Software Requirements Specification (SRS)
(IEEE 830-Style Format)

1. Introduction

This document follows an IEEE-style Software Requirements Specification (SRS) structure. It defines the purpose, scope, terminology, references, and system overview for the College Complaint Management System.

1.1 Purpose

The primary purpose of this document is to specify the requirements of the College Complaint Management System in a precise and unambiguous manner. This document acts as a formal agreement between the stakeholders and the development team regarding the expected behaviour of the system.

The SRS defines:

- Functional requirements of the system
- Non-functional requirements such as performance, security, and usability
- System interfaces and architecture
- User roles and responsibilities

1.2 Document Conventions

This document follows the IEEE 830 Software Requirements Specification standard. The following conventions are used throughout the document:

- FR**-#** : Functional Requirement
- NFR**-#** : Non-Functional Requirement
- CCMS : College Complaint Management System

1.3 Intended Audience and Reading Suggestions

This document is intended for the following audiences:

- **Project Supervisors and Evaluators** – to understand the system objectives, scope, and overall design
- **Software Developers** – to analyze requirements and implement system functionality
- **Test Engineers** – to derive test cases for verification and validation
- **College Administration** – to understand system workflow and operational benefits

Readers may review sections relevant to their role.

1.4 Project Scope

The scope of the College Complaint Management System includes the development of a web-based platform that allows students to register complaints and track their resolution status.

The system provides:

- Online complaint submission
- Categorization of complaints
- Assignment of complaints to concerned departments
- Status updates (Pending, In Progress, Resolved)
- Administrative monitoring and reporting

The system does not aim to replace institutional decision-making but acts as a supporting tool to enhance efficiency, transparency, and record management.

1.5 References

[1] IEEE Std 830-1998, IEEE Recommended Practice for Software Requirements Specification

[2] Pressman, R. S., *Software Engineering: A Practitioner's Approach*

[3] Software Engineering Documentation Standards

2. Overall Description

2.1 Product Perspective

The College Complaint Management System is a web-based application developed to replace the existing manual complaint handling process. It acts as an interface between students and college authorities, enabling efficient submission, tracking, and resolution of complaints. The system follows a client–server architecture using modern web technologies.

2.2 Product Functions

The major functions of the system include:

- User registration and secure login
- Online complaint submission
- Complaint assignment to concerned departments

- Status tracking and updates
- Feedback and report generation

2.3 User Classes and Characteristics

The system supports multiple types of users, each with specific roles and responsibilities.

Student

Students are the primary users of the system. They can:

- Register and log in to the system
- Submit complaints with relevant details
- View complaint history
- Track status updates
- Provide feedback after resolution

Administrator

The administrator manages the overall functioning of the system. Responsibilities include:

- Reviewing all submitted complaints
- Assigning complaints to departments
- Monitoring complaint resolution progress
- Generating reports
- Managing user accounts

Department Staff

Department staff members handle complaints assigned to their department. They can:

- View assigned complaints
- Update complaint status
- Add remarks or resolution details

Database Administrator

The database administrator is responsible for:

- Maintaining system data
- Performing backups and recovery
- Ensuring data consistency and security

2.4 Operating Environment

The College Complaint Management System is designed to operate in a modern and secure computing environment.

The operating environment includes:

- Web-based user interface accessible through browsers such as Chrome, Firefox, and Edge
- Backend server running Node.js runtime environment
- MongoDB database server for data storage
- Operating systems such as Windows and Linux
- Secure internet connectivity

The system supports responsive design, allowing access from desktops, laptops, and tablets.

2.5 Design and Implementation Constraints

The following constraints apply to the system:

- Users must have active internet connectivity
- Data security must be maintained at all levels
- System performance depends on server availability
- Users must enter accurate information while submitting complaints

Although strong security measures are implemented, continuous monitoring is required to protect against cyber threats.

2.6 User Documentation

User manuals, onboarding guides, and helpdesk support documents will accompany the release.

2.7 Assumptions and Dependencies

- Users possess basic computer knowledge
- Departments update complaint status regularly
- Server and database availability is maintained

3. System Features (Functional Requirements)

FR1: User Authentication

- The system shall allow students, administrators, and department staff to register and log in using secure credentials.

- The system shall validate user identity before granting access.
- The system shall provide logout functionality to securely end user sessions.

FR2: Role-Based Authorization

- The system shall enforce role-based access control.
- Different permissions shall be assigned to students, administrators, and department staff.
- Unauthorized users shall not be allowed to access restricted features.

FR3: Complaint Submission

- The system shall allow students to submit complaints through an online form.
- Users shall be able to select the complaint category and provide detailed descriptions.
- Each submitted complaint shall be assigned a unique complaint identification number.

FR4: Complaint Workflow Management

- The system shall allow administrators to review submitted complaints.
- Complaints shall be assigned to the appropriate department for action.
- The system shall support multiple complaint states such as pending, in progress, and resolved.

FR5: Complaint Status Tracking

- The system shall allow students to view the current status of their complaints.
- The system shall maintain a history of all updates made to a complaint.
- Status changes shall be visible in real time.

FR6: Notification Management

- The system shall notify users when complaint status changes.
- Notifications may be delivered through system alerts or email messages.
- The system shall ensure timely communication between users and authorities.

FR7: Complaint Resolution and Feedback

- Department staff shall update complaint resolution details.
- Students shall be allowed to provide feedback after resolution.
- Administrators shall have the authority to close complaints.

FR8: Reporting and Monitoring

- The system shall generate complaint summary reports.
- Reports shall support department-wise and time-based analysis.
- Administrators shall use reports for monitoring system performance.

4. External Interface Requirements

4.1 User Interfaces

The user interface shall include separate dashboards for different user roles such as students, administrators, and department staff. Each dashboard will display features and options relevant to the user's role.

The student interface shall allow users to:

- Register and log in to the system
- Submit complaints
- View complaint details
- Track complaint status
- View previous complaint history

The administrator interface shall allow:

- Viewing all submitted complaints
- Assigning complaints to departments
- Monitoring resolution progress
- Generating reports

The department staff interface shall allow:

- Viewing assigned complaints
- Updating status and remarks

4.2 Hardware Interfaces

The system shall operate under a standard client-server architecture.

Client Side Requirements:

- Desktop or laptop computer
- Keyboard and mouse or touch input
- Internet connectivity

Server Side Requirements:

- Application server hosting Node.js and Express
- Database server hosting MongoDB

4.3 Software Interfaces

The College Complaint Management System interfaces with the following software components:

- **Web Browser:** Used by end users to access the system.
- **Backend Server:** Node.js with Express framework.
- **Database System:** MongoDB for storing complaint and user data.

The system shall be compatible with operating systems such as Windows and Linux. Communication between frontend and backend shall be carried out using RESTful APIs with JSON data format.

4.4 Communication Interfaces

The system shall use standard internet communication protocols.

- Communication between client and server shall occur through HTTP/HTTPS.
- Secure communication shall be ensured using encryption techniques.
- Data shall be exchanged in structured formats such as JSON.

The system shall support communication between:

- Student and system
- Administrator and department staff
- Backend services and database

All communication shall follow standard web application security practices to ensure confidentiality and integrity of data.

5. Non-Functional Requirements

5.1 Performance Requirements

NFR1:
The system shall support multiple concurrent users without significant degradation in performance.

NFR2:
The system shall load major system pages such as login, complaint submission, and status tracking within an acceptable response time.

NFR3:
The system shall process complaint submissions and updates in real time.

NFR4:
The system shall maintain consistent performance during peak hours such as examination or admission periods.

5.2 Security Requirements

NFR5:
The system shall enforce secure authentication mechanisms for all users.

NFR6:
User passwords shall be encrypted before being stored in the database.

NFR7:
The system shall implement role-based access control to restrict unauthorized actions.

NFR8:
The system shall protect against common web vulnerabilities such as SQL injection, cross-site scripting (XSS), and unauthorized access.

NFR9:
All communication between client and server shall be conducted using secure HTTPS protocol.

5.3 Availability and Reliability

NFR10:
The system shall be available for use at all times except during scheduled maintenance.

NFR11:
The system shall ensure reliable storage of complaint records and user data.

NFR12:
Regular database backups shall be maintained to prevent data loss.

NFR13:
The system shall recover gracefully from system failures.

5.4 Scalability Requirements

NFR14:
The system architecture shall be scalable to accommodate an increase in users.

NFR15:
The system shall support future integration with mobile applications or notification services.

NFR16:
The database design shall allow easy extension of data structures.

5.5 Usability Requirements

NFR17:
The user interface shall be simple and intuitive.

NFR18:
Users shall be able to perform common tasks with minimal training.

NFR19:
System messages and alerts shall be clear and understandable.

NFR20:
The system shall provide meaningful error messages and guidance.

5.6 Maintainability Requirements

NFR21:
The system shall follow modular design principles.

NFR22:
Source code shall be well documented.

NFR23:
The system shall allow easy bug fixing and feature enhancement.

5.7 Portability Requirements

NFR24:
The system shall be deployable on different operating systems such as Windows and Linux.

NFR25:
The system shall be accessible through commonly used web browsers.

6. System Architecture Overview

The College Complaint Management System follows a layered architecture approach. This architecture separates system functionality into independent layers, improving maintainability, scalability, and clarity of design.

6.1 Presentation Layer

The presentation layer provides the user interface through which users interact with the system. This layer is responsible for handling all user inputs and displaying system outputs.

Features of the presentation layer include:

- Login and registration screens
- Complaint submission forms
- Status tracking pages
- Dashboards for students, administrators, and department staff

The presentation layer is implemented using React, which enables responsive design and dynamic user interaction.

6.2 Application (Business Logic) Layer

The application layer contains the core business logic of the system. It processes user requests received from the presentation layer and performs necessary validations.

Responsibilities of this layer include:

- User authentication and authorization
- Complaint processing and assignment logic
- Status updates and workflow management
- Enforcement of business rules

This layer is implemented using Node.js with Express framework.

6.3 Data Layer

The data layer is responsible for storing and retrieving data from the database.

This layer manages:

- Student information
- Complaint details
- Status history
- System logs and feedback

The system uses MongoDB as the database, ensuring flexible and efficient data storage.

7. System and Data Models (Placeholder)

- **Use Case Diagram:**
  Describes interactions between users and the system.
- **Class Diagram:**
  Represents system classes such as User, Complaint, Admin, and Department.
- **Sequence Diagram:**
  Illustrates the flow of actions during complaint submission and resolution.
- **Entity Relationship (ER) Diagram:**
  Defines relationships between database entities.
- **Workflow Diagram:**
  Shows the step-by-step complaint handling process.

8. Validation and Acceptance Criteria

The College Complaint Management System shall be validated to ensure that it meets all specified requirements.

Validation activities include:

- Unit testing of individual modules
- Integration testing between frontend and backend
- System testing for complete workflow
- Security testing to prevent vulnerabilities

User Acceptance Testing (UAT) shall be conducted by authorized stakeholders to verify that the system satisfies user expectations.

The system shall be accepted only if:

- All functional requirements are met
- Non-functional requirements are satisfied
- System performance and security standards are achieved

9. Appendices

Appendix A: Glossary

- CCMS**:** College Complaint Management System
- Complaint**:** Issue reported by a student
- Administrator**:** Authorized personnel managing complaints
- UAT**:** User Acceptance Testing

Appendix B: Sample Data

- Sample student profiles
- Sample complaint records
- Sample status updates
- Sample feedback entries

Appendix C: Compliance Checklist

- Data security compliance
- Privacy and access control compliance
- Logging and audit compliance
- Usability and accessibility standards compliance