“ApplyNext”
A global Educational Platform

Software Requirements Specification

Prepared by

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Student ID : 22301689

Version	Date	Author	Description of Changes
1.0	07.09.2025	Tasnim Rahman Moumita	Initial Draft of the Software Requirements Specification (SRS) for the **ApplyNext Platform**, including a detailed overview of the project's purpose, scope, and agile development plan.

1. Introduction

1.1 Purpose

This Software Requirements Specification (SRS) document outlines the requirements for developing the "ApplyNext Platform", a full-stack MERN (MongoDB, Express.js, React, Node.js) application for discovering and managing global education opportunities. The primary goal of this application is to facilitate a secure and efficient platform for users to find, manage, and track educational opportunities, inspired by leading education platforms like IDP.

1.2 Type of Project

This project is a **full-stack MERN (MongoDB, Express.js, React, Node.js) application for discovering and managing global education opportunities**, named "ApplyNext". It is an online platform that acts as a central hub for students and other users to find and apply for courses and scholarships worldwide.

1.3 Target Users

The platform is designed to serve two primary categories of users, each with distinct needs and roles within the application.

Users (Students and Job Seekers)

- **Description:** This is the primary user group of the platform. They are individuals seeking to enhance their education or career prospects.
- **Characteristics:**
    - They are actively searching for courses, scholarships, and educational programs from various universities and institutions worldwide.

- They need a user-friendly interface to search, filter, and bookmark opportunities.
- They require a secure profile to manage their personal information, track applications, and view bookmarked courses.
- They interact with the payment system to enroll in courses or programs.

Admins

- **Description:** This group includes individuals responsible for the overall management and maintenance of the platform.
- **Characteristics:**
  - They require a dedicated dashboard with administrative privileges.
  - Their key tasks include adding, editing, and deleting courses and scholarships.
  - They are responsible for managing user accounts, tracking application statuses, and monitoring platform analytics.
  - They may also oversee the payment system and handle applicant management.

1.4 Scope

The scope of this project includes the design, development, and deployment of a web application that caters to both regular users and administrators. The platform will provide functionalities such as:

1. user authentication,
2. course discovery,
3.course bookmarking,
4.profile management,
5.Payment

This SRS covers the functional and non-functional requirements, constraints, assumptions, and the high-level design of the project.

1.5 Definitions, Acronyms, and Abbreviations

- **MERN:** MongoDB, Express.js, React, Node.js
- **JWT:** JSON Web Token
- **CORS:** Cross-Origin Resource Sharing
- **NoSQL:** A type of database that doesn't use the traditional table structure of a relational database.
- **ODM:** Object Data Modeling
- **SRS:** Software Requirements Specification
- **XSS:** Cross-Site Scripting

1.6 Overview

This document is organized into several sections. Section 1 provides an introduction, purpose, and scope of the project. Section 2, "Overall Description," details the product features, user classes, operating environment, and constraints. Section 3 outlines the functional and non-functional requirements, including performance, security, and usability. Section 4 provides a high-level overview of the technology stack and architecture, while Section 5 covers the deployment plan. The final section discusses the acceptance criteria for the project.

2. Overall Description

2.1 Product Perspective

The "ApplyNext Platform" is a standalone system built on the MERN stack. It is a single, integrated web application with a React frontend and a Node.js/Express.js backend. The application's architecture is designed to support the discovery and management of global education opportunities.

2.2 Product Features

The platform offers the following key features:

Sprint 1: Core Functionality

- **1.1 User Management:** The system provides secure user authentication, including registration, login, and password recovery.
- **1.2 Profile Management:** Users can edit their personal profiles and upload a picture.
- **1.3 Search Bar:** A universal search bar is available for users to find courses.
- **1.4 Dashboard Separation:** The application features distinct dashboards for administrators and regular users, each with role-based access.

Sprint 2: User Engagement & Content Management

- **2.1 Course Bookmarking and Tracking:** Users can save and track their favorite courses and scholarships from their profile.
- **2.2 Content Addition:** Administrators have the ability to add new courses and scholarships to the platform, including all relevant details.
- **2.3 Application Process:** The system allows users to initiate an application for an eligible course or scholarship.

Sprint 3: Advanced Features & Monetization

- **3.1 Chatbot:** An integrated chatbot assists users with general inquiries and support.
- **3.2 Applicant Management:** The system provides tools for managing applicants, likely for administrators to track user applications.
- **3.3 Analytics and Monetization:** The platform includes features for tracking analytics and monetization, such as course statistics or premium content access.
- **3.4 Payment System:** The system integrates a secure payment system using **Stripe** to handle transactions.

2.3 User Classes and Characteristics

1. **Registered Users:** Individuals who create an account to browse and bookmark courses, manage their profile, and payment completion to their desired courses.. They require a user-friendly and secure interface.
2. **Administrators:** Users with elevated privileges who can access a separate dashboard to manage platform statistics, courses, and user data. They need a secure and intuitive interface for administrative tasks.

2.4 Operating Environment

The application is designed to run in a web browser environment on various devices. The server-side component requires Node.js (v14 or higher) and a MongoDB instance.

Web Application: Accessible on modern web browsers (Chrome, Firefox, Edge, Safari).

Mobile Compatibility: Responsive design for smartphones and tablets.

Server-Side: Node.js and Express.js running in a containerized or cloud environment.

Database: MongoDB cluster (preferably cloud-managed for scalability and backups).

Hosting: Deployment could be on AWS, Azure, Google Cloud, or any equivalent production environment.

2.5 Constraints

- **Technology Stack:** The project is constrained to using the **MERN** stack.
- **Security:** The system must use JWT tokens with HTTP-only cookies, implement password hashing with `bcrypt` (12 salt rounds), and include rate limiting, input validation, and sanitization to prevent attacks like XSS and NoSQL injection.
- **Time & Resources:** The project is already completed.

2.6 Assumptions and Dependencies

- The system assumes users have a stable internet connection.
- Third-party services like `nodemailer` for email functionality are assumed to be reliable and available.

- The application relies on the functionality of the MERN stack components for its core operations.

3. System Requirements

3.1 Functional Requirements

3.1 Functional Requirements

3.1.1 Authentication & Authorization

- **FR-1:** The system shall allow new users to register with an email and password.
- **FR-2:** The system shall allow users to log in with their credentials.
- **FR-3:** The system shall support a secure password reset process via email with time-limited tokens.
- **FR-4:** The system shall provide a separate login interface for administrators.
- **FR-5:** The system shall use JWT-based authentication with HTTP-only cookies to manage user sessions.
- **FR-6:** The system shall enforce role-based access control to protect administrative and user-specific routes.

3.1.2 Course Discovery & Management

- **FR-7:** The system shall allow users to search and browse courses from various universities worldwide.
- **FR-8:** The system shall provide advanced filtering options for courses by country, level, and field of study.
- **FR-9:** The system shall display detailed information for each course.
- **FR-10:** Registered users shall be able to bookmark courses for later reference.

3.1.3 User & Admin Dashboards

- **FR-11:** The system shall provide a personal dashboard for users to view their bookmarked courses and activity.
- **FR-12:** The system shall provide an administrative dashboard with navigation and statistics.
- **FR-13: Payment Processing:** The system shall securely process payments for services or products using the **Stripe API**.
- **FR-14: Secure Checkout:** The system shall provide a secure, encrypted checkout page to capture user payment information.
- **FR-15: Payment Confirmation:** The system shall send a payment confirmation email to the user upon a successful transaction.

3.1.4 Additional Features

- **FR-13:** The system shall integrate with the **Stripe** API to handle payments.
- **FR-14:** The system shall provide a **chatbot interface** for answering user queries and providing support.

3.2 Non-Functional Requirements

3.2.1 Performance Requirements

- **NFR-1:** The real-time search functionality should provide results with minimal latency.
- **NFR-2:** The application's pages and components should load efficiently to provide a smooth user experience.

3.2.2 Security Requirements

- **NFR-3:** All passwords shall be hashed using `bcrypt` with at least 12 salt rounds.
- **NFR-4:** Authentication routes shall have rate limiting to prevent brute-force attacks.
- **NFR-5:** The system shall have input validation and sanitization to protect against XSS and NoSQL injection.
- **NFR-6:** The backend shall implement CORS protection with whitelisted domains.
- **NFR-7:** The system shall use security headers (Helmet, CSP, XSS protection) to prevent common web vulnerabilities.

3.2.3 Reliability & Availability

- **NFR-8:** The system shall be reliable and available for users with minimal downtime.
- **NFR-9:** Data backups shall be taken regularly to ensure minimal data loss.

3.2.4 Maintainability

- **NFR-10:** The project structure and codebase should be well-organized and easy to maintain for future enhancements.
- **NFR-11:** All API endpoints should be well-defined and consistent.

3.2.5 Scalability

- **NFR-12:** The MERN stack architecture should support horizontal scaling to accommodate a growing number of users and courses.

3.3 External Interface Requirements

3.3.1 User Interfaces

- **UI-1:** The application shall have a responsive, mobile-friendly design using Tailwind CSS.
- **UI-2:** The design shall feature modern, card-based layouts and smooth hover animations.

3.3.2 Hardware Interfaces

- **HI-1:** None specific. The system is designed to run on standard server hardware or cloud-based instances.

3.3.3 Software Interfaces

- **SI-1:** The backend shall use `nodemailer` for email functionality.
- **SI-2:** The frontend shall use `axios` as the HTTP client to communicate with the backend API.
- **SI-3:** The authentication system will utilize `JWT` and `bcryptjs`.

  SI-4: Stripe API: The system shall interface with the **Stripe API** for handling all payment-related transactions.

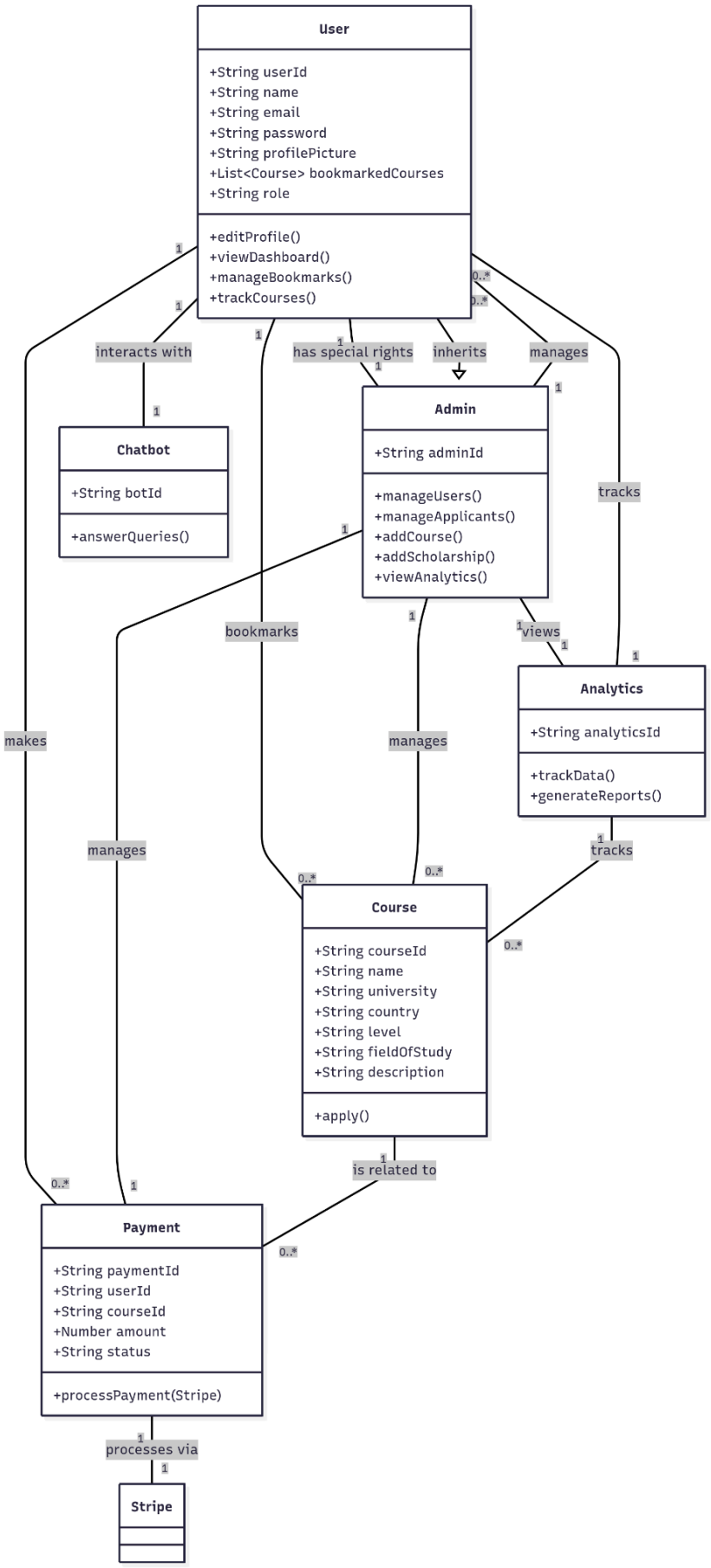
- **SI-5:** The system shall integrate with a **chatbot API** or service for user support.

3.3.4 Communication Interfaces

- **CI-1:** The frontend and backend shall communicate via RESTful APIs.

4.Class Diagram:

(created using Mermaid diagram tool)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+viewDashboard()
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5.Tools and Technologies (Frontend and Backend)

5.1 MERN Stack Components

- **Node.js:** The JavaScript runtime environment for the backend.
- **Express.js:** The web framework for building the backend API routes.
- **React:** The UI library for building the responsive frontend.
- **MongoDB:** The NoSQL database for data storage.
- **Mongoose:** The ODM for interacting with the MongoDB database.

5.2 High-Level Architecture

The application follows a standard MERN stack architecture:

1. **Presentation Layer (React):** Handles user interaction and displays data.
2. **Business Logic Layer (Express.js/Node.js):** Manages API routes, controllers, and middleware.
3. **Data Layer (MongoDB):** Stores all persistent data, including user and course information.

5.3 Compatibility with System Environment

The platform is designed to be highly compatible with a modern web environment, ensuring a smooth experience for all users, administrators, and developers.

Software Environment

- **Operating System:** The application is OS-independent and can be accessed from any operating system that supports a modern web browser, including but not limited to Windows, macOS, Linux, Android, and iOS.
- **Web Browser:** The application is a single-page application (SPA) and is optimized to run on all major modern web browsers, including Google Chrome, Mozilla Firefox, Microsoft Edge, and Safari.
- **Backend:** The server-side environment is built on Node.js (version 16 or higher) and Express.js (version 4 or higher), and the database is MongoDB (version 5 or higher).

- **Frontend:** The client-side is built with React (version 18 or higher) and is styled using Tailwind CSS.

Hardware Environment

- **Client-Side:** Users need a device with a modern web browser and a stable internet connection. The application is optimized for both desktop and mobile devices.
- **Server-Side:** The application can be hosted on any cloud service provider that supports the MERN stack, such as Amazon Web Services (AWS), Google Cloud Platform (GCP), or Microsoft Azure. The specific hardware requirements will depend on the expected user load and data storage needs.

6. Tentative Development Plan

The project is already completed.

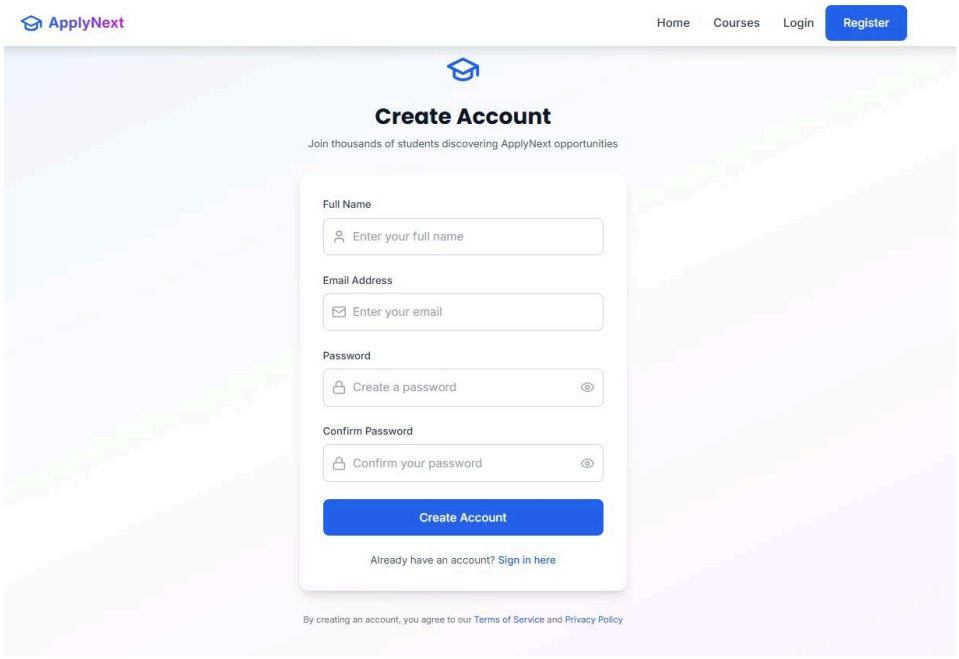
7. Acceptance Criteria

The system is considered accepted if all defined functional and non-functional requirements are met, and the platform operates as described.

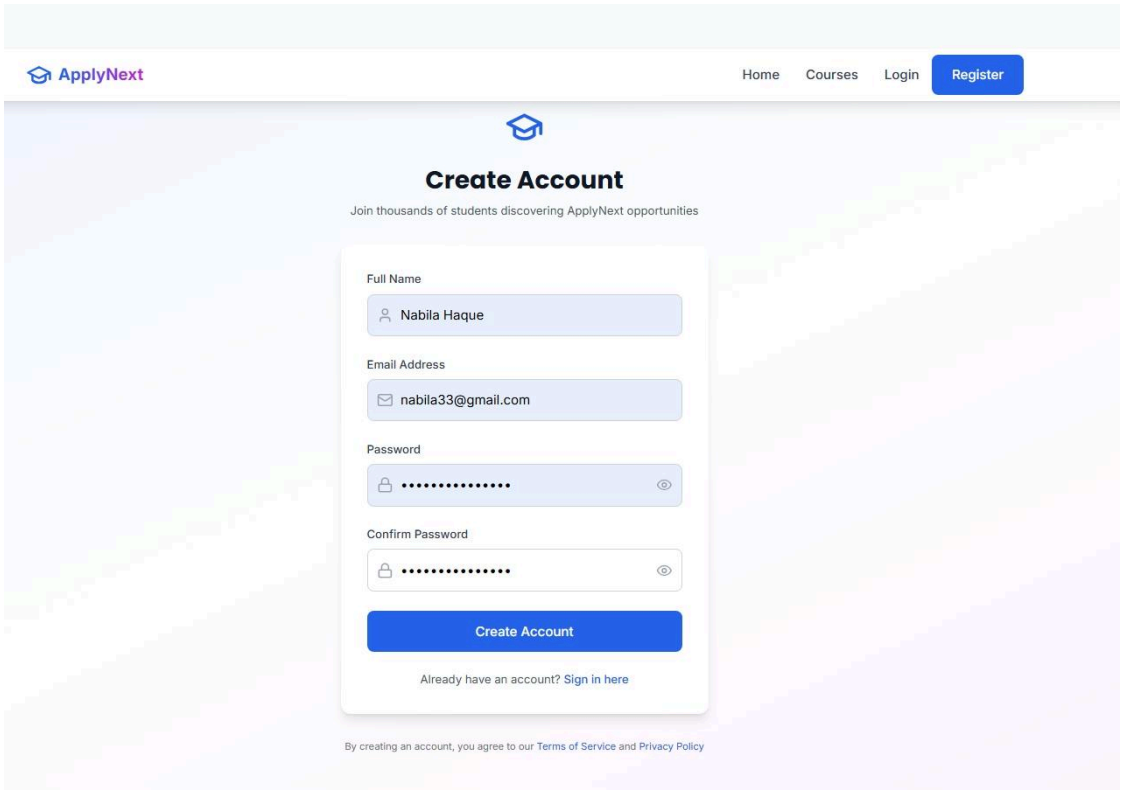
Implementation

#1: SPRINT 1

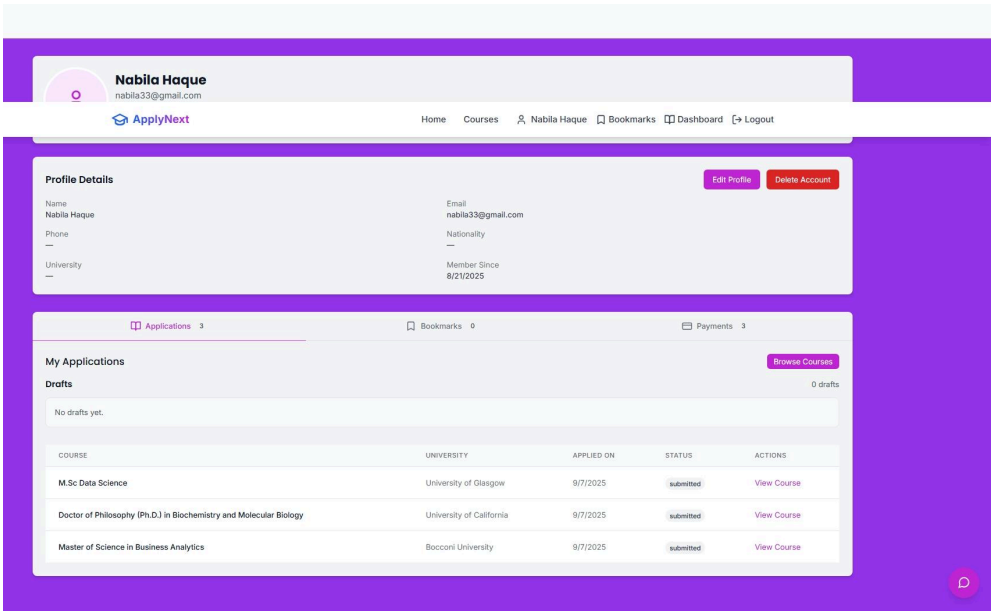
1.1 User Authentication: Secure JWT-based authentication with HTTP-only cookies.



- The user registers



- **1.2 Profile Management:** Users can edit their personal profiles and upload a picture.



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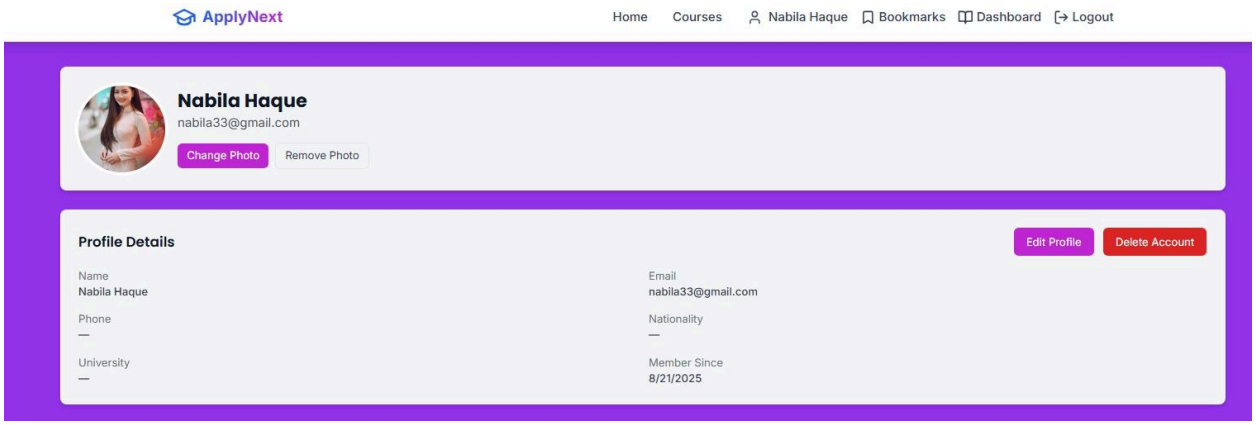
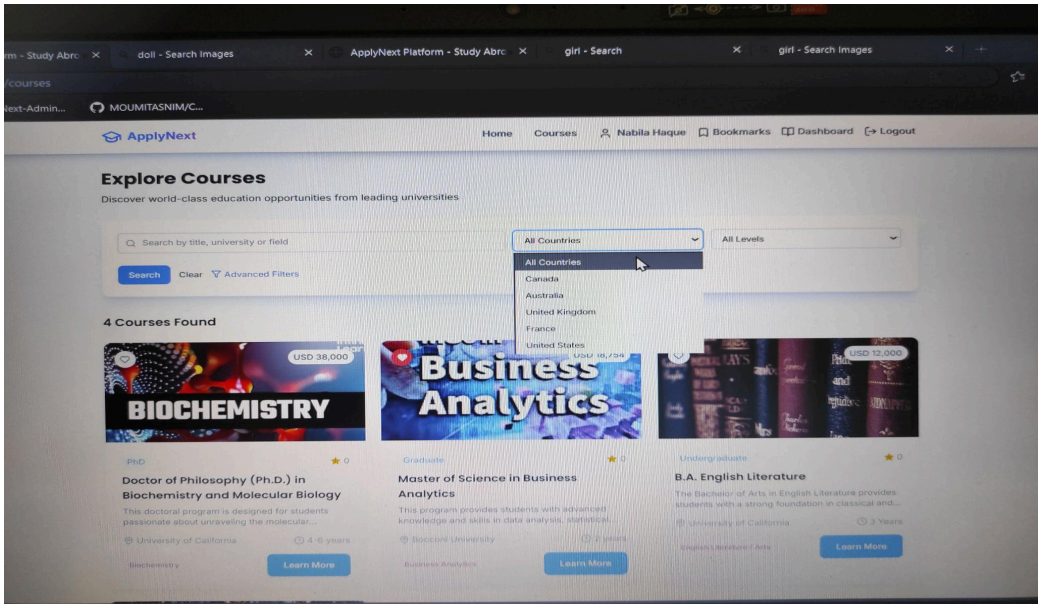


- **1.3 Search Bar:** A universal search bar is available for users to find courses.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USD 38,000
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Doctor of Philosophy (Ph.D.) in Biochemistry and Molecular Biology
This doctoral program is designed for students passionate about unraveling the molecular...
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4-6 years
Biochemistry
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Graduate
Master of Science in Business Analytics
This program provides students with advanced knowledge and skills in data analysis, statistical...
Bocconi University
2 years
Business Analytics
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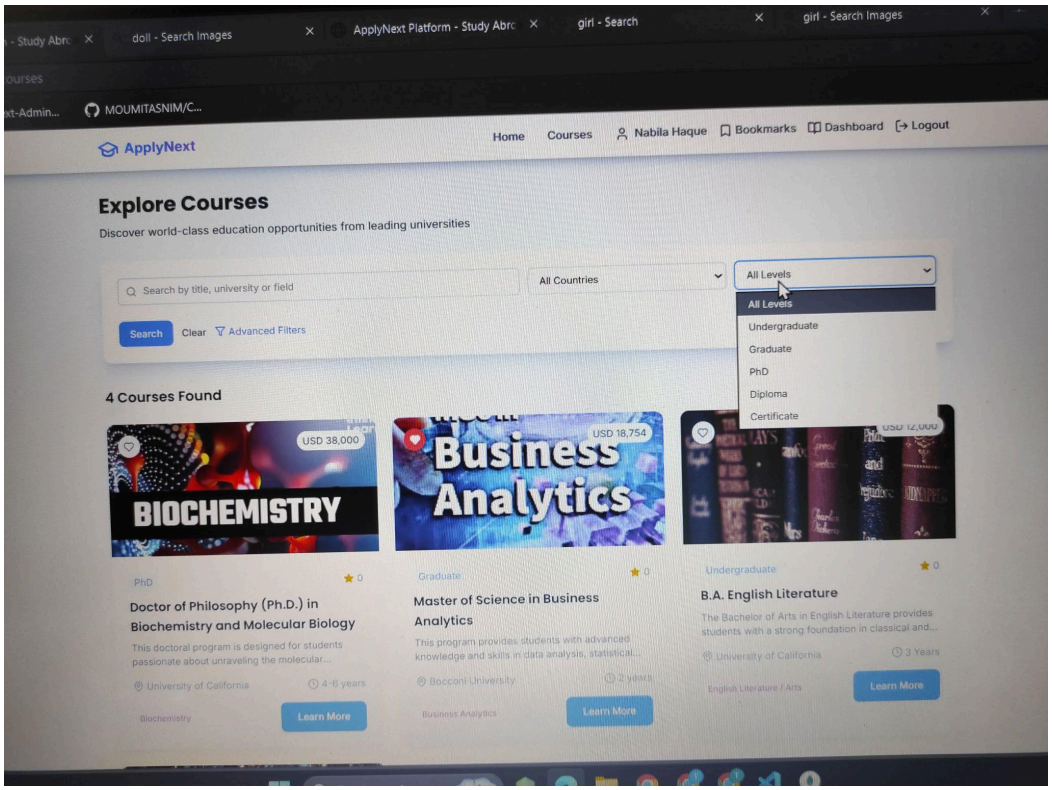
Undergraduate
B.A. English Literature
The Bachelor of Arts in English Literature provides students with a strong foundation in classical and...
University of California
3 Years
English Literature / Arts
Learn More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This doctoral program is designed for students passionate about unraveling the molecular...
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Master of Science in Business Analytics
This program provides students with advanced knowledge and skills in data analysis, statistical...
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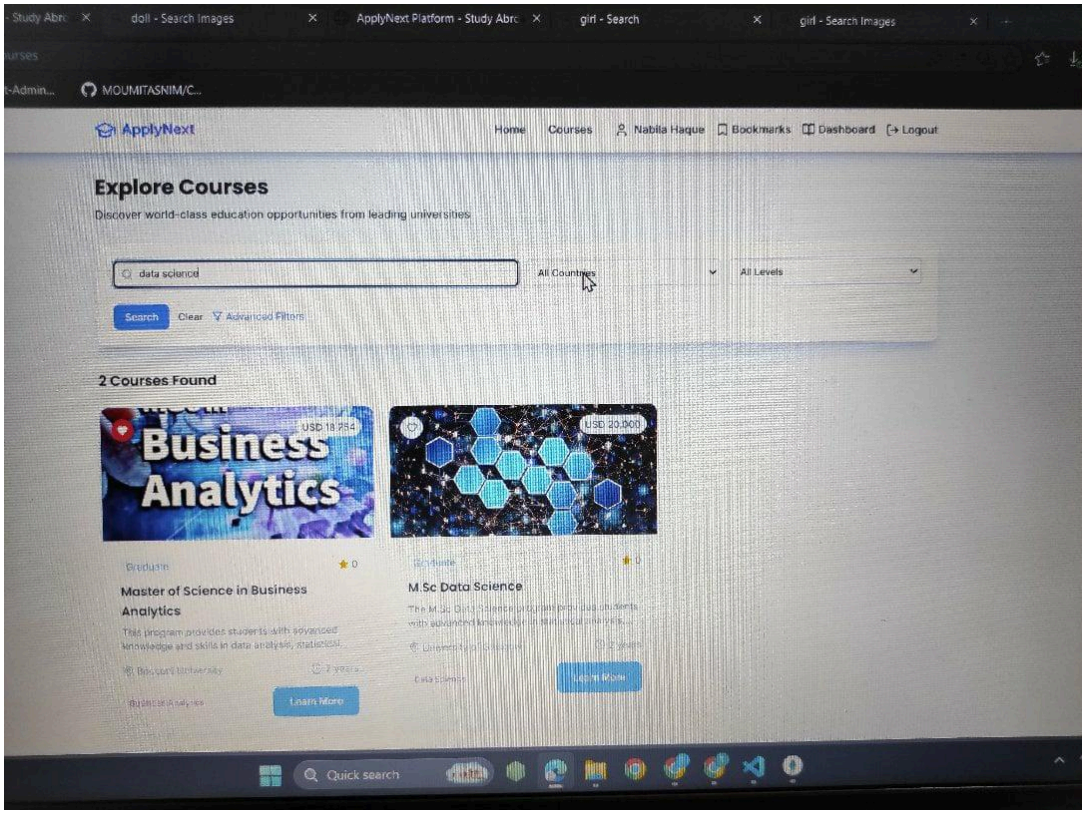
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2 Courses Found
USD 18,754
Business Analytics
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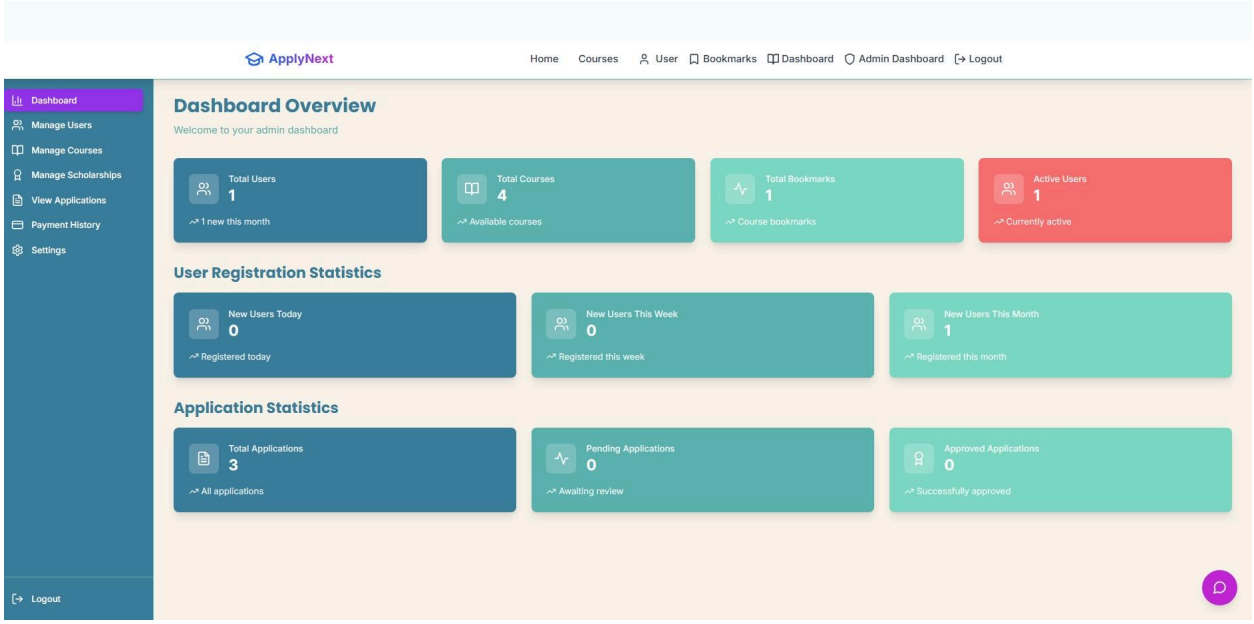
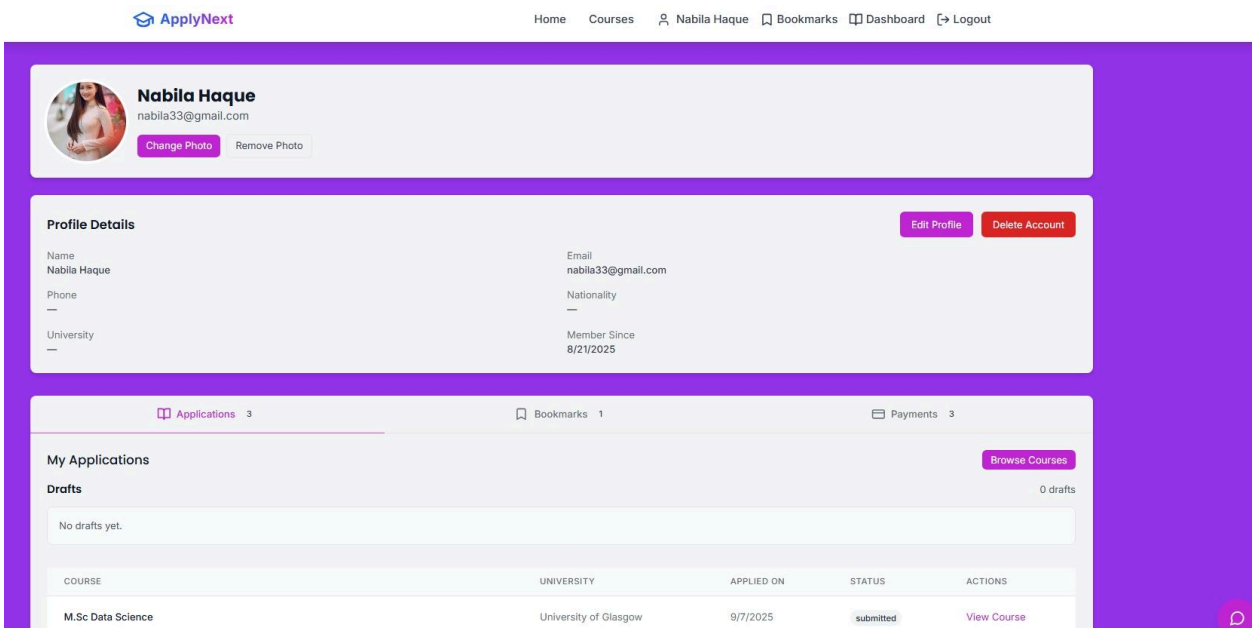
Master of Science in Business Analytics
This program provides students with advanced knowledge and skills in data analysis, statistical...
Learn More
M.Sc Data Science
Learn More
Quick search

- **1.4 Dashboard Separation:** The application features distinct dashboards for administrators and regular users, each with role-based access.

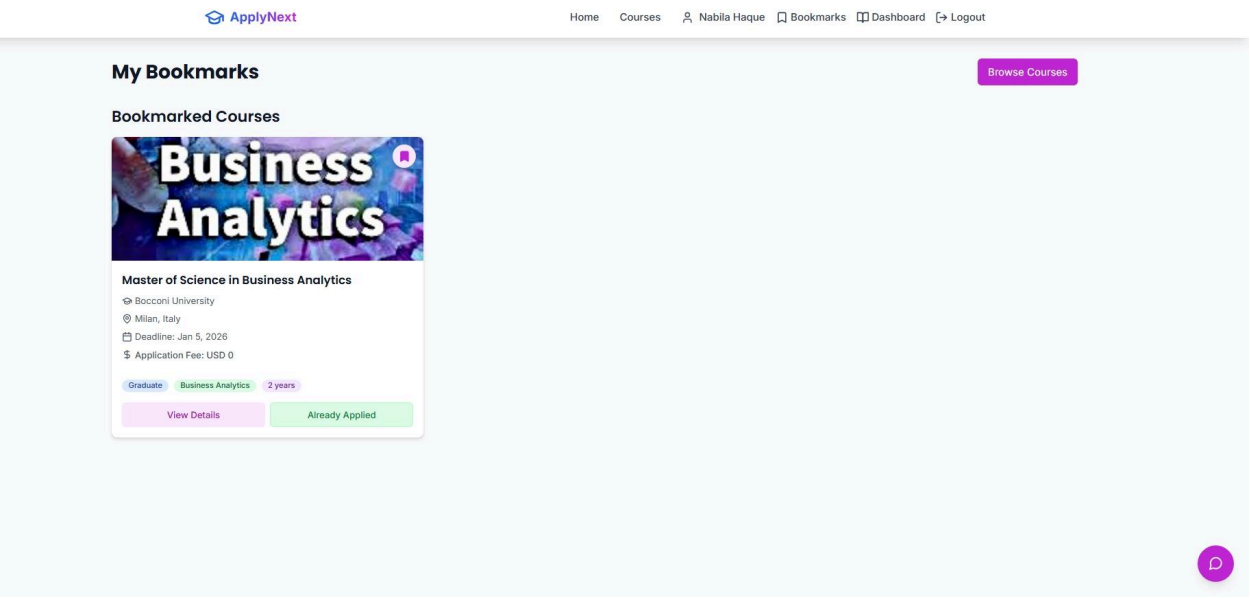




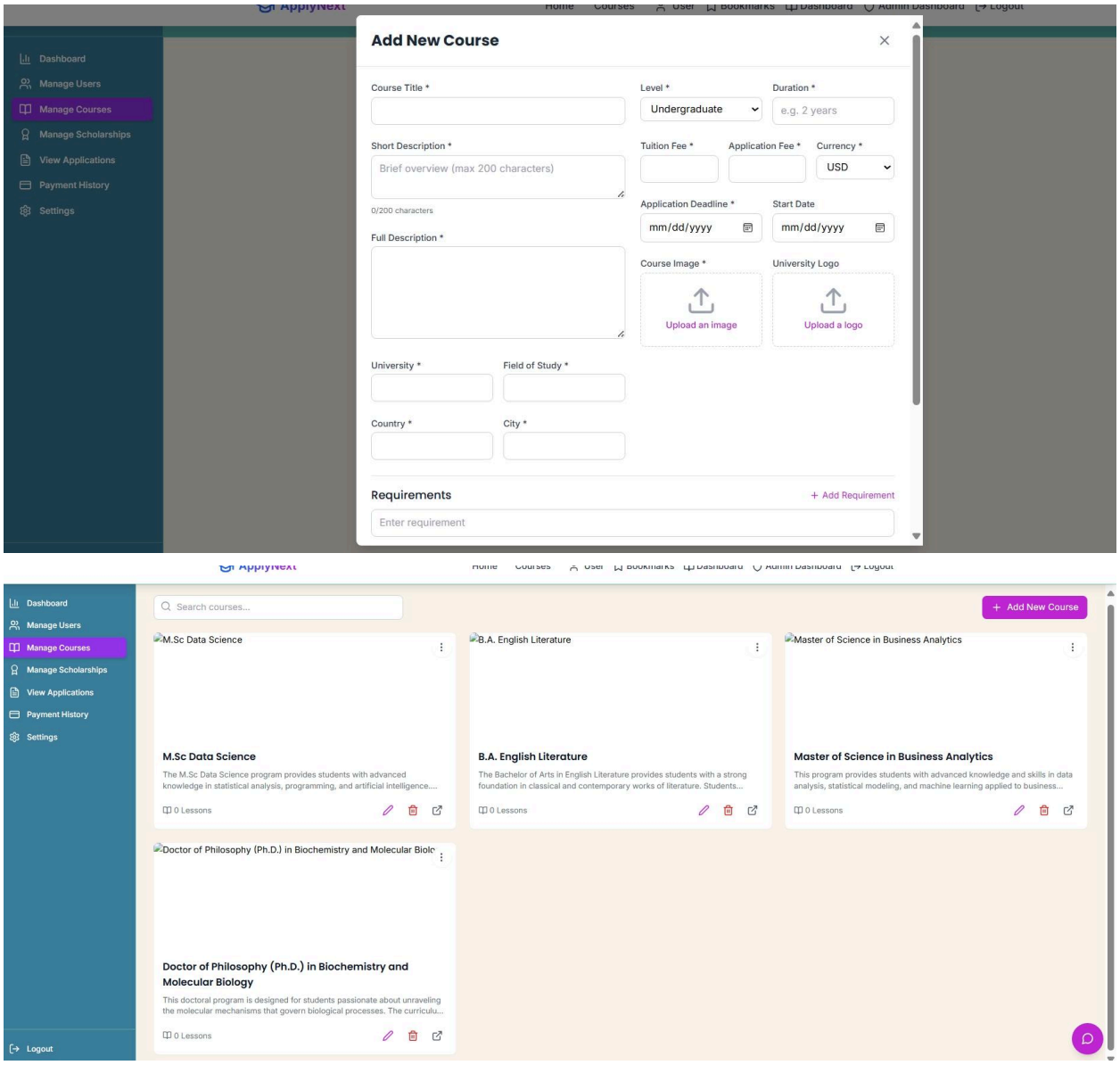
#2: SPRINT 2:

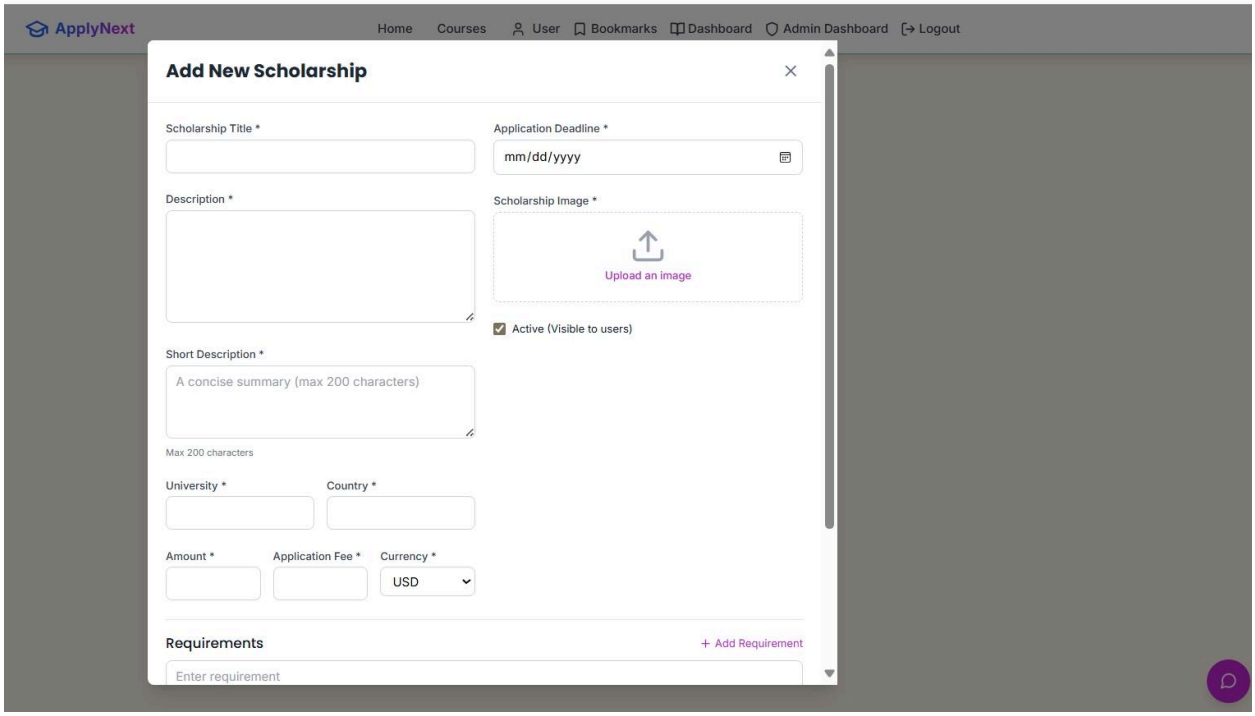
User Engagement & Content Management

- **2.1 Course Bookmarking and Tracking:** Users can save and track their favorite courses and scholarships from their profile.



- **2.2 Content Addition:** Administrators have the ability to add new courses and scholarships to the platform, including all relevant details.

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A concise summary (max 200 characters)
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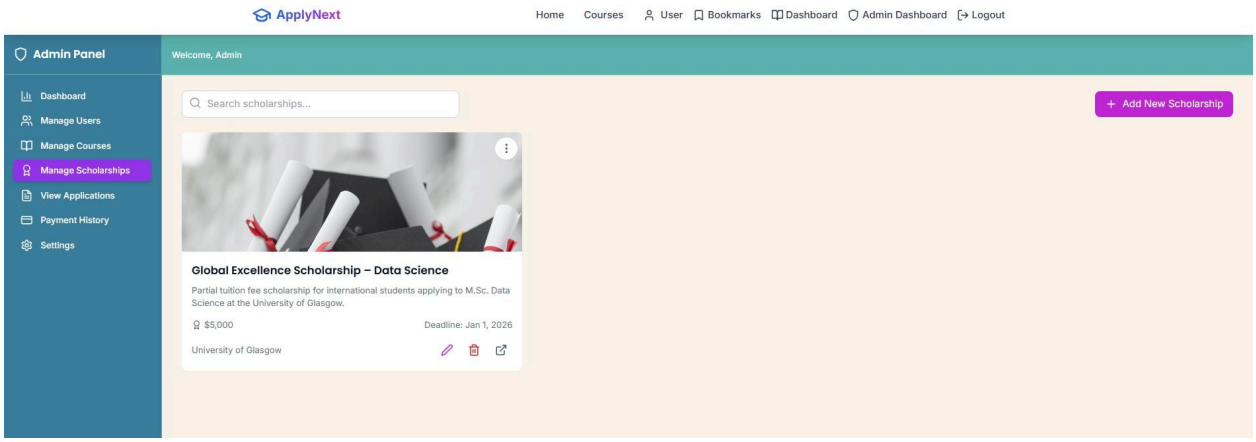
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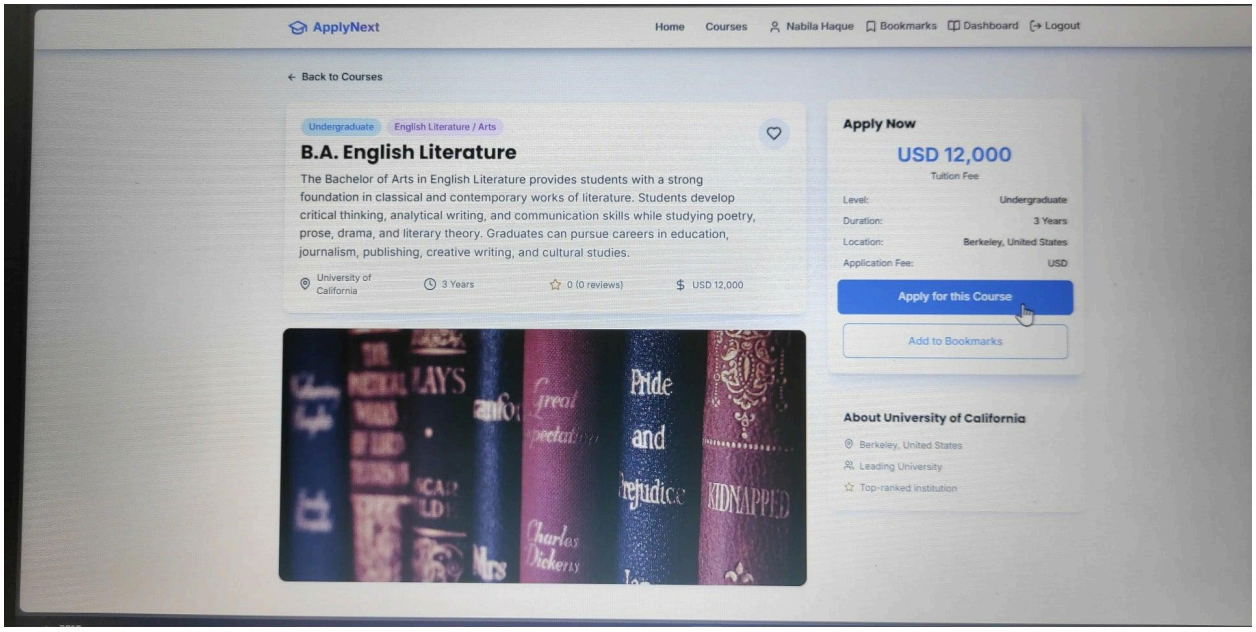
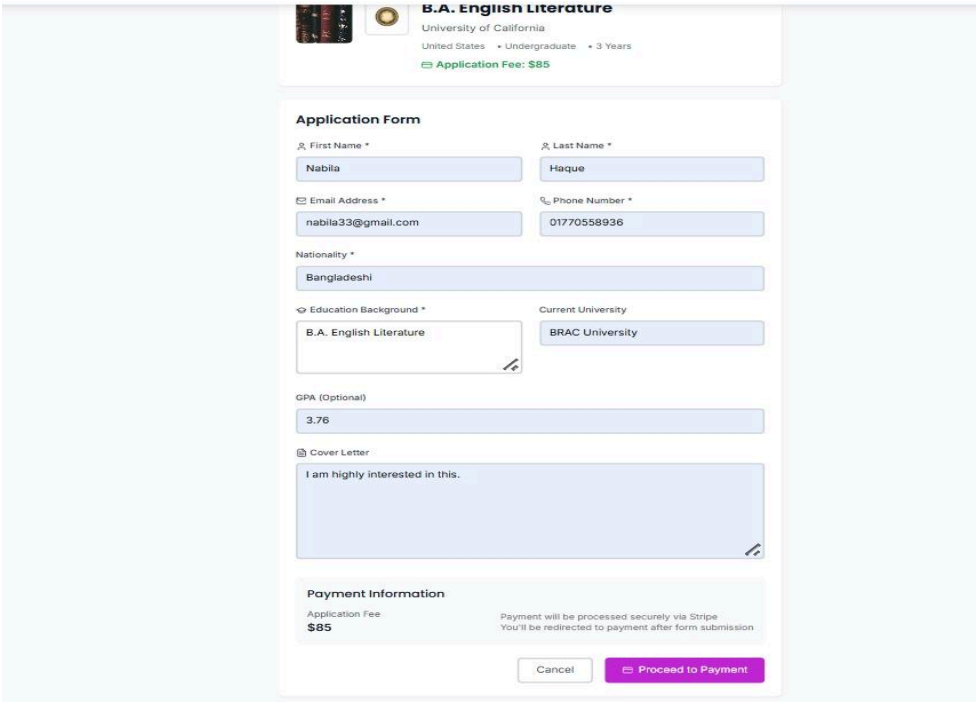
Manage Courses
Manage Scholarships
View Applications
Payment History
Settings
Search scholarships...
+ Add New Scholarship
Global Excellence Scholarship – Data Science
Partial tuition fee scholarship for international students applying to M.Sc. Data Science at the University of Glasgow.
$5,000
Deadline: Jan 1, 2026
University of Glasgow

- **2.3 Application Process:** The system allows users to initiate an application for an eligible course or scholarship.



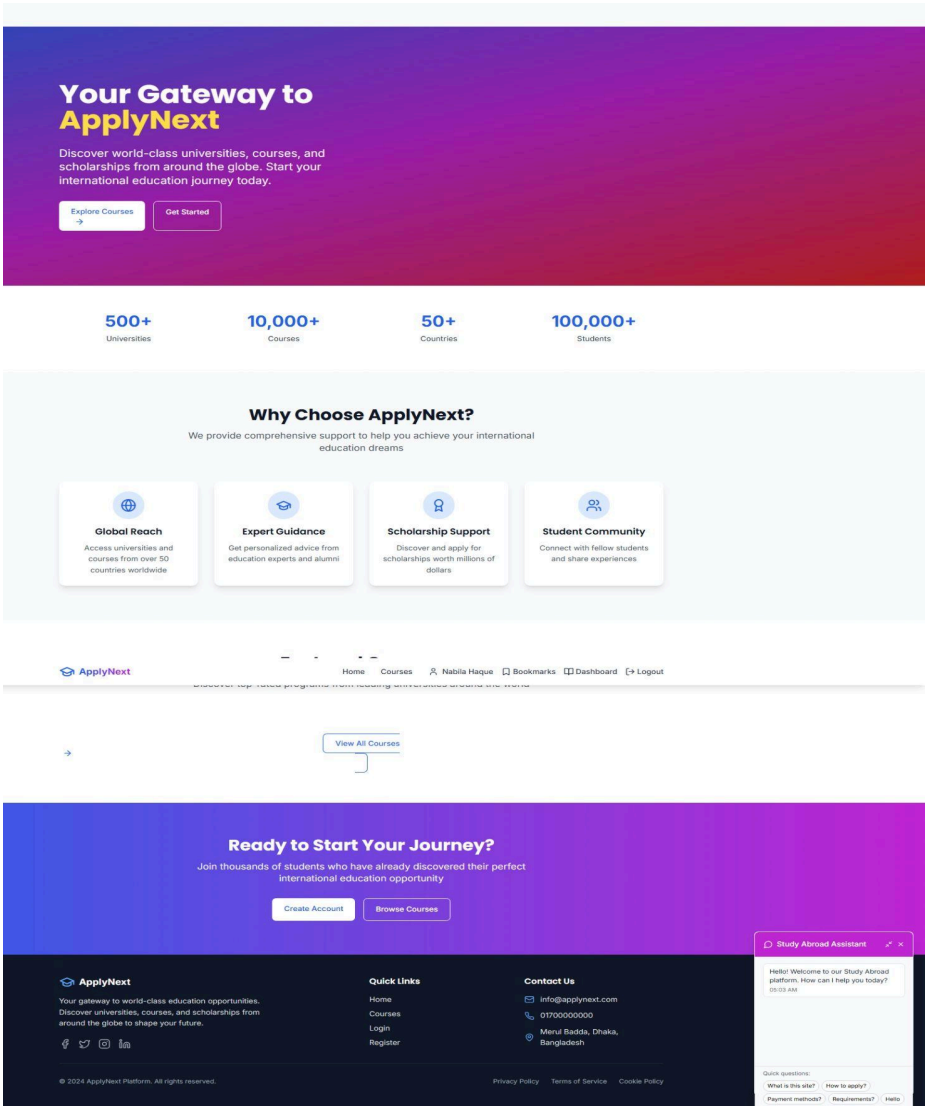
Then, the application page will look like this:

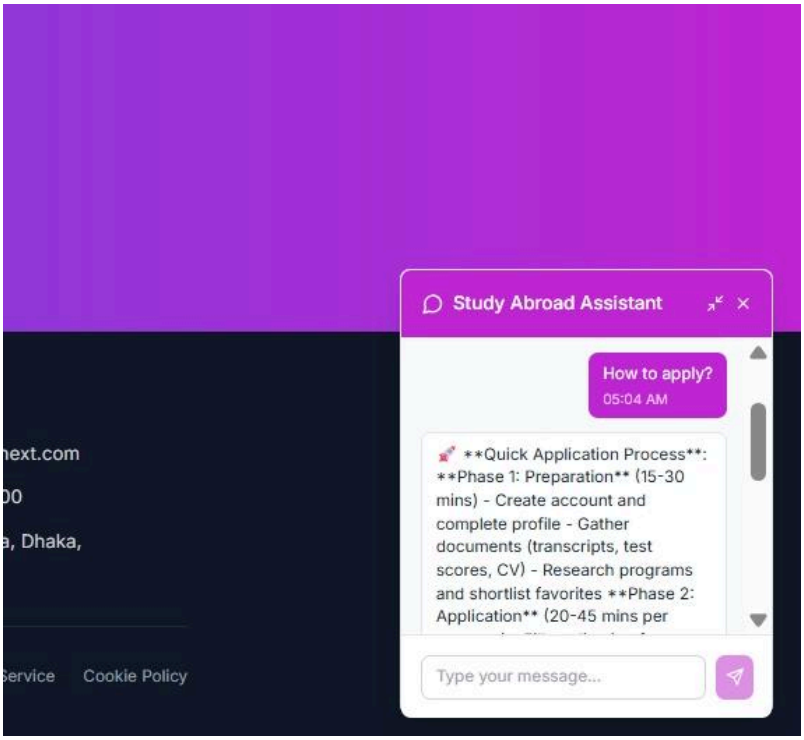


#3: Sprint 3:

Advanced Features & Monetization

3.1 Chatbot: An integrated chatbot assists users with general inquiries and support.




Study Abroad Assistant
How to apply?
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Quick Application Process: **Phase 1: Preparation** (15-30 mins) - Create account and complete profile - Gather documents (transcripts, test scores, CV) - Research programs and shortlist favorites **Phase 2: Application** (20-45 mins per
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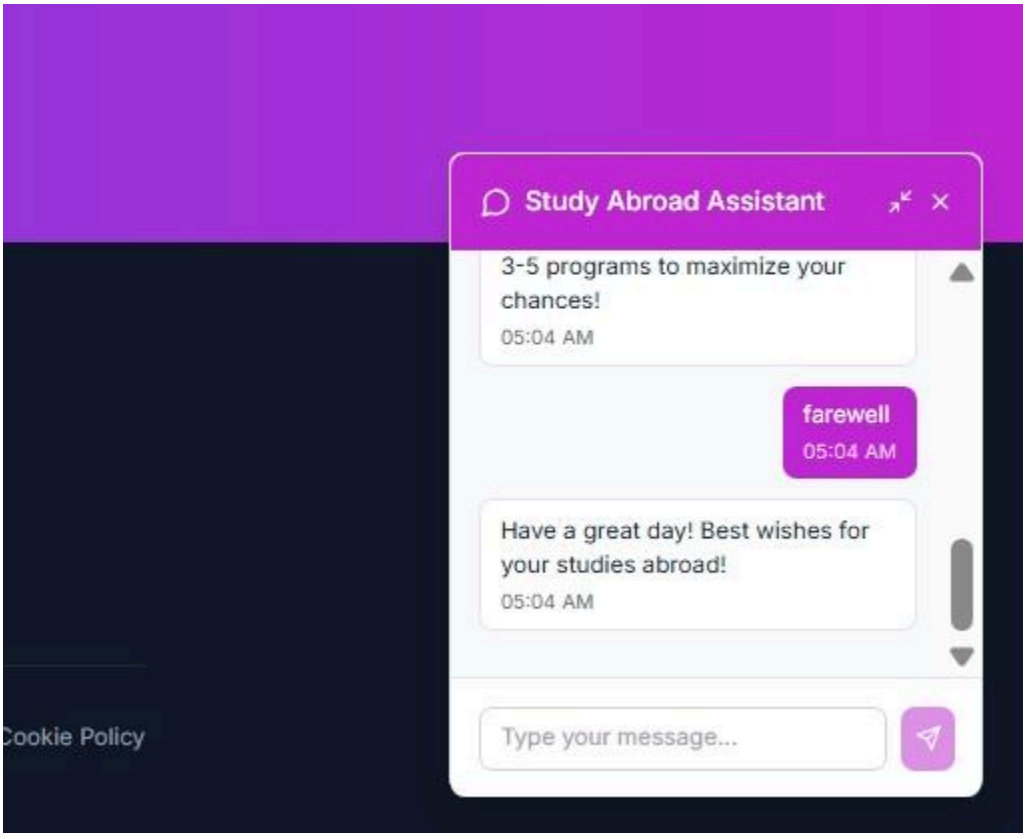
Study Abroad Assistant
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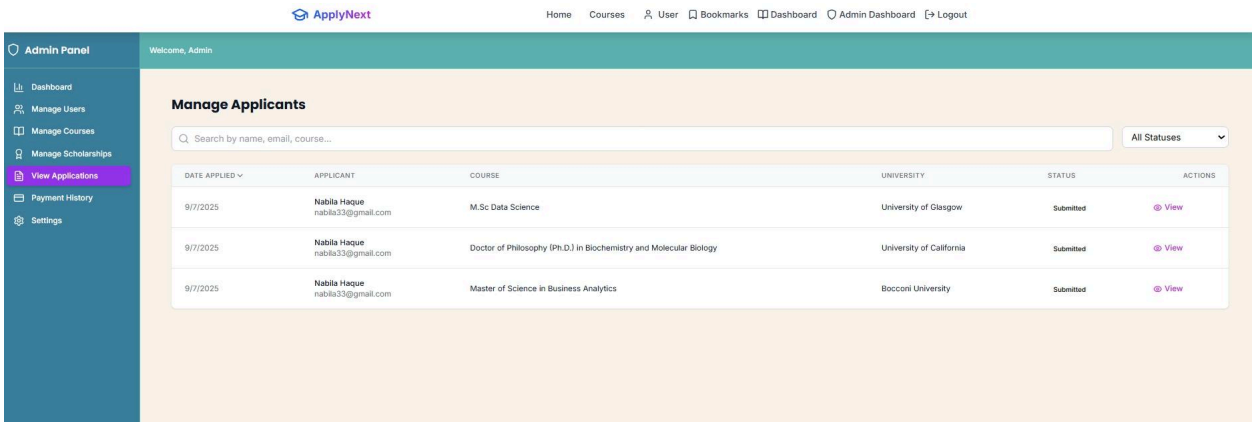
Have a great day! Best wishes for your studies abroad!
05:04 AM
Type your message...
Cookie Policy

- **3.2 Applicant Management:** The system provides tools for managing applicants, likely for administrators to track user applications.



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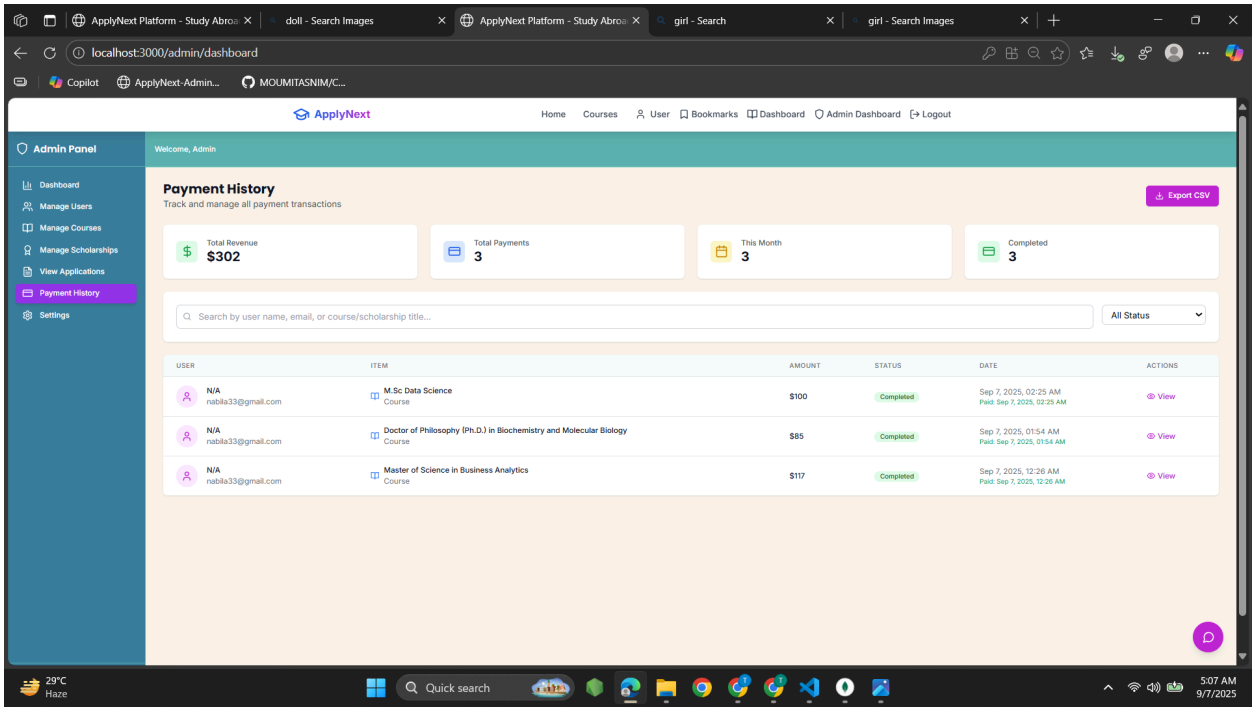
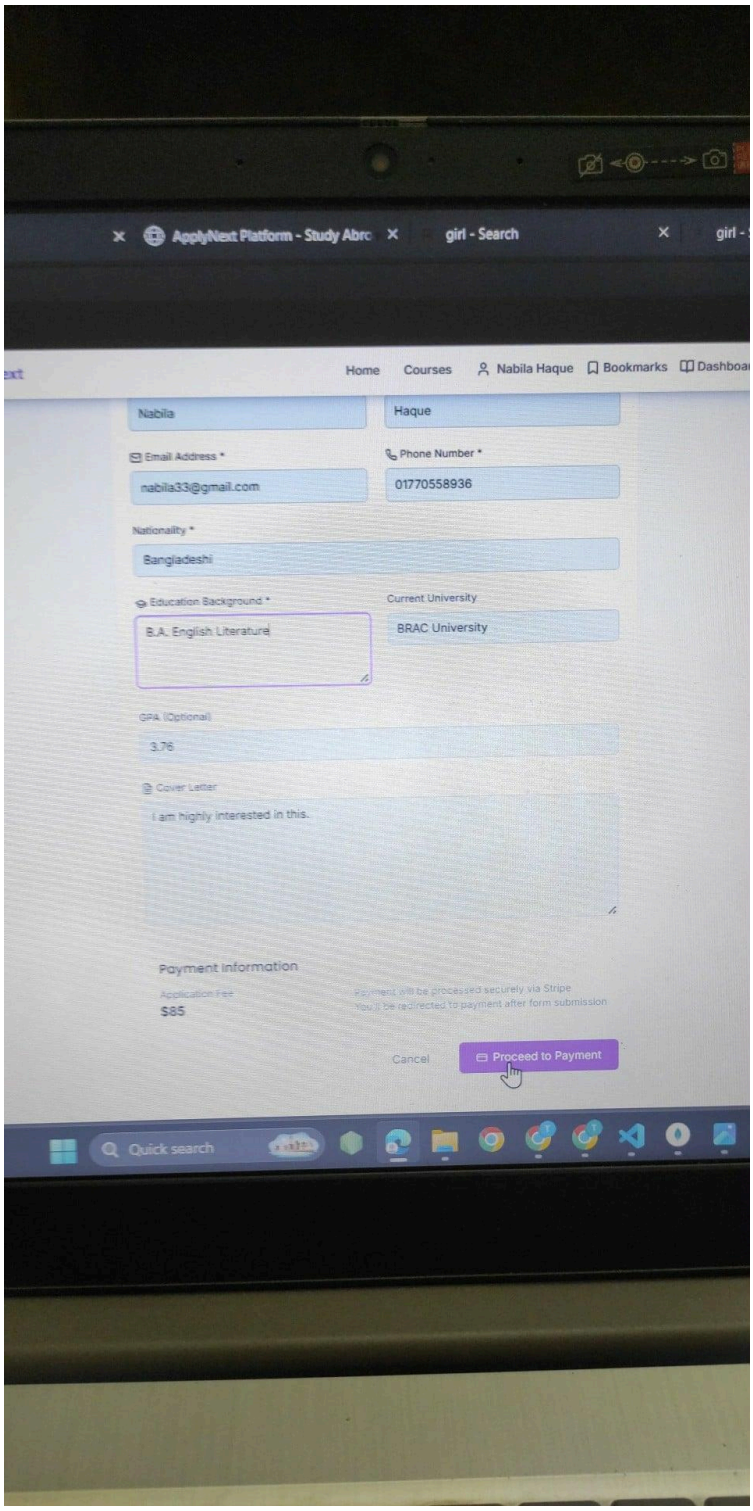
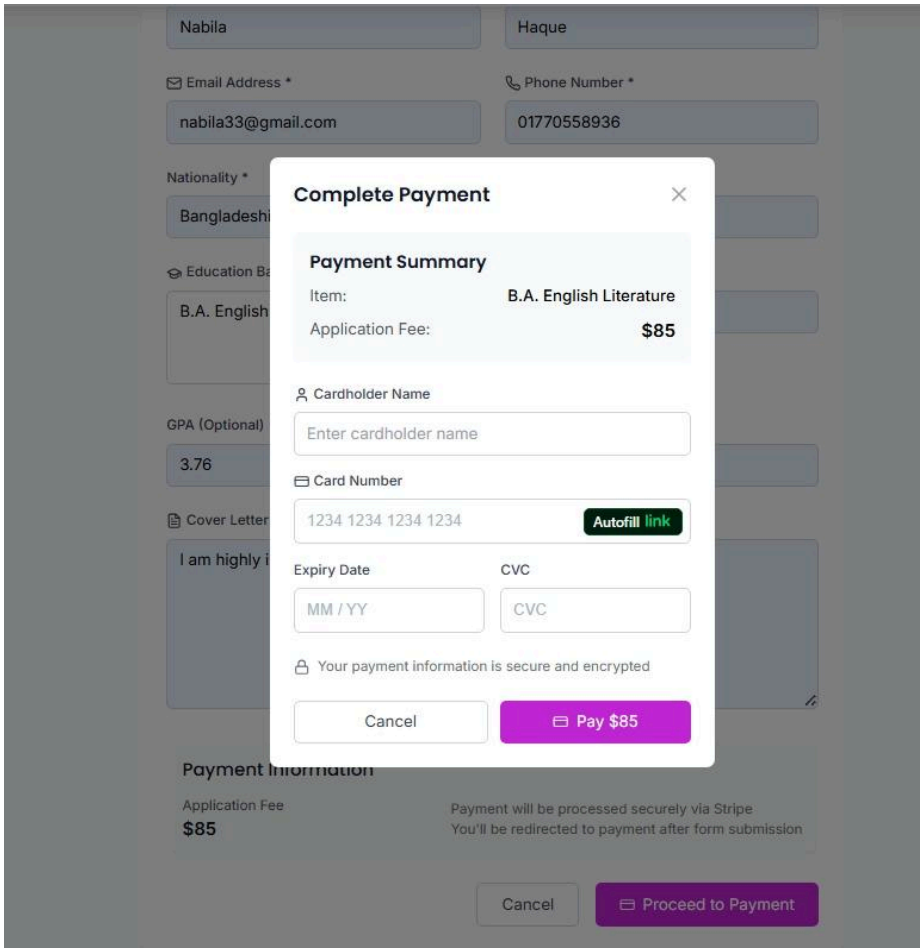
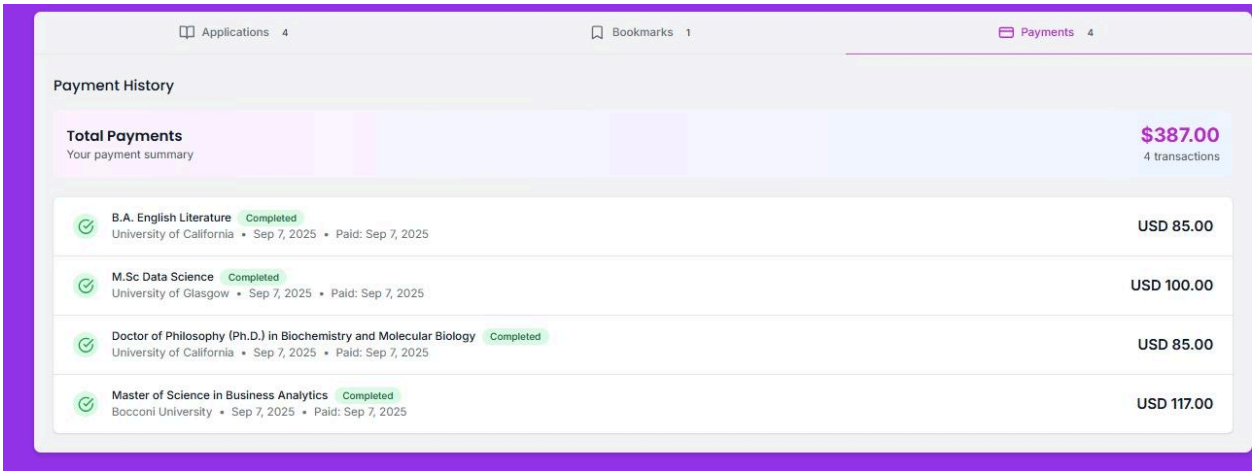


- **3.4 Payment System:** The system integrates a secure payment system using **Stripe** to handle transactions.

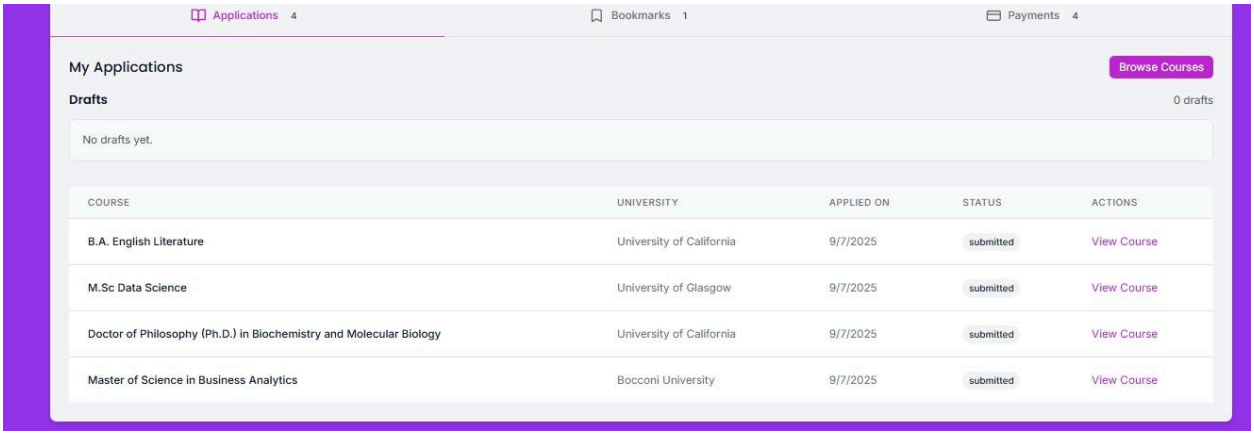



Nabila
Haque
Email Address *
Phone Number *
nabila33@gmail.com
01770558936
Nationality *
Bangladeshi
Education Ba
B.A. English
GPA (Optional)
3.76
Cover Letter
I am highly i
Complete Payment
Payment Summary
Item:
B.A. English Literature
Application Fee:
$85
Cardholder Name
Enter cardholder name
Card Number
1234 1234 1234 1234
Autofill link
Expiry Date
CVC
MM / YY
CVC
Your payment information is secure and encrypted
Cancel
Pay $85
Payment Information
Application Fee
$85
Payment will be processed securely via Stripe
You'll be redirected to payment after form submission
Cancel
Proceed to Payment

After successful payment through card, it will show in the user's profile dashboard :



And will also show in admin's dashboard's "payment History":



Challenges:

Building the "ApplyNext Platform" presents several key challenges, which can be grouped into three main areas:

- Technical Challenges: Ensuring the real-time search functions with minimal delay as the course database grows. This requires smart indexing and optimized queries. Additionally, making sure the platform scales to handle a large number of users without slowing down is a major hurdle. Finally, integrating third-party services like Stripe and a chatbot requires careful handling to ensure seamless and secure communication.
- Security Challenges: Protecting sensitive user data is paramount. The biggest challenge is correctly implementing security measures like password hashing, JWT tokens, and input validation to prevent vulnerabilities like SQL injection or XSS attacks. A single security flaw could put all user information at risk.
- Operational Challenges: Managing the application after deployment is a continuous challenge. This includes monitoring for errors, applying software updates, and ensuring the database is always backed up and performing well.

Conclusion

This SRS provides a detailed outline for the "ApplyNext Platform", a comprehensive web application designed to support global education opportunities. The MERN stack has been utilized to create a robust, secure, and user-friendly solution, with the added functionalities of payment integration and a chatbot to enhance the user experience.

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