Software Requirements Specification

for

E-Learning Website
(Back to School)

Version 1.0

Prepared by Project Team 24

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Revision History

Name	Date	Reason For Changes	Version

1. Introduction

1.1 Purpose

The purpose of this document is to offer a comprehensive overview of "Back To School", an E-Learning Platform. It delineates both functional and non-functional requisites of the platform, elucidating its functionalities such as course enrollment, content delivery, assessment, and collaboration tools. Additionally, it addresses performance benchmarks and security protocols to ensure a robust system.

1.2 Intended Audience and Reading Suggestions

This document caters to a diverse audience including developers, educators, Subscribers, and educational institutions.

- *Developers*: For developers, this document serves as a blueprint for system design and development. It delineates functional and non-functional requisites, performance criteria, and security protocols, offering clarity on project scope and expectations.
- *Educators*: For educators, it provides insights into the platform's capabilities, including course creation, content delivery, and assessment methods. Understanding these functionalities aids educators in leveraging the platform effectively for course delivery.
- *Subscribers*: Subscribers benefit from understanding the platform's features, including course enrollment, content access, assessment methods, and collaboration tools. This document serves as a guide for Subscribers to navigate the platform efficiently and maximize learning outcomes.
- *Educational Institutions*: Educational institutions can assess the suitability of Back To School for their educational needs. Decision-makers should review this document to evaluate alignment with institutional requirements and objectives.

1.3 Project Scope

The scope of the Back To School E-Learning Platform project delineates its objectives and limitations, defining the functionalities it will encompass.

- *Course Management*: Development of a platform enabling educators to create and manage courses, including course content and assessment criteria.
- *User Authentication and Authorization*: Implementation of robust authentication and authorization mechanisms to safeguard user data and ensure secure access to the platform.
- *Interactive Learning*: Incorporation of interactive learning features, including multimedia content, quizzes, Courses, and discussion forums, to facilitate Subscriber engagement and comprehension.
- *Real-time Feedback*: Integration of a feedback mechanism allowing instructors to provide real-time feedback on Subscriber submissions, fostering continuous improvement and engagement.

- *Collaboration Tools*: Provision of collaboration tools such as discussion forums, chat functionalities, and group projects, enabling Subscribers to collaborate effectively and enhance their learning experience.
- *Scalability*: Ensuring the platform's scalability to accommodate a growing user base and evolving educational needs while maintaining performance and reliability.
- *Accessibility*: Designing the platform with accessibility features to ensure inclusivity and accommodate users with diverse needs and abilities.

1.4 References

• https://spring.io/
• https://www.javascript.com/
• https://developer.mozilla.org/en-US/docs/Web/JavaScript
• https://en.wikipedia.org/wiki/Model%E2%80%93view%E2%80%93controller
• Spring Boot + React: JWT Authentication with Spring Security – BezKoder

2. Overall Description

2.1 Product Perspective

The "Back To School" E-Learning Platform aims to revolutionize traditional methods of course submission and review in online learning environments. With the burgeoning enrollment in online courses and the escalating demand for efficient assessment systems, there is an urgent need for a modernized and technology-driven solution. "Back To School" endeavors to provide a centralized platform where Subscribers can seamlessly submit their Courses and receive prompt feedback from instructors or peers. By streamlining the course submission and review process, the platform seeks to enhance the learning experience for Subscribers while augmenting the efficiency of instructors or reviewers.

2.2 Product Features

User Authentication and Authorization:
Back To School will incorporate robust user authentication and authorization mechanisms. Users will log in using their credentials, and the system will ascertain their access level and permissions, ensuring secure access to the platform.

Course Submission:
Subscribers will be required to submit Courses through Back To School, providing a link to their work hosted on platforms like GitHub. The system will validate the URL to ensure it points to a public repository, facilitating transparency and authenticity. Additionally, Subscribers will specify the correct branch for submission.

Course Review:
Instructors or designated reviewers will have access to submitted Courses for review. They will be able to view, assess, and provide feedback on Subscriber submissions, fostering constructive engagement and continuous improvement.

Commenting Functionality:
Back To School will facilitate communication between reviewers and Subscribers through a commenting system. Both parties can leave comments on specific Courses, with real-time updates on the posting time and date, promoting effective collaboration and feedback exchange.

Course Rejection and Resubmission:
Reviewers will have the authority to reject Courses, accompanied by explanatory comments for necessary revisions. Subscribers can then resubmit updated Courses, ensuring iterative learning and improvement.

Notification System:
A robust notification system will keep users informed about new Courses, updates on Courses under review, and other relevant activities, enhancing communication and engagement within the platform.

Reporting and Analytics:
Administrators will have access to comprehensive reporting and analytics functionalities. They can generate reports to track course progress, Subscriber

performance, and other relevant metrics, facilitating informed decision-making and assessment management.

User Management:

Back To School administrators will have control over user management aspects, including adding, editing, and deleting users, as well as assigning roles and permissions, ensuring smooth platform administration and user experience.

Data Security and Privacy:

The platform will prioritize data security and privacy, implementing stringent measures to safeguard user data storage and transmission. Back To School will adhere to privacy regulations, ensuring compliance and instilling user trust.

2.3 User Classes and Characteristics

The "Back To School" E-Learning Platform caters to three primary user classes, each with distinct characteristics and requirements:

1. **Subscriber:**

- **Characteristics:** Subscriber constitute the primary user base of the platform. They utilize Back To School to access the courses, track their progress, and engage with course materials.
- **Requirements:** Subscriber should be able to log into the platform securely, accessing their personalized dashboard. The dashboard will provide essential information such as upcoming course deadlines, submission statuses, and feedback received.

2. **Instructors/Teachers:**

- **Characteristics:** Instructors play a pivotal role in course delivery. They are tasked with reviewing Subscriber's to providing feedback, and facilitating effective learning experiences.
- **Requirements:** Instructors require access to a dedicated interface within Learn Ease that enables them to manage courses efficiently.

3. **Administrators:**

- **Characteristics:** Administrators hold administrative privileges and are responsible for overseeing the platform's operation and user management.
- **Requirements:** Administrators should possess comprehensive control over user management functionalities within Learn Ease. This includes the ability to create, edit, and delete user accounts, as well as assign roles and permissions. Furthermore, administrators require access to system-wide data and information for monitoring platform usage, generating reports, and ensuring compliance with policies and regulations.

2.4 Operating Environment

The operating environment for the project consists of the following hardware and software components:

Hardware:

• A machine with at least 8GB of RAM and a fast processor, such as Intel Core i5 or higher, to ensure smooth and efficient execution of the project.

Software:

• ReactJS for the frontend development.
• Spring Boot for the backend development
• MySQL for the database management.
• JWT Authentication for security.

Other Applications:

• Code editor (such as Visual Studio Code, Eclipse)
• Git version control software
• Command line interface (CLI) or terminal
• A browser for testing the application.
• Postman for testing APIs.
• MySQL Workbench or another database management tool
• An AWS account for deployment.

2.5 Design and Implementation Constraints

• User interface is only in English. No other language option is available.
• Compatibility issues while mapping Frontend to two backends.
• Parallel Operations may load the system and not function smoothly
• Limited to HTTPS.

2.6 User Documentation

User documentation within the learn Ease E-Learning Platform encompasses a comprehensive Help menu integrated into the application interface. This Help menu serves as a user-friendly resource, offering detailed insights into various modules and functionalities of the platform. Users can refer to the documentation to understand how to navigate the application, utilize its features effectively, and troubleshoot any issues they encounter. The documentation provided within learn Ease ensures that users have access to all necessary information, including project overview, functionality details, user roles, software and hardware requirements, and operational guidelines. It serves as a valuable resource for users to maximize their experience and proficiency with the platform.

3. System Features

3.1 User Login

3.1.1 Description and Priority

In the Back To School E-Learning Platform, user login functionality holds high priority. Subscribers and instructors can securely access the platform by logging in with their unique credentials.

3.1.2 Stimulus/Response Sequences

Upon navigating to the app's homepage, users click the "Login" button and enter their credentials. Upon submission, if the credentials are valid, users are directed to their respective dashboards.

3.1.3 Functional Requirements

- **User authentication:** Verify the validity of user credentials against the database.
- **Session management:** Track user sessions and automatically log users out after a set period of inactivity or manual logout.
- **Data encryption:** Encrypt user passwords before storing them in the database to ensure security.

3.2 Dashboard

3.2.1 Description and Priority

The dashboard feature is of high priority in Back To School. Subscriber are presented with a comprehensive dashboard displaying current and past courses, including due dates and statuses.

3.2.2 Stimulus/Response Sequences

Upon successful login, users are directed to their dashboard, which prominently lists their courses, due dates, and statuses.

3.2.3 Functional Requirements

- **Display current and past courses:** Present users with a list of courses, including relevant details such as title, due date, and status.
- **Sort by due date:** Allow users to sort courses by due date, facilitating prioritization of tasks with the earliest courses displayed first.

3.3 Commenting Domain
3.3.1 Description and Priority

The commenting domain feature enables both instructors and Subscriber to provide feedback. It includes real-time updates of post time and dates for each comment, enhancing collaboration and feedback exchange.
Priority: Medium

3.3.2 Stimulus/Response Sequences

Upon selecting a submitted course, the instructor clicks the "Claim Review" button, triggering the system to update the course status to "in review." Subsequently, the reviewer can view all comments related to the course.

3.3.3 Functional Requirements

- **Ability to view all comments:** Provide users with the capability to access and view all comments associated with a specific course.
- **Real-time updates:** Ensure real-time updates of post time and date for each comment, allowing users to track the timeline of feedback.
- **User interface for comment addition:** Implement a user-friendly interface enabling users to easily add new comments to Courses, fostering seamless communication and collaboration.

3.4 Payment Gateway Integration
3.4.1 Description and Priority

The integration of a secure payment gateway is crucial for enabling users to purchase courses and access premium content within the e-learning platform.
Priority: High

3.4.2 Stimulus/Response Sequences

Upon selecting a course for purchase, users are directed to the payment page where they can securely enter their payment details. Upon successful payment processing, users receive confirmation of their enrolment and gain access to the course content.

3.4.3 Functional Requirements

- **Secure payment processing:** Implement a reliable payment gateway that supports secure transactions and complies with industry standards for data security.

- **Multiple payment methods:** Offer users various payment options such as credit/debit cards, digital wallets, and bank transfers to enhance convenience and accessibility.
- **Confirmation and receipt generation:** Provide users with immediate confirmation of successful payments and generate receipts for their records.

3.5 Course Enrollment and Add to Cart Functionality

3.5.1 Description and Priority

The ability for users to easily enroll in courses and add them to their cart for future purchase or browsing is essential for enhancing user experience and facilitating course selection.

Priority: Medium

3.5.2 Stimulus/Response Sequences

Users browse the course catalog and select courses of interest. They have the option to either enroll immediately or add courses to their cart for later consideration. Upon enrollment or adding to cart, users receive confirmation and can proceed to access or review their selections.

3.5.3 Functional Requirements

- **Course browsing and selection:** Offer users a comprehensive catalog of courses with detailed descriptions, enabling them to browse and select courses based on their interests and requirements.
- **Enrolment and cart functionality:** Implement intuitive interfaces for users to enrol in courses with a single click or add courses to their cart for future consideration. Include options for users to view and manage their enrolled courses and cart items.

3.6 Admin Role

3.6.1 Description and Priority

• **Description:** The admin role is responsible for managing the system, creating and managing user accounts, and monitoring the overall functionality of the system.
• **Priority:** High

3.6.2 Stimulus/Response Sequences

• The admin logs in to the app, then performs tasks such as creating user accounts for new students, adding or removing code reviewers, and managing assignments and reviews. The system responds by displaying the relevant information and allowing the admin to make changes as needed.

3.6.3 Functional Requirements

• Admin should be able to log in using unique credentials.
• Admin should be able to create and manage user accounts.
• Admin should be able to view reports and analytics generated by the system.
• Admin should be able to monitor the overall functioning of the system and make necessary adjustments.

4. External Interface Requirements

4.1 User Interfaces

The new system shall provide a very intuitive and simple interface to the user and the administrator, so that the user can easily navigate through pages, start new courses, write comments, generate feedback and the administrator can easily manage user details.

4.2 Hardware Interfaces

Server side:
• The web application will be hosted on a web server which is listening on the web standard port, port 80.

Client side:
• Monitor screen – the software shall display information to the user via the monitor screen.
• Mouse – the software shall interact with the movement of the mouse and the mouse buttons. The mouse shall activate areas for data input, command buttons and select options from menus.
• Keyboard – the software shall interact with the keystrokes of the keyboard. The keyboard will input data into the active area of the database.

4.3 Software Interfaces

Server side:
An Apache web server will accept all requests from the client and forward it accordingly. A database will be hosted centrally using MySQL.

Client side:
An OS which is capable of running a modern web browser which supports JavaScript and HTML5.

4.4 Communications Interfaces

The HTTP or HTTPS protocol(s) will be used to facilitate communication between the client and server.

5. Other Nonfunctional Requirements

5.1 Performance Requirements

The performance requirements of the project should outline the expected speed, reliability, scalability, and efficiency of the system. This may include the maximum response time for user actions, the expected uptime percentage, the ability to handle increasing numbers of users and submissions, and the resource usage of the system. These requirements should be realistic and achievable, taking into account factors such as hardware limitations and network bandwidth. They should also be measurable and verifiable, allowing the system to be tested and evaluated against the defined standards.

5.2 Safety Requirements

The system should be reliable and have minimal downtime to ensure that Subscribers can subscribe to courses and receive feedback in a timely manner. The user interface should be intuitive and user-friendly to prevent errors or misunderstandings while using the app. The app should have robust error handling mechanisms to deal with unexpected situations and prevent any harm to the user or loss of data.

5.3 Security Requirements

The project would include measures to protect the confidentiality, integrity, and availability of sensitive information such as subscribed courses and personal information. Some of the security requirements are:

- **Authentication:** Implement a secure authentication system that ensures only authorized users can access the system.
- **Authorization:** Develop an authorization mechanism to determine what actions a user can perform within the system based on their role and permissions.
- **Encryption:** Ensure that data in transit and at rest is encrypted to protect sensitive information from being intercepted or accessed by unauthorized parties.
- **Access Control:** Implement a mechanism to control access to sensitive information within the system, including the ability to set permissions for different users and roles.

5.4 Software Quality Attributes

The software quality attributes for the project include the following:

- **Usability:** The user interface should be intuitive, easy to navigate, and user-friendly, allowing users to easily submit and review courses.
- **Reliability:** The system should be reliable and provide accurate results, ensuring that users can subscribe to courses and receive accurate and efficient reviews.
- **Performance:** The system should perform efficiently and respond quickly to user requests, allowing for fast and seamless accessibility of courses.

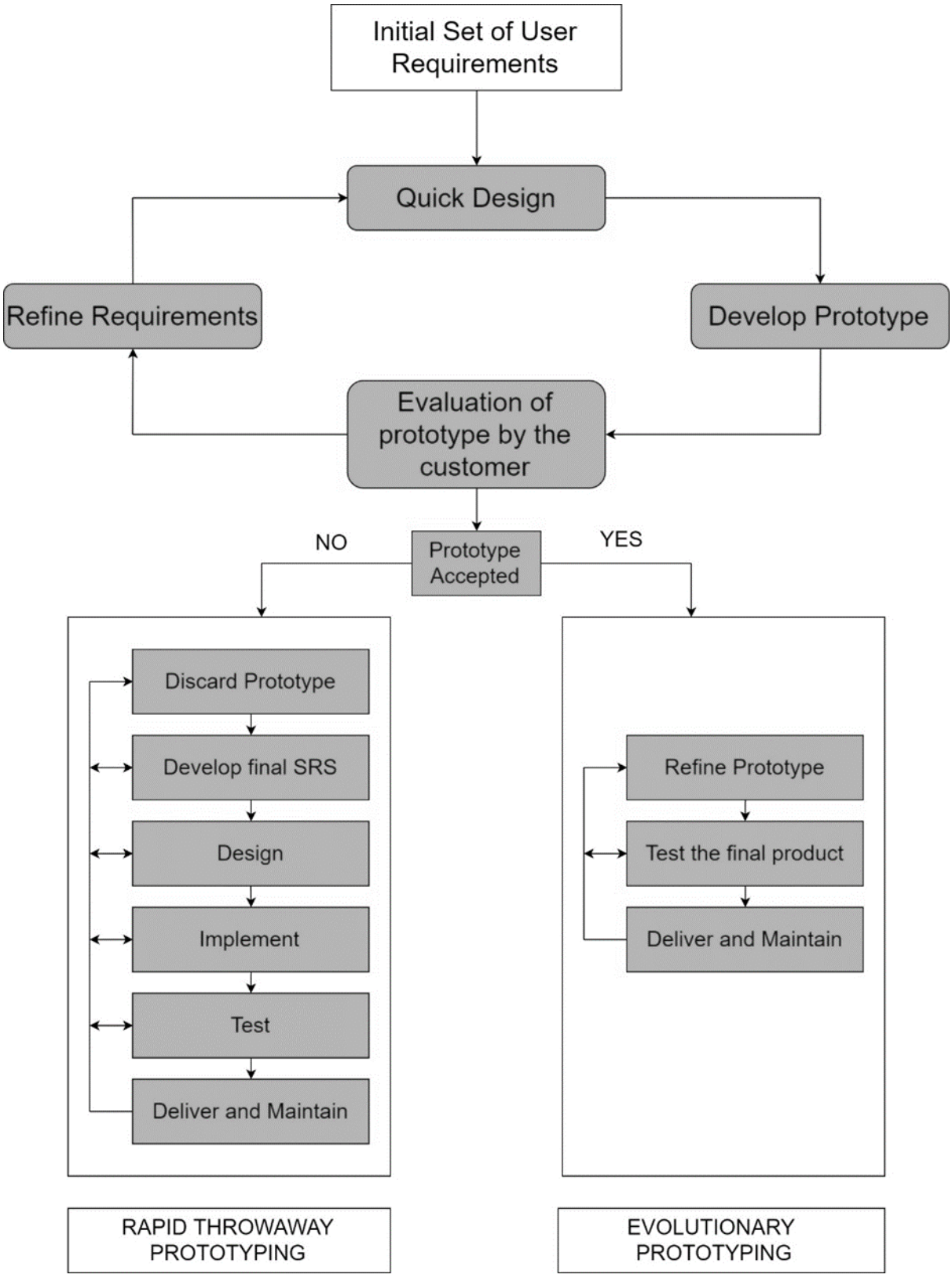
- **Scalability:** The system should be scalable, allowing for an increasing number of users and courses as the demand grows.
- **Maintainability:** The system should be maintainable, with easy-to-update code and well-documented processes, ensuring that updates and improvements can be made quickly and efficiently.
- **Security:** The system should have strong security features, protecting sensitive information and ensuring the privacy and confidentiality of user data.
- **Compliance:** The system should comply with relevant regulations and standards, ensuring that it operates within the bounds of the law and industry best practices.

Appendix A: Glossary

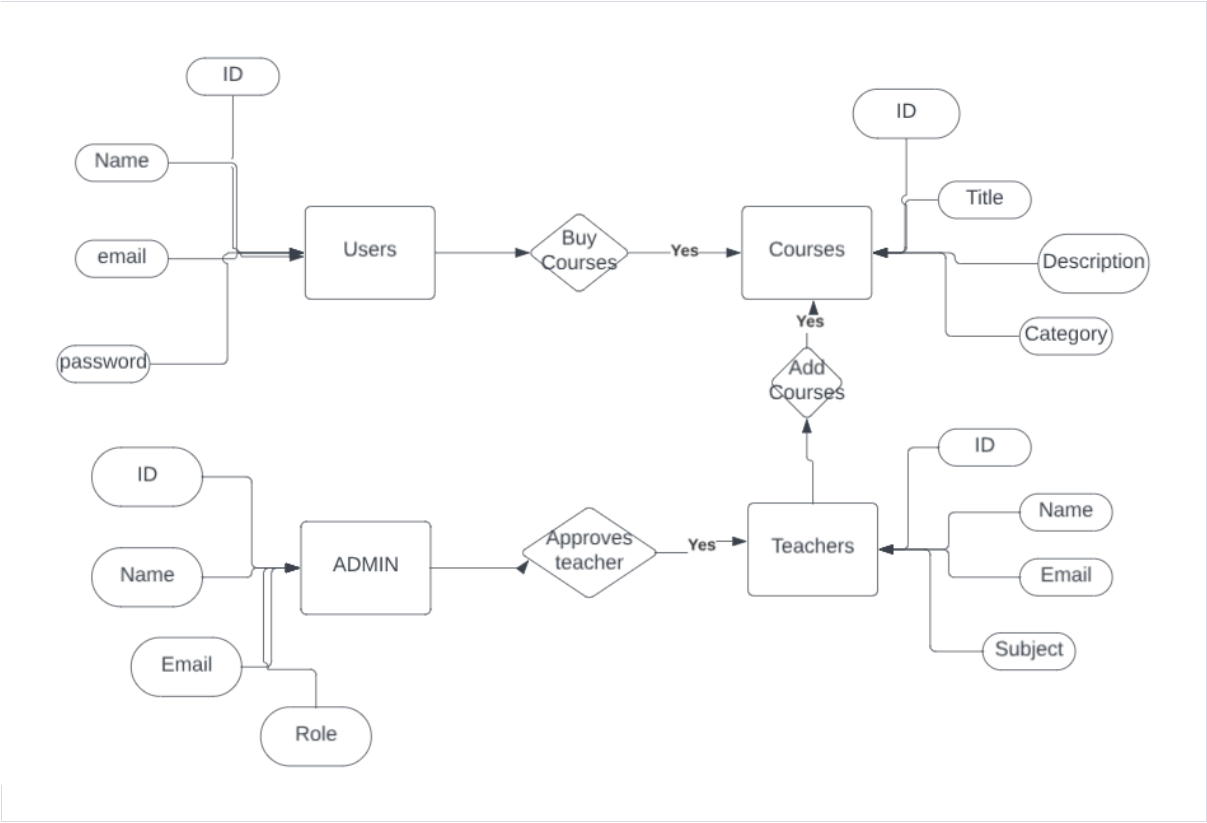
Sr. No.	Full Form	Abbreviation
1.	Application Programming Interface	API
2.	Amazon Web Service	AWS
3.	Command Line Interface	CLI
4.	Gigabyte	GB
5.	Hypertext Markup Language	HTML
6.	Hypertext Transfer Protocol / Secure	HTTP / HTTPS
7.	Identification	ID
8.	JavaScript	JS
9.	Java Web Token	JWT
10.	Operating System	OS
11.	Random Access Memory	RAM
12.	Structured Query Language	SQL
13.	Software Requirement Specification	SRS
14.	Uniform Resource Locator	URL
15.	Entity Relationship	ER

Appendix B : Analysis Models

- **Software Development Approach in Our System**



- **ER Diagram**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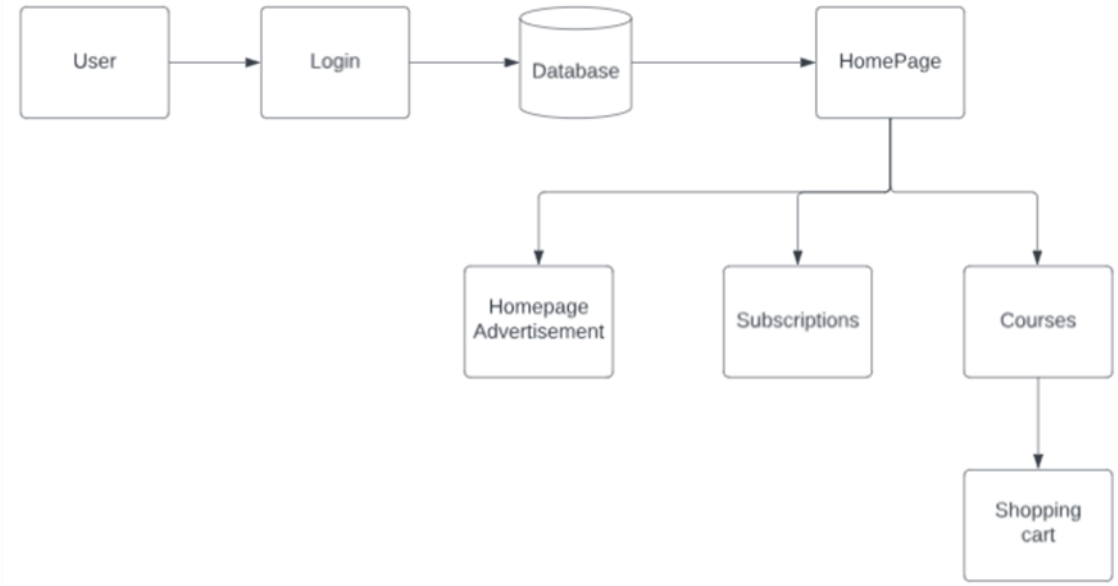
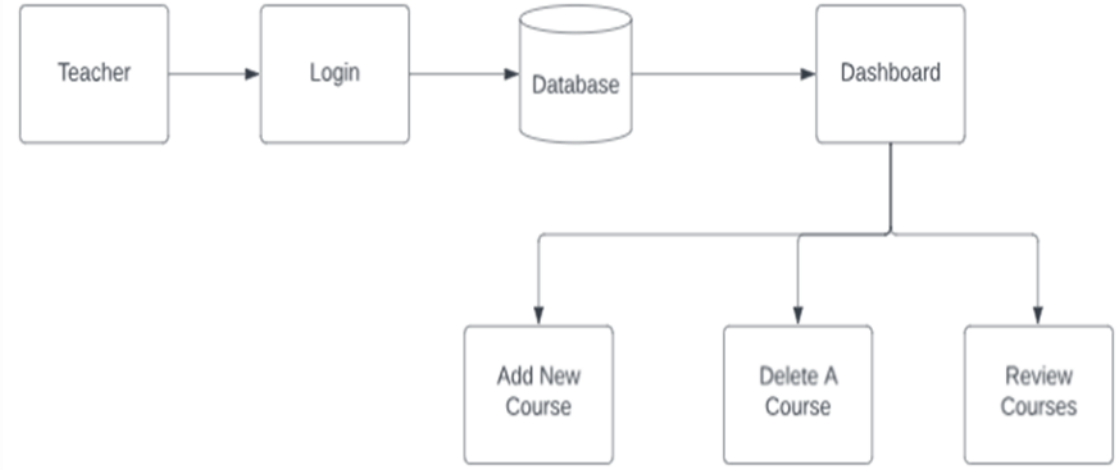
Role

- **Data-Flow Diagram**

1. User Module



2. Teacher Module



3. Admin Module