data and visualizations.

FR-14: Visualize Society Memberships

- **Description:** The system shall provide visualizations (e.g., bar charts, pie charts) for professional society memberships based on selected filters.
- **Input:** Selected filters.
- **Process:**
 1. Generate visualizations using a charting library.
 2. Render the visualizations on the dashboard.
- **Output:** Visualizations displayed on the dashboard.

6. Interactive Features

FR-15: Interactive Tooltips

- **Description:** The system shall provide interactive tooltips that display detailed statistics when hovering over visualizations.
- **Input:** Hover action on a visualization element.
- **Process:**
 1. Fetch detailed data for the hovered element.
 2. Display a tooltip with detailed statistics.
- **Output:** Tooltip displayed on the visualization.

FR-16: Customize Color Schemes

- **Description:** The system shall allow the system admin to customize color schemes for different visualization types.
- **Input:** Selected color scheme.
- **Process:**
 1. Apply the selected color scheme to the visualization.
- **Output:** Updated visualization with the new color scheme.

3. Non-Functional Requirements

3.1 Performance

NFR-1: The system shall handle large datasets efficiently, with a response time of less than 2 seconds for most queries.

NFR-2: The system shall support up to 100 concurrent users without performance degradation.

3.2 Usability

NFR-3: The user interface shall be intuitive and user-friendly, with clear navigation and visual elements.

3.3 Scalability

NFR-4: The system shall be scalable to accommodate future growth in data volume and user base.

NFR-5: The system shall support the addition of new departments, companies, event types, and professional societies without requiring significant changes to the architecture.

3.4 Security

NFR-6: The system shall encrypt user passwords and sensitive data using industry-standard encryption algorithms.

NFR-7: The system shall implement role-based access control to restrict access to sensitive data.

3.5 Reliability

NFR-8: The system shall have an uptime of 99.9%, ensuring minimal downtime.

NFR-9: The system shall provide data backup and recovery mechanisms to prevent data loss.

3.6 Maintainability

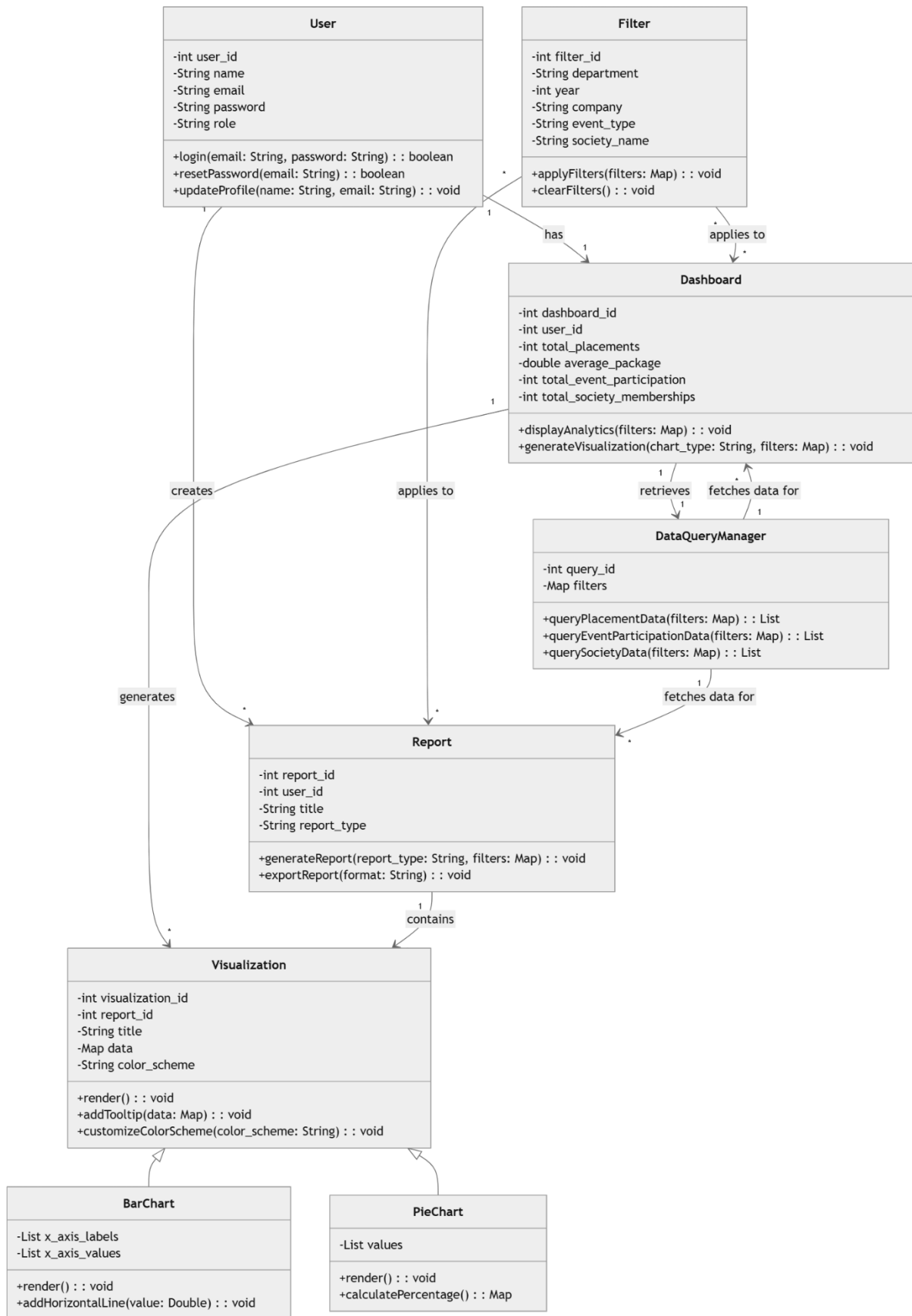
NFR-10: The system shall be modular, allowing for easy updates and maintenance.

NFR-11: The system shall provide comprehensive logging and error handling to facilitate debugging and troubleshooting.

4. Class Diagrams

System Class Diagram

Below is the class diagram



5.Conclusion

This SRS document outlines the functional and non-functional requirements for the Student Details Visualization System. The system aims to provide a robust, user-friendly platform for managing and analyzing student placement, event participation, and professional society membership data. The requirements align with the provided UI design and ensure that the system is scalable, secure, and efficient.

