

Software Requirements Specification

A Software Requirements Specification (SRS) document for an online examination portal outlines the functional and nonfunctional requirements of the system. Below is an example of what an SRS document for an online examination portal might include. Please note that this is a generic template, and you may need to customize it based on the specific needs and features of your online examination portal.

Software Requirements Specification

1. Introduction

1.1 Purpose

The purpose of this document is to provide a detailed description of the requirements for the development of the Online Examination Portal.

1.2 Scope

The Online Examination Portal will be a webbased application that allows users to conduct and participate in online examinations. The system will support various types of questions, user authentication, exam creation, grading, and reporting.

1.3 Definitions, Acronyms, and Abbreviations

- **SRS:** Software Requirements Specification
- **UI:** User Interface
- **API:** Application Programming Interface
- **SQL:** Structured Query Language

2. Overall Description

2.1 Product Perspective

The Online Examination Portal will operate as a standalone web application. It will interact with a database for storing user data, exam details, and results.

2.2 Product Features

1. User Authentication: Users should be able to register, log in, and reset their passwords.
2. Exam Creation: Admin users can create exams, set time limits, and define question banks.
3. Question Types: Support for multiplechoice, true/false, short answer, and essaytype questions.
4. Exam Participation: Users can join exams, view questions, and submit answers within the specified time.
5. AutoGrading: Automated grading for multiplechoice questions; manual grading for subjective questions.
6. Result Generation: Instant generation of results upon exam completion.
7. Reporting: Detailed performance reports for users and administrators.
8. Security: Secure user authentication, data encryption, and prevention of unauthorized access.

3. Specific Requirements

3.1 User Interfaces

3.1.1 Login Page

- Users should be able to log in using a username and password.
- Forgot password functionality should be available.

3.1.2 Exam Creation Page

- Admins can create exams by specifying the exam name, time limit, and question bank.

3.1.3 Exam Participation Page

- Users can view questions, select answers, and submit their responses.

3.2 Functional Requirements

3.2.1 User Management

- The system shall allow user registration with a unique username and password.
- Users should be categorized as admins or regular users.

3.2.2 Exam Management

- Admins can create, edit, and delete exams.
- Each exam must have a unique identifier, name, time limit, and associated question bank.

3.2.3 Question Bank

- The system shall support different question types: multiplechoice, true/false, short answer, and essay.
- Questions must be categorized for easy retrieval.

3.3 NonFunctional Requirements

3.3.1 Performance

- The system should support at least 500 simultaneous users.
- Response time for actions should be within 3 seconds.

3.3.2 Security

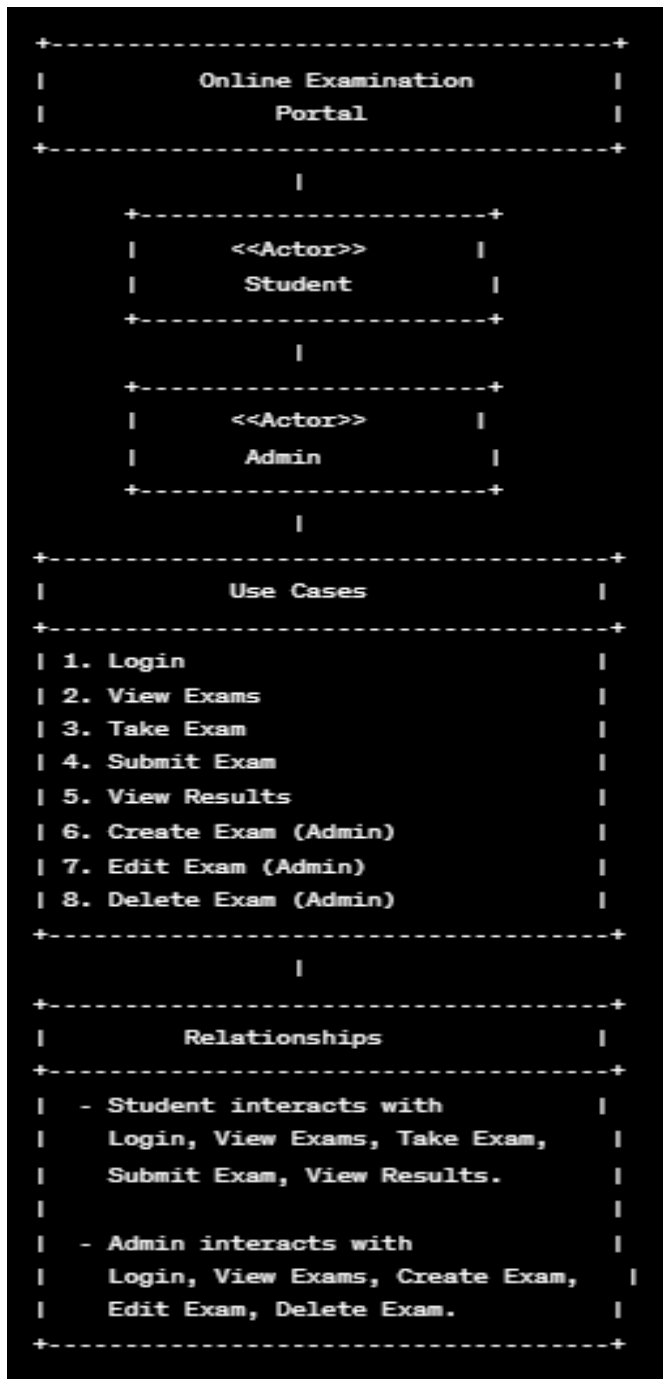
- User passwords must be securely stored using encryption.
- Access to exams and results should be restricted to authorized users.

4. System Models

4.1 Use Case Diagram

A use case diagram provides a high-level view of system's functionality from the user's perspective.

In the context of Online Examination Portal , here's the basic use diagram :



In this use case diagram:

- **Actors:**
 - Student: Represents the users who take exams.
 - Admin: Represents the administrators who manage exams and view results.
- **Use Cases:**
 - Login: Both students and admins need to log in to access the system.
 - View Exams: Students and admins can view available exams.
 - Take Exam: Students can take exams.

- Submit Exam: Students can submit their completed exams.
- View Results: Students and admins can view exam results.
- Create Exam (Admin): Admins can create new exams.
- Edit Exam (Admin): Admins can edit existing exams.
- Delete Exam (Admin): Admins can delete exams.
- **Relationships:**
 - The Student interacts with the login, viewing exams, taking exams, submitting exams, and viewing results use cases.
 - The Admin interacts with the login, viewing exams, creating exams, editing exams, deleting exams, and viewing results use cases

4.2 Class Diagram



5. External Interface Requirements

5.1

User Interfaces

5.1.1 Web Interface

- The system shall have a userfriendly web interface accessible through popular web browsers.
- The UI shall be responsive and compatible with various screen sizes.

5.1.2 Mobile Interface

- The system should provide a mobilefriendly version for users accessing the portal on mobile devices.

5.2 Hardware Interfaces

- The system shall be hosted on a web server with sufficient processing power and memory.
- The database server should meet the storage and retrieval requirements of the application.

5.3 Software Interfaces

- The application shall use a relational database management system (e.g., MySQL, PostgreSQL) for data storage.
- Integration with a secure authentication system (e.g., OAuth) for user login.

5.4 Communication Interfaces

- The system shall use HTTPS for secure communication between the client and the server.
- API endpoints should be welldocumented for potential integration with other systems.

6. Other Nonfunctional Requirements

6.1 Reliability

- The system should have a backup and recovery mechanism to prevent data loss.

6.2 Usability

- The UI should be intuitive, requiring minimal training for users.
- Error messages should be clear and guide users on corrective actions.

6.3 Maintainability

- The system should be easily maintainable with modular code and proper documentation.

Use case scenarios describe interactions between actors (users or external systems) and the system to achieve specific goals. Here are some basic use case scenarios for an online examination portal:

6.3.1.Student Login and Take Exam:

Actor: Student

Preconditions: Student is registered and logged in.

Flow:

- Student logs in.

- Student views available exams.
- Student selects an exam.
- Student takes the exam, answering questions.
- Student submits the completed exam.

Postconditions: Exam is submitted, and results may be viewed.

6.3.2.Admin Login and Manage Exams:

Actor: Admin

Preconditions: Admin is registered and logged in.

Flow:

- Admin logs in.
- Admin views the exam dashboard.
- Admin creates a new exam or selects an existing exam.
- Admin edits exam details or adds/removes questions.
- Admin publishes or deletes the exam.

Postconditions: Exam details are updated, and changes are reflected in the system.

6.3.3.Student View Results:

Actor: Student

Preconditions: Student is registered and logged in, has completed exams.

Flow:

- Student logs in.
- Student navigates to the results section.
- Student selects a completed exam.
- Student views detailed results and feedback.
- Postconditions: Student has reviewed exam results.

6.3.4.Admin View Exam Statistics:

Actor: Admin

Preconditions: Admin is registered and logged in, has access to exam data.

Flow:

- Admin logs in.
- Admin accesses the exam dashboard.
- Admin selects an exam.
- Admin views statistical data, such as average scores and completion rates.

Postconditions: Admin has insights into the performance of the selected exam.

6.3.5.Student Account Management:

Actor: Student

Preconditions: Student is registered and logged in.

Flow:

- Student logs in.
- Student navigates to the account settings.
- Student updates personal information (e.g., password, email).

Postconditions: Student's account information is updated.

6.3.6.Admin User Management:

Actor: Admin

Preconditions: Admin is registered and logged in.

Flow:

- Admin logs in.
- Admin accesses user management features.
- Admin adds or removes users, manages roles.

Postconditions: User information is updated in the system.

6.3.7.System Security - Unauthorized Access Attempt:

Actor: Unauthorized User

Preconditions: User is not registered or logged in.

Flow:

- User attempts to access a protected resource.

Postconditions: Access is denied, and the user is prompted to log in.

These scenarios cover typical interactions with an online examination portal and can be used as a starting point for more detailed use case descriptions.

Testing an online examination portal requires a comprehensive set of test cases to ensure the functionality, security, and usability of the system. Below are some basic test cases covering different aspects of the portal:

User Authentication:

1. Positive Test Case - Valid Login:

- Input: Valid username and password.
- Expected Result: User is successfully logged in.

2. Negative Test Case - Invalid Login:

- Input: Invalid username or password.
- Expected Result: Authentication fails, and an appropriate error message is displayed.

3. Negative Test Case - Account Lockout:

- Input: Repeated failed login attempts.
- Expected Result: Account is locked after a certain number of unsuccessful attempts.

Exam Taking:

4. Positive Test Case - Start Exam:

- Input: Student selects and starts a valid exam.
- Expected Result: Exam starts, and questions are presented to the student.

5. Positive Test Case - Answer Questions:

- Input: Student answers questions within the time limit.
- Expected Result: Answers are recorded, and the exam progresses.

6. Negative Test Case - Time Exceeded:

- Input: Student exceeds the time limit for the exam.
- Expected Result: Exam is automatically submitted, and the student is notified.

7. Positive Test Case - Submit Exam:

- Input: Student submits the completed exam.
- Expected Result: Exam is successfully submitted, and results are calculated.

Exam Creation and Management:

8. Positive Test Case - Create Exam:

- Input: Admin creates a new exam with valid details.
- Expected Result: Exam is successfully created and added to the system.

9. Positive Test Case - Edit Exam:

- Input: Admin modifies the details of an existing exam.
- Expected Result: Exam details are updated without affecting ongoing exams.

10. Negative Test Case - Delete Exam:

- Input: Admin attempts to delete an ongoing exam.
- Expected Result: Deletion is not allowed, and an appropriate error message is displayed.

Results and Reporting:

11. Positive Test Case - View Exam Results:

- Input: Student or Admin views the results of a completed exam.
- Expected Result: Results are displayed accurately with scores and feedback.

12. Positive Test Case - Exam Statistics:

- Input: Admin views statistical data for an exam.
- Expected Result: Statistical data (average scores, completion rates) is accurate.

Security:

13. Negative Test Case - Unauthorized Access:

- Input: User tries to access admin features without proper permissions.
- Expected Result: Access is denied, and an appropriate error message is displayed.

14. Security Test Case - Data Encryption:

- Input: Information transmitted between the client and server.
- Expected Result: Data is encrypted, ensuring secure communication.

Usability:

15. Positive Test Case - User Interface:

- Input: User interacts with the portal using different devices and browsers.
- Expected Result: The UI is consistent, responsive, and functional across various platforms.

16. Positive Test Case - Account Settings:

- Input: User updates personal information in the account settings.
- Expected Result: Changes are saved, and the user's information is updated.

These test cases cover some fundamental scenarios, and you can expand them based on the specific features and requirements of your online examination portal. Additionally, consider including edge cases, boundary tests, and negative scenarios to ensure thorough testing coverage.

8. Glossary:

Here's a basic glossary with terms commonly associated with such portals:

Online Examination Portal (OEP):

A web-based platform that facilitates the creation, management, and administration of online exams.

User:

An individual interacting with the online examination portal. Users can be students or administrators.

Student:

A user who takes exams on the online examination portal.

Admin (Administrator):

A user with elevated privileges responsible for managing exams, questions, and user accounts.

Exam:

A set of questions designed to assess a student's knowledge on a particular subject. Exams can have time limits and different question types.

Question Bank:

A repository or database containing a collection of questions categorized by topic or difficulty level. Admins can use questions from the question bank to create exams.

Question:

A single inquiry presented to the student during an exam. Questions can be of various types, such as multiple-choice, true/false, short answer, or essay.

Exam Result:

The outcome of a student's performance in an exam, typically presented as a score or grade.

User Authentication:

The process of verifying the identity of a user to ensure that they are who they claim to be before granting access to the portal.

Login:

The act of providing credentials (username and password) to access the online examination portal.

Logout:

The act of terminating a user's session in the online examination portal.

Time Limit:

The maximum duration allotted for completing an exam. Once the time limit is reached, the exam is automatically submitted.

Dashboard:

A graphical user interface that provides an overview of relevant information, such as available exams, exam statistics, and user details.

Result Analysis:

The process of reviewing and analyzing exam results to gain insights into student performance and overall exam effectiveness.

Feedback:

Comments or information provided to students regarding their performance in an exam, offering guidance or explanations for correct/incorrect answers.

Encryption:

The process of converting information into a code to secure it during transmission (e.g., HTTPS encryption for secure communication).

User Roles:

Different levels of access and permissions assigned to users. For example, roles may include student, admin, or instructor.

Security Audit:

A systematic evaluation of the security measures implemented in the online examination portal to identify and address vulnerabilities.

API (Application Programming Interface):

A set of rules that allows different software applications to communicate with each other.

Data Backup:

The process of creating copies of data to prevent data loss in case of system failures or other unforeseen events.

This glossary provides a foundation for understanding key terms related to an online examination portal.