

MEKELLE UNIVERSITY COLLEGE OF ETI-M

SCHOOL OF COMPUTING

ASSEIGMENT SRS software testing

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1.functional and non -functional

1.1, Functional Requirements

1. Student Enrollment and Management

* ID: FR-001
* Description: The system shall allow administrators to enroll new students, including capturing personal details, assigning student IDs, and managing student records.
* Priority: High
* Source: School Administration
* Owner: Registrar Office
* Supporting Materials: Enrollment Policy Document
* Data Requirements:
  + - Gender
    - Address
    - Parent/Guardian Information
    - Enrollment Date
    - Grade Level
    - Previous School Information

2. Class Scheduling and Management

* ID: FR-002
* Description: The system shall enable administrators to create, modify, and manage class schedules.
* Priority: High
* Source: Academic Office
* Owner: Academic Office
* Supporting Materials: Academic Calendar
* Data Requirements:
  + - Class ID
    - Class Name
    - Class Schedule (Days, Times)
    - Classroom Location
    - Teacher ID
    - Student IDs

3. Attendance Tracking

* ID: FR-003
* Description: The system shall allow teachers to record and track student attendance on a daily basis.
* Priority: High
* Source: Teachers
* Owner: Academic Office
* Supporting Materials: Attendance Policy
* Data Requirements:
  + - Attendance ID
    - Student ID
    - Class ID
    - Date
    - Attendance Status (Present/Absent)
    - Teacher ID

4. Grade Management

- ID: FR-004

- Description: The system shall enable teachers to input and manage grades for each student.

- Priority: High

- Source: Teachers

- Owner: Academic Office

- Supporting Materials: Grading Policy

- Data Requirements:

- Grade ID

- Student ID

- Class ID

- Grade

- Date of Grade Entry

- Teacher ID

5. Report Generation

* ID: FR-005
* Description: The system shall generate various reports including student performance reports, attendance reports, and class schedules.
* Priority: Medium
* Source: School Administration
* Owner: Academic Office
* Supporting Materials: Reporting Requirements Document
* Data Requirements:
  + - Predefined Report Formats
    - Custom Report Criteria
    - Student Performance Data
    - Attendance Data
    - Class Schedules

6. Fee Management

* ID: FR-006
* Description: The system shall allow administrators to manage and track student fee payments.
* Priority: High
* Source: Finance Office
* Owner: Finance Office
* Supporting Materials: Fee Management Policy
* Data Requirements:
  + - Fee ID
    - Student ID
    - Amount Due
    - Amount Paid
    - Payment Date
    - Payment Method

7. Communication Management

* ID: FR-007
* Description: The system shall provide communication tools for teachers, students, and parents, including email notifications and messaging capabilities.
* Priority: Medium
* Source: School Administration
* Owner: IT Department
* Supporting Materials: Communication Policy
* Data Requirements:
  + - Message ID
    - Sender ID
    - Recipient ID
    - Message Content
    - Date Sent
    - Announcement ID
    - Title
    - Content
    - Recipients

8. Library Management

* ID: FR-008
* Description: The system shall manage the inventory of library books and other resources.
* Priority: Medium
* Source: Library Staff
* Owner: Library Department
* Supporting Materials: Library Management Policy
* Data Requirements:
  + - Book ID
    - Title
    - Author
    - ISBN
    - Publication Year
    - Genre
    - Availability Status
    - Borrowing ID
    - Student ID
    - Borrow Date
    - Return Date

2. Non-Functional Requirements

1. Performance

* ID: NFR-001
* Description: The system shall support up to 1000 concurrent users without performance degradation.
* Priority: High
* Source: IT Department
* Owner: IT Department
* Supporting Materials: Performance Testing Plan
* Data Requirements:
  + - Concurrent Users Count
    - Response Time Logs
    - System Throughput Data

2. Security

* ID: NFR-002
* Description: The system shall enforce role-based access control to ensure that users only have access to information and functions relevant to their role.
* Priority: High
* Source: IT Department
* Owner: IT Department
* Supporting Materials: Security Policy Document
* Data Requirements:
  + - Role ID
    - Role Description
    - Permissions Assigned
    - User ID
    - Action Performed
    - Timestamp
    - Encryption Keys

3. Usability

* ID: NFR-003
* Description: The system shall provide an intuitive and user-friendly interface that can be easily navigated by users with basic computer skills.
* Priority: Medium
* Source: User Feedback
* Owner: UX Team
* Supporting Materials: Usability Testing Results
* Data Requirements:
  + - Feedback ID
    - User ID
    - Feedback Content
    - Date Submitted
    - Usability Test Results
    - UI Mockups

4. Reliability

* ID: NFR-004
* Description: The system shall have an uptime of 99.9% during school hours, ensuring minimal disruption to school operations.
* Priority: High
* Source: IT Department
* Owner: IT Department
* Supporting Materials: Service Level Agreement (SLA)
* Data Requirements:
  + - Uptime Records
    - Downtime Incidents
    - Backup Schedules
    - Backup Status
    - System Health Metrics
    - Error Logs

5. Scalability

* ID: NFR-005
* Description: The system shall be scalable to accommodate the growth in the number of students, teachers, and administrative staff.
* Priority: Medium
* Source: IT Department
* Owner: IT Department
* Supporting Materials: Scalability Plan
* Data Requirements:
  + - Current Capacity
    - Projected Growth
    - Load Handling Results
    - Hardware and Software Specifications

6. Maintainability

* ID: NFR-006
* Description: The system shall be designed for easy maintenance and updates, allowing IT staff to address issues and deploy updates with minimal downtime.
* Priority: Medium
* Source: IT Department
* Owner: IT Department
* Supporting Materials: Maintenance Plan
* Data Requirements:
  + - Maintenance Logs
    - Update Records
    - Issue Tracking Data

7. Compatibility

* ID: NFR-007
* Description: The system shall be compatible with common web browsers (e.g., Chrome, Firefox, Safari) and accessible on various devices, including desktops, laptops, tablets, and smartphones.
* Priority: Medium
* Source: IT Department
* Owner: IT Department
* Supporting Materials: Compatibility Testing Plan
* Data Requirements:
  + - Supported Browsers and Devices
    - Integration Records
    - Compatibility Test Resu

2. Software Requirements Specification (SRS) for School Management System

1. Introduction

1.1 Purpose

The purpose of this document is to define the software requirements for the School Management System (SMS). The SMS is intended to streamline the management of various school operations, including student enrollment, class scheduling, attendance tracking, grade management, fee management, communication, and library management.

1.2 Scope

The School Management System will provide functionalities for administrators, teachers, students, and parents to manage and access school-related information and operations. The system will be web-based and accessible from various devices, including desktops, laptops, tablets, and smartphones.

1.3 Definitions, Acronyms, and Abbreviations

* SMS: School Management System
* SRS: Software Requirements Specification
* GUI: Graphical User Interface
* API: Application Programming Interface
* SLA: Service Level Agreement

1.4 References

* Enrollment Policy Document
* Academic Calendar
* Attendance Policy
* Grading Policy
* Reporting Requirements Document
* Fee Management Policy
* Communication Policy
* Library Management Policy
* Security Policy Document

2. Overall Description

2.1 Product Perspective

The SMS is a standalone system that integrates various modules required for managing school operations. It will interact with external systems for payments and notifications.

2.2 Product Functions

* Student Enrollment and Management
* Class Scheduling and Management
* Attendance Tracking
* Grade Management
* Report Generation
* Fee Management
* Communication Management
* Library Management

2.3 User Classes and Characteristics

* Administrators: Manage overall school operations, including student enrollment, scheduling, fee management, and reports.
* Teachers: Manage class schedules, attendance, grades, and communicate with students and parents.
* Students: Access class schedules, attendance records, grades, and communicate with teachers.
* Parents: Monitor their children's attendance, grades, and communicate with teachers.

2.4 Operating Environment

The system will be web-based, compatible with modern web browsers (e.g., Chrome, Firefox, Safari), and accessible on desktops, laptops, tablets, and smartphones.

2.5 Design and Implementation Constraints

* The system must comply with relevant data protection regulations (e.g., GDPR).
* The system should support scalability to accommodate growth in the number of users.

2.6 User Documentation

User manuals and help documentation will be provided to guide users on how to use the system.

2.7 Assumptions and Dependencies

* Reliable internet access is available for all users.
* Users have basic computer literacy.

3. Functional Requirements

FR-001: Student Enrollment and Management

* The system shall allow administrators to enroll new students, including capturing personal details, assigning student IDs, and managing student records.
* Data Requirements: Student ID, Name, Date of Birth, Gender, Address, Parent/Guardian Information, Enrollment Date, Grade Level, Previous School Information.

FR-002: Class Scheduling and Management

* The system shall enable administrators to create, modify, and manage class schedules.
* Data Requirements: Class ID, Class Name, Class Schedule, Classroom Location, Teacher ID, Student IDs.

FR-003: Attendance Tracking

* The system shall allow teachers to record and track student attendance on a daily basis.
* Data Requirements: Attendance ID, Student ID, Class ID, Date, Attendance Status, Teacher ID.

FR-004: Grade Management

* The system shall enable teachers to input and manage grades for each student.
* Data Requirements: Grade ID, Student ID, Class ID, Grade, Date of Grade Entry, Teacher ID.

FR-005: Report Generation

* The system shall generate various reports including student performance reports, attendance reports, and class schedules.
* Data Requirements: Predefined Report Formats, Custom Report Criteria, Student Performance Data, Attendance Data, Class Schedules.

FR-006: Fee Management

* The system shall allow administrators to manage and track student fee payments.
* Data Requirements: Fee ID, Student ID, Amount Due, Amount Paid, Payment Date, Payment Method.

FR-007: Communication Management

* The system shall provide communication tools for teachers, students, and parents, including email notifications and messaging capabilities.
* Data Requirements: Message ID, Sender ID, Recipient ID, Message Content, Date Sent, Announcement ID, Title, Content, Recipients.

FR-008: Library Management

* The system shall manage the inventory of library books and other resources.
* Data Requirements: Book ID, Title, Author, ISBN, Publication Year, Genre, Availability Status, Borrowing ID, Student ID, Borrow Date, Return Date.

4. Non-Functional Requirements

NFR-001: Performance

* The system shall support up to 1000 concurrent users without performance degradation.
* Data Requirements: Concurrent Users Count, Response Time Logs, System Throughput Data.

NFR-002: Security

* The system shall enforce role-based access control to ensure that users only have access to information and functions relevant to their role.
* Data Requirements: Role ID, Role Description, Permissions Assigned, User ID, Action Performed, Timestamp, Encryption Keys.

NFR-003: Usability

* The system shall provide an intuitive and user-friendly interface that can be easily navigated by users with basic computer skills.
* Data Requirements: Feedback ID, User ID, Feedback Content, Date Submitted, Usability Test Results, UI Mockups.

NFR-004: Reliability

* The system shall have an uptime of 99.9% during school hours, ensuring minimal disruption to school operations.
* Data Requirements: Uptime Records, Downtime Incidents, Backup Schedules, Backup Status, System Health Metrics, Error Logs.

NFR-005: Scalability

* The system shall be scalable to accommodate the growth in the number of students, teachers, and administrative staff.
* Data Requirements: Current Capacity, Projected Growth, Load Handling Results, Hardware and Software Specifications.

NFR-006: Maintainability

* The system shall be designed for easy maintenance and updates, allowing IT staff to address issues and deploy updates with minimal downtime.
* Data Requirements: Maintenance Logs, Update Records, Issue Tracking Data.

NFR-007: Compatibility

* The system shall be compatible with common web browsers (e.g., Chrome, Firefox, Safari) and accessible on various devices, including desktops, laptops, tablets, and smartphones.
* Data Requirements: Supported Browsers and Devices, Integration Records, Compatibility Test Results.

5. System Architecture

5.1 Overview

The system architecture will be a multi-tier architecture with a presentation layer, application layer, and data layer.

5.2 Components

* Presentation Layer: User interface accessible via web browsers.
* Application Layer: Business logic and application services.
* Data Layer: Database management system for storing all data.

6. Data Requirements

6.1 Data Entities and Attributes

* Student Information:
* Student ID, First Name, Last Name, Date of Birth, Gender, Address, Parent/Guardian Information, Enrollment Date, Grade Level, Previous School Information.
* Class Information:
* Class ID, Class Name, Class Schedule, Classroom Location, Teacher ID, Student IDs.
* Attendance Records:
* Attendance ID, Student ID, Class ID, Date, Attendance Status, Teacher ID.
* Grade Records:
* Grade ID, Student ID, Class ID, Grade, Date of Grade Entry, Teacher ID.
* Fee Records:
* Fee ID, Student ID, Amount Due, Amount Paid, Payment Date, Payment Method.
* Messages:
* Message ID, Sender ID, Recipient ID, Message Content, Date Sent.
* Library Inventory:
* Book ID, Title, Author, ISBN, Publication Year, Genre, Availability Status.
* Borrowing Records:
* Borrowing ID, Student ID, Book ID, Borrow Date, Return Date.

7. External Interface Requirements

7.1 User Interfaces

* Web-based interface accessible through modern web browsers.

7.2 Hardware Interfaces

* Compatible with standard desktop, laptop, tablet, and smartphone hardware.

7.3 Software Interfaces

* Integration with external payment systems and email services.

7.4 Communication Interfaces

* Internet connectivity for accessing the web-based system.

8. Other Requirements

8.1 Performance Requirements

* The system should handle up to 1000 concurrent users and respond to user actions within 2 seconds under normal operating conditions.

8.2 Security Requirements

* Role-based access control, data encryption in transit and at rest, and regular security audits.

8.3 Safety Requirements

* Regular backups and disaster recovery plans.

8.4 Software Quality Attributes

* Usability, reliability, maintainability, scalability, and compatibility as outlined in the non-functional requirements.

This SRS provides a comprehensive outline of the requirements for the School Management System, ensuring all necessary functionalities and attributes are covered for effective development and deployment.