1.4 Product Goal

The primary goal of the platform is to revolutionize the learning experience by providing a personalized, community-driven approach to education. The platform aims to empower individuals by offering customized learning paths that adapt to their unique preferences, abilities, and goals, ensuring that every user can achieve their full potential. By leveraging AI technology, the platform continuously assesses and refines the learning journey, making it more engaging and effective over time. This goal is rooted in making quality education accessible to everyone, regardless of location or background, by breaking down barriers to entry and promoting lifelong learning.

In addition to personalized learning, the platform seeks to foster a vibrant skill-sharing community that encourages individuals to actively participate in teaching and learning. The goal is to create a sustainable educational environment where users not only gain knowledge but also contribute to the learning of others through live, peer-to-peer sessions. This approach ensures that learning extends beyond individual progress to community growth, enabling the transfer of valuable skills and experiences within local contexts.

Ultimately, the product goal is to create an educational ecosystem that is not just about acquiring information, but about building meaningful connections, promoting collaboration, and driving sustainable development in communities. Through this blend of AI-driven personalization and local skill-sharing, the platform aspires to make education a collaborative, enriching, and socially impactful experience.

1.5 Product Backlog

Table 1.1 Detailed User Stories for the entire project

S.No	USER STORIES OF AI E-Learning Application
#US 1	As a new user, I want to easily register for the platform so that I can gain access to its features like Profile creation and skill enhancement and resources to self learning.
#US 2	As a new user, I want to create a personal profile after registration so that I can showcase my skills, interests, and achievements to the community.
#US 3	As a user, I want to search for skills, courses, and other users on the platform
#US 4	As a user, I want to create and browse skill-sharing listings
#US 5	As a user, I want to participate in peer-to-peer learning sessions
#US 6	As a video provider, I want to post a quiz
#US 7	As a user, I want real-time feedback during peer learning sessions
#US 8	As a user, I want the platform to analyze facial expressions to provide sentiment analysis
#US 9	As a user, I want to engage in forums and group activities
#US 10	As a user, I want enhanced search functionality to find relevant content quickly
#US 11	As a user, I want to provide feedback on the platform’s features and content

The product backlog of Ai E-learning Application was configured using the MS planner Agile Board which is represented in the following Figure 1.1. The Product Backlog consists of the complete user stories of Ai based E-learning Application

Each user story consists of necessary parameters like MoSCoW prioritization, Functional and non-functional parameters, detailed acceptance criteria with linked tasks.

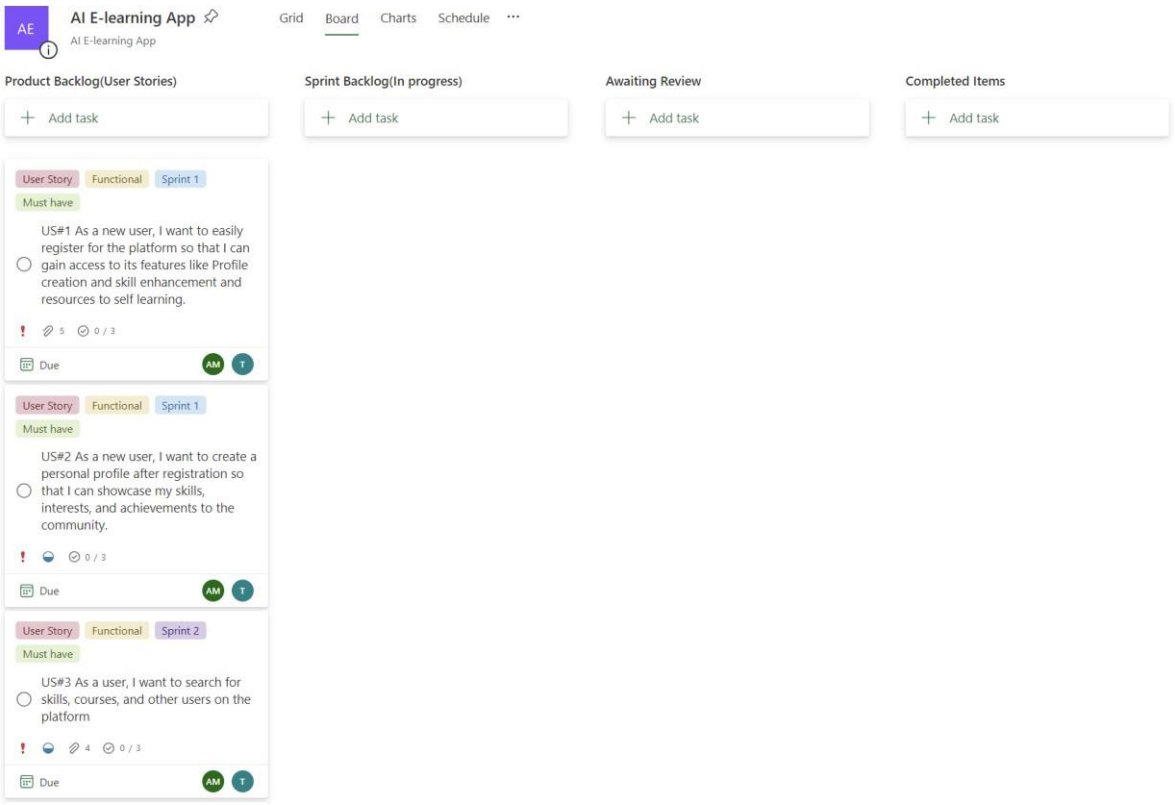

Figure 1.1 MS Planner Board of Ai E-learning Application

1.7 Product Release Plan

The following Figure 1.2 depicts the release plan of the project

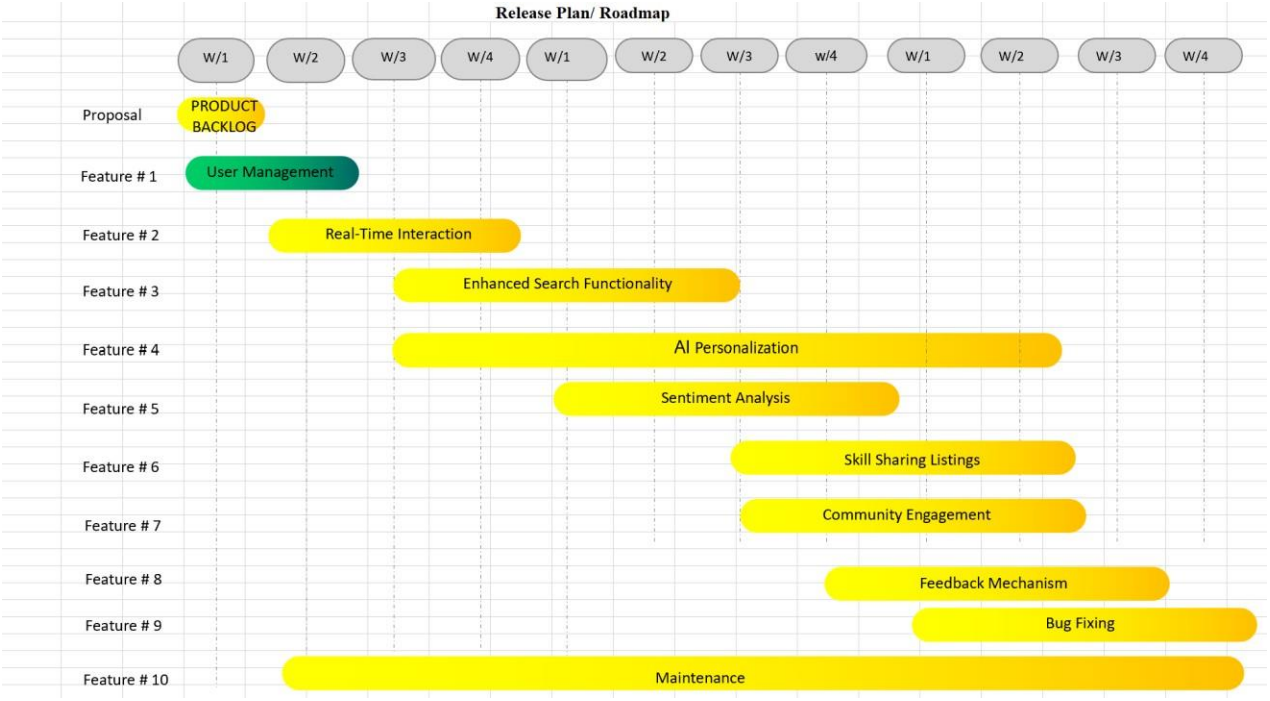

Figure 1.2 Release plan of AI E-learning Application

CHAPTER 2

SPRINT PLANNING AND EXECUTION

2.1 Sprint 1

2.1.1 Sprint Goal with User Stories of Sprint 1

The Goal of the first sprint is to construct the user landing page and to enable the search functionalities such as skills and courses.

The following table 2.1 represents the detailed user stories of the sprint 1

Table 2.1 Detailed User Stories of sprint 1

S.NO	Detailed User Stories
US #1	As a new user, I want to easily register for the platform so that I can gain access to its features like Profile creation and skill enhancement and resources to self learning.
US #2	As a new user, I want to create a personal profile after registration so that I can showcase my skills, interests, and achievements to the community.
US #3	As a user, I want to search for skills, courses, and other users on the platform

Planner Board representation of user stories are mentioned below figures 2.1,2.2 and 2.3

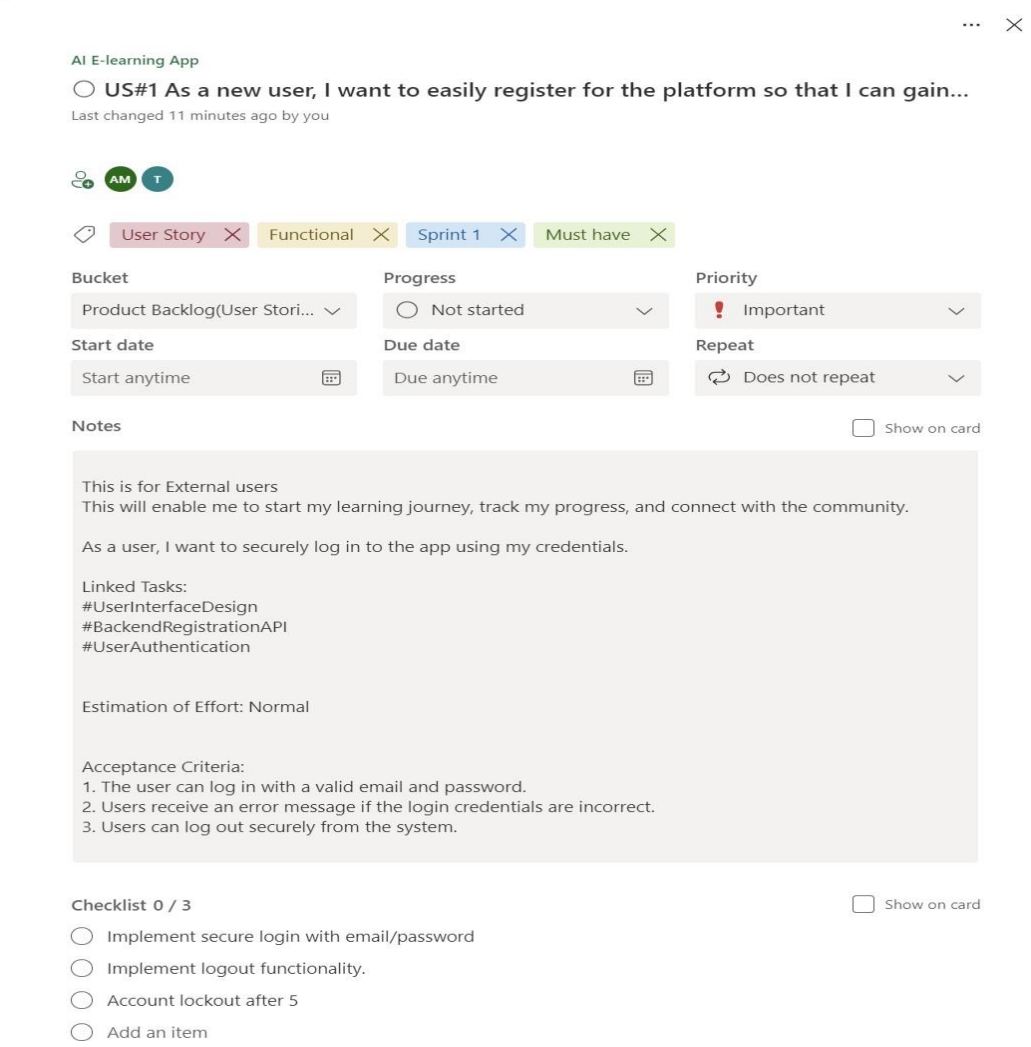

Figure 2.1 user story for user registration

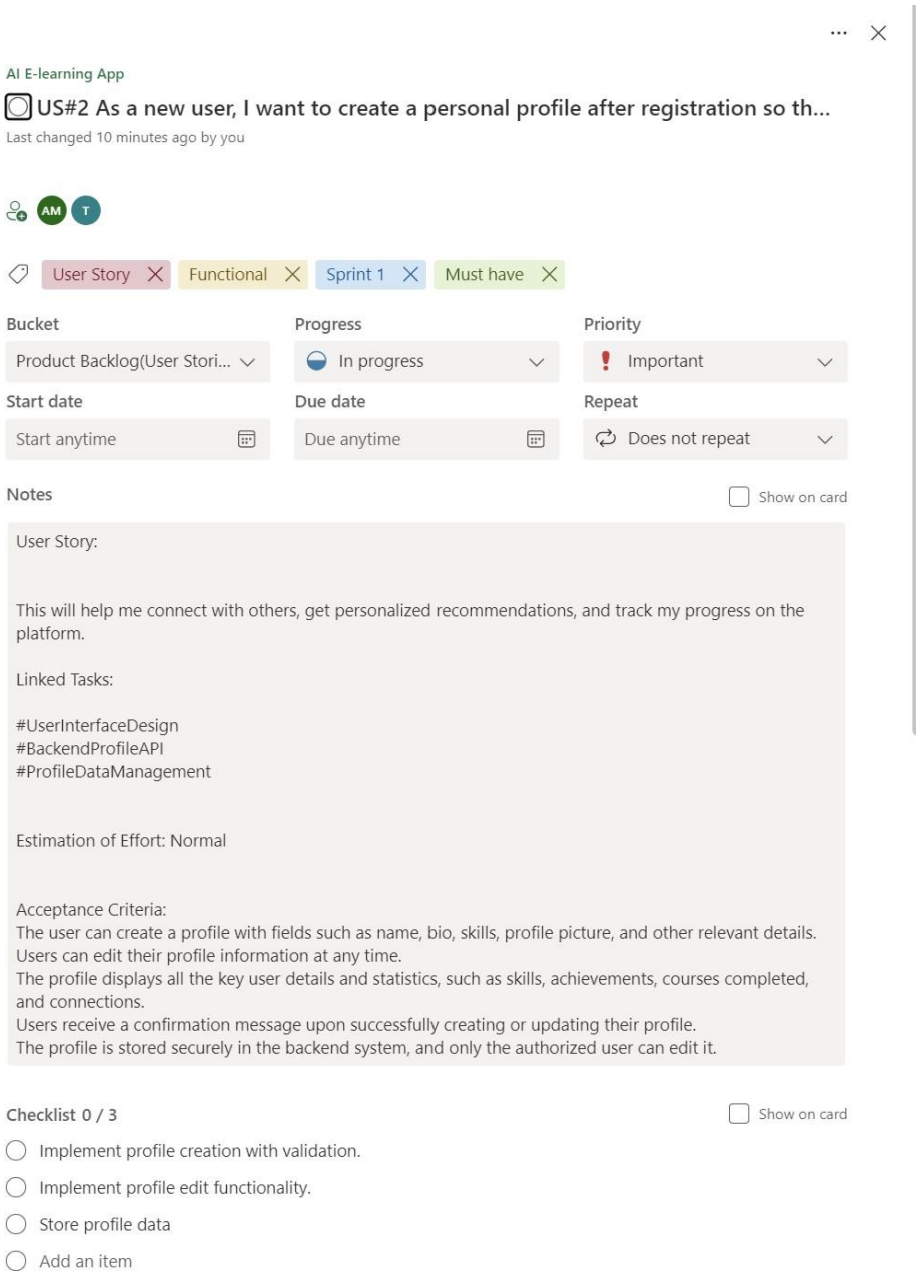

Figure 2.2 user story for profile creation

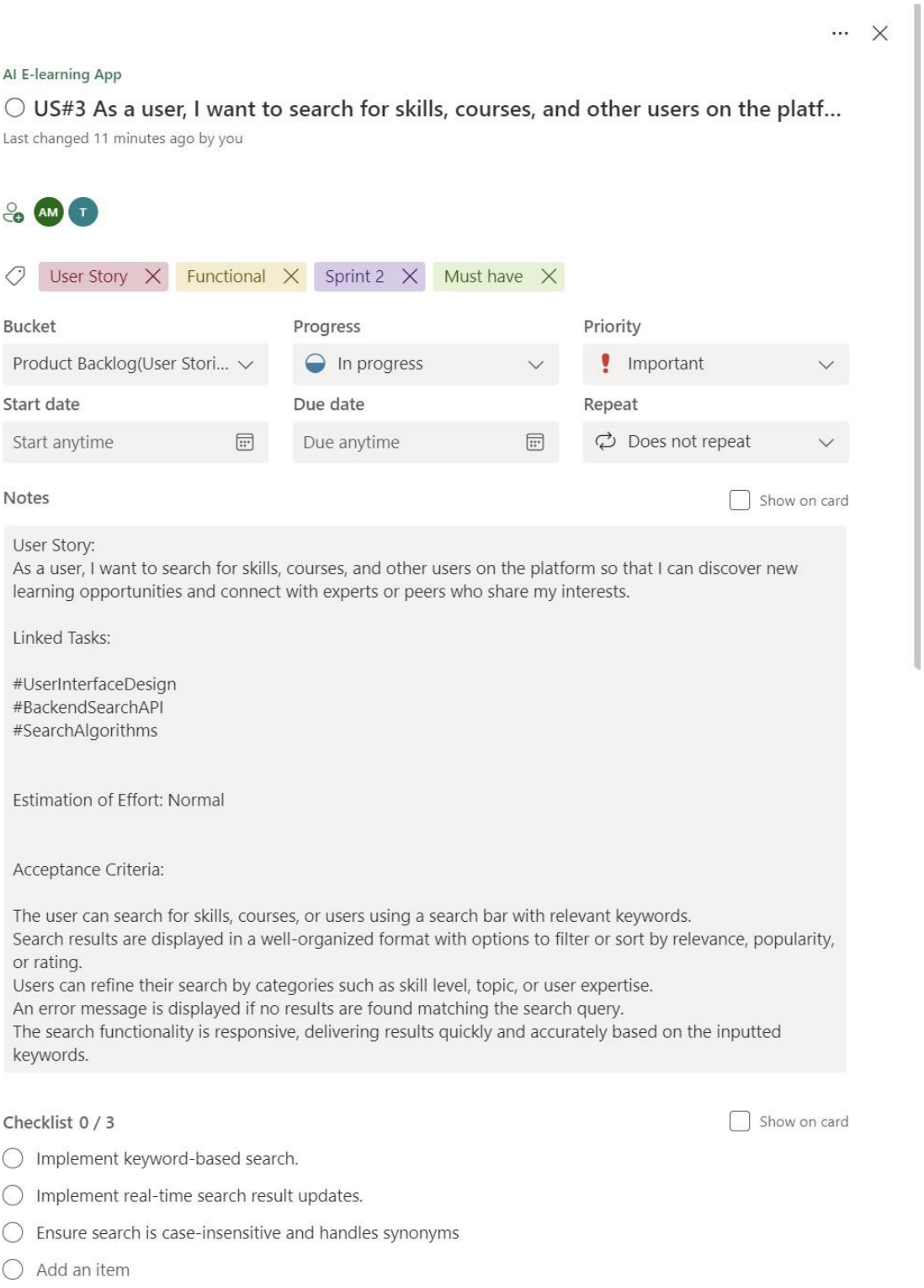

Figure 2.3 User story for search functionality

2.1.2 Functional Document

2.1.2.1. Introduction

The AI-Powered Skill-Sharing and Learning Platform project aims to create a dynamic, user-centric platform that combines artificial intelligence with community collaboration. This project focuses on delivering personalized learning experiences, facilitating real-time peer-to-peer engagement, and fostering a collaborative learning environment. The platform is designed to address the diverse needs of learners by providing tailored learning paths and live engagement sessions.

2.1.2.2. Product Goal

The primary goal of this project is to develop a platform that enhances the learning experience by personalizing content and enabling real-time peer interaction. The platform aims to:

- Personalize learning paths based on individual needs and preferences.
- Facilitate real-time skill-sharing and learning sessions.
- Use AI to analyze user sentiment and adapt the learning experience accordingly.
- Foster a community of learners and educators to promote skill-sharing.

2.1.2.3. Demography (Users, Location)

Users:

- Target Users: Students, professionals, hobbyists, and educators.
- User Characteristics: Varying levels of technical proficiency, diverse backgrounds, different learning goals.

Location:

- Target Location: Global, with particular emphasis on regions with high internet penetration and a strong culture of online learning and collaboration.

2.1.2.4. Business Processes

The key business processes include:

User Registration and Authentication:

- Users can register securely using their email or social media accounts.
- Authentication ensures secure access to personalized content and peer-to-peer sessions.

Personalized Learning Path Creation:

- The system generates personalized learning paths based on user interests, goals, and learning history.

2.1.2.5. Features

This project focuses on implementing the following key features:

Feature 1: User Registration

1. Description:
    - The platform provides personalized learning paths that guide users through courses and sessions based on their interests, skills, and learning objectives.
2. User Story:
    - As a user, I want the platform to recommend a learning path that aligns with my goals, so I can learn efficiently and effectively.

Feature 2: Profile Creation

1. Description:
    - The platform allows users to join or host live learning sessions where they can collaborate and learn from peers in real-time.

2. User Story:
    - As a user, I want to participate in live learning sessions to gain knowledge from others in real-time.

Feature 3: Enhanced Search Functionality

1. Description:
    - The platform offers advanced search options, allowing users to find learning sessions and content based on specific criteria such as topic, difficulty level, and user ratings.
2. User Story:
    - As a user, I want to easily find the most relevant content using filters and search tools, so I can quickly access what I need.

2.1.2.6. Authorization Matrix

Table 2.2 Access level Authorization Matrix

Role	Access Level
Administrator	Full access to user management, content management, and platform settings.
Educator	Access to content creation, session management, and student interaction tools.
Learner	Access to personalized learning paths, sessions, and community features.
Guest User	Limited access to browse available sessions and view public content.

2.1.2.7. Assumptions

- The AI models for personalization and sentiment analysis will be trained using a dataset that accurately reflects the diversity of the target audience.
- The development team will have continuous access to cloud infrastructure to test and deploy features.
- Users and stakeholders will provide timely feedback during testing phases.
- The platform will comply with global data protection regulations, ensuring user privacy and security.

2.1.3 Architecture Document

2.1.3.1. Application

Microservices:

The platform is built on a microservices architecture, where different functionalities are encapsulated within independent services. Key services include:

- Authentication Service: Manages user login, two-factor authentication, and account recovery.
- Course Management Service: Handles course creation, categorization, and enrollment.
- User Role Management Service: Controls role-based access, ensuring users have appropriate permissions based on their roles (e.g., Student, Educator, Administrator).
- Notification Service: Manages the sending of real-time notifications related to course updates and account activities.

2.1.3.2 System Architecture-

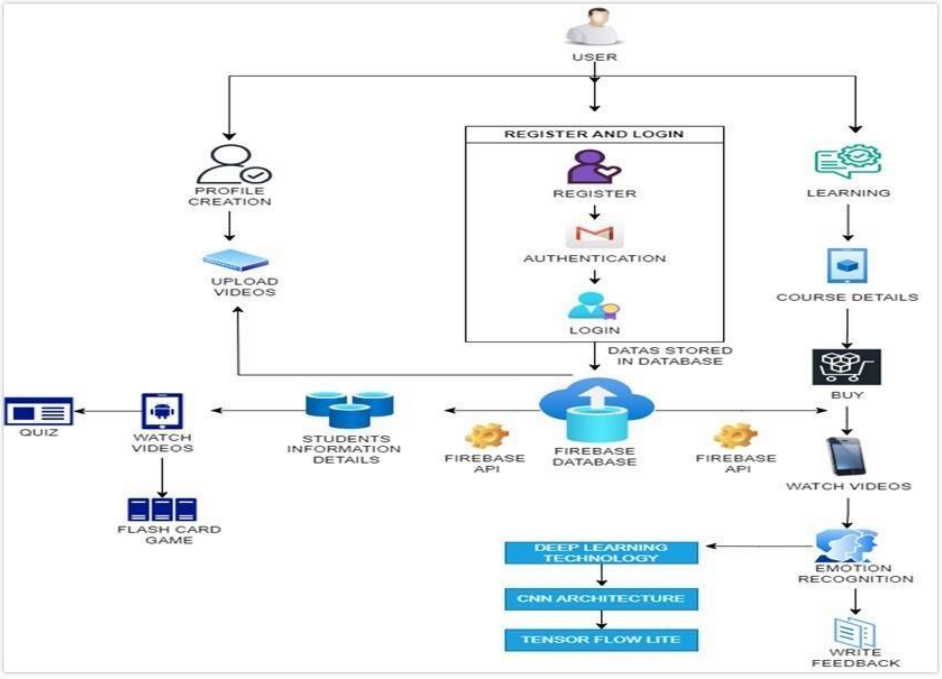

Figure 2.4 System Architecture Diagram

2.1.3.3. Data Exchange Contract:

Frequency of Data Exchanges:

Data exchanges are managed with careful consideration of timing and performance:

- Real-Time Exchanges: For critical operations like user authentication and course enrolments, data is exchanged in real-time via APIs.
- Periodic Syncs: Non-critical data, such as user activity logs or historical performance data, is synchronized at scheduled intervals.

Data Sets:

The platform handles several key data sets, each with specific exchange requirements:

- User Data: Includes personal details, credentials, and preferences. This data is exchanged during login, profile updates, and role assignments.
- Course Data: Encompasses course details, content, and metadata, exchanged during course creation, updates, and deletions.
- Enrolment Data: Tracks student progress and performance, exchanged when students enroll, complete, or drop courses.

Mode of Exchanges (API, File, Queue, etc.) :

Various methods are used for data exchange across the platform:

- API: RESTful APIs facilitate real-time data exchanges between the front-end and back-end services.
- Message Queues: Services such as RabbitMQ or AWS SQS are used for handling asynchronous tasks like sending notifications or processing background jobs.
- File-Based Exchanges: Certain data, such as bulk uploads of course materials, are handled via file exchanges, typically through S3 or similar storage services.

2.1.4 UI DESIGN

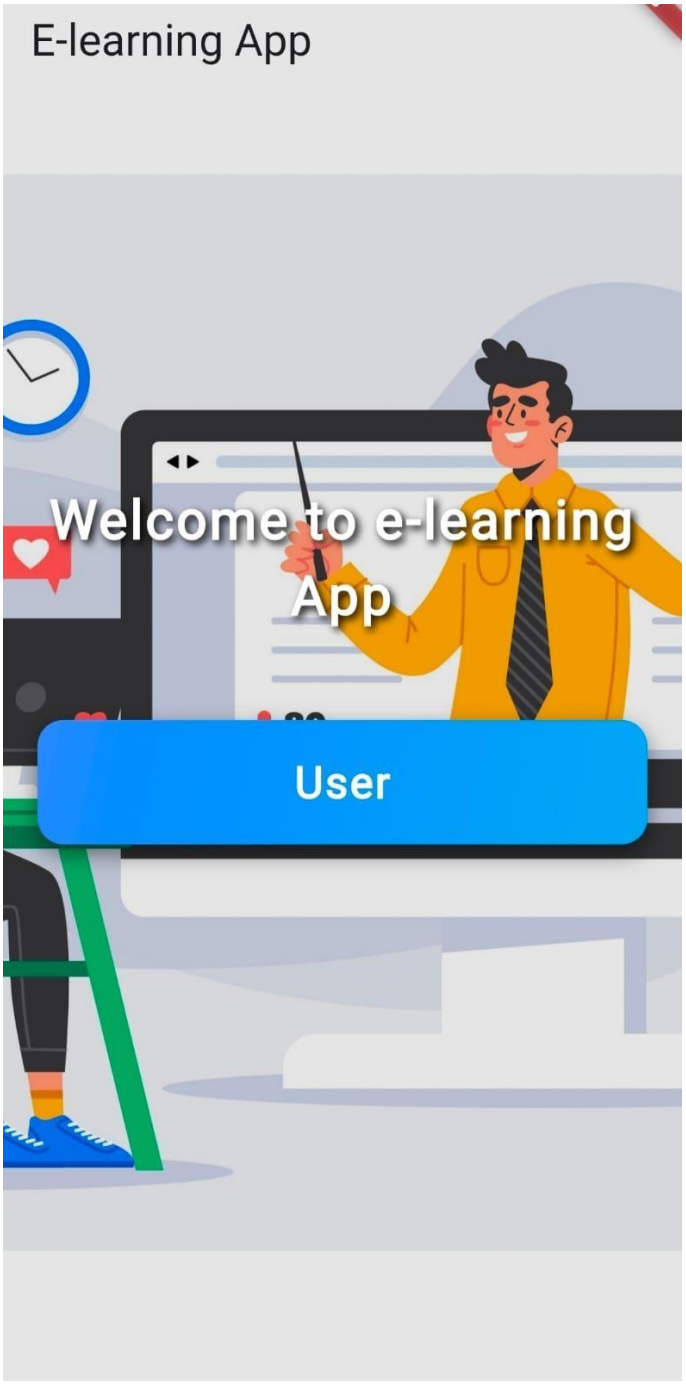

Figure 2.5 UI Design for Landing page

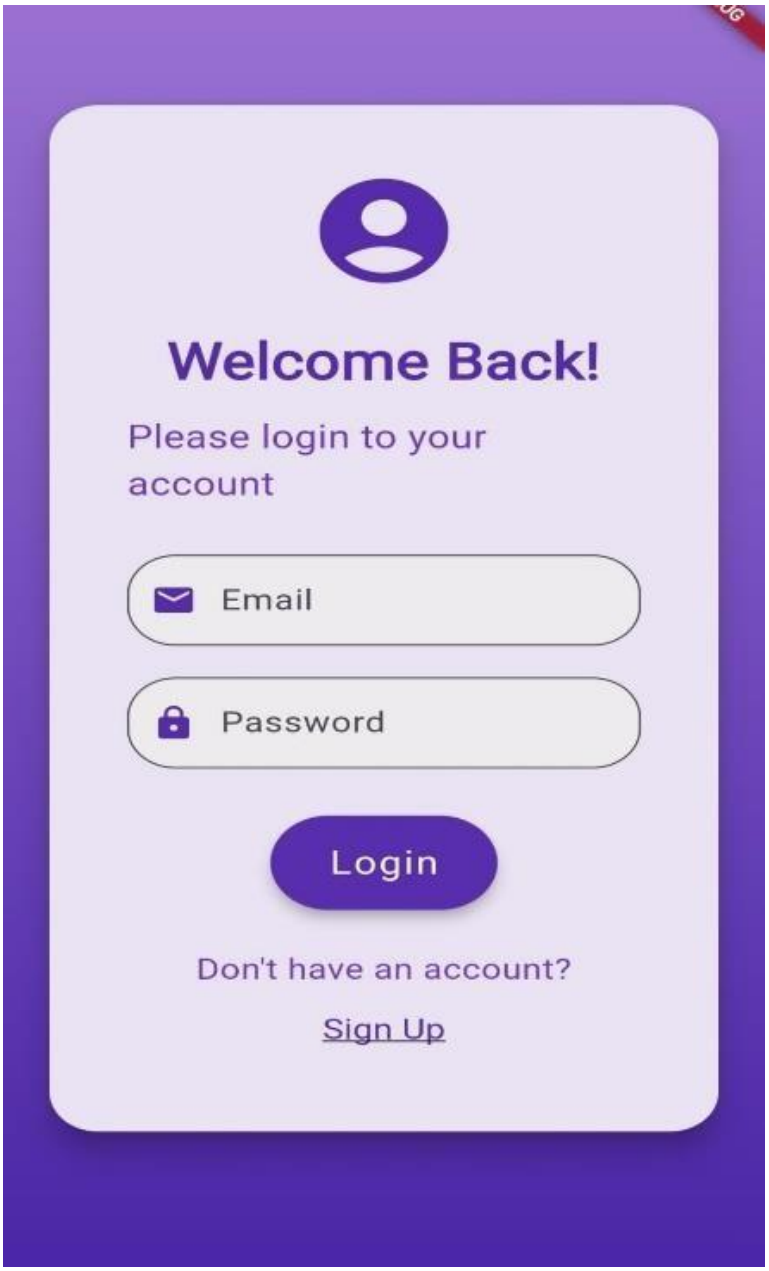

Figure 2.6 UI design for login page

2.1.5 Functional Test Cases

Table 2.3 Detailed Functional Test Case for Sprint 1

		Functional Test Case Template				
Feature	**Test Case**	**Steps to execute test case**	**Expected Output**	**Actual Output**	**Status**	**More Information**
User Registration	**Valid User Registration**	1. Open the application's registration page. 2. Enter a valid username. 3. Enter a valid email address. 4. Enter a strong password. 5. Click on the "Register" button.	The user should be successfully registered and redirected to the welcome page.	The user is successfully registered. The application redirects the user to the welcome page.	Pass	No error messages are displayed. The user profile information is correctly displayed on the welcome page. Verify email confirmation link is received.
Enhanced User Authentication	**Valid User Login**	1. Open the application's login page. 2. Enter a valid username. 3. Enter a valid password. 4. Click on the "Login" button.	The user should be successfully logged into the system. The application should redirect the user to the home page.	The user is successfully logged in. The application redirects the user to the home page.	Pass	No error messages are displayed. The user profile information is correctly displayed on the home page. Check if the login time is recorded for the user.
Enhanced User Authentication	**Two-Factor Authentication**	1. Open the application's login page. 2. Enter a valid username and password. 3. Click on the "Login" button. 4. Enter the code received via SMS/email. 5. Click on "Verify" button.	The user should be successfully authenticated after entering the code and redirected to the home page.	The user is successfully authenticated and redirected to the home page.	Pass	Verify the code received matches the one displayed on the screen. Check for any delay in receiving the code.
Password Recovery	Forgot Password	1. Open the application's login page. 2. Click on the "Forgot Password" link. 3. Enter a valid email address. 4. Click on the "Submit" button.	The system should send a password reset email to the provided email address. The user should receive an email with instructions on resetting the password.	The system successfully sends a password reset email. The user receives the email with reset instructions.	Pass	Verify the content of the password reset email. Check that the link in the email redirects the user to the password reset page
Course Search Optimization	Search with Filters	2. Go to the search bar and enter a keyword (e.g., "Python"). 3. Apply filters (e.g., difficulty level, rating). 4. Click on "Search" button.	The search results should display courses matching the keyword and applied filters.	The search results correctly display courses matching the keyword and applied filters		Verify that the results are sorted correctly according to the filters. Check that irrelevant results are not displayed.

2.1.6 Daily Call Progress

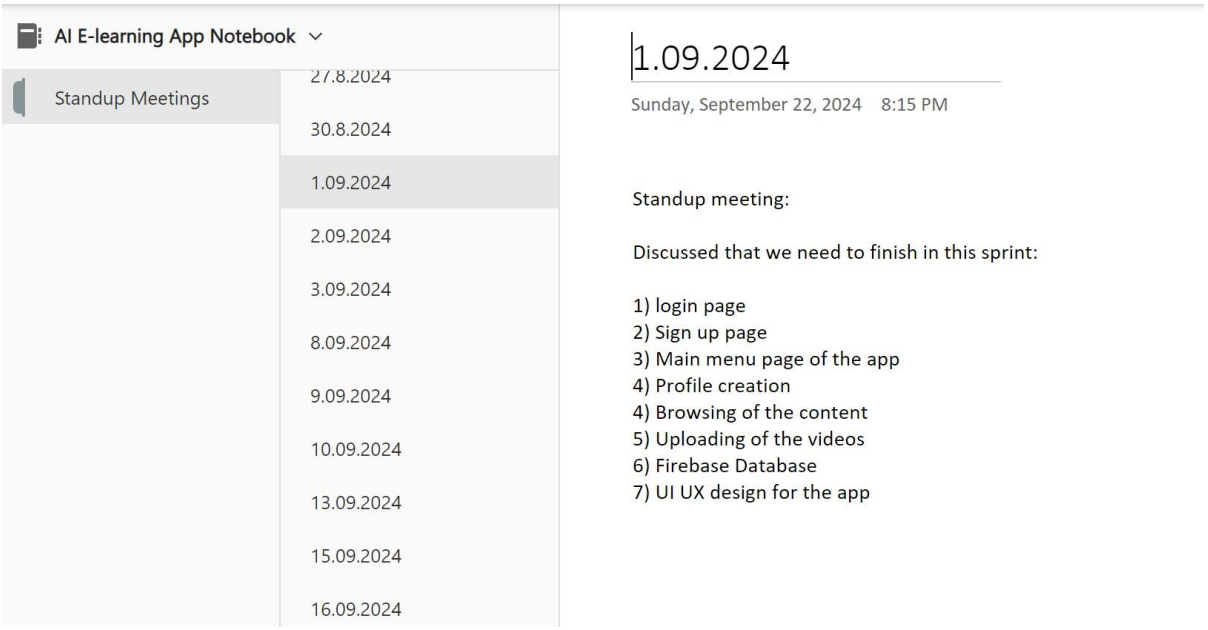

Figure 2.7 Standup meetings for Sprint 1

2.1.7 Committed Vs Completed User Stories

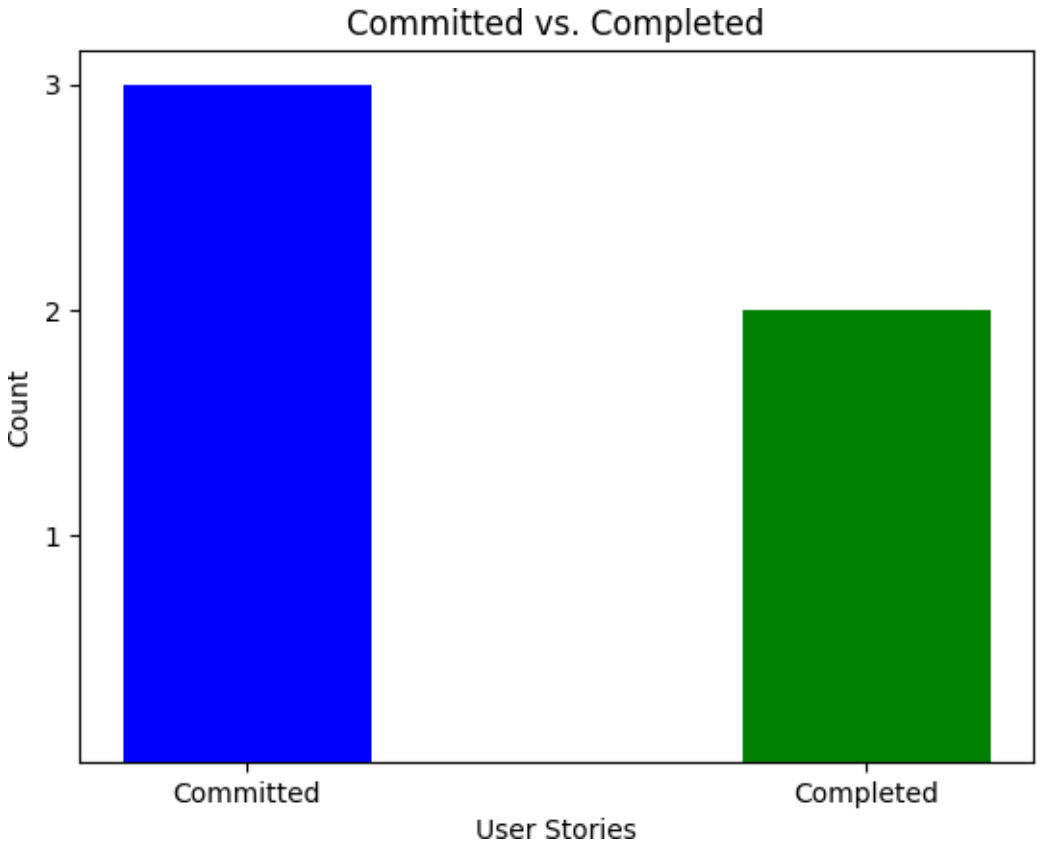

Figure 2.8 Bar graph for Committed Vs Completed User Stories for sprint 1

2.1.8 Sprint Retrospective

Sprint Retrospective			
Liked	**Learned**	**Lacked**	**Longed For**
Share aspects of the sprint that you enjoyed or found particularly effective.	*Discuss lessons learned, whether they are related to processes, technical aspects, or teamwork.*	*Identify areas where the team felt a lack of resources, support, or information.*	*Discuss any desires or expectations that the team had but were not met during the sprint.*
The collaboration and open communication between team members were exceptional, leading to efficient problem-solving and quick decision-making.	We learned that integrating early feedback from stakeholders into the sprint cycle can greatly enhance the relevance and quality of the deliverables.	We lacked sufficient documentation for some of the third-party integrations, which slowed down the development process.	We longed for a more structured and time-boxed daily stand-up meeting to ensure all team members' concerns and progress were addressed effectively.

Figure 2.9 Sprint Retrospective for the Sprint 1