Software Requirements Specification(SRS)

for

A College Automation System

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1. Introduction

1.1 Purpose

This Software Requirements Specification (SRS) document defines the complete functional and non-functional requirements of the College Management System (CMS). The purpose of this document is to provide a clear, structured, and comprehensive description of the system's operational behavior, system constraints, quality attributes, and user responsibilities.

This document establishes a mutual understanding between stakeholders, developers, testers, and institutional authorities by clearly defining system capabilities, limitations, assumptions, and dependencies.

It serves as:

- A reference for system design and implementation
- A validation baseline for testing and verification
- A monitoring document for institutional management
- A contractual agreement of system expectations

The SRS ensures that the developed system aligns with academic, administrative, and organizational objectives of the institution.

1.2 Project Scope

The College Management System is a centralized, web-based integrated platform designed to automate and streamline academic and administrative operations within a college environment.

The system integrates multiple modules including:

- Student Information Management
- Attendance Monitoring and Tracking
- Examination Scheduling and Result Processing
- Fee Management and Payroll Processing
- Library Management
- Transport Administration
- Canteen Billing and Sales Monitoring
- Digital Report Generation

Primary Objectives

- Reduction of manual paperwork
- Minimization of administrative errors
- Improved data accuracy and transparency
- Centralized data storage and retrieval
- Enhanced communication across departments
- Secure handling of academic and financial data

The system is scalable and designed to accommodate institutional growth.

1.3 Environmental Characteristics

The system operates within a multi-user institutional environment using Role-Based Access Control (RBAC).

System Requirements

- Stable internet connectivity
- Centralized relational database server
- Web-enabled client devices (desktop/laptop/tablet)
- Secure authentication mechanism
- Controlled access to academic and financial records

The system is designed to handle concurrent access from multiple departments without performance degradation.

2. Overall Description of Organisation of SRS Document

2.1 Product Perspective

The College Management System functions as a fully integrated institutional automation platform. It consolidates academic, administrative, and service-related operations into a unified system architecture.

Although modules operate independently at the functional level, they share a centralized database to ensure data consistency and integrity.

The system may interface with external services such as:

- Online payment gateways for digital transactions
- Email and SMS notification systems
- Optional biometric attendance systems (future integration)

The CMS replaces fragmented manual systems and spreadsheet-based management with a structured digital framework.

2.2 Product Features

The major functional components of the system include:

- Student admission, enrollment, and profile management
- Attendance recording with automatic percentage calculation
- Examination scheduling, marks entry, and automated result computation
- Fee billing, tracking, receipt generation, and financial reporting
- Payroll management for faculty and staff
- Library catalog maintenance with issue-return monitoring
- Transport route management and student allocation
- Canteen menu management and sales tracking
- Generation of academic, financial, and administrative reports

Together, these modules provide a comprehensive institutional management solution.

2.3 User Classes

Administrator

Has complete control over system configuration, user management, data monitoring, and report generation. Responsible for maintaining system integrity and security.

Faculty

Responsible for academic operations such as attendance marking, marks entry, timetable viewing, and student performance evaluation.

Students

Can access personal profiles, attendance records, examination results, fee payment details, library status, and transport information. Access is restricted to view-only in most cases.

Office Staff

Handles admissions, student record maintenance, fee processing, certificate issuance, payroll processing, and administrative documentation.

Librarian

Manages book inventory, processes borrowing and returns, monitors overdue books, and calculates penalties.

Transport Manager

Oversees route scheduling, vehicle allocation, student transport registration, and transport fee monitoring.

Canteen Manager

Manages menu items, pricing, billing transactions, and daily sales reporting.

Each user role is assigned specific access privileges based on institutional policies.

2.4 Operating Environment

- Operating Systems: Windows and Linux
- Web Browsers: Google Chrome, Microsoft Edge, Mozilla Firefox
- Database: Relational Database Management System (e.g., MySQL)
- Architecture: Client–Server Web Application
- Deployment: Cloud-hosted or On-premise server

The system must function consistently across supported environments.

2.5 Design and Implementation Constraints

- Role-based authentication and authorization must be enforced.
- All data must be stored securely using encryption techniques where required.
- The system must comply with institutional data privacy regulations.
- Scalability must be supported to accommodate increased data and users.
- The architecture must support modular expansion for future enhancements.

2.6 User Documentation

The system shall provide comprehensive documentation including:

- Administrator Manual
- Faculty User Guide
- Student User Guide
- Library and Transport Module Manuals
- Technical Installation and Deployment Guide
- Online Help and FAQ Support

Documentation must be clear, accessible, and periodically updated.

3. Functional Requirements

3.1 Student Module

- The system shall allow authorized personnel to register and enroll new students.
- The system shall store personal, academic, and contact details securely.
- Students shall be able to view attendance percentages in real time.
- The system shall display subject-wise marks and overall results.
- Students shall be able to view fee payment history and outstanding balances.
- The system shall allow profile updates for permitted fields.

3.2 Faculty Module

- The system shall provide secure login credentials for faculty.
- Faculty shall record and modify attendance for assigned subjects.
- Faculty shall enter internal and external assessment marks.
- Faculty shall access class timetables and teaching schedules.
- Faculty shall view and analyze student academic performance records.

3.3 Exam Module

- The system shall generate and publish examination timetables.
- Administrators shall assign invigilation duties.
- The system shall allow secure marks entry and verification.
- Automatic grade calculation shall be performed based on predefined criteria.
- Final results shall be published and made accessible to students.

3.4 Office Module

- The system shall manage admission workflows and documentation.
- Office staff shall process fee payments and generate receipts.
- Authorized personnel shall issue academic certificates.
- Staff payroll shall be calculated based on institutional salary rules.
- Institutional records shall be securely maintained.

3.5 Library Module

- The system shall manage book inventory records.
- Librarians shall process borrowing and return transactions.
- Overdue fines shall be automatically calculated.
- Users shall search books using title, author, ISBN, or subject.

3.6 Transport Module

- The system shall maintain bus route and stop information.
- Students shall register for transport services.
- Transport fee status shall be monitored.
- Vehicle and driver details shall be recorded.
- Route schedules shall be updated when necessary.

3.7 Canteen Module

- The system shall manage menu items and pricing.
- Users shall place orders digitally.
- The system shall generate automated invoices.
- Payment records shall be securely stored.
- Daily sales reports shall be generated for analysis.

4. External Interface Requirements

4.1 User Interfaces

- Secure login interface
- Role-based dashboards
- Structured data entry forms
- Search and filter functionalities
- Tabular and graphical reports
- Responsive design for different devices

4.2 Hardware Interfaces

- Client systems connected to central server
- Printers for receipts and reports
- Networking infrastructure
- Optional biometric devices

4.3 Software Interfaces

The system shall integrate with:

- Relational Database Management System
- Payment Gateway APIs
- Email/SMS notification services

4.4 Communications Interfaces

- HTTPS secure communication protocol
- Encrypted transaction handling
- Real-time server synchronization
- Email (SMTP) and SMS gateway integration

5. Other Non-Functional Requirements

5.1 Performance Requirements

- The system shall support concurrent multi-user access.
- Data retrieval response time shall be minimal.
- Reports shall be generated efficiently without system lag.

5.2 Safety Requirements

- Automated daily backups must be scheduled.
- Data recovery procedures shall be defined.
- System failures shall not result in data corruption.

5.3 Security Requirements

- Secure authentication mechanism must be enforced.
- Role-based access control must restrict unauthorized access.
- Passwords must be encrypted.
- Sensitive financial and academic data must be protected.

5.4 Software Quality Attributes

1. Reliability: Continuous and stable system operation.
2. Usability: User-friendly and intuitive interface design.
3. Maintainability: Modular architecture for easy updates.
4. Scalability: Support increasing users and data volume.
5. Portability: Compatibility across supported platforms.

5.5 Business Rules

- Only administrators can create or remove user accounts.
- Faculty can modify only academic data related to their courses.
- Students have restricted access to modify institutional records.
- Library fines are automatically computed based on due dates.
- Payroll follows predefined institutional salary policies.
- Transport allocation is subject to seat availability.

6. Other Requirements

Data Management

All institutional data shall be stored in a centralized relational database ensuring consistency, integrity, and confidentiality. Backup and recovery mechanisms must be implemented.

Legal Compliance

The system shall comply with applicable educational policies and data protection regulations. Personal and financial data must be handled according to institutional and legal standards.

Audit Trail

The system shall log critical activities including:

- User login/logout
- Fee payments
- Payroll processing
- Result publication
- Record modifications

Audit logs must be securely stored and accessible for review.

Reporting

The system shall generate structured academic, financial, and administrative reports in formats such as:

- PDF
- Excel
- CSV

Reports shall support printing, sharing, and analysis.

7. Appendices

7.1 Glossary

- Administrator – System controller with full access
- Faculty – Teaching staff
- Payroll – Salary processing system
- Attendance Percentage – Ratio of attended classes to total classes
- Library Circulation – Book issue and return management

7.2 Future Enhancements

- Mobile application integration
- Biometric attendance system
- SMS notifications
- Online examination module
- Advanced analytics dashboard
- AI-based performance prediction system