Tribhuvan University

Academia International College

Final Year Project Report
On
Abroad Advise
[CSC 412]

Under the supervision of

"Dr. Sunil Chaudhary"

Submitted by

Prabin Acharya (T.U. Exam Roll No. 29020/078)

Ronish Dhakal (T.U. Exam Roll No. 29024/078)

Siddhartha Thapa (T.U. Exam Roll No. 29030/078)

Submitted to

Department of Computer Science and Information Technology

Academia International College

Institute of Science and Technology

Tribhuvan University

September, 2025

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On

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A final year project submitted in partial fulfillment of the requirement for the degree of Bachelor of Science in Computer Science and Information Technology awarded by Tribhuvan University

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Email: mail@academiacollege.edu.np

Supervisor's Recommendation

I hereby recommend that this project work report prepared under my supervision by Mr. Prabin Acharya (29020/078), Mr. Ronish Dhakal (29024/078), and Mr. Siddhartha Thapa (29030/078) entitled "Abroad Advise" be accepted as fulfilling in partial requirements for the degree of Bachelors of Science in Computer Science and Information Technology. In my best knowledge, this is an original work in Computer Science and Information Technology.

.....

Dr. Sunil Chaudhary

Project Supervisor

Department of Computer Science and Information Technology

Academia International College

Gwarko, Lalitpur

Tribhuvan University

Department of Computer Science and Information Technology

Academia International College

Certificate of Approval

This is to certify that this project prepared by Mr. Prabin Acharya, Mr. Ronish Dhakal, and Mr. Siddhartha Thapa entitled "Abroad Advise" in partial fulfillment of the requirements for the degree of Bachelor of Science in Computer Science and Information Technology has been well studied. In our opinion, it is satisfactory in the scope and quality as a project for the required degree.

…….. Dr. Sunil Chaudhary Project Supervisor Department of Computer Science and IT Academia International College	…….. Mr. Bishwas Mathema HOD/Program Coordinator Department of Computer Science and IT Academia International College
…….. Internal Examiner	…….. External Examiner

Acknowledgement

We owe our most profound appreciation to Academia International College for giving us a chance to work on this project as part of our syllabus.

Special thanks to our supervisor, Dr. Sunil Chaudhary and Bishwas Mathema (HOD/Program Coordinator, Academia International College), for their consistent guidance, support, and feedback throughout the report's creation. We are generously obligated to them for providing this excellent opportunity to expand our knowledge. It helped us a lot to realize what we studied for.

We would like to express our sincere gratitude to all those individuals, friends, colleagues, and teachers for supporting and helping us a lot in finalizing this project within the limited time frame by providing valuable insights and feedback on the report.

Thanking You,

Prabin Acharya (T.U. Exam Roll No. 29020/078)

Ronish Dhakal (T.U. Exam Roll No. 29024/078)

Siddhartha Thapa (T.U. Exam Roll No. 29030/078)

Abstract

This project was developed to address the challenges Nepali students face when seeking higher education opportunities abroad, where traditional resources are often fragmented, outdated, and lack transparency, leading to reliance on unverified consultancies and inconsistent information. This project provides a centralized, user-friendly web application where students can explore verified universities, courses, events, and scholarships, while consultancies, universities, colleges, and super admins benefit from role-based dashboards, advanced search and filtering, direct inquiry submission, real-time analytics, and comprehensive content management. Built using Django REST Framework and Next.js, the platform ensures security, scalability, and accessibility, with iterative development and rigorous testing guaranteeing a reliable and seamless user experience. By combining modern technology with the specific needs of Nepali students, our project enhances access, transparency, and outcomes in study-abroad counseling, with future improvements including recommendation algorithms, expanded institutional coverage, and continuous UI/UX enhancements, further empowering students and educational institutions alike.

Keywords: API, role-based dashboard, JWT, REST Framework, VPS, PostgreSQL

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Chapter 1: Introduction

1.1 Introduction

For many students in Nepal, studying abroad has become not just a dream but a crucial stepping stone toward building a successful and fulfilling future. With globalization, increased awareness, and the rise of international academic opportunities, the number of Nepali students seeking higher education overseas continues to grow each year. Studying abroad opens doors to advanced knowledge, cultural exposure, and career prospects that may not always be available locally. However, navigating this path is often challenging. Students face a maze of scattered information, unreliable online sources, uncertified consultancies, and hidden costs, all of which can make the decision-making process overwhelming and stressful. These obstacles often leave students and their families confused, anxious, and uncertain about the best options for their education abroad.

Abroad Advise was created to directly address these challenges by offering a single, centralized platform that simplifies the journey of studying abroad. Through this platform, students can easily explore universities, compare detailed course structures, check eligibility criteria, find trusted and certified consultancies, and stay informed about the latest education-related events, scholarships, and updates, all in one place. The platform is designed to save students valuable time and effort by providing accurate and verified information, eliminating the need to rely on multiple websites or informal sources. Moreover, Abroad Advise allows students to directly send inquiries to universities or consultancies through the platform, making the communication process faster, transparent, and more reliable. By combining convenience with credibility, Abroad Advise ensures that students can make well-informed decisions about their academic future.

At its core, Abroad Advise is more than just a directory or information portal; it is a technology-driven ecosystem that brings transparency and trust into Nepal’s education consultancy sector. Instead of depending on word-of-mouth recommendations, scattered websites, or unregulated service providers, students and educational institutions can connect safely and securely. The platform prioritizes certified consultancies, authentic course information, and real-time updates, allowing students to plan their international

education journey with confidence. Beyond serving students, Abroad Advise also benefits universities and consultancies by providing a structured and professional channel to reach qualified Nepali applicants, streamline inquiries, and maintain credibility in the market.

Our broader mission at Abroad Advise is to empower Nepali students with accurate guidance, reduce unnecessary risks, and open doors to global opportunities with clarity and assurance. By providing comprehensive information, user-friendly tools, and a trustworthy network of verified consultancies and institutions, we aim to transform the study abroad experience into a seamless and confident journey. We envision a future where Nepali students can pursue their dreams of international education without fear of misinformation, unnecessary delays, or exploitation. Abroad Advise is committed to being the bridge that connects ambition with opportunity, knowledge with action, and students with their global aspirations.

1.2 Problem Statement

Nepali students and their families are often forced to navigate a confusing and risky landscape when planning to study abroad. The lack of a centralized, trustworthy digital platform leads to:

- Reliance on unverified consultancies and word-of-mouth guidance
- Scattered, inconsistent, and often outdated online resources
- Absence of side-by-side comparison tools for universities, courses, scholarships, and destinations
- No digital mechanism for direct communication between students and institutions
- Institutional users (consultancies, colleges, universities) lack dashboards to manage their public profiles or inquiries, leading to inefficient processes and missed engagement opportunities.

1.3 Objectives

- To develop a transparent, user-friendly web platform that streamlines the study-abroad process for Nepali students, consolidating all essential information in one place.

- To provide dedicated dashboards for consultancies and universities enabling personalized access, profile management, and content oversight.
- To allow students to search, filter, and compare verified institutions, courses, and events based on their preferences, while enabling direct inquiry submissions to institutions or consultancies.
- To support institutional users with analytics tracking, leads management, and content management to ensure smooth operations and informed decision-making.

1.4 Scopes and Limitations

1.4.1 Scope

- Development of a modular, scalable web application accessible on all devices
- Centralized, verified data on consultancies, universities, courses, destinations, events, and scholarships
- Separate, role-based dashboards for institutions and admin
- Real-time analytics, search, filter, and inquiry modules
- VPS-based deployment for cost efficiency and scalability

1.4.2 Limitation

- Initial focus is exclusively on Nepali students and local institutions
- Advanced algorithmic features (recommendation, AI) planned for later phases
- Dependence on institutional cooperation for content accuracy

1.5 Methodology

When we started building this project, we chose Scrum as our development methodology to keep this project organized, flexible, and manageable. Instead of attempting to complete everything at once, we first created a product backlog that listed all the important features we envisioned, such as the superadmin login system, role-based dashboards for institutions, inquiry submission and tracking, and later enhancements like featured consultancies and global search. This backlog acted as our single source of truth, giving us a clear picture of the work ahead.

From the backlog, we set clear sprint goals so that each cycle had a specific focus and measurable outcomes. Before every sprint, we held sprint planning sessions where the team prioritized the most valuable tasks. Breaking the work into one- or two-week sprints made the project more approachable and reduced the risk of burnout, since each sprint felt like an achievable step rather than an overwhelming workload. Every sprint was designed to deliver a small but meaningful improvement, ensuring the platform grew steadily in both functionality and quality.

During the sprints, the entire Scrum team collaborated closely. We conducted daily scrums to check progress, identify blockers, and stay aligned on priorities. Development and testing went hand-in-hand, bugs were detected early, and quick iterations were possible. This meant that by the end of each sprint, we had a working, tested feature that met our agreed-upon definition of done.

At the close of every sprint, we held sprint reviews where we demonstrated what had been built, gathered feedback, and aligned the output with real user needs. Immediately after, we ran retrospectives to reflect on what went well, what challenges we faced, and how we could improve our teamwork and processes for the next sprint. These ceremonies kept us in a constant loop of building, reviewing, and refining.

Over time, this iterative rhythm allowed us to adapt to changing requirements while still maintaining steady progress. The combination of transparency, teamwork, and continuous feedback ensured that we weren’t just delivering features but delivering them in a way that added value to students in Nepal exploring study abroad opportunities. In the end, Scrum not only helped us manage complexity but also shaped Abroad Advise into a reliable, user-friendly platform that continues to improve with every iteration.

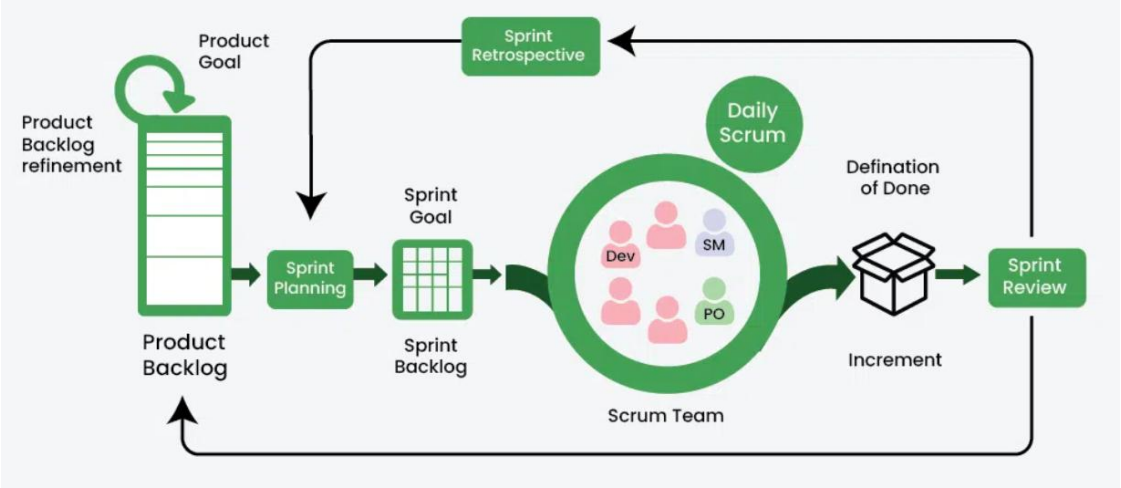

Figure 1.1 Scrum Methodology

1.6 Report Organization

After the successful completion of this project, a comprehensive project report has been prepared to document all aspects of its development and outcomes. The report begins with the essential preliminary sections, including the Title Page, Certificate Page, Acknowledgement, Abstract, Table of Contents, and lists of Abbreviations, Figures, and Tables.

The main body of the report is systematically structured into six chapters, each dedicated to a specific domain of this project:

Chapter 1: Introduction

Provides an overview of this project, encompassing the introduction, problem statement, objectives, scope and limitations, as well as the methodology adopted during development.

Chapter 2: Background Study and Literature Review

Explores the background of the project and offers a critical review of existing literature, including summaries of related projects, research papers, and academic articles that have influenced the project's approach.

Chapter 3: System Analysis

Presents a detailed analysis of the system, including requirement identification and feasibility studies. This chapter also defines functional requirements through the use of diagrams and visualizes the project schedule and progress using a Gantt chart.

Chapter 4: System Design

Focuses on the design phase, detailing the implementation process, model architecture, user interfaces, and system interactions. It further discusses the high-level methodologies and algorithms employed within the system.

Chapter 5: Implementation and Testing

Describes the implementation strategy and testing procedures, providing an overview of the tools, frameworks, and dependencies used to develop the platform. It also outlines the testing methods adopted to ensure system reliability and functionality.

Chapter 6: Conclusion and Recommendations

Concludes the report with a summary of key findings, achievements, and overall project outcomes. It also highlights recommendations and potential directions for future enhancements.

Chapter 2: Background Study and Literature Review

2.1 Background Study

In recent years, Nepal has witnessed a significant surge in the number of students aspiring to pursue higher education abroad. This growing trend is driven by global opportunities, access to world-class institutions, and the desire for international exposure. However, the study abroad journey for many Nepali students is fraught with challenges rooted in the current digital landscape.

Students often struggle to find clear and reliable information about studying abroad. Details about universities, courses, scholarships, and application processes are usually scattered across different places, like static listings, social media groups, or word of mouth. This makes it difficult to know what's accurate and which consultancies or opportunities can truly be trusted. Without a single, transparent source, the process can feel confusing and leave students unsure about their decisions.

Moreover, the counseling and consultancy sector in Nepal has traditionally operated without adequate digital transformation. Many consultancies continue to rely on manual processes, paper records, and basic web pages that do not offer personalized guidance or real-time updates. As a result, students from less privileged backgrounds, who may not have access to reliable guidance networks, are often left behind or fall prey to misinformation and fraudulent practices.

Adding to the challenge, digital solutions in the Nepali educational domain have largely focused on domestic programs and entrance preparation, with little emphasis on streamlining the international application experience. Platforms that do exist for study abroad are often paywalled, have limited interactivity, and rarely provide unbiased, verified content or direct inquiry features.

This situation calls for a shift towards digital empowerment, creating platforms that prioritize student needs, transparency, and equal access to information. By integrating robust systems, role-based dashboards, and real-time inquiry handling, digital solutions like Abroad Advise can bridge the information gap, ensure trustworthiness, and democratize

access to study-abroad opportunities for all students, regardless of their socio-economic background.

The need of the hour is not just the aggregation of data, but also the thoughtful curation of information, interactive user experiences, and the establishment of a secure and supportive ecosystem. Abroad Advise aspires to redefine the approach to study abroad counseling in Nepal, making the process more accessible, reliable, and centered on genuine student outcomes.

2.2. Literature Review

The shift towards digital platforms has completely changed the way Nepali students explore academic opportunities. Locally, platforms like Edusanjal [1] and College Info Nepal [2] have become go-to resources, offering students the ability to search, compare, and directly inquire about colleges and courses in Nepal. Features such as dashboards, verification badges, and real-time content updates work well for students who want to study within the country. But for those dreaming of studying abroad, these platforms stop short. They don't extend their advanced features to international education, leaving a clear information gap.

Because of this, many students interested in studying abroad turn to simple directories like ConsultancyNepal.com [3]. While these sites provide lists of consultancy contacts, they rarely go beyond that. There is little in the way of verified guidance, direct inquiry, or smart search tools to explore global universities. In practice, this means students often fall back on word-of-mouth recommendations or unverified information, a risky approach when the decision involves their future.

The situation is made worse by the lack of regulation in Nepal's consultancy sector. According to a report by OnlineKhabar [4], only about 900 education consultancies are officially registered with the Ministry of Education, while more than 4,100 are operating without registration. This unregulated environment makes it even harder for students to know which consultancies are genuinely trustworthy and which might be misleading them.

Globally, the picture looks very different. The UCAS system in the UK, for instance, has set a benchmark by centralizing applications and creating a streamlined, verified process for students [5]. StudyPortals, which runs platforms like BachelorsPortal, MastersPortal,

and PhDPortal, gives students powerful tools to search across countries, compare programs, and even read peer reviews [6]. Similarly, TopUniversities.com, managed by QS Quacquarelli Symonds, offers rankings, comparison tools, and in-depth university profiles, making it easier for students to start their research journey [7].

These international portals have shown the value of user-friendly design, transparent information, and unbiased reviews. However, they focus on the global market at large and don't provide the kind of localized, hands-on consultancy guidance that Nepali students need, especially when navigating the specific challenges of studying abroad from Nepal.

Abroad Advise aims to bridge this gap. By combining the strengths of international models with the local realities of Nepali students, it provides verification badges, dashboards, real-time inquiries, and updated information focused entirely on studying abroad. In doing so, Abroad Advise seeks to become Nepal's first fully dedicated and trusted digital bridge between students and global education opportunities.

Chapter 3: System Analysis

3.1. System Analysis

Before development began on the Abroad Advise platform, a detailed task breakdown was created to ensure both functional and non-functional requirements were fully considered. The goal was to analyze how the intended system should operate to maximize reliability, user trust, and ease of use for students, institutions, and administrators.

3.1.1 Requirement Analysis

The requirements for the Abroad Advise platform are divided into functional and non-functional categories.

i. Functional Requirements

The platform must support the following core functionalities:

a) User Management: Role-based authentication and secure login for consultancies, universities, and admins, with profile verification for institutions.
b) Search, Inquiries & Communication: Search and filtering across universities, courses, scholarships, and events, along with a real-time inquiry system for students and institutions.
c) Dashboards & Content Management: Separate dashboards for institutions to update profiles, manage content (courses, scholarships, destination, exams, media), and access analytics.
d) Analytics & Reporting: Track engagement through statistics such as page views, inquiries, and overall performance insights.

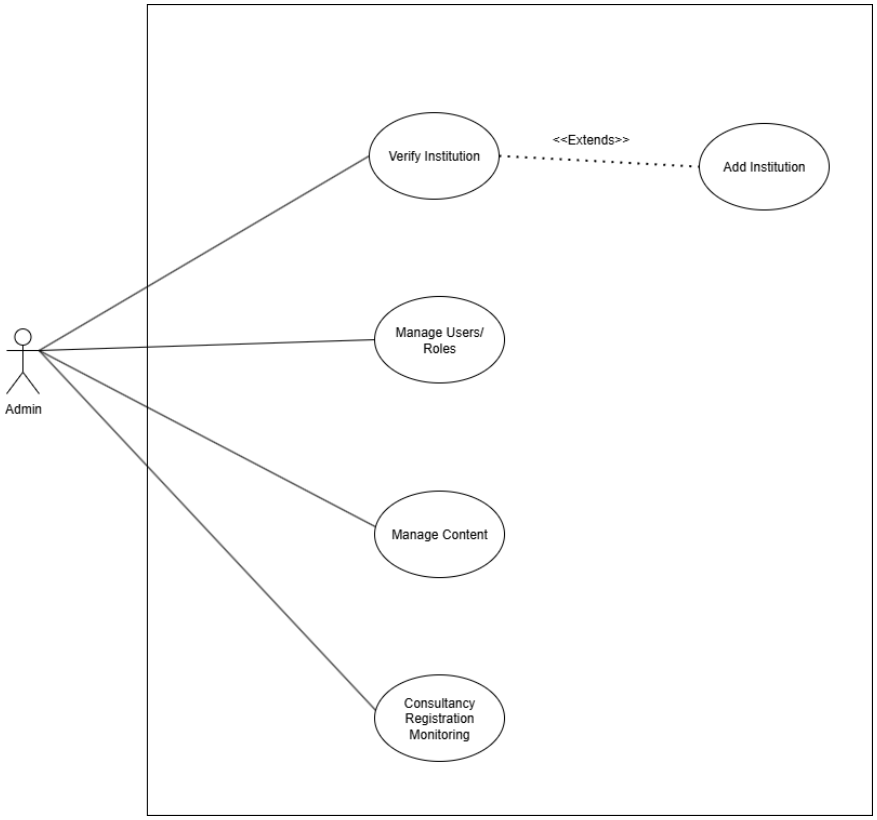

Figure 3.1 Super Admin Use Case Diagram

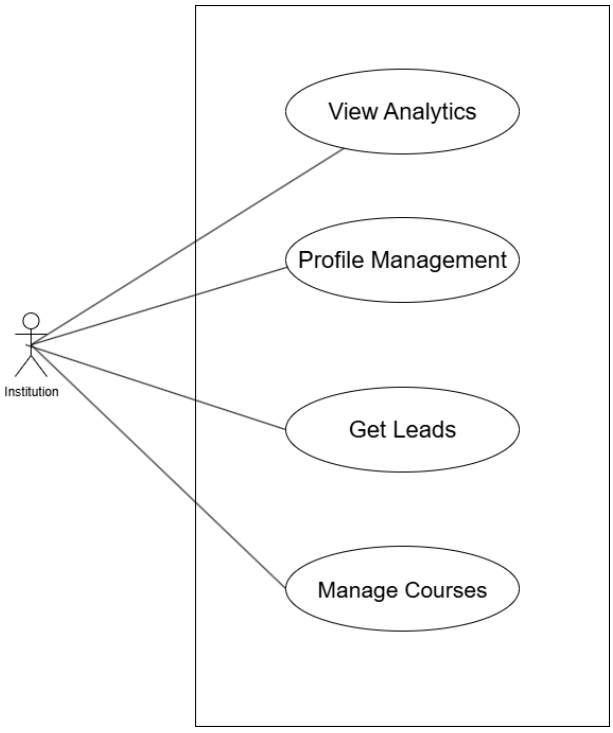

Figure 3.2 Institution Use Case Diagram

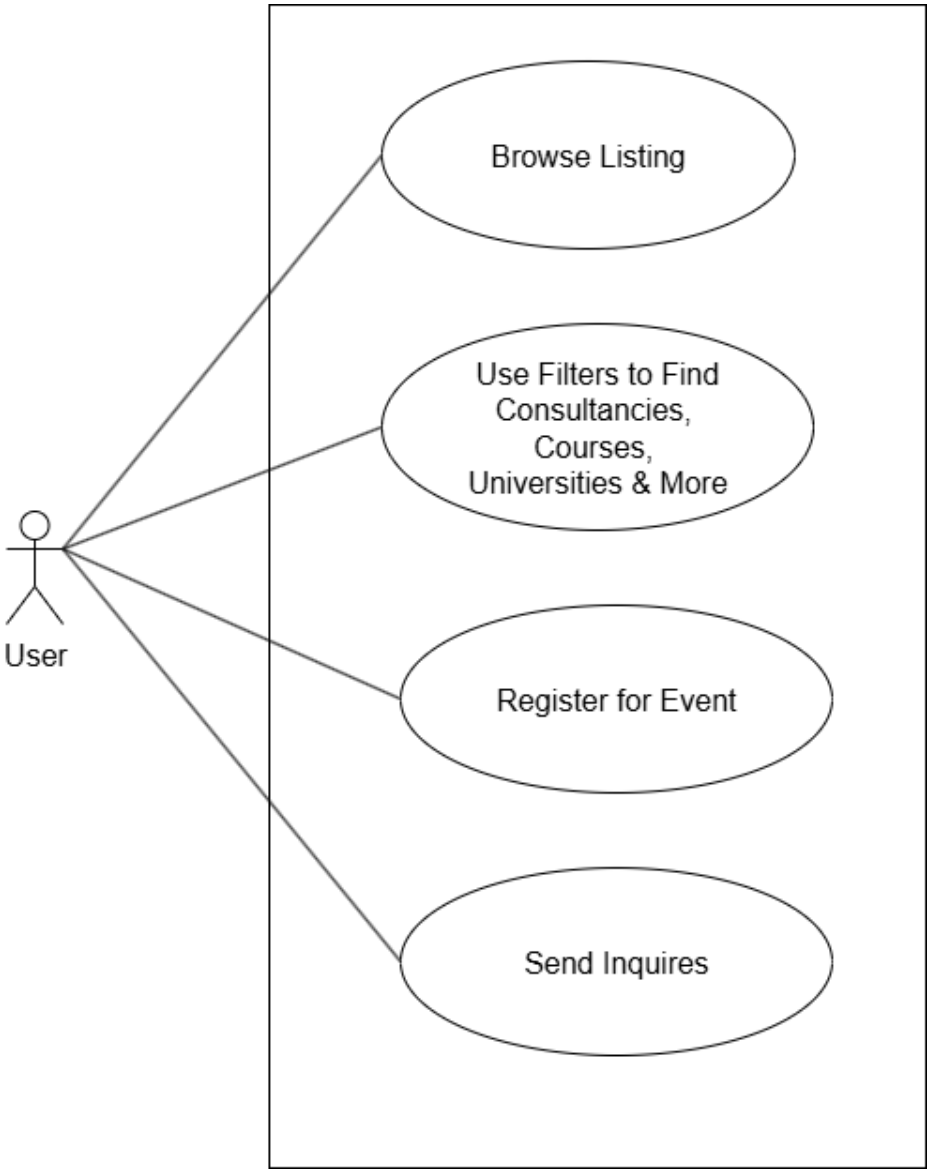

Figure 3.3 Visitor Use Case Diagram

ii. Non-Functional Requirements

Non-functional requirements were equally critical:

a) Security and Reliability: User data is protected through secure logins and encrypted connections, with automated backups and high uptime to keep the system available at all times.

b) Performance and Scalability: The platform loads quickly and is designed to grow, handling thousands of users and listings without major redesigns.
c) Accessibility: The interface is intuitive and easy to use, ensuring that both students and institutional staff can navigate the system effectively, regardless of their digital experience.

3.1.2 Feasibility Analysis

i. Technical Feasibility

The project is technically feasible and utilizes established, widely-used technologies. Abroad Advise is built with Django REST Framework (Python) for the backend and Next.js (React) for the frontend, both of which are modern, well-supported, and open-source. The platform is deployed on a Virtual Private Server (VPS) running Ubuntu, which provides flexibility and scalability. All required tools and frameworks are freely available and well-documented, making the project accessible to the development team.

ii. Operational Feasibility

Operationally, the platform is easy to maintain and use. Students and institutional users interact with intuitive dashboards designed for varying levels of digital literacy. Content management, inquiries, and profile updates can be performed by institutions with minimal training. The system can be accessed from any modern web browser, ensuring broad accessibility for users across Nepal.

iii. Economic Feasibility

The Abroad Advise project is economically feasible because it relies on open-source tools and cost-effective hosting, while generating significant value for both students and institutions.

1. Tangible Investments

- **Development Effort** – Most of the coding and setup is done by the project team as part of their coursework, so there is no direct salary cost.

- **Hosting & Domain** – A reliable VPS with domain registration and SSL security costs about $500 per year, which is enough for current traffic.
- **Miscellaneous Costs** – Small expenses for email services or upgrades may come up, but these remain minimal.

2. Intangible Investments

- **Learning & Training** – Team members invest time in learning Django, React, and deployment, which improves their skills.
- **Maintenance Time** – Occasional bug fixes and updates are needed, but these do not require heavy expenses.

3. Tangible Benefits

- **Lower Admin Costs** – Inquiry tracking, event registration, and dashboards save time and reduce the need for manual paperwork.
- **Affordable Scalability** – The system can support more universities and consultancies without adding extra hardware or licenses.
- **Reduced Printing & Marketing Costs** – Digital promotion replaces many physical campaigns.

4. Intangible Benefits

- **Reputation Boost** – The platform reflects a modern, tech-driven image for the institution.
- **Better Insights** – Data on inquiries and interests helps universities and consultancies make informed decisions.
- **Improved Student Experience** – A smooth, user-friendly system builds trust among students exploring study abroad opportunities.
- **Skill Development** – Team members gain practical experience in real-world software development.

5. Cost–Benefit Overview

Items	Annual Cost (NPR)	Annual Benefits (NPR)
Hosting & Domain	70,000	-

Maintenance & Domain	50,000	-
Marketing/Other	30,000	-
Subscriptions (7 clients)	-	218,400
Total	**150,000**	218,400

Net Profit (Year 1) = 218,400 – 150,000 = NPR 68,400

5. Break-Even Analysis

- Break-Even Revenue Needed = NPR 150,000
- Monthly Revenue Needed = 150,000 ÷ 12 ≈ NPR 12,500
- With 7 clients paying NPR 2,600/month, monthly revenue = 7 × 31,200 = NPR 218,400
- **Break-Even Point**: Within first 5 months of operation.

iv. Schedule Feasibility

The project was divided into manageable milestones and tracked using a Gantt chart. Tasks included requirement analysis, design, development, content entry, testing, and report writing. Regular meetings and iterative reviews with the supervisor ensured that the project remained on track and any issues were quickly addressed.

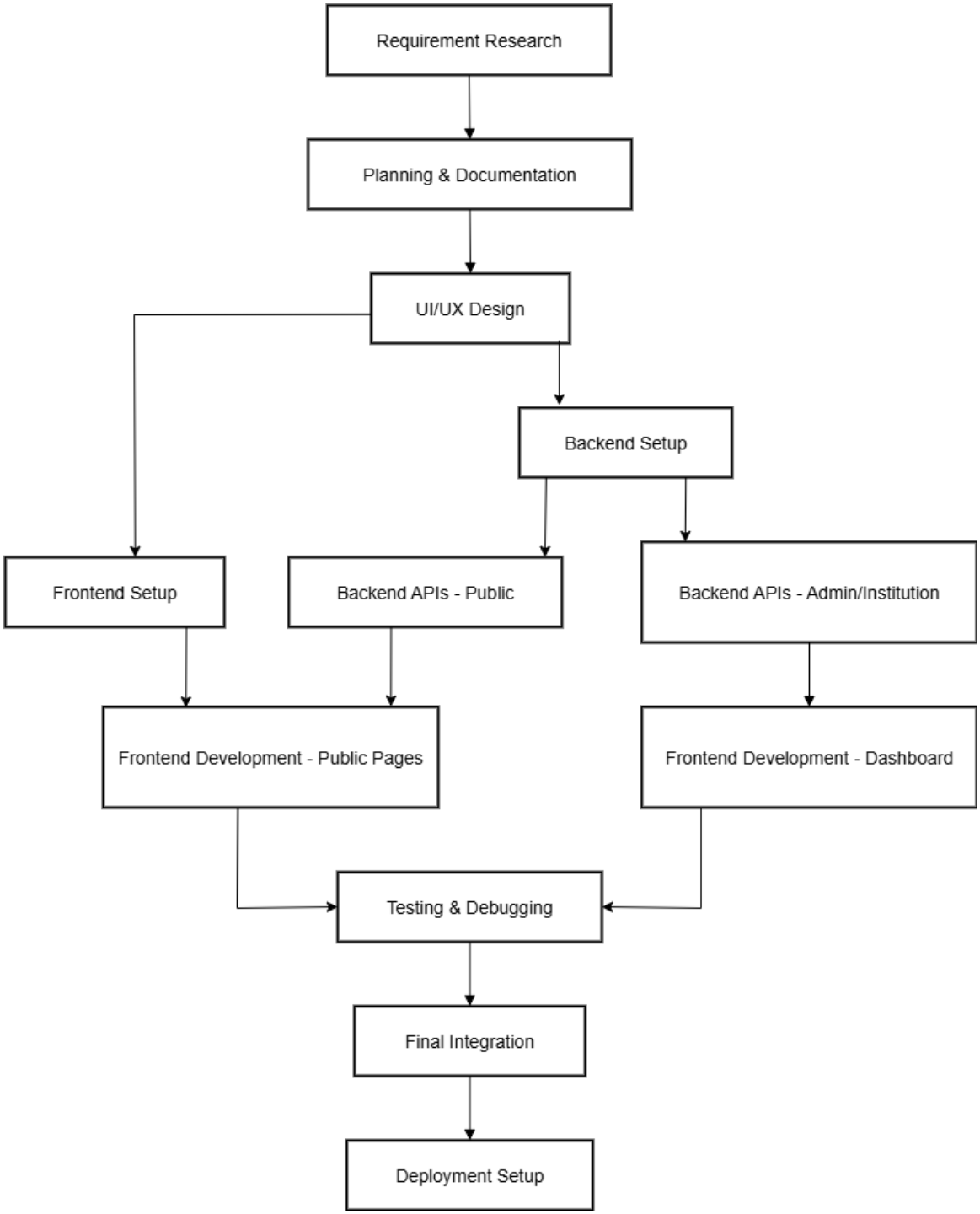

Figure 3.4 Network Diagram

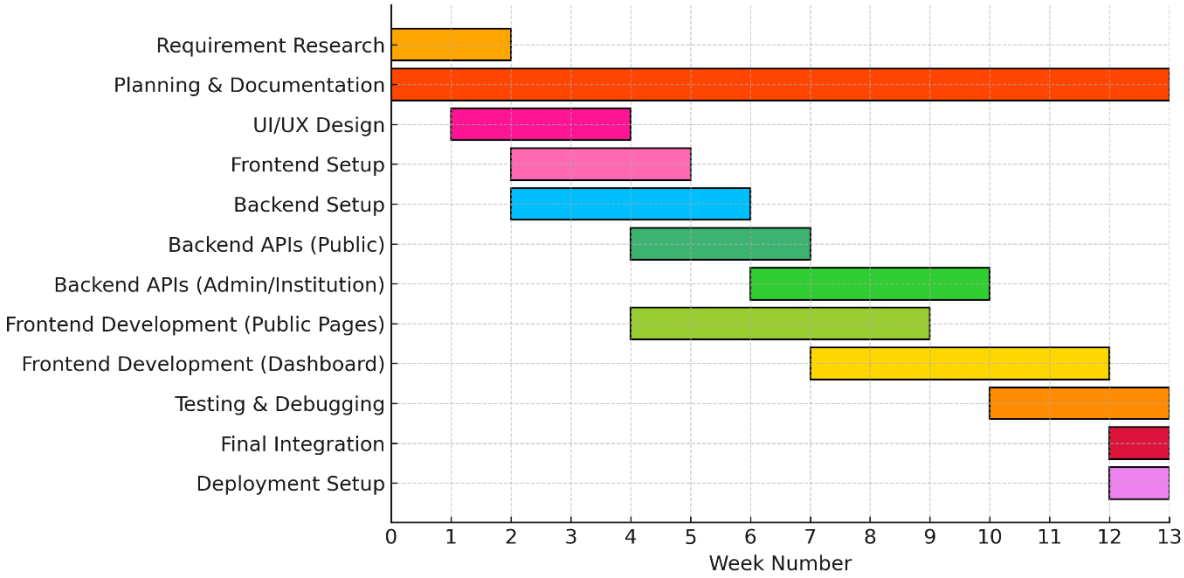

Figure 3.5 Gantt Chart

3.1.3. Object Modeling using Class and Object Diagrams

Abroad Advise follows an object-oriented approach in its design and implementation, leveraging the capabilities of Django and React for modular, maintainable code. The main system components are structured as classes and objects that interact to provide core functionalities, such as user authentication, inquiry management, and profile updates.

The class diagram for the Abroad Advise platform outlines the major classes, including User, Consultancy, University, Course, Colleges, Inquiry, and Admin & More. Each class encapsulates relevant attributes and methods. For example, the User class contains role information and authentication details, while the Consultancy and University classes store institutional data, linked to Inquiry objects representing communication with students.

Object diagrams represent specific system instances, such as a particular student user inquiring about a course at a university, with their inquiry tracked and managed by the system. These relationships ensure a seamless experience, where updates in one component (such as a consultancy verifying its profile) are reflected across the platform.

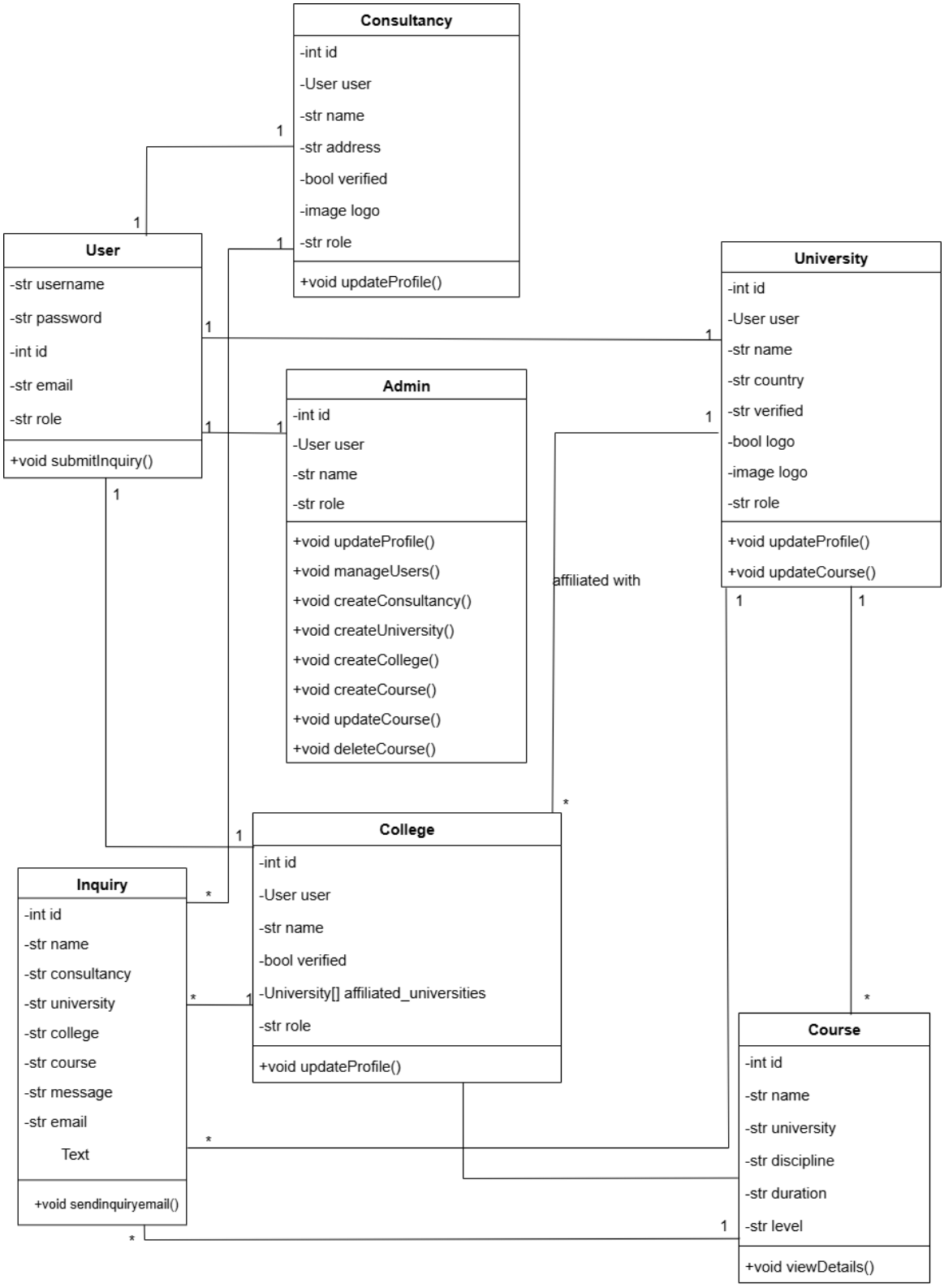

Figure 3.6 Class Diagram

3.1.4 Dynamic Modeling using State and Sequence Diagrams

Dynamic modeling illustrates how system states change in response to user actions and events. For Abroad Advise, the state diagram describes the transitions between different user and institutional states, such as “Browsing,” “Inquiring,” “Profile Verified,” and “Inquiry Responded.”

A typical sequence diagram models a scenario where a student submits an inquiry. The sequence begins with the student user authenticating, followed by searching and selecting a course or institution, submitting an inquiry, and receiving a response from the consultancy or university. The diagram demonstrates the flow of requests and data among the User, Inquiry, Consultancy/University, and Admin objects.

These diagrams help clarify the platform’s workflow, ensuring that every user action triggers the appropriate state transitions and backend processes.

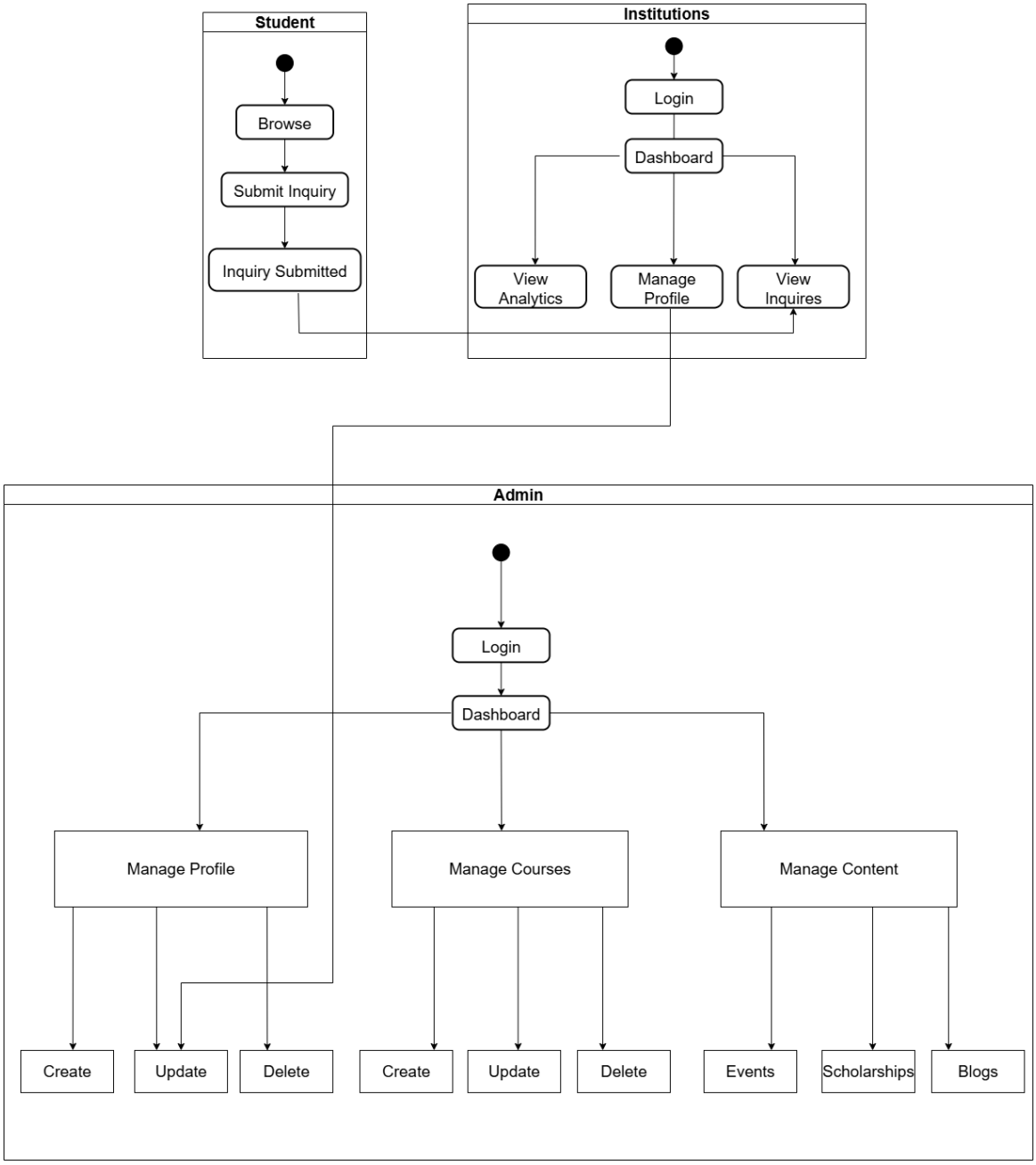

Figure 3.7 State Diagram

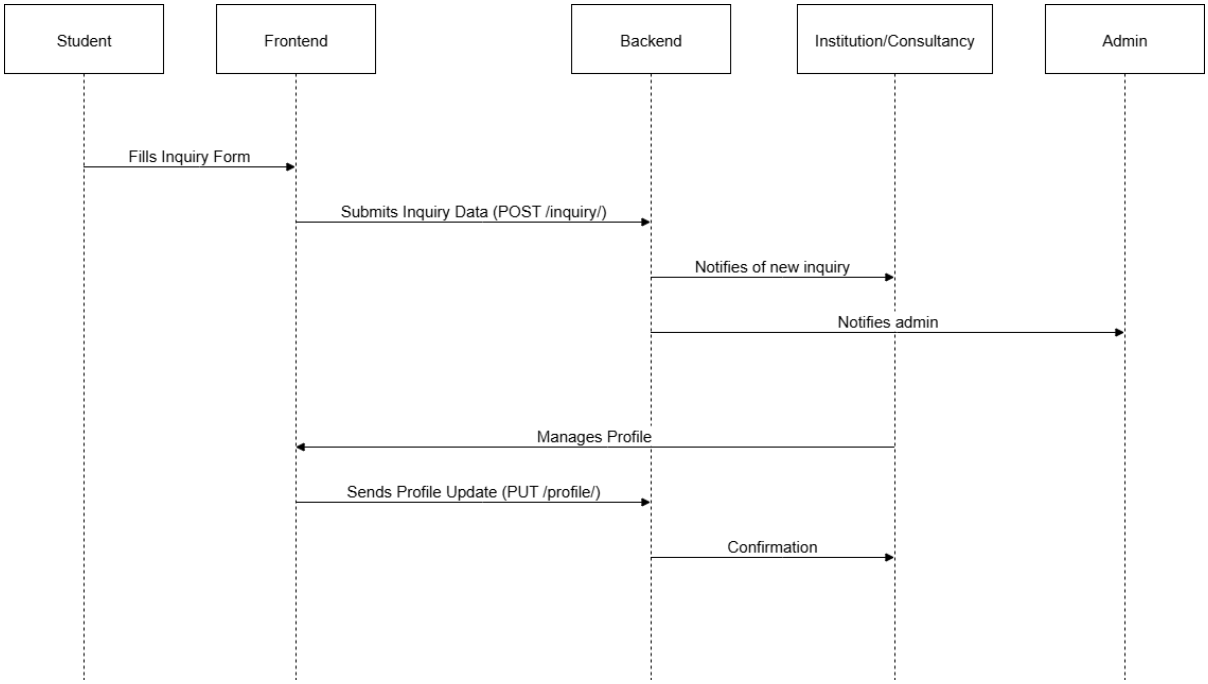

Figure 3.8 Sequence Diagram

3.1.5 Process Modeling using Activity Diagram

The activity diagram for Abroad Advise represents the flow of actions and decisions from the moment a user accesses the platform to the successful completion of their task (e.g., submitting an inquiry or updating a profile). The diagram starts with visiting our website through steps such as browsing, filtering, selecting an institution, and submitting an inquiry, and ends with the institution responding and the admin verifying completion if needed.

This graphical workflow helps visualize all possible paths users may take, including alternate flows for actions like resubmitting or editing inquiries. It also highlights decision points, such as verifying a user's role or validating form inputs, which are critical for both usability and security.

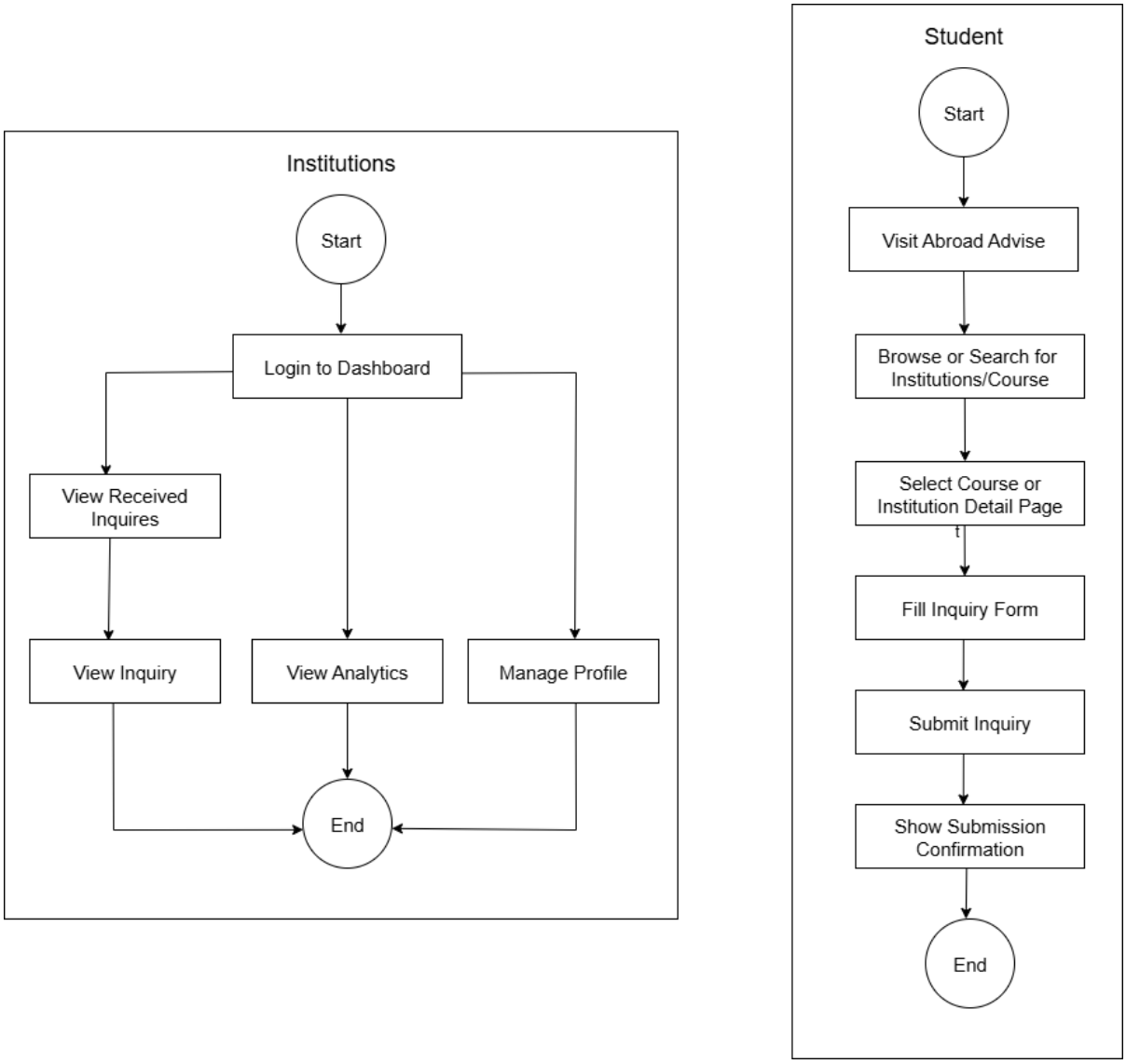

Figure 3.9 Activity Diagram

Chapter 4: System Design

4.1 Design

As outlined in the analysis chapter, the system design for Abroad Advise also adopts an object-oriented approach, focusing on modularity and maintainability across all core features.

- **Refinement of Class, Object, and Activity Diagrams:**

  Given the scope and structure of the project, the class, object, and activity diagrams created during the analysis phase are already sufficiently detailed and directly applicable to the system's implementation. These diagrams ensure clear relationships and workflows between users, institutions, inquiries, and content management modules.

- **Component Diagram:**

  The component diagram for Abroad Advise visually represents how the platform's major parts interact to deliver a seamless user experience. Main components include:

  - Frontend Application (Next.js): Handles user interface, server-side rendering, and interaction logic.
  - Backend API (Django REST Framework): Manages data storage, authentication, user management, and all business logic.
  - Database (PostgreSQL): Stores all core entities—users, institutions, courses, inquiries, and analytics.
  - Media Storage: Stores uploaded documents, images, and brochures.
  - Authentication Module (JWT): Provides secure, role-based access to the platform.
  - Analytics: Tracks page views and user engagement for consultancies and universities.

- Admin Dashboard: Enables administrators to verify profiles, manage content, and monitor system health.

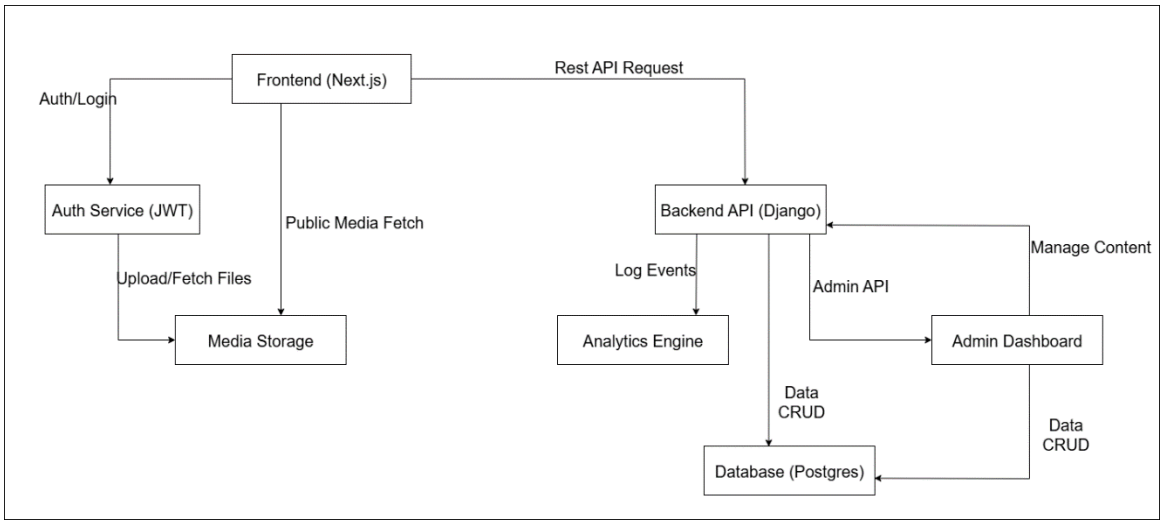

Figure 4.1 Component Diagram

4.2 Algorithm Details

4.2.1 Levenshtein Distance Based Fuzzy Search

To improve the search experience on the Abroad Advise platform, we have successfully implemented a fuzzy search mechanism using the Levenshtein Distance algorithm. This feature is now integrated into the global search functionality and enables users to find relevant results even when their queries contain spelling mistakes, typographical errors, or alternate spellings of institutions or countries.

What is Levenshtein Distance?

Levenshtein Distance measures how many single-character edits are needed to transform one word into another. The edits can be:

- inserting a character
- deleting a character
- replacing one character with another

For example, the distance between "Nepal" and "Neapl" is 2, since two edits are needed to fix the spelling.

Implementation Workflow in Abroad Advise

1. **User Query Input**
   When a user submits a search query, the platform first attempts to find exact matches using standard icontains filters. Alongside this, the platform evaluates approximate matches using the Levenshtein Distance algorithm.
2. **Similarity Scoring**
   We use a highly optimized version of the Levenshtein Distance function. This implementation uses a single-row dynamic programming approach, significantly reducing memory usage. It also supports early termination and case-insensitive comparison for efficiency. To handle multi-word fields like university or course titles, the system tokenizes each record and applies levenshtein_distance_phrase (query, text), which computes the minimum distance between the user's query and any word in the target text.
3. **Suggestion System ("Did you mean")**
   If the system cannot find any direct matches, it automatically searches across all records to find the closest match using Levenshtein similarity. This enables intelligent spelling correction. For example, if a user types "Univercity of Torento", the system may suggest "University of Toronto" as a correction.

4. **Ranking and Thresholding**
   All potential matches are scored based on normalized similarity values. Only results above a certain threshold (for example, a similarity score above 0.6) are considered

valid suggestions or corrections. This ensures that suggestions remain relevant and helpful to the user.

Why Levenshtein?

- User-Friendly: Greatly reduces frustration from “no results” due to minor errors.
- Efficient: Can be computed quickly for moderate-size lists, and is widely used in search engines.
- Localized for Nepal: Especially important given the variety of English spellings and transliterations commonly seen.

Outcome and Benefits

The integration has improved the usability and accuracy of the global search system across all major entities. Users are now able to discover the correct information even with incorrect or partial input, increasing the overall accessibility and reliability of the platform.

Next Steps

Future improvements may include caching repeated searches, phonetic matching (e.g., Soundex), and optimization for large-scale databases using Elasticsearch or similar technologies.

Chapter 5: Implementation and Testing

5.1 Implementation

The development of the this project followed a staged, modular approach. Core system components, including user authentication, dashboards, search and filter systems, inquiry management, and analytics, were developed iteratively. Frequent testing and feedback cycles were integrated into each stage to ensure robust, user-friendly features and efficient performance.

5.1.1 Tools Used

- Django REST Framework (Python): Backend API development and business logic
- Next.js (React): Frontend application with server-side rendering for SEO optimization
- PostgreSQL: Relational database for storing all structured data
- Ubuntu VPS: Hosting environment for production deployment
- Git & GitHub: Version control and collaborative code management
- Visual Studio Code: Primary code editor for frontend and backend
- Trello/Notion: Project management and task tracking

5.1.2 Implementation Details of Modules

a) **User Authentication and Authorization:**

Custom user model with roles (consultancy, university, admin). JWT-based authentication is implemented, providing secure access and role-based permissions for different dashboards.

b) **Consultancy and University Dashboards:**

Dashboards enable institutions to edit their profiles, upload gallery images and brochures, view analytics, and respond to student inquiries. Admin users can verify profiles, manage content, and oversee the entire ecosystem.

c) Search and Filter Module:

Students can search and filter universities, consultancies, courses, events, and scholarships using various criteria such as country, discipline, level, and type. The frontend leverages Next.js dynamic routing and the backend exposes efficient API endpoints for real-time queries.

d) **Inquiry Management System:**

Students can submit inquiries directly to institutions. These inquiries are stored in dashboards, with real-time email notifications for consultancies.

e) **Analytics Module:**

Tracks user activity, page views, and inquiry counts for consultancies and universities, providing valuable feedback on engagement and platform reach.

f) **Content Management (CRUD) System:**

Admins and institutions can create, update, and delete core entities including universities, consultancies, courses, events, and scholarships.

g) Media Uploads:

The platform allows for uploading and managing images, brochures, and documents, ensuring that profiles remain rich and up-to-date.

5.2 Testing

Testing was conducted throughout the development cycle to ensure that each module of the Abroad Advise platform functions correctly and reliably. Both unit and integration testing

approaches were used, with manual and automated tests performed at key stages. User feedback and performance optimization were also central to the testing process.

5.2.1 Test Cases for Unit Testing

Unit testing focused on individual backend endpoints, utility functions, and core logic. Example test cases:

Table 5.1: Unit Test Cases for User Registration and Authentication

Test ID	Test Scenario	Expected Result	Observed Result	Test Status
UT1	Create New Consultancy	Consultancy & User created successfully	Same as expected	Pass
UT2	Login with valid credentials	JWT token returned, access granted	Same as excepted	Pass
UT3	Login with invalid credential	Error message shown, access denied	Same as expected	Pass
UT4	Password reset	Rest email sent	Email was not received	Failed

Table 5.2: Unit Test Cases for Inquiry Submission

Test ID	Test Scenario	Expected Result	Observed Result	Test Status
UI1	Submit Inquiry with valid fields	Inquiry stored and notification	Same as expected	Pass
UI2	Submit inquiry with missing field	Error message displayed	Not As Expected	Failed

5.2.2 Test Cases for Integration Testing

Integration testing ensured that various modules worked together as intended (e.g., dashboards, search, inquiry).

Table 5.3: Integration Testing

Test ID	Test Scenario	Test Steps	Expected Result	Observed Result	Test Status
IT1	Inquiry System	Student submits inquiry, consultancy receives	Inquiry appears in dashboard	Same as expected	Pass
IT2	Analytics Integration	User visits consultancy profile	Page view count increases	Same as expected	Pass
IT3	Content Update	Consultancy updates profile	Changes reflected on site	Same as expected	Pass

5.2.3 Test Cases for System Testing

System testing focused on overall performance, usability, and cross-browser compatibility.

Table 5.4: System Testing

Test ID	Test Scenario	Expected Result	Observed Result	Test Status
ST1	Page load time	Pages load in under 2 seconds	Same as expected	Pass
ST2	Mobile device accessibility	Responsive UI, touch actions work correctly	Same as expected	Pass
ST3	Search and filter workflow	Search returns relevant and accurate results	Same as expected	Pass
ST4	File upload	Images and documents upload without error	Same as expected	Pass

Testing was performed on multiple browsers and devices, and user feedback was used to further refine the platform. Any bugs or inconsistencies discovered were promptly resolved before deployment.

5.3 Result Analysis

Testing and user feedback confirmed that the core features of the Abroad Advise platform have been successfully implemented and meet the desired criteria for performance, reliability, and usability.

- **Performance Metrics:**

  The platform consistently delivers fast load times, with most pages loading in under two seconds on standard broadband connections. Resource usage on the VPS server remains within efficient limits, supporting multiple simultaneous users without noticeable slowdowns.

- **User Experience:**

  Test users reported that the dashboards and search features are intuitive and easy to navigate. Inquiry submission and response workflows were clear and reliable, with real-time notifications functioning as intended. Mobile responsiveness and accessibility were confirmed across a range of devices and browsers.

- **Technical Achievement:**

  All planned modules - including authentication, dashboards, inquiry management, content management, and analytics were implemented successfully. Manual testing revealed no critical errors, and any minor issues identified during user testing were quickly resolved. The use of open-source frameworks and modular architecture ensures maintainability and scalability for future growth.

Chapter 6: Conclusion and Future Recommendations

6.1 Conclusion

In summary, the development of the Abroad Advise marks a significant step forward in digitalizing and democratizing access to study-abroad opportunities for Nepali students. The project successfully achieved its initial goals, delivering a centralized, reliable, and user-friendly web portal where students can discover universities, consultancies, courses, events, and scholarships, all with verified information and direct inquiry options. By leveraging open-source tools and modern frameworks, the team was able to create an efficient, scalable, and maintainable system ready for further growth. The feedback from early users and testing indicates that the platform meets its core objectives and stands out from existing solutions by addressing the specific needs and challenges of the Nepali context.

6.2 Future Recommendations

To further enhance the Abroad Advise platform and its impact, the following improvements and expansions are recommended for future phases:

- **Mobile App Development:** Consider developing a dedicated mobile application to further increase accessibility and reach.
- **Enhance Analytics and Reporting**: Provide institutions with deeper insights into student engagement, inquiry trends, and platform performance to support data-driven decision making.
- **Recommendation Algorithms:** Integrate personalized recommendations to help students discover relevant opportunities even with typos or incomplete queries.
- **Introduce User Reviews and Ratings:** Allow students to leave feedback on institutions and consultancies, increasing transparency and trust for future users.

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Appendices

Screenshot of Websites

1. Home Page

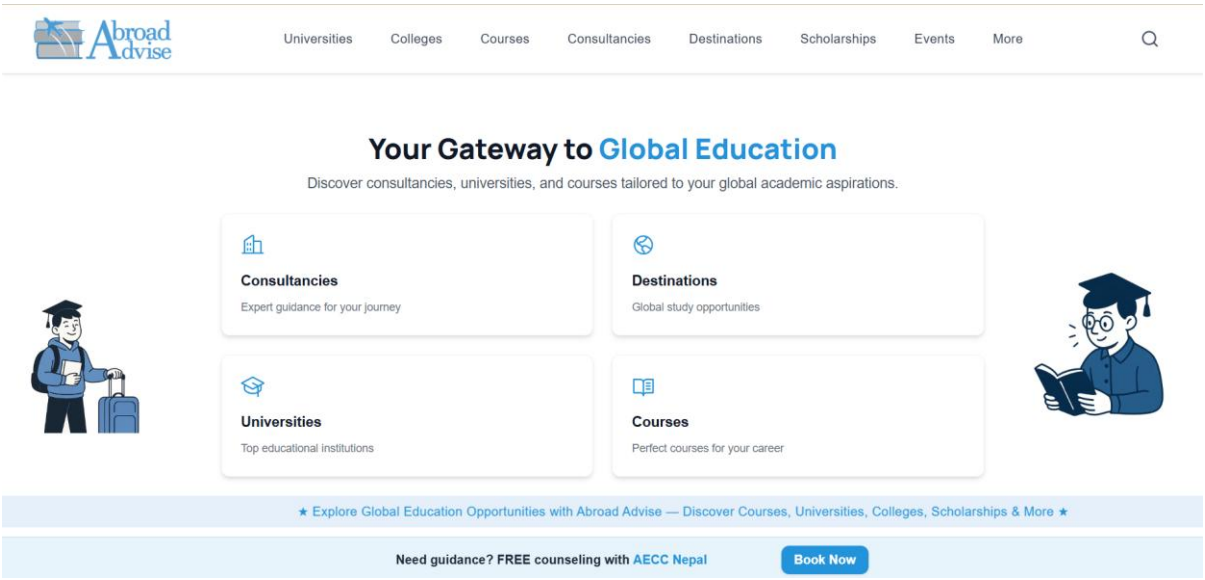

Figure 1 Home Page

2. Admin Dashboard

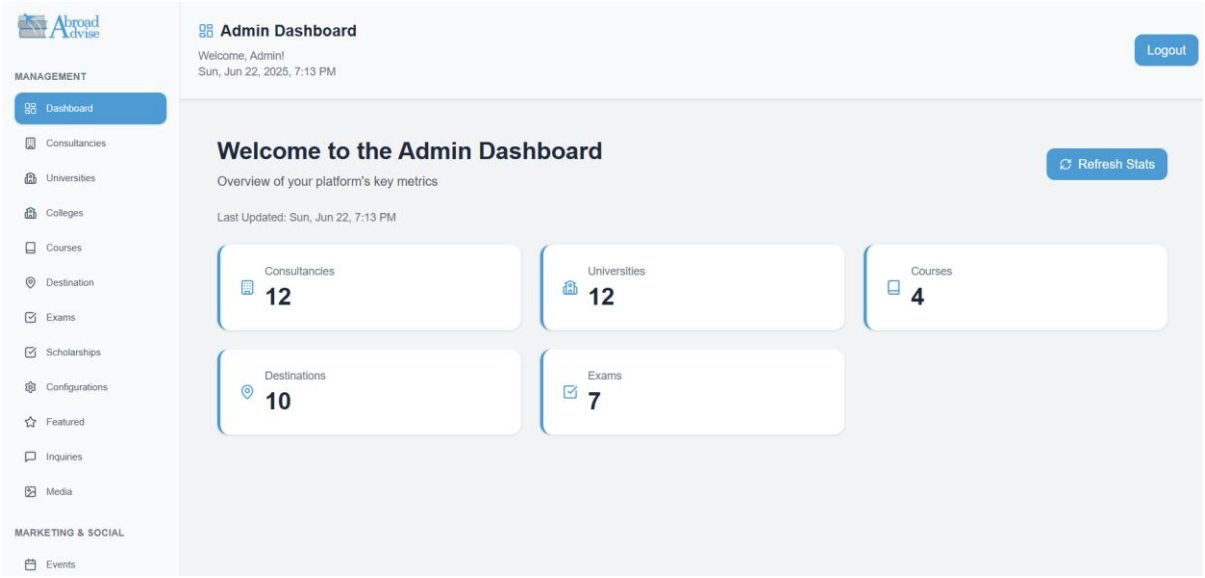

Figure 2 Super Admin Dashboard

3. Consultancy Dashboard Home

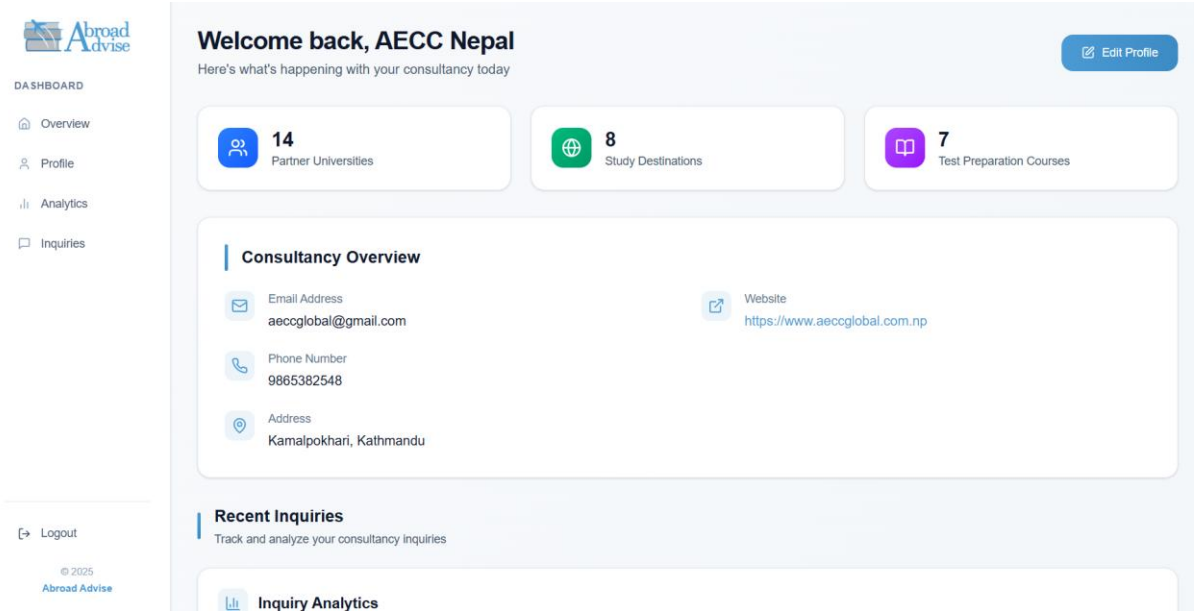

Figure 2 Consultancy Dashboard Home

4. Consultancy Dashboard Analytics

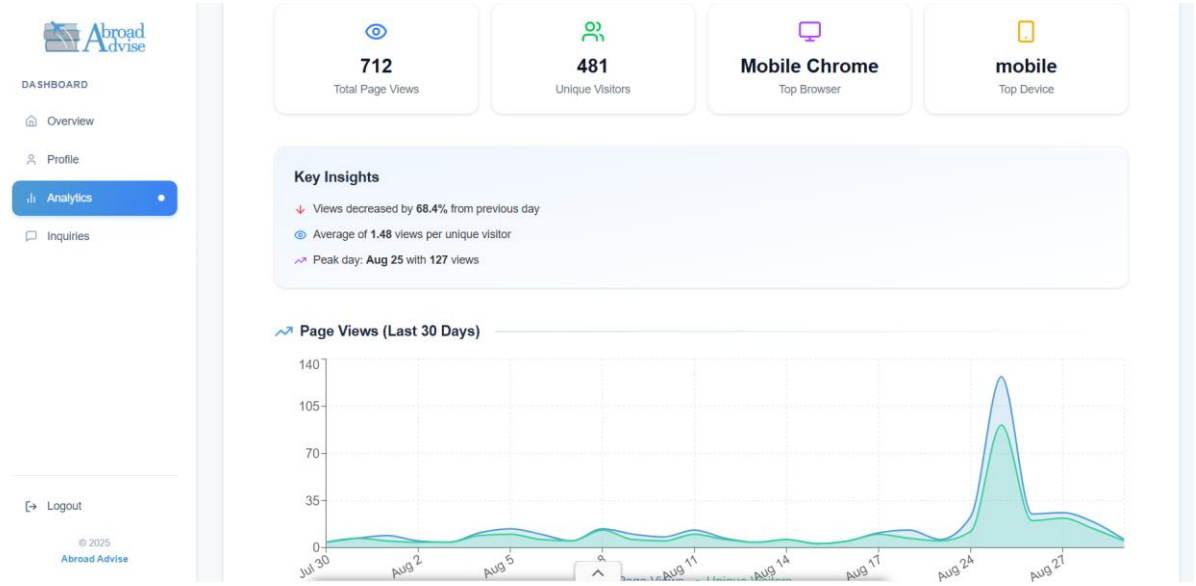

Figure 3 Consultancy Dashboard Analytics

5. University Dashboard Home

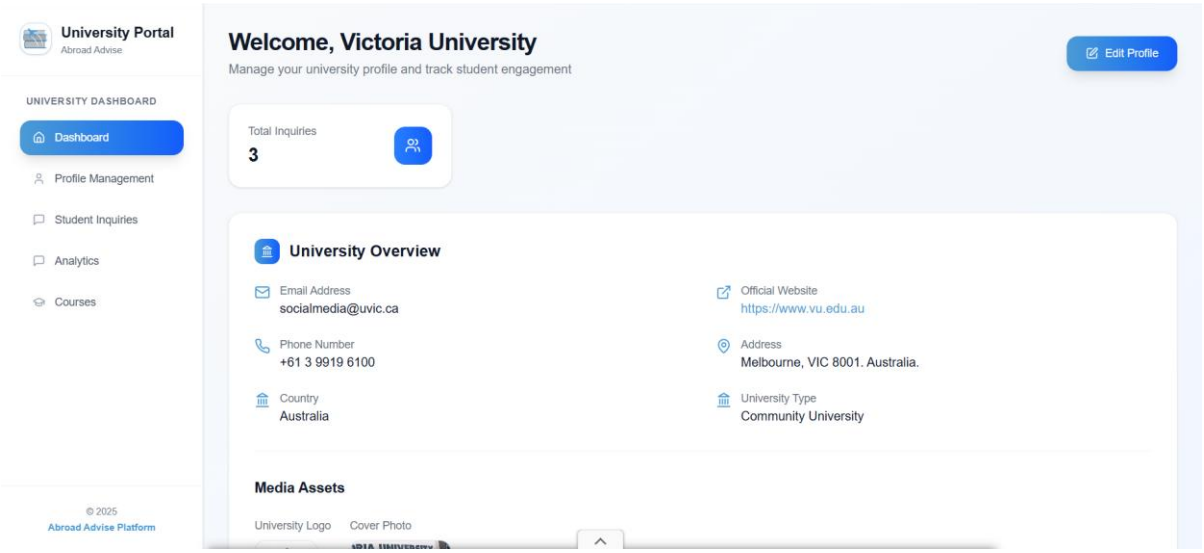

Figure 4 University Dashboard Home

6. University Dashboard Courses Page

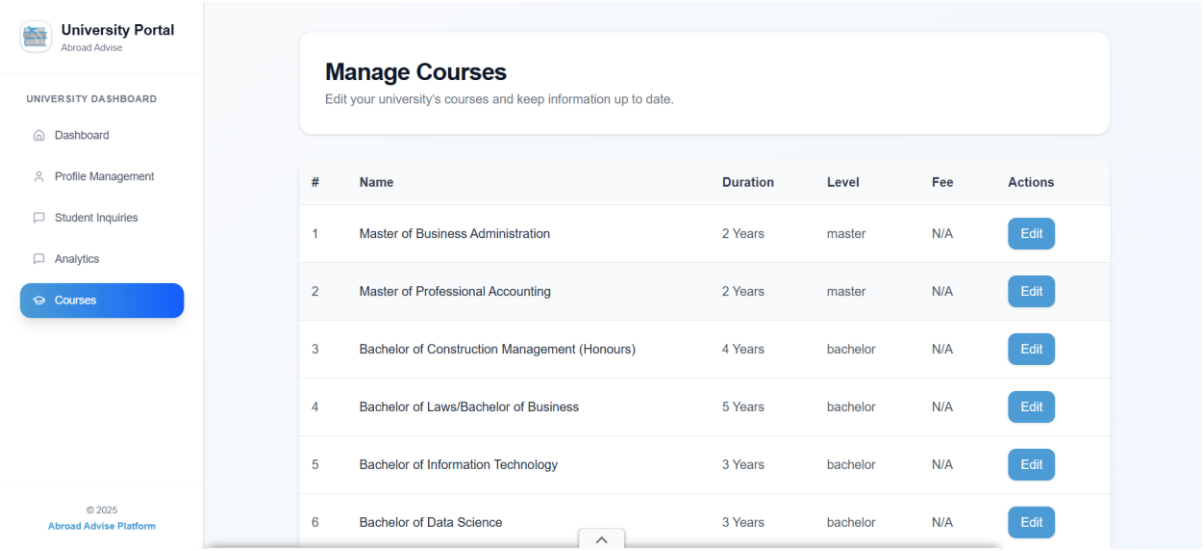

Figure 5 University Dashboard Courses Page