# Design and Development of a Web-Based Alumni Academic Networking and Career Development Platform

# (Borobhai.online)

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Submitted in partial fulfillment of the requirements for the degree of
**Bachelor of Science in Computer Science and Engineering**




**DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING**
**SONARGAON UNIVERSITY (SU)**
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# APPROVAL

The project titled "**Design and Development of a Web-Based Alumni Academic Networking and Career Development Platform (Borobhai.online)"** submitted by Md. Sajal Ahmed Sumon (CSE2203027002), Md.Shahidul Islam Shovon (CSE2203027049), Ayesha Akter (CSE2203027020), Pingky Tikadher (CSE2203027080) and Umme Ertiza (CSE2203027038) to the Department of Computer Science and Engineering, Sonargaon University (SU), has been accepted as satisfactory for the partial fulfillment of the requirements for the degree of Bachelor of Science in Computer Science and Engineering, and approved as to its style and contents.

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# DECLARATION

We hereby declare that the work presented in this project report, titled **"Design and Development of a Web-Based Alumni Academic Networking and Career Development Platform (Borobhai.online),"** submitted to the Department of Computer Science and Engineering, Sonargaon University, is our own original work, completed in partial fulfillment of the requirements for the degree of B.Sc. in CSE.

This project was carried out under the supervision of **Mohammad Naderuzzaman, Associate Professor,** Department of Computer Science and Engineering, Sonargaon University.

We further declare that this report has not been submitted to any other university or institution for any academic qualification. All sources and references used in this report have been properly acknowledged.

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# ABSTRACT

The rapid advancement of digital technology has transformed the way educational institutions manage alumni information and maintain long-term engagement with their graduates. Despite this, many universities still rely on manual records, spreadsheets, and informal social media groups, which makes it difficult to maintain accurate alumni data, verify user identity, and establish structured interaction among alumni, students, teachers, and university authorities. To address these limitations, this project presents Borobhai.online, a web-based Alumni Academic Networking and Career Development Platform that consolidates alumni management, professional networking, career services, academic resource sharing, and administrative oversight into a single, secure application.

The system supports four user roles Student, Alumni, Teacher, and Administrator — and provides role-based registration with dual verification (email link and Student/Alumni ID verification through a One-Time Password), structured profile management, a social news feed, a moderated job portal, a centralized research-paper repository, real-time private messaging, a notification service, a content-reporting workflow, and an analytics-driven administrative dashboard. The platform was developed using Laravel 11, PHP 8.2, MySQL 8.0, the Blade templating engine, Bootstrap 5, JavaScript, AJAX, and Chart.js, following the Model–View–Controller (MVC) architectural pattern.

Three safeguards were introduced to preserve content quality in the job portal: a per-user job-posting quota, automated duplicate-post detection, and an AI-assisted scam screening mechanism that withholds suspicious postings and routes them to an administrative review queue. The system was validated through functional, validation, user-acceptance, and performance testing. All twelve functional test cases and five validation test cases passed; user-acceptance testing produced an average usability rating of 4.67 out of 5 across six modules; and performance testing recorded feed page-load times below 2 seconds, AJAX response times below 500 ms, and stable operation under 50 concurrent simulated users. The results confirm that the proposed platform provides a practical, secure, and scalable solution for strengthening university–alumni relationships, supporting student career development, and building a more connected academic community.

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# LIST OF ABBREVIATIONS

| | |
|---|---|
| AI | Artificial Intelligence |
| AJAX | Asynchronous JavaScript and XML |
| API | Application Programming Interface |
| CSS | Cascading Style Sheets |
| DBMS | Database Management System |
| DFD | Data Flow Diagram |
| ERD | Entity Relationship Diagram |
| HTML | HyperText Markup Language |
| HTTP/HTTPS | HyperText Transfer Protocol (Secure) |
| MVC | Model–View–Controller |
| MySQL | My Structured Query Language |
| OTP | One-Time Password |
| PHP | PHP: Hypertext Preprocessor |
| SQL | Structured Query Language |
| SDLC | Software Development Life Cycle |
| UI/UX | User Interface / User Experience |
| UML | Unified Modeling Language |
| URL | Uniform Resource Locator |

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# CHAPTER 1
# INTRODUCTION

## 1.1 Background of the Study

In the current era of digital transformation, educational institutions are increasingly adopting technology-driven solutions to improve administrative processes, communication, and academic services. Every year, universities produce a large number of graduates, and maintaining a long-term relationship with these alumni has become an important aspect of institutional growth. Alumni can contribute significantly through professional networking, career guidance, mentorship, research collaboration, financial support, and knowledge sharing [1].

However, many universities still manage alumni information using traditional methods such as manual records, spreadsheets, social media groups, and informal communication channels. These approaches often make it difficult to maintain accurate alumni databases, track career progress, organize events, and establish effective communication between alumni and current students.

A well-organized alumni management system can provide a centralized platform where alumni information can be stored, updated, and accessed conveniently. Such a system can help a university maintain long-term relationships with its graduates and create opportunities for collaboration among alumni, students, and academic authorities.

"Borobhai.online" is a web-based Alumni Networking Platform designed to establish a centralized digital communication platform among students, alumni, teachers, and university authorities. The system includes several features, such as user authentication, profile management, social networking, a job portal service, research paper sharing, messaging, notification management, and administrative controls.

The system aims to bridge the communication gap between a university and its alumni through a reliable digital platform. Through this platform, alumni can stay connected with their institution, share professional experience, support current students, and participate in university activities.

The development of this system contributes to creating a sustainable digital ecosystem for alumni engagement, strengthening the overall relationship between an educational institution and its graduates.

## 1.2 Problem Statement

Maintaining up-to-date and reliable alumni information is a major challenge for many educational institutions. After graduation, universities often lose contact with their students due to the absence of a proper tracking system. As a result, important information such as current employment status, professional achievements, contact details, and career progress remains unavailable or outdated.

Traditional alumni management practices suffer from several limitations:

- Lack of a centralized alumni database.
- Difficulty in tracking alumni career information.
- Inefficient communication between alumni and university authorities.
- Limited opportunities for student–alumni interaction.
- Challenges in organizing alumni events and activities.
- Dependence on external social media platforms for communication.

These limitations reduce a university's ability to build a strong alumni community and utilize alumni resources effectively.

Therefore, a dedicated digital platform is needed that can collect, manage, and analyze alumni information while also providing networking opportunities among alumni, students, and university authorities. The proposed Alumni Networking Platform addresses these challenges by providing a centralized, secure, and user-friendly system.

## 1.3 Research Motivation

The primary motivation behind this project stems from the growing importance of maintaining a strong relationship between a university and its graduates. The alumni community is a valuable asset to an educational institution, as they can provide career support, industry knowledge, mentorship, and professional opportunities to current students.

Existing communication methods are often fragmented and unable to provide systematic alumni engagement. A dedicated platform can improve alumni engagement by offering personalized profiles, networking features, and efficient communication channels.

The key motivations for this project are:

- Building a centralized platform for alumni information management.
- Improving communication among alumni, students, and university authorities.
- Providing career networking opportunities.
- Supporting mentorship and knowledge-sharing activities.
- Increasing alumni participation in university development.

## 1.4 Objectives of the Project

The primary objective of this project is to design and implement a web-based Alumni Networking Platform that ensures effective management of alumni information and improves interaction among alumni, students, and university authorities.

The specific objectives are:

- To create a secure registration and authentication system for alumni and users.
- To develop a centralized database for storing alumni information.
- To provide facilities for creating and updating alumni profiles.
- To track alumni professional and career-related information.
- To establish networking opportunities among alumni and students.
- To provide an administrative panel for managing users and system activity.
- To improve communication through a digital alumni platform.
- To build a scalable system capable of supporting future expansion.

## 1.5 Scope of the Project

The scope of Borobhai.online is limited to a web-based platform that facilitates alumni management, academic networking, and career development at a university. The system is intended for use by four categories of users: Student, Alumni, Teacher, and Administrator.

The features of this project include user registration, authentication, profile management, news-feed interaction, professional networking, posting and applying for jobs, uploading and downloading research papers, messaging, notifications, and administrative management. The system also incorporates email verification, Student/Alumni ID verification, job-posting quotas, duplicate job-post detection, and AI-driven scam detection [2] to enhance the security and robustness of the platform.

The platform is expected to be accessed primarily through modern web browsers. Its responsive interface allows it to function well across a range of screen sizes. Although currently intended for a single-university environment, the architecture is designed to be extensible for future scaling.

## 1.6 Significance of the Project

The proposed system provides multiple benefits to different stakeholders within a university community. It serves as a centralized platform that improves communication, information exchange, and professional collaboration among students, alumni, teachers, and administrators.

For students, the system creates opportunities to connect with experienced alumni, receive career guidance, apply for internships and jobs, and gain access to research materials. Alumni can maintain a professional relationship with their university, mentor junior students, share career opportunities, and contribute to academic development. Teachers can participate in academic collaboration and share research papers and educational resources.

University administration benefits from a well-organized alumni database, simplified user management, improved communication, and analytical reports that support decision-making. Overall, this project contributes to strengthening alumni engagement, promoting knowledge sharing, and expanding career-development opportunities through modern information technology.

## 1.7 Limitations of the Project

While Borobhai.online provides a comprehensive platform for networking, the current implementation has several limitations:

- The system is primarily designed for a single-university environment.
- The current version does not include native mobile applications for Android or iOS.
- The AI-based scam detection is primarily focused on job postings and does not analyze all types of user-generated content.
- Integration with external professional networking platforms such as LinkedIn is limited.
- The platform relies on an active internet connection for all operations.
- Some advanced communication features, such as video calling or live meetings, are not currently supported.
- Large-scale deployment across multiple universities has not yet been implemented.

## 1.8 Organization of the Report

This project report is organized into six chapters, each focusing on a specific aspect of the proposed system.

**Chapter 1** presents the introduction to the project, including the background of the study, problem statement, motivation, objectives, scope, significance, limitations, and the organization of the report.

**Chapter 2** presents a literature review discussing existing alumni management systems, related research, current technologies, and the research gap that motivated the development of the proposed system.

**Chapter** 3 describes system analysis and requirements determination, including analysis of existing systems, an overview of the proposed system, functional and non-functional requirements, feasibility analysis, and hardware/software requirements.

**Chapter 4** explains the system design. This chapter presents the overall architecture of the system and various design diagrams, such as the Use Case Diagram, Activity Diagram, Sequence Diagram, Data Flow Diagram (DFD), Entity Relationship Diagram (ERD), Class Diagram, and Deployment Design.

**Chapter 5** discusses the implementation of the system, including the development environment, technologies used, implementation of each module, the application's user interface, various testing methods, test cases, performance evaluation, and results analysis.

**Chapter 6** concludes the project by summarizing the overall achievements, discussing the limitations of the current system, and proposing possible future enhancements.

# CHAPTER 2
# LITERATURE REVIEW

## 2.1 Introduction

A literature review is an essential part of any research or software development project, as it provides a clear understanding of existing systems, technologies, and research related to the proposed work. It helps identify the strengths and weaknesses of current solutions and highlights the research gap that the proposed system aims to address.

Many universities around the world have adopted digital alumni management systems to maintain contact with their graduates and strengthen the relationship between alumni and the institution. These systems typically offer features such as alumni registration, profile management, event announcements, and communication services. However, many existing platforms focus solely on maintaining alumni records and do not provide comprehensive networking, career-development, or academic-collaboration features.

The proposed system, Borobhai.online, has been developed to address these limitations by integrating professional networking, job and internship management, research-paper sharing, messaging, notifications, and administrative management into a single web-based platform. The system also incorporates email verification, Student ID verification, job-posting quota management, duplicate job detection, and AI-assisted scam detection to strengthen the platform's security and reliability.

This chapter reviews existing alumni management systems and related technologies, compares their features with the proposed system, and identifies the research gap that motivated the development of Borobhai.online.

## 2.2 Overview of Alumni Management Systems

An alumni management system is a digital platform designed to maintain contact between an educational institution and its graduates. These systems store alumni information, manage user profiles, and facilitate interaction between alumni and the university. They help institutions maintain up-to-date graduate records while allowing alumni to remain connected with their academic community.

A typical alumni management system includes features such as registration, profile management, an alumni directory, event announcements, and communication tools [3], [4]. Some systems also provide job boards, donation management, and networking opportunities. Such platforms improve alumni engagement and simplify administrative work by relying on a centralized digital database instead of manual record-keeping.

Despite these benefits, many existing alumni systems provide only basic management operations. They often lack advanced networking capabilities, secure verification processes, a unified resource

repository, and intelligent content moderation. As a result, users are frequently forced to rely on multiple separate platforms to meet their academic and professional needs.

The growing demand for digital collaboration and career development has encouraged the development of more comprehensive alumni networking platforms. Modern systems are expected to support secure communication, professional networking, career services, document sharing, and administrative oversight within a single integrated environment. This demand forms the foundation for the development of Borobhai.online, which brings these functionalities together in one unified platform.

## 2.3 Existing Alumni Networking Platforms

Many universities and educational institutions use alumni networking platforms to maintain contact with their graduates. These platforms are designed to help alumni stay connected with their university, participate in institutional activities, and contribute to academic and professional development. Most existing systems provide basic features such as alumni registration, profile management, event announcements, and communication services.

Beyond university-specific alumni platform s, general professional networking platforms are also widely used to build professional relationships among graduates, explore employment opportunities, and share career experience [1]. However, these platforms are designed for general professional Alumni Networking rather than the specific needs of a particular university community. As a result, they do not provide institution-specific features such as student verification, alumni identification, department-based networking, or academic document management.

Many alumni platform s also have limited functionality. Some focus solely on maintaining alumni records, while others provide only communication features without career development, research collaboration, or centralized administrative management. In many cases, users must rely on multiple platforms to perform tasks such as job searching, document sharing, messaging, and networking.

This limitation highlights the need for an integrated system that combines alumni management, academic collaboration, career development, and secure communication into a single platform. The proposed system, Borobhai.online, has been designed to fulfill this need by delivering multiple services through one centralized web application.

## 2.4 Review of Related Technologies

Developing a modern web-based information system requires reliable technologies that ensure security, performance, scalability, and ease of maintenance. Borobhai.online has been developed using widely adopted web technologies that support these requirements.

Laravel 11 was used as the back-end framework because it follows the Model–View–Controller (MVC) architecture and provides built-in features such as authentication, routing, middleware,

database migration, and security [5], [6]. These features simplify application development and improve code organization.

PHP, as the server-side programming language, is responsible for processing business logic, handling user requests, managing sessions, and communicating with the database [7].

The front-end was developed using the Blade Templating Engine, Bootstrap 5, JavaScript, and AJAX. Blade provides reusable templates that simplify interface development, while Bootstrap 5 ensures a responsive and consistent user interface across devices [8]. JavaScript and AJAX enable asynchronous operations and improve the user experience by avoiding unnecessary page reloads.

MySQL was used as the relational database management system to store user profiles, posts, job data, messages, notifications, and other application data [9]. Its structured data model supports efficient data retrieval and management.

The system also uses Chart.js to visualize analytical data on the administrative dashboard [10]. Graphical reports help administrators monitor user activity, growth, and overall system performance. The combination of these technologies provides a stable, secure, and scalable environment suitable for developing an integrated alumni networking platform.

## 2.5 Comparison with Existing Systems

A comparison between traditional alumni management systems and the proposed system helps identify the improvements introduced by Borobhai.online.

| **Feature** | **Traditional Alumni Systems** | **Borobhai.online** |
|---|---|---|
| Alumni profile management | Yes | Yes |
| Student–alumni networking | Limited | Yes |
| Job and internship platform | Limited | Yes |
| Research paper repository | Usually absent | Yes |
| Email verification | Limited | Yes |
| Student/Alumni ID verification | No | Yes |
| Job-posting quota | No | Yes |
| Duplicate job detection | No | Yes |
| AI-based scam detection | No | Yes |
| Real-time messaging | Limited | Yes |
| Notification system | Limited | Yes |

| Feature | Traditional Alumni Systems | Borobhai.online |
|---|---|---|
| Administrative analytics | Basic | Yes |

**Table 2.1: Comparison between Traditional Alumni Systems and Borobhai.online**

## 2.6 Research Gap Analysis

Existing alumni management systems mainly focus on basic features such as registration, profile management, and announcements. However, they often lack unified services for professional networking, career development, academic collaboration, and centralized administration.

Many systems also lack secure user verification, which exposes them to risks such as fake accounts and unauthorized access [11]. In addition, features such as research paper sharing [12], duplicate job detection, AI-assisted moderation [2], and advanced administrative oversight are generally unavailable.

The proposed Borobhai.online platform addresses these limitations by integrating secure user verification, alumni networking, job and internship management, research-paper sharing, messaging, notifications, and administrative control into a single web-based system, providing a more secure and efficient solution for a university community.

## 2.7 Summary

This chapter reviewed existing concepts, technologies, and platforms related to alumni management and professional networking. It discussed the common features of traditional alumni management systems, examined the technologies used in modern web applications, and compared existing solutions with the proposed system.

The comparison revealed that while many current systems support basic alumni management, they typically lack integrated networking, secure verification, academic document management, intelligent job moderation, and comprehensive administrative features.

The research gap analysis demonstrated the need for a centralized platform that combines communication, career development, research collaboration, and administrative management into a single system. Borobhai.online was developed to fulfill this need by providing a secure, scalable, and user-friendly solution that strengthens the relationship among students, alumni, teachers, and the university.

The findings presented in this chapter provide the theoretical foundation for the following chapter, which focuses on analyzing system requirements and designing the proposed solution.

# CHAPTER 3
# SYSTEM ANALYSIS AND REQUIREMENTS DETERMINATION

## 3.1 Introduction

System analysis and requirements determination are essential stages of software development. They help identify user needs, analyze existing problems, and define the functional and non-functional requirements of the proposed system. A clear requirements determination ensures that the developed system meets user expectations while maintaining performance, security, and usability.

The proposed system, Borobhai.online, is a centralized Alumni Networking Platform designed to connect students, alumni, teachers, and administrators through a secure web-based platform. The system integrates alumni management, professional networking, career development, research-paper sharing, messaging, notifications, and administrative oversight into a single application.

This chapter analyzes the limitations of existing alumni management practices, presents the proposed solution, identifies the requirements of the system, and evaluates the feasibility of implementing the system.

## 3.2 Analysis of the Existing System

Many universities still manage alumni information using traditional methods such as spreadsheets, manual records, social media groups, and email communication. While these methods support basic communication, they are not sufficient to maintain long-term engagement between alumni and the university community.

Information stored in manual records is often outdated and difficult to maintain. Similarly, social media platforms are designed for general communication rather than structured alumni management. As a result, universities face challenges in tracking alumni activity, verifying user identity, sharing academic resources, and managing career opportunities.

The absence of a centralized platform also makes it difficult for students to communicate with alumni, apply for internships, access research papers, and build a professional network. Administrative oversight and content moderation become more complex when information is scattered across multiple platforms.

Therefore, an integrated and secure web-based solution is required to overcome these limitations and provide efficient alumni management.

### 3.2.1 Problems with the Existing System

The existing alumni management process suffers from several limitations, which reduce efficiency and user satisfaction. The main problems include:

- Lack of a centralized alumni database.
- Difficulty in maintaining up-to-date alumni information.
- Limited communication between students and alumni.
- No secure verification process for student or alumni identity.
- Absence of an integrated job and internship management system.
- No centralized repository for research papers and project reports.
- Limited opportunities for professional networking.
- Lack of intelligent spam and duplicate job detection.
- Weak administrative oversight and reporting facilities.
- Dependence on multiple external platforms for different activities.

These problems reduce collaboration and make alumni management less effective.

## 3.3 Overview of the Proposed System

The proposed system, Borobhai.online, is a web-based Alumni Networking Platform designed to solve the limitations of existing alumni management practices. The system provides a centralized platform where students, alumni, teachers, and administrators can interact securely and efficiently.

Key features of the proposed system include role-based registration, secure verification, profile management, a social news feed, a job portal with quota and scam-detection safeguards, a research-paper repository, private messaging, real-time notifications, a reporting and moderation workflow, and an administrative dashboard for platform oversight.

By integrating these features into a single, secure, and scalable web application, Borobhai.online provides a practical and modern solution for university alumni engagement, career development, and academic collaboration.

## 3.4 Functional Requirements

Functional requirements describe the exact actions and features that the Borobhai.online system needs to perform for its users. This requirement describes the process through which various users use the system and how the system deals with their activity. As the system is meant for Students, Alumni, Teachers, and Administrators, all of them have been given relevant rights and features.

Functional requirements help the system in handling activities related to alumni involvement, professional networking, career development, academic resources, communication, and administration in an organized way.

### 3.4.1 User Registration and Authentication

The system must allow users to register under one of three self-service roles — Student, Alumni, or Teacher and log in securely using email/password credentials or a supported social login provider.

### 3.4.2 Account Verification

The system must verify a user's email address and, where applicable, their Student/Alumni ID through a One-Time Password (OTP) sent to the institution's records, before granting full access to core features [11].

### 3.4.3 Profile Management

The system must allow users to create and update profiles, including education, experience, certifications, and personal documents.

### 3.4.4 News Feed and Post Management

The system must allow users to create posts, upload media, like and comment on posts, and control the privacy of shared content.

### 3.4.5 Job Portal

The system must allow Alumni and Teacher accounts to post jobs subject to a posting quota, automated duplicate-post detection, and AI-assisted scam screening [2]. Students must be able to browse, filter, save, and apply to jobs, and track their application status.

### 3.4.6 Research Paper Management

The system must allow users to upload theses, project reports, and research papers, which are automatically listed in a centralized, searchable Research Papers repository.

### 3.4.7 Networking and Messaging

The system must support friend requests, connection management, and private real-time messaging between connected users.

### 3.4.8 Notification Management

The system must generate real-time notifications for relevant activities such as friend requests, comments, likes, job-status updates, and moderation decisions.

### 3.4.9 Administrative Management

The system must provide an administrative dashboard for managing users, reviewing reports, moderating flagged job posts, and monitoring platform-wide analytics.

## 3.5 Non-Functional Requirements

Non-functional requirements define the quality standards of Borobhai.online, rather than its specific features. They describe how efficiently, securely, and reliably the Alumni Networking Portal should operate for students, alumni, teachers, and administrators. Profile searches, job browsing, and messaging should remain responsive while personal information is protected. Clear navigation, helpful feedback, and layouts that adapt to different screen sizes should allow users to complete routine tasks on desktop and mobile devices. These requirements also support long-term operation through predictable error handling, modular design, and maintainable code. They provide a basis for evaluating the quality of the platform during testing and future updates. The key requirements are outlined below

### 3.5.1 Performance

The system must respond to user actions quickly, load the feed and job listings efficiently, and support pagination and infinite scroll for large datasets.

### 3.5.2 Security

The system must protect user data through password hashing, role-based access control [13], rate-limited verification attempts, and HTTPS-encrypted communication [14].

### 3.5.3 Usability

The system must provide a clean, responsive, and intuitive interface that functions consistently across desktop and mobile browsers.

### 3.5.4 Reliability and Maintainability

The system must remain stable under normal operating conditions and should be built on a modular architecture that supports easy maintenance and future feature additions.

## 3.6 Feasibility Analysis

Feasibility analysis is conducted to determine whether the proposed Borobhai.online system can be successfully developed, operated, and maintained using the available technologies, resources, and infrastructure. The analysis considers the technical, operational, and economic aspects of the proposed system. It helps determine whether the selected technologies are suitable, whether users can operate the system effectively, and whether the overall development and operational costs are reasonable for a university-based project.

### 3.6.1 Technical Feasibility

The proposed system uses widely adopted, well-documented, and freely available technologies Laravel, PHP, MySQL, Bootstrap, and JavaScript making it technically feasible to develop, deploy, and maintain with standard web-hosting infrastructure.

### 3.6.2 Operational Feasibility

The system is designed with a simple and intuitive interface, requiring minimal training for students, alumni, teachers, and administrators to use the platform effectively.

### 3.6.3 Economic Feasibility

Since the system is built entirely on open-source technologies and standard web-hosting services, the development and operational costs remain low, making the project economically feasible for a university environment.

## 3.7 System Requirements

The proposed Borobhai.online Alumni Networking Platform requires appropriate hardware and software configurations to ensure smooth development, testing, deployment, and operation. The hardware and software requirements are described below.

### 3.7.1 Hardware Requirements

The hardware requirements represent the minimum physical resources recommended for developing and running the proposed system. Since Borobhai.online is a web-based application, development requires a computer capable of running the Laravel development environment, PHP, MySQL, a web server, a code editor, and modern web browsers simultaneously. An Intel Core i5 processor or an equivalent processor is recommended to provide sufficient processing capability for development and testing activities. A minimum of 8 GB RAM is required, while 16 GB is recommended for smoother multitasking when running the development server, database server, browser, code editor, and other supporting applications together. A 256 GB SSD or higher is recommended for storing the operating system, development environment, source code, database files, and project resources. A stable broadband internet connection is also required for downloading dependencies, using version-control services, accessing development resources, and deployment-related activities. A standard HD display with a resolution of 1366×768 or higher is sufficient for working with the development environment and testing the responsive web interface.

The minimum hardware specifications required for the development and operation of the system are presented in Table 3.1.

| Component | Specification |
|---|---|
| Processor | Intel Core i5 (or equivalent) or higher |
| RAM | 8 GB minimum (16 GB recommended) |
| Storage | 256 GB SSD or higher |
| Internet Connection | Broadband connection for development and deployment |
| Display | Standard HD display (1366×768 or higher) |

**Table 3.1: Hardware Requirements**

### 3.7.2 Software Requirements

The software tools, frameworks, databases, and development environments required for the system are presented in Table 3.2.

| Component | Specification |
|---|---|
| Backend Framework | Laravel 11 (PHP 8.2+) |
| Frontend | Blade Template Engine, Bootstrap 5, JavaScript, AJAX |
| Database | MySQL 8.0 |
| Web Server | Apache / Nginx |
| Code Editor | Visual Studio Code |
| Version Control | Git and GitHub |
| API Testing | Postman |
| Operating System | Windows 10/11, or Linux (Ubuntu) |
| Browser Support | Google Chrome, Mozilla Firefox, Microsoft Edge |

**Table 3.2: Software Requirements**

## 3.8 Chapter Summary

This chapter presented a comprehensive analysis and requirements determination for the proposed **Borobhai.online — Alumni Tracking and Networking Portal**. The chapter first discussed the limitations and challenges of traditional alumni management practices, where alumni information, communication, professional activities, and academic contributions are often maintained through scattered and inefficient methods. Based on these limitations, the proposed system was introduced as a centralized web-based platform designed to improve communication, information management, and networking among students, alumni, teachers, and administrators.

The functional requirements of the system were identified and described according to the major activities that the platform needs to support. These requirements include user registration and authentication, account verification, profile management, news feed and post management, alumni networking, messaging, notifications, job posting and searching, research-paper management, search functionality, reporting, and content moderation. The administrative requirements were also discussed, including user management, monitoring of platform activities, content moderation, job-post management, research-paper management, and analytical reporting. These requirements provide a clear understanding of how different users will interact with and utilize the proposed system.

The chapter also defined the **non-functional requirements** of the system, focusing on important quality attributes such as performance, security, usability, reliability, maintainability, and scalability. These requirements ensure that the system is not only capable of providing the required functions but also remains secure, responsive, user-friendly, and dependable during regular operation. Special consideration was given to protecting user information and ensuring controlled access to different system features based on user roles.

Furthermore, a feasibility analysis was conducted to determine whether the proposed system could be successfully developed and implemented. The analysis considered **technical, operational, and economic feasibility**. The findings indicated that the system is technically achievable using the selected technologies and development tools, operationally suitable for the intended users, and economically practical within the available resources. The chapter also presented the required hardware and software specifications for system development, testing, deployment, and regular operation.

Overall, the analysis and requirements presented in this chapter establish a clear foundation for the development of Borobhai.online. The identified requirements and feasibility results provide the necessary guidelines for designing a structured, secure, and user-friendly alumni networking platform. **The next chapter presents the system design of Borobhai.online, including the overall system architecture, system workflow, UML diagrams, database design, Entity Relationship Diagram (ERD), and other important design components that define the structure and interaction of the proposed system.**

# CHAPTER 4
# SYSTEM DESIGN

## 4.1 Introduction

This is the stage where the proposed requirements are transformed into a real software application. This chapter presents the overall architecture of Borobhai.online and a series of design diagrams that illustrate how the system's components interact with one another and with the database. A well-planned design ensures that the development process proceeds smoothly and that the final system meets the requirements identified in Chapter 3. To provide a detailed understanding of the proposed system, this chapter presents multiple workflow models, including UML diagrams, Data Flow Diagrams, an Entity Relationship Diagram, a Class Diagram, and a Deployment Diagram.

## 4.2 Overall System Design

**Borobhai.online** follows a layered architecture built on the Laravel MVC (Model–View–Controller) framework. The presentation layer (Blade Template, Bootstrap 5, JavaScript, AJAX) handles user interaction across the Student, Alumni, Teacher, and Administrator roles. The application layer, built on Laravel 11, contains the core modules — Authentication, Account Verification, Profile Management, News Feed & Post, Networking, Job Portal, Research Paper, Messaging, Notification, and Admin Management. The data layer, backed by a MySQL database, stores users, profiles, posts, jobs, applications, research papers, messages, notifications, and reports. External services Email Verification, OTP Verification, AI Scam Detection, and Notification delivery are integrated with the application layer. As shown in **Fig 4.1**, the proposed system follows this layered architecture, illustrating how the presentation, application, data, and external service layers interact with one another.

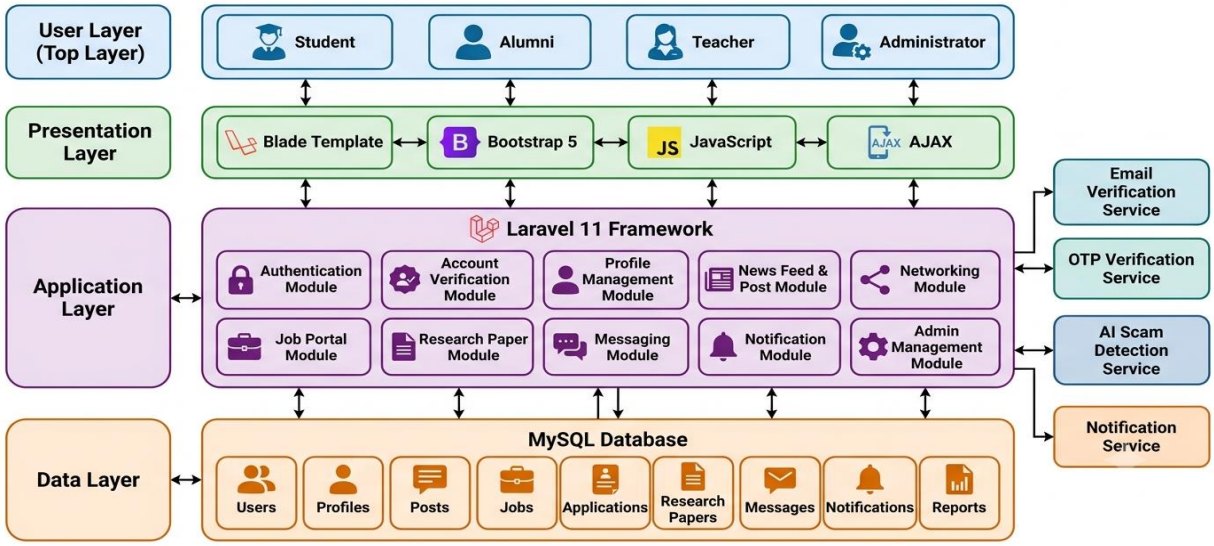



**Fig 4.1: System Architecture Diagram**

## 4.3 UML System Design

Unified Modeling Language (UML) diagrams are used to visually represent the structure and behavior of the proposed system. This section presents the Use Case Diagram, Activity Diagrams, and Sequence Diagrams developed for Borobhai.online.

### 4.3.1 Use Case Diagram

The Use Case Diagram illustrates the interactions between the system's actors. Student, Alumni, Teacher, and Administrator and the core functionalities of Borobhai.online, including authentication, profile management, networking, content management, career management, communication, and administration. **Fig 4.2** presents the complete Use Case Diagram, which visually summarizes the interactions between the system actors and the core functionalities of Borobhai.online.

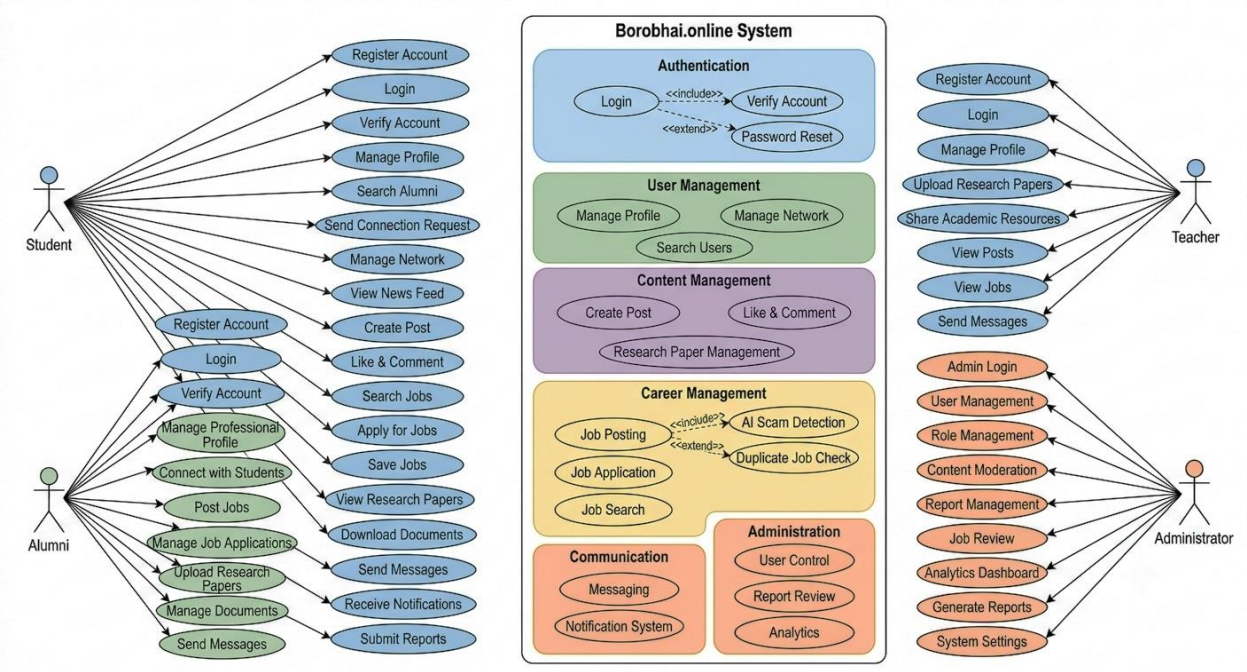



**Fig 4.2: Use Case Diagram**

### 4.3.2 User Registration Activity Diagram

The Activity Diagram illustrates the complete workflow of the user registration and verification process. As shown in **Fig 4.3**, the process begins when a user accesses the registration page and selects an appropriate account type. The user then provides the required personal information and submits the registration form. The system validates the entered information and proceeds with OTP-based verification. After successful OTP verification, the registration process is completed, and the user is redirected to the appropriate dashboard based on their selected account type. This workflow provides a clear representation of the sequential activities involved in account creation, validation, verification, and dashboard access.

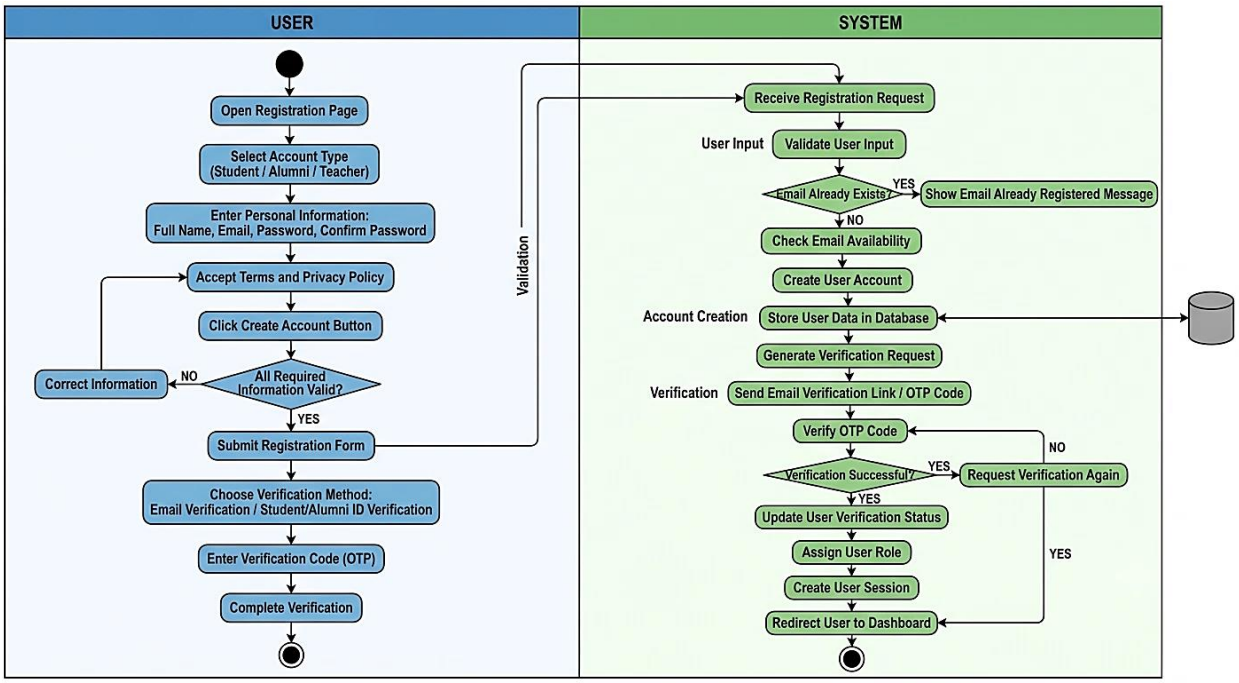



**Fig 4.3: User Registration Activity Diagram**

### 4.3.3 Job Posting and AI Scam Detection Activity Diagram

The Activity Diagram presents the complete workflow of job posting by an Alumni user in Borobhai.online. As illustrated in **Fig 4.4**, the process begins when the Alumni user accesses the job posting interface and enters the required job information, including the job title, company name, location, job type, experience requirements, salary, application deadline, description, and other relevant details. After submitting the form, the system first checks whether the user has an available job-posting quota. If the quota is not available, the submission is stopped and the user is notified accordingly. If the quota is available, the system checks the submitted job against existing postings to identify possible duplicate entries.

When no duplicate is detected, the submitted job is forwarded to the AI-based scam detection process. The AI system analyzes the job information to identify suspicious, misleading, or potentially fraudulent content. Based on the screening result, a job that passes the verification process can be published on the Job Portal, while a suspicious submission is placed in the Admin review queue for further inspection. The Admin can then review the flagged job and decide whether it should be approved or rejected. This multi-step workflow helps maintain the reliability and quality of job listings by controlling posting quotas, reducing duplicate content, and providing an additional layer of protection against potentially fraudulent or misleading job advertisements.

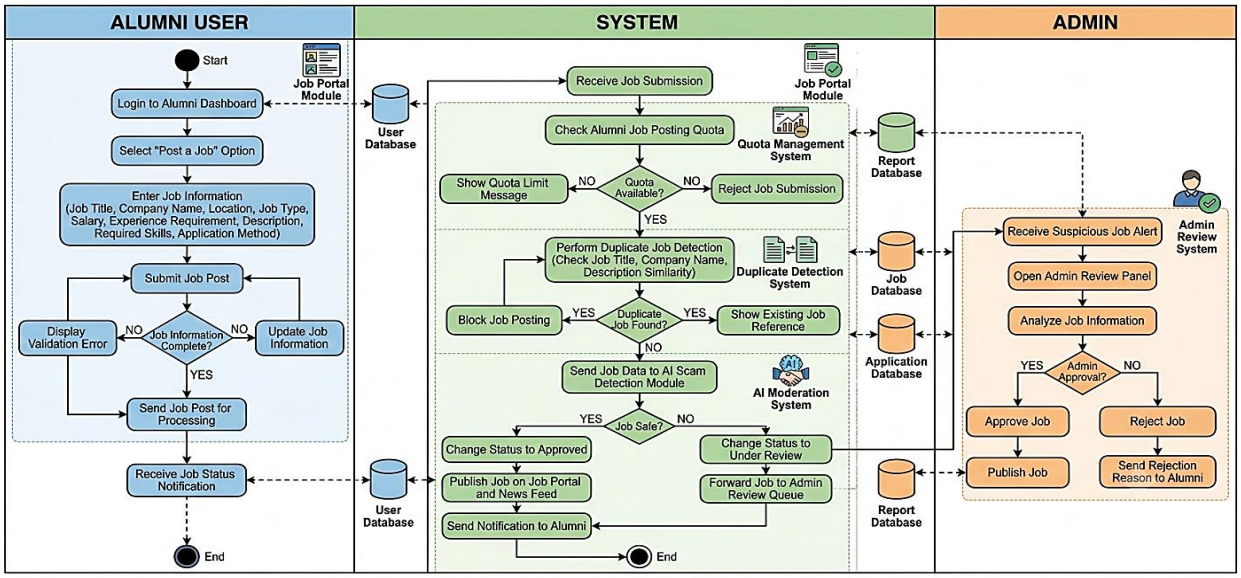



**Fig 4.4: Activity Diagram — Job Posting and AI Scam Detection Workflow**

### 4.3.4 User Login Sequence Diagram

A Sequence Diagram represents the time-ordered interactions between the user, interface, and system components during a specific process. For Borobhai.online, **Fig 4.5** illustrates the login sequence, showing how user credentials are submitted, authenticated by the system, and followed by the loading of the appropriate dashboard. This diagram provides a clear view of the communication between the components during authentication.

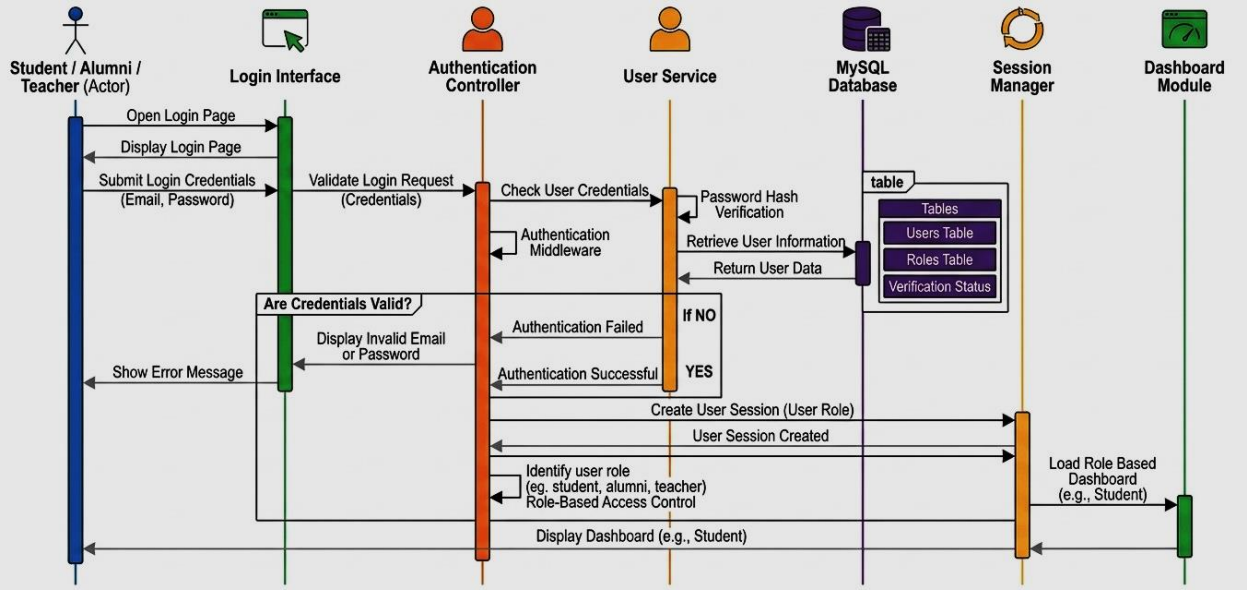



**Fig 4.5: Sequence Diagram — User Login Process**

### 4.3.5 Job Posting and AI Moderation Sequence Diagram

This Sequence Diagram illustrates the message flow among the Alumni user, Job Controller, Quota Management System, Duplicate Detection Module, AI Scam Detection Module, MySQL database, and Admin Panel during a job-posting event. As shown in **Fig 4.6**, the Alumni user submits a job posting, which is processed through quota verification, duplicate detection, and AI-based scam screening. The job data is then stored in the MySQL database, while suspicious submissions are forwarded to the Admin Panel for review. The diagram provides a clear overview of the interaction among these components during the job-posting process.

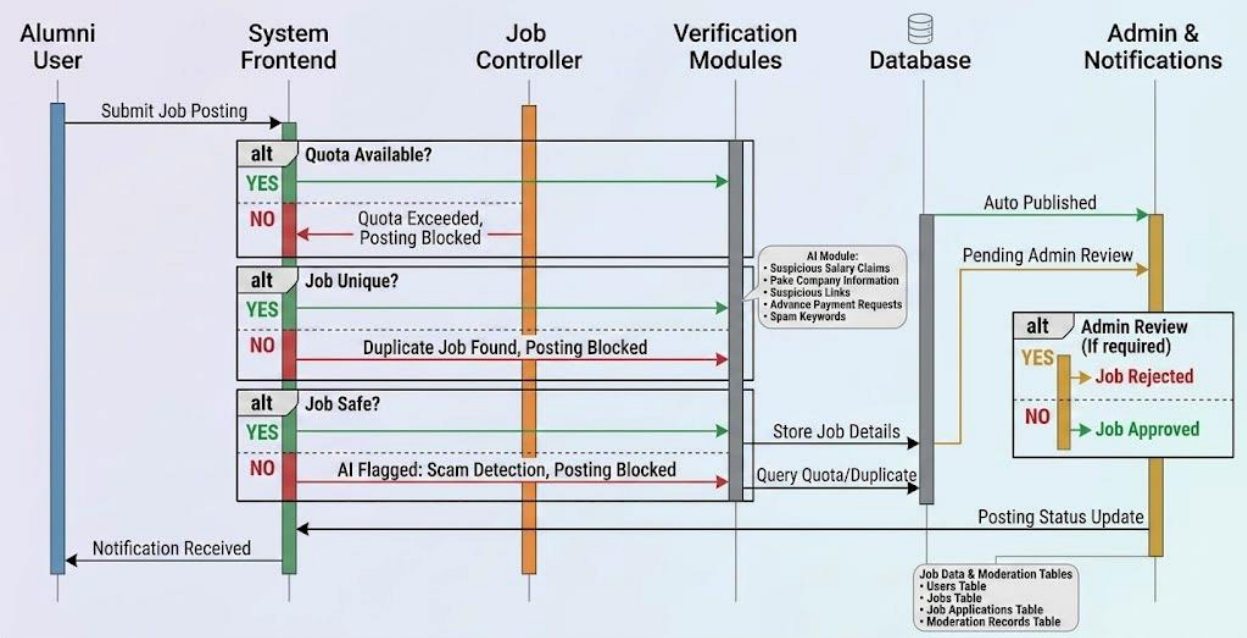



**Fig 4.6: Sequence Diagram — Job Posting and AI Moderation Process**

## 4.4 Data Flow Design

A Data Flow Diagram (DFD) is used to graphically represent how data moves through the Borobhai.online system. The DFD shows how users, processes, and data stores exchange information — describing how data is entered, processed, stored, and retrieved by the system. Both a Level 0 (Context Diagram) and a Level 1 DFD were developed for the proposed system.

### 4.4.1 Data Flow Diagram (DFD) — Level 0

The Level 0 DFD, also known as the Context Diagram, provides a high-level view of the Borobhai.online system and its interaction with external actors. As illustrated in **Fig 4.7**, Students, Alumni, Teachers, and Administrators interact with the system through activities such as registration, login, profile management, job services, communication, and administration. The diagram presents the overall flow of information between the external users and the system without showing its internal processing details.

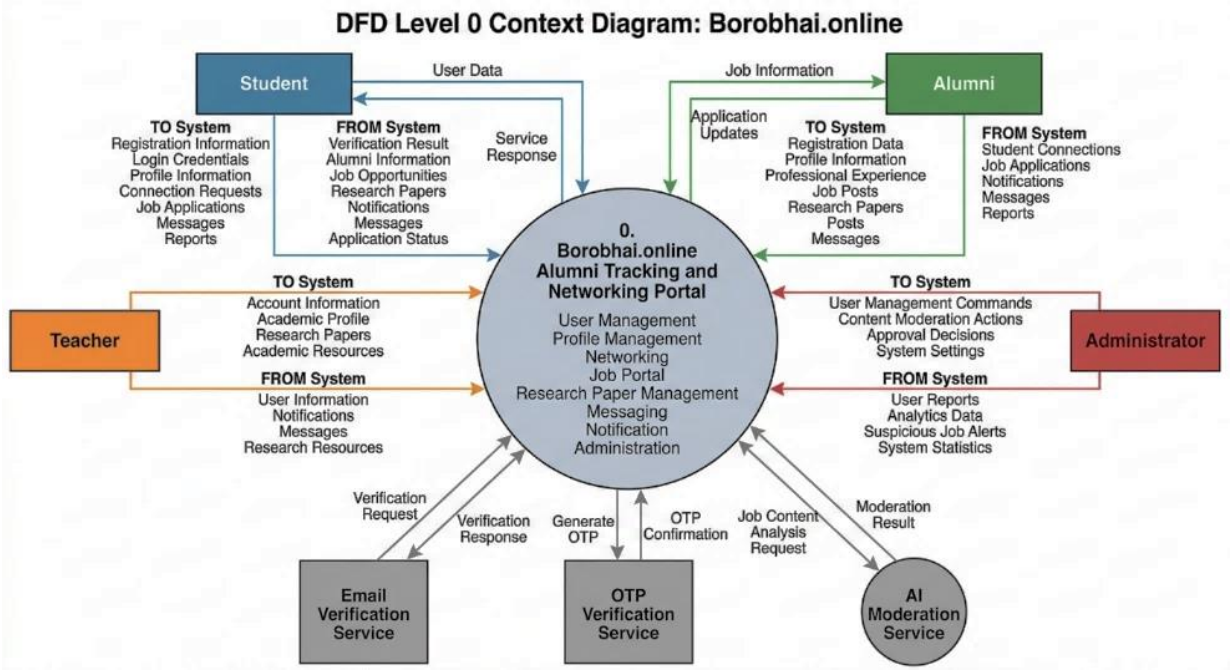



**Fig 4.7: Data Flow Diagram (DFD) Level 0 — Context Diagram**

### 4.4.2 Data Flow Diagram (DFD) — Level 1

The Level 1 DFD provides a detailed view of the Borobhai.online system by dividing it into major sub-processes. As illustrated in **Fig 4.8**, these include User Authentication, Profile Management, Networking, Job Portal, Research Paper Management, Communication and Notification, and Admin Management. The diagram shows how these processes interact with users and their respective data stores.

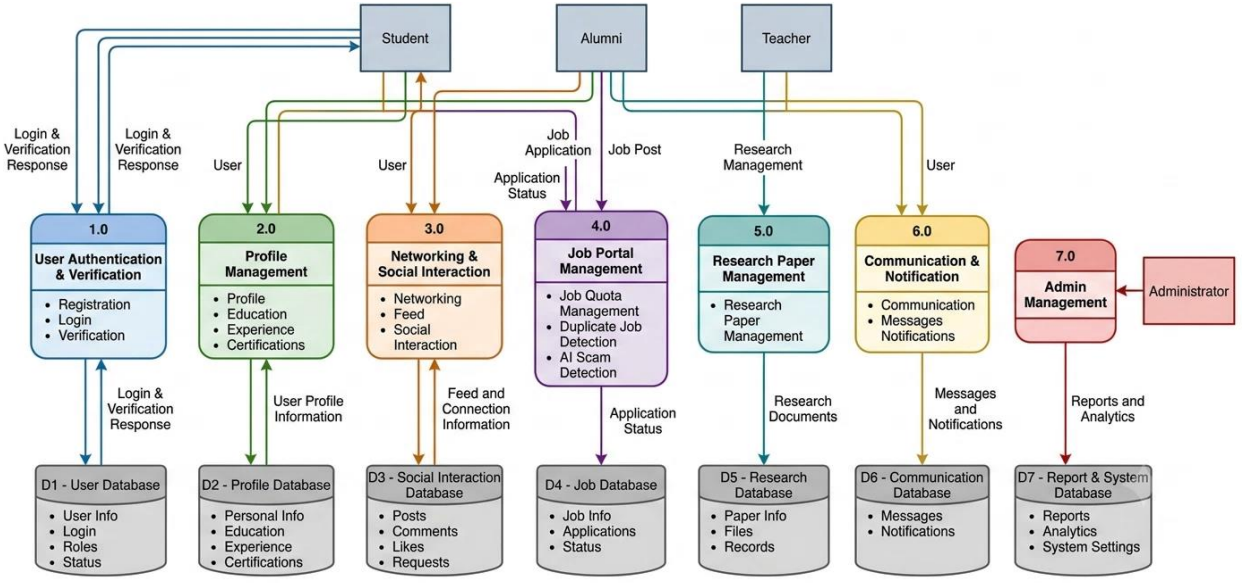



**Fig 4.8: Data Flow Diagram (DFD) Level 1 — Detailed System Process Flow**

## 4.5 Database Design — Entity Relationship Diagram (ERD)

The Entity Relationship Diagram (ERD), designed following standard relational database principles [9], represents the structure of the Borobhai.online database and the relationships among its core entities. As illustrated in **Fig 4.9**, the central User entity is connected with Profile, Post, Job, Research Paper, Message, Notification, Report, and Friend Request. A Post can have multiple Comments and Likes, while a Job can receive multiple Job Applications. This relational structure helps maintain data integrity and supports efficient data management across the platform's modules.

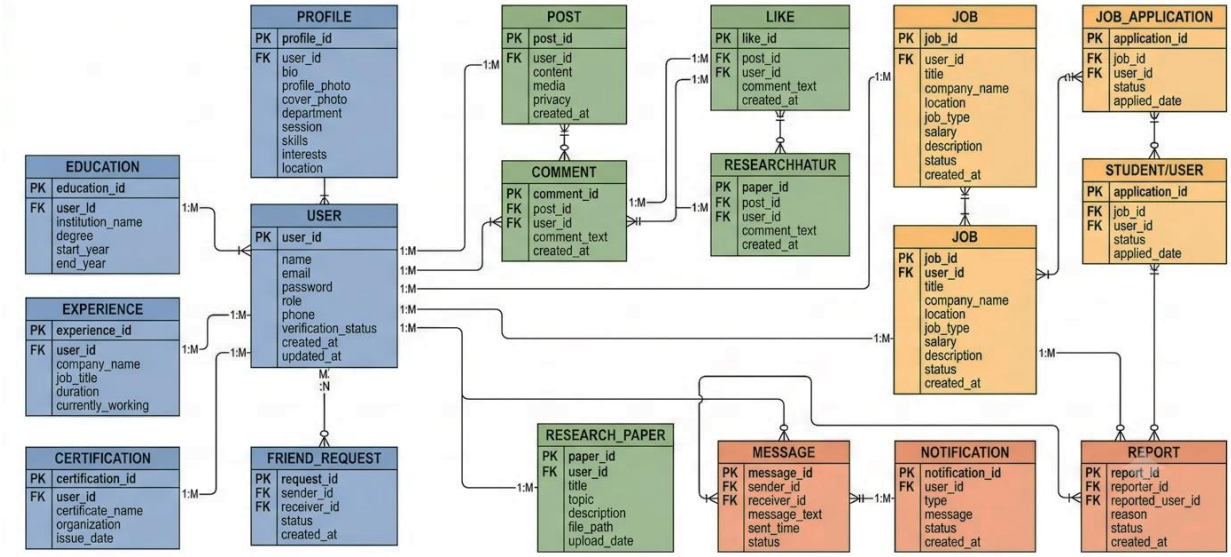



**Fig 4.9: Entity Relationship Diagram (ERD)**

## 4.6 Software Design — Class Diagram

The Class Diagram illustrates the object-oriented structure of the Borobhai.online application, which is implemented using Laravel's Eloquent models and controllers. As shown in **Fig 4.10**, the diagram presents the core classes of the system, including User, Profile, Post, Job, Job Application, Message, Notification, Report, and Admin, along with their attributes, methods, and relationships. It demonstrates how these classes are connected and interact with each other to support the major functionalities of the platform. The User class serves as a central component, maintaining relationships with several other classes and enabling different user-related operations. The diagram also reflects the use of Laravel's MVC architecture, where models manage data and relationships while controllers handle application logic and user requests. Overall, the Class Diagram provides a clear representation of the software structure and the relationships among the major components of Borobhai.online..

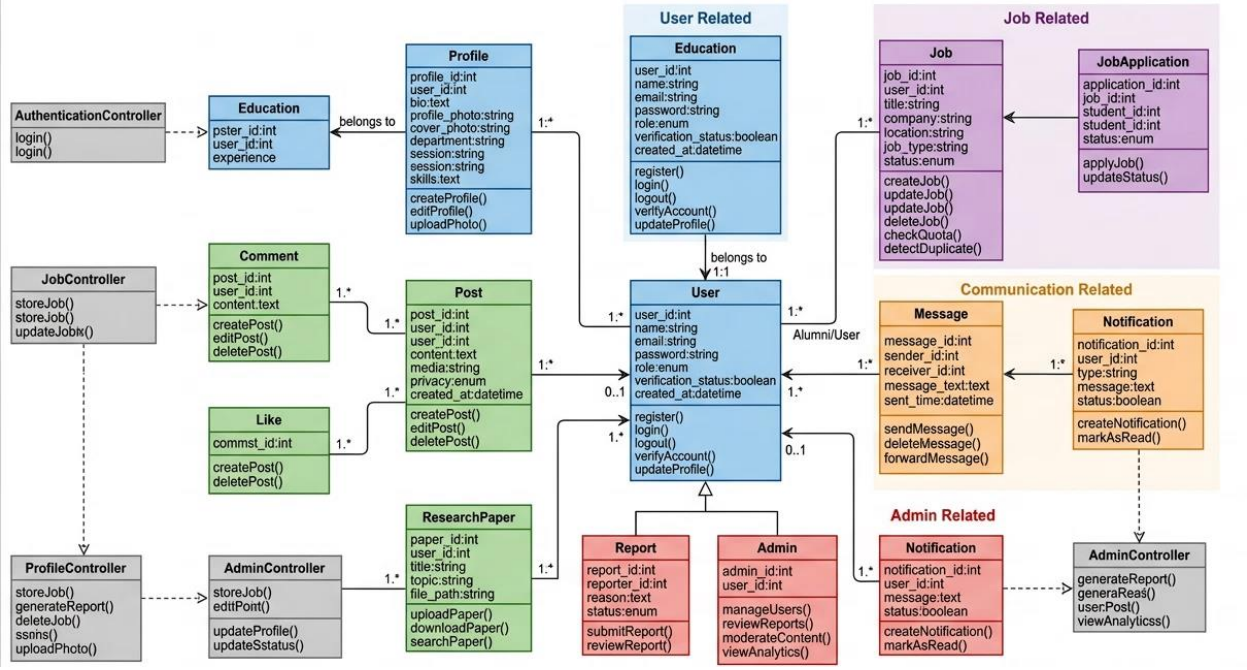



**Fig 4.10: Class Diagram — Laravel MVC-Based System Design**

## 4.7 Deployment Design

The Deployment Diagram shows the physical architecture of the Borobhai.online system and illustrates how its different components are connected and communicate with each other. As illustrated in **Fig 4.11**, users access the platform through web browsers using different client devices, such as computers, laptops, tablets, or smartphones. These client devices communicate with the Web Server over a secure HTTPS connection, where the Laravel 11 application handles user requests, authentication, business logic, and other system operations.

The Laravel application communicates with the MySQL Database Server to store and retrieve important system information, including user accounts, profiles, posts, jobs, applications, messages, notifications, and reports. The system also uses File Storage for managing uploaded documents and other user-generated files. In addition, the application connects with external services for email verification, OTP-based verification, and AI-based moderation. This deployment structure provides a clear representation of the physical components and communication paths required to operate the Borobhai.online platform efficiently and securely.

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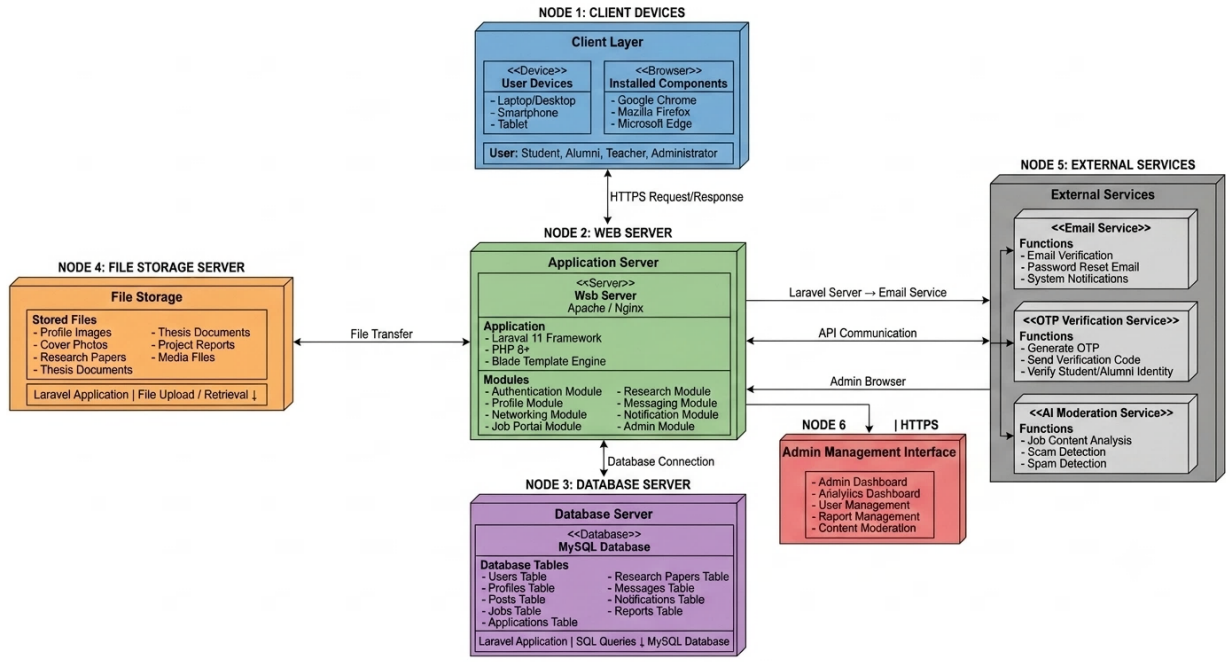



**Fig 4.11: Deployment Diagram — Server, Laravel Application, Database and External Services Architecture**

## 4.8 Chapter Summary

This chapter presented a detailed overview of the design of the proposed **Borobhai.online, Alumni Networking Platform.** It described the overall system architecture and illustrated the functional and structural aspects of the system using UML diagrams, Data Flow Diagrams (DFDs), the Entity Relationship Diagram (ERD), Class Diagram, and Deployment Diagram. These design models helped to clearly define the interactions between different users, system components, processes, and database entities.

The chapter also provided a clear representation of how the major modules of the system are organized and connected with each other. The database and application structure were designed to support the functional requirements of the platform while maintaining consistency, scalability, and ease of maintenance. Overall, the design artifacts presented in this chapter provide a structured blueprint for the development of the proposed application. The design established in this chapter serves as the foundation for the system implementation, testing, and performance evaluation discussed in the following chapter.

# CHAPTER 5
# SYSTEM IMPLEMENTATION, TESTING AND RESULTS

## 5.1 Introduction

This chapter presents the implementation, testing, and evaluation of the proposed Borobhai.online, Alumni Networking Platform. It covers the development environment, the technologies used, the implementation of each functional module, the testing methods applied, and an analysis of the results obtained. Following the design presented in Chapter 4, the system was developed using Laravel 11, PHP, MySQL, Blade Template, Bootstrap 5, JavaScript, and AJAX. Each module was implemented, tested individually, and then integrated into the complete platform.

## 5.2 Development Environment

The development of Borobhai.online was conducted locally using Laravel 11, PHP 8.2+, and MySQL 8.0. Visual Studio Code was used for development, while Composer managed dependencies and Git/GitHub supported version control.

### 5.2.1 Hardware Requirements

The hardware requirements used for the development environment are presented in Table 5.1, which specifies the minimum recommended processor, RAM, storage, and internet connectivity required for developing and operating the system.

| Component | Specification |
|---|---|
| Processor | Intel Core i5 or higher |
| RAM | 8 GB minimum (16 GB recommended) |
| Storage | 256 GB SSD or higher |
| Internet Connection | Stable broadband connection |

**Table 5.1: Hardware Requirements (Development Environment)**

### 5.2.2 Software Requirements

The software requirements of the development environment are summarized in Table 5.2, including the backend and frontend technologies, database system, development tools, and server environment used for implementing Borobhai.online.

| Component | Specification |
|---|---|
| Backend | Laravel 11, PHP 8.2+ |
| Frontend | Blade Template, Bootstrap 5, JavaScript, AJAX |

| Component | Specification |
|---|---|
| Database | MySQL 8.0 |
| Development Tools | Visual Studio Code, Postman, Git/GitHub |
| Server Environment | Apache / Nginx (XAMPP/Laravel Sail for local development) |

**Table 5.2: Software Requirements (Development Environment)**

## 5.3 System Implementation

Following the software architecture presented in Chapter 4, the Borobhai.online platform was implemented module by module. This section describes the implementation of each functional module along with the corresponding user interface.

### 5.3.1 User Registration Module

The registration module allows new users to select an account type (Student, Alumni, or Teacher), provide their name, email, and password, and accept the Terms & Privacy Policy. As shown in Fig 5.1, the interface includes required fields and client-side validation. The "Create Account" button remains disabled until all required information is entered correctly, reducing invalid submissions and improving usability.

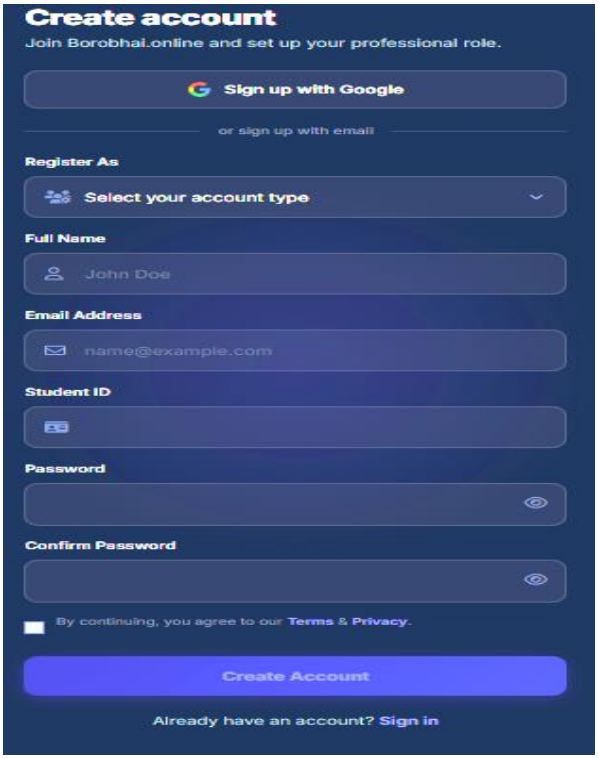



**Fig 5.1: User Registration Interface**

### 5.3.2 User Login Module

The login module allows a registered user to sign in using their email/Student ID and password, or through Google sign-in. A password-visibility toggle and a "Keep me logged in" option improve usability, and the interface is fully responsive across desktop and mobile devices, as shown in Fig 5.2(a) and Fig 5.2(b).

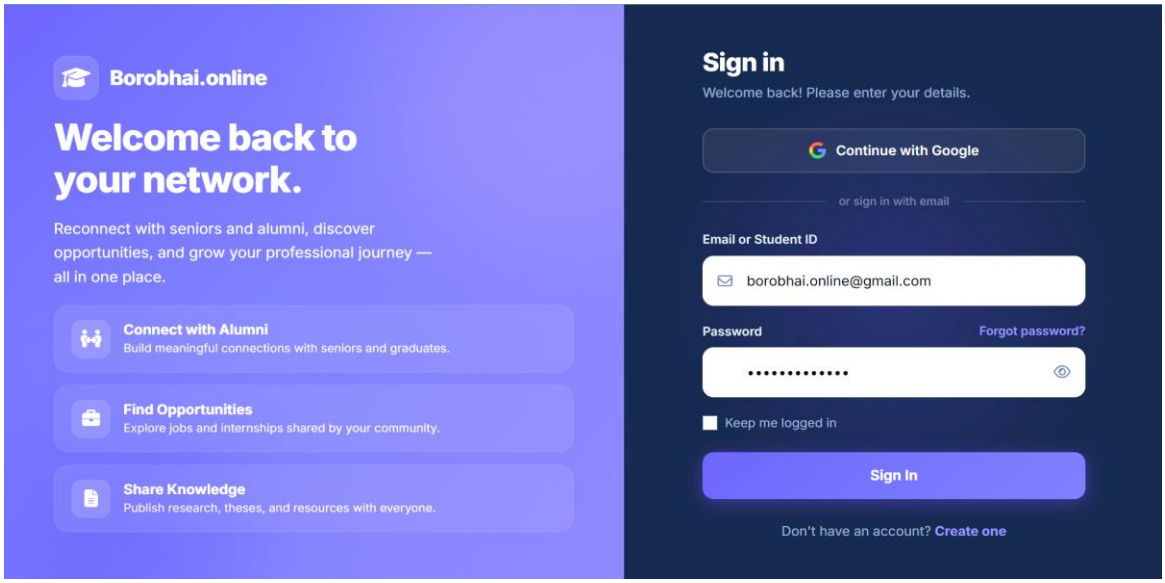



**Fig 5.2(a): User Login Interface — Desktop View**

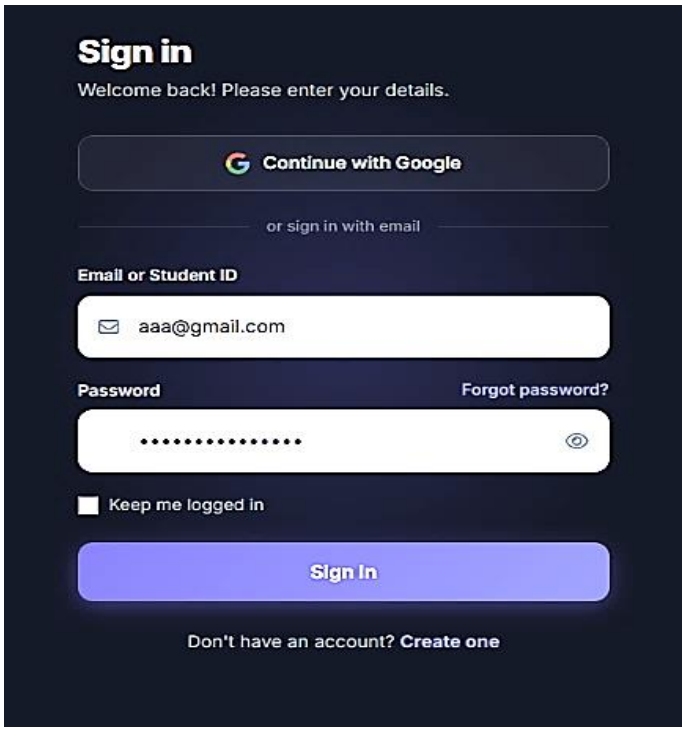



**Fig 5.2(b): User Login Interface — Responsive (Mobile/Compact) View**

### 5.3.3 Account Verification Module

To increase user authenticity and prevent unauthorized access, Borobhai.online includes an account verification module. Newly registered users must complete a verification step before accessing the platform's full features.

The system offers two verification methods:

- Email Verification
- Student/Alumni ID Verification (via OTP)

After registration, the system sends a verification notification to the user's dashboard. For email verification, the system sends a verification link to the registered email. Alternatively, users can verify their identity by providing their student or Alumni ID; the system then looks up the contact information already on file for that ID and sends a One-Time Password (OTP). Once the correct code is entered, the account is marked as verified.

After successful verification, a "Verified Badge" is displayed on the user's profile, which increases trust and confirms that the account belongs to a genuine member of the university.

### 5.3.4 User Dashboard and News Feed Module

After logging in, users are directed to a personalized dashboard that combines a social news feed with quick-access navigation. **As shown in Fig 5.4,** the center column displays posts from connections along with a post-composer supporting text, photos/videos, and background colors; the left sidebar provides navigation to Friends, saved items, Job History, and Research Papers; and the right sidebar surfaces recent job listings, active connections, and suggested contacts.

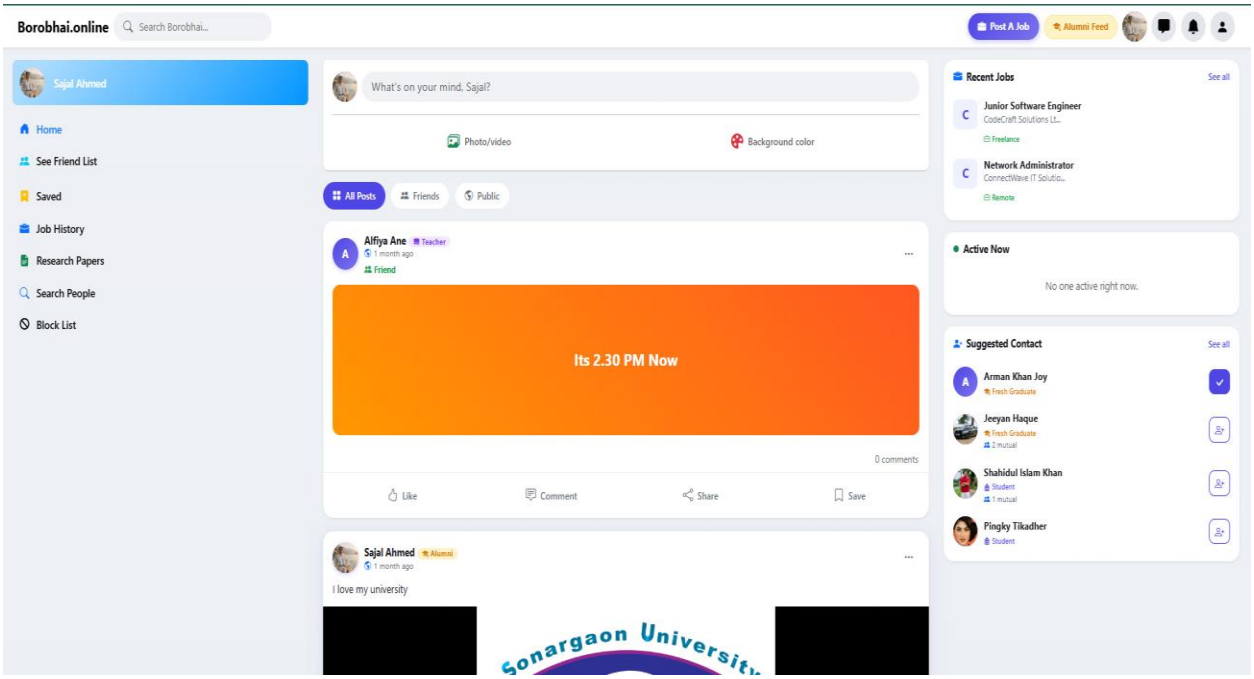



**Fig 5.4: User Dashboard and News Feed Interface**

### 5.3.5 Profile Management Module

The Profile Management module allows users to create, update, and maintain their personal, academic, and professional information through a structured and user-friendly interface. The module is divided into several sections, including **About, Education, Experience, Certifications, and Documents**, allowing users to manage different types of information separately. Users can update their personal details, academic qualifications, professional experience, certifications, and relevant documents as needed. The module also supports profile and cover photo updates through **AJAX**, allowing changes to be applied instantly without requiring a complete page reload. In addition, users can add multiple entries under the **Education** and **Experience** sections and independently edit or remove individual entries when necessary. The system automatically displays the most recent education and experience information first, making the user's latest academic and professional achievements easier to identify. As shown in **Fig 5.5**, the resulting profile view presents this information in an organized manner, helping users maintain an up-to-date professional identity and allowing other members to easily understand their academic and career background.

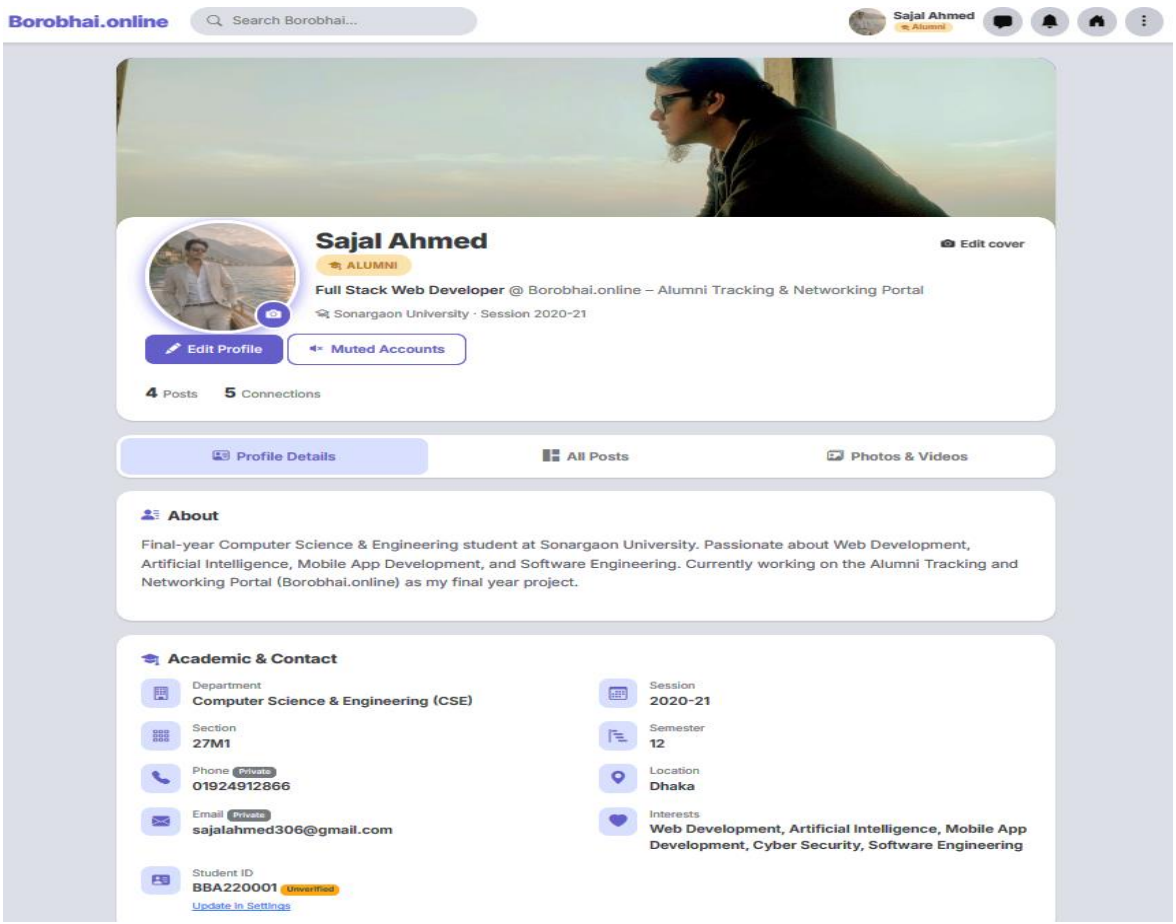



**Fig 5.5: Profile Management Interface**

### 5.3.6 Job Portal Module

The Job Portal displays published job and internship listings as cards showing title, company, location, job type, salary, experience required, and application deadline, with a "View Details & Apply" action on each. The listing supports search, filtering by job type, and sorting by newest or deadline. Fig 5.6 shows the Job Portal interface where these job and internship opportunities are presented with the available search and filtering features.

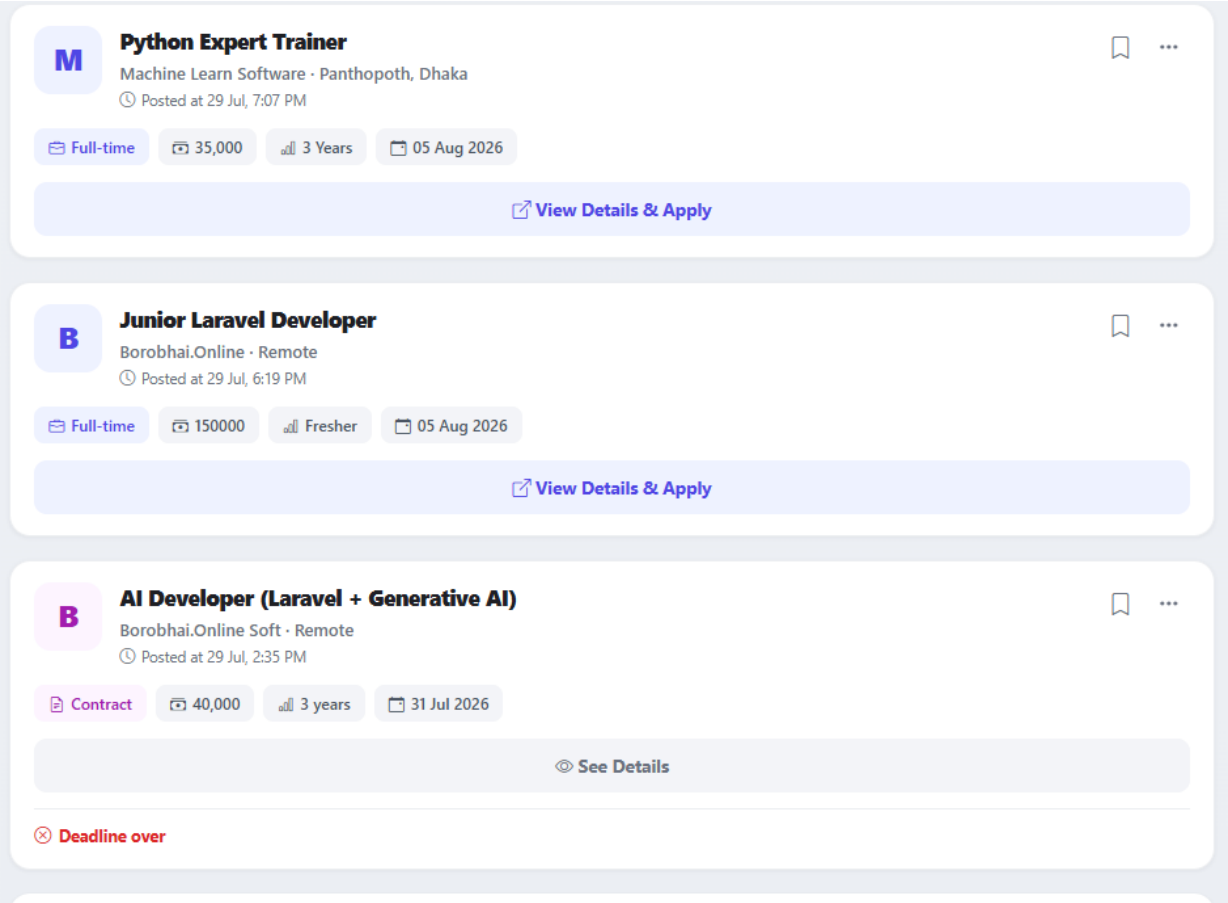



**Fig 5.6: Job Portal Interface**

### 5.3.7 Job Posting Interface

The Job Posting Interface provides Alumni and Teacher accounts with a dedicated and structured form for publishing job and career opportunities on the platform. Through the **"Post a Job"** option, authorized users can enter all necessary information related to a job vacancy, including Job Title, Company Name, Location, Job Type, Required Experience, Salary, Job Category, Application Deadline, Job Description, Requirements, Required Skills, and Apply Link or Email. The form is designed to ensure that sufficient and relevant information is provided before a job circular is submitted. **As shown in Fig 5.7, the Job Posting Interface provides a structured form through which authorized users can enter and submit the required job information.**

During submission, the system performs quota verification, duplicate-post detection, and **AI-assisted scam screening** to identify suspicious or fraudulent job postings. If necessary, a submission is flagged for Admin review before publication. These checks help reduce spam and duplicate content while maintaining the quality and reliability of job-related information on the platform.

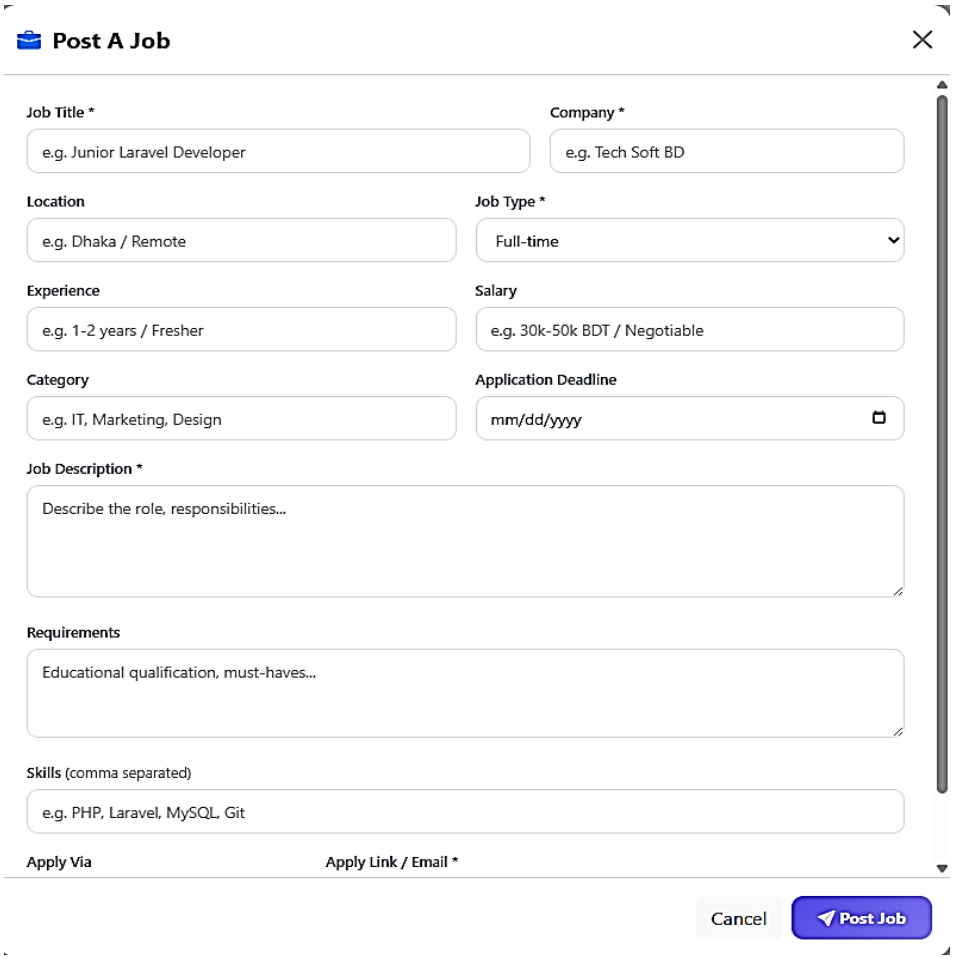



**Fig 5.7: Job Posting Interface**

### 5.3.8 Research Paper Management Module

The Research Papers module allows users to access academic documents such as:

- Thesis Papers
- Project Reports
- Research Articles
- Academic Presentations

Users can upload and download papers, with each upload requiring metadata such as document title, research topic, and document type. Papers can also be previewed, saved, and searched or filtered by title, topic, or department, making the repository a convenient, centralized academic library for the whole university community. **Fig 5.8** shows the Research Papers interface that supports these academic document management and repository functions.

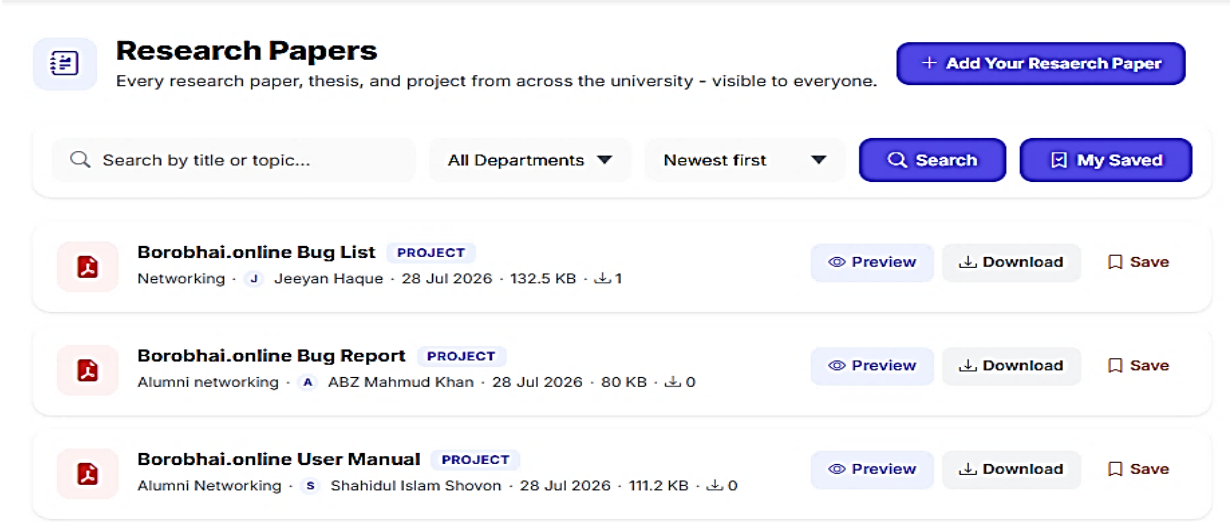



**Fig 5.8: Research Papers Interface**

### 5.3.9 Search System Module

The global search feature, accessible from the top navigation bar, provides live suggestions as the user types. Results are grouped by category — such as People and Thesis Topic — allowing users to quickly locate other members, research papers, or relevant content across the platform. **As shown in Fig 5.9,** the Search System interface presents the search functionality and categorized results that help users locate relevant information efficiently.

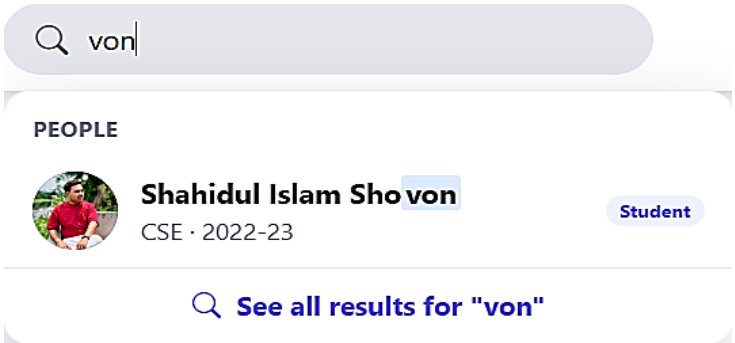



**Fig 5.9: Search System Interface**

### 5.3.10 Networking and Friend System Module

The Networking and Friend System Module allows users to send, accept, or decline connection requests, unfriend or block other users, view mutual connections, and discover suggested contacts based on shared department, batch, or interests. As shown in **Fig 5.10**, the **"My Network"** interface brings together the user's connections, pending requests, and suggested contacts in a single place, making it easier to manage and expand their professional and academic network.

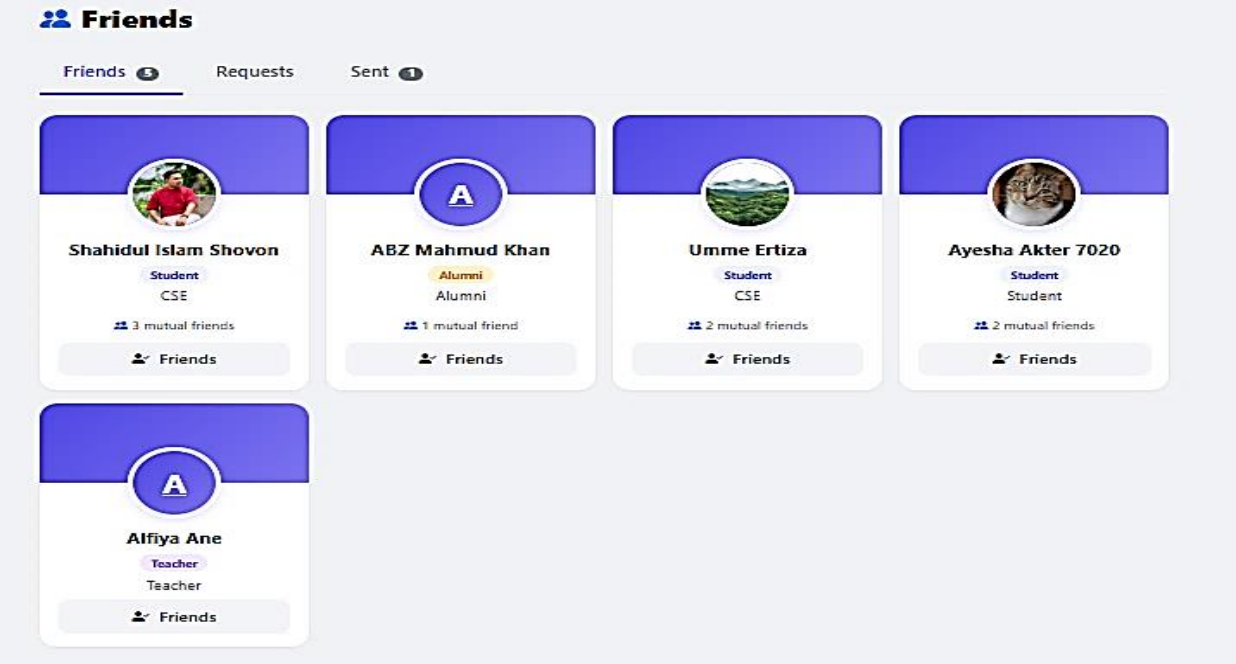



**Fig 5.10: Networking**

### 5.3.11 Messaging Module

The Messaging Module enables private and real-time communication between connected users of the system. It provides a convenient environment for users to communicate directly with their friends, classmates, alumni, teachers, and other connected members. The module supports sending and deleting messages, viewing the online status of users, and checking their last-seen information. Users can exchange text-based messages within individual conversations, allowing them to maintain direct communication without relying on external messaging platforms. The conversation interface is designed to provide a simple and user-friendly experience for viewing previous messages and managing ongoing conversations. As shown in **Fig 5.11**, the Messaging Interface provides a dedicated conversation environment where connected users can communicate, view message history, and manage their messages conveniently. This module enhances networking and collaboration among members of the Borobhai.online platform.

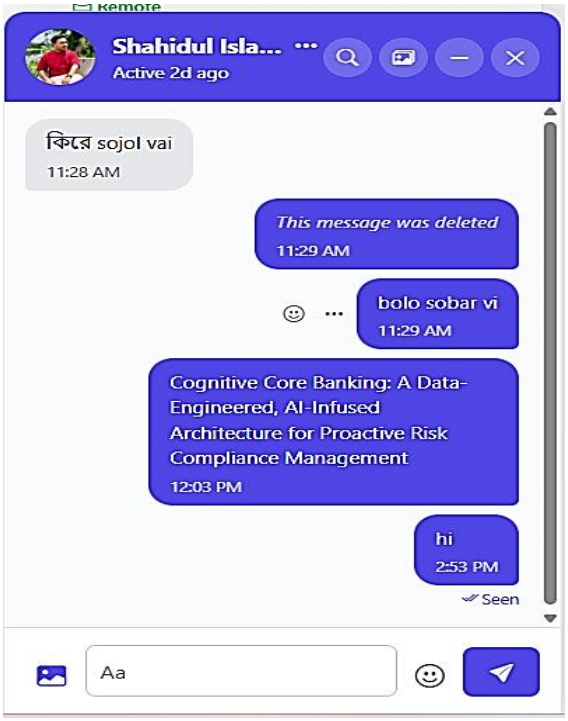



**Fig 5.11: Messaging Interface**

### 5.3.12 Notification Management Module

The Notification Management Module keeps users informed about important platform activities, such as warnings, friend requests, comments, likes, and replies. Notifications are available through a dropdown panel in the top navigation bar and can be marked as read individually or all at once. As shown in **Fig 5.12**, the Notification Interface provides a centralized panel for viewing and managing notifications conveniently.

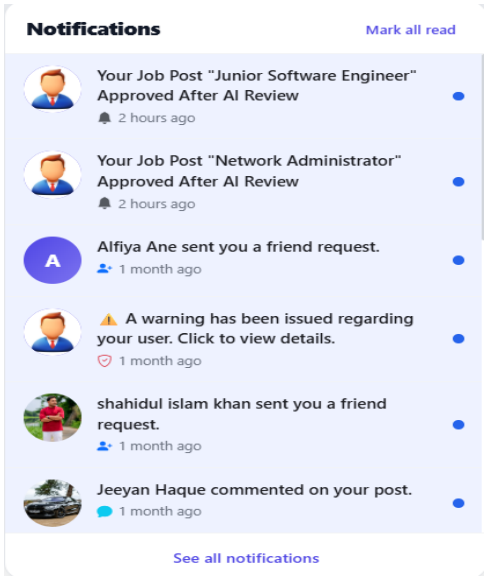



**Fig 5.12: Notification Interface**

### 5.3.13 Report and Content Moderation Module

The Report and Content Moderation Module allows users to report posts, jobs, or accounts that appear inappropriate or suspicious by providing a specific reason. Submitted reports are added to the Admin's review queue for further evaluation. As shown in **Fig 5.13**, the moderation interface allows administrators to review reported content and take appropriate actions, such as marking a report as seen, warning a user, dismissing a report, deleting reported content, or suspending an account. This module helps maintain a safe and reliable environment across the platform.

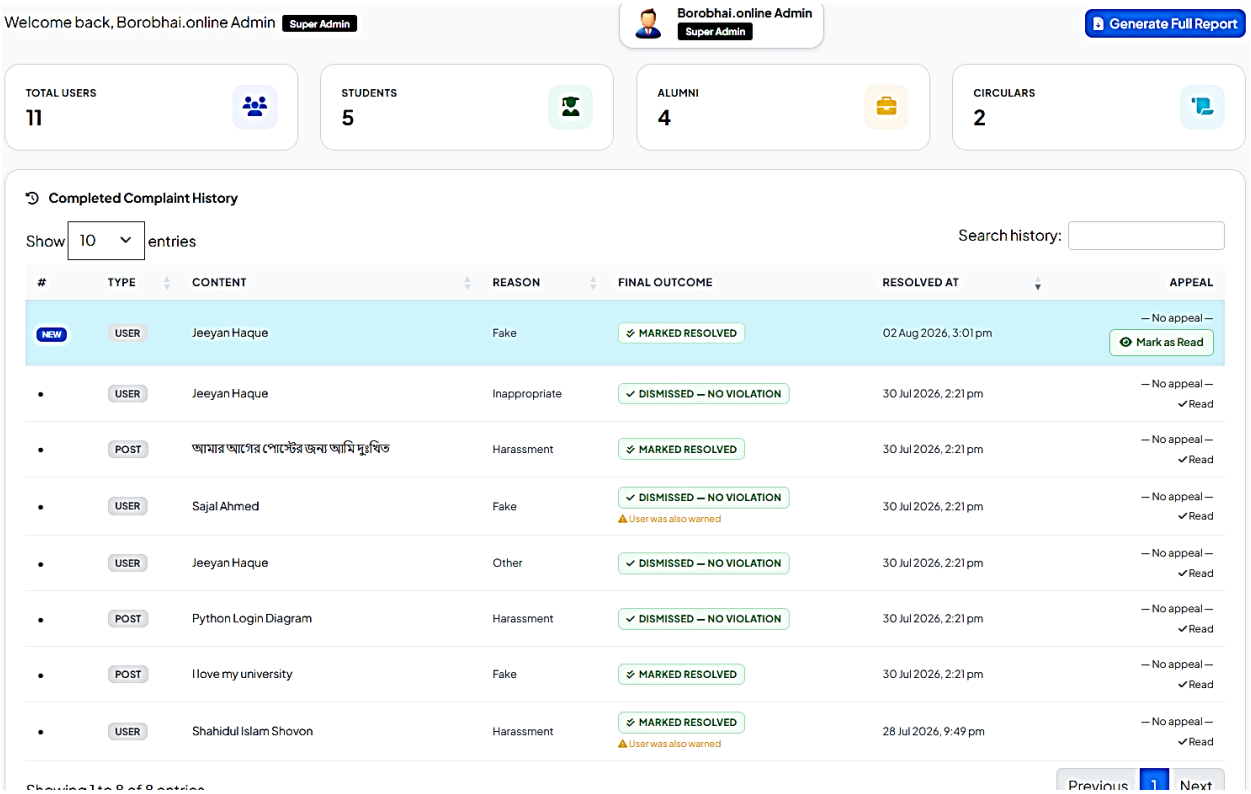



Fig 5.13: Report and Content Moderation Interface

### 5.3.14 Admin Dashboard Implementation

The Admin Dashboard provides a centralized control panel for platform administrators. It includes an Analytics view with registration and user-engagement metrics generated using **Chart.js**, along with sections for User Management, Reported Content, Reported Jobs, and Completed Reports. As shown in **Fig 5.14(a)**, the Analytics view presents platform activity and user statistics in a clear visual format, helping administrators monitor overall system performance.

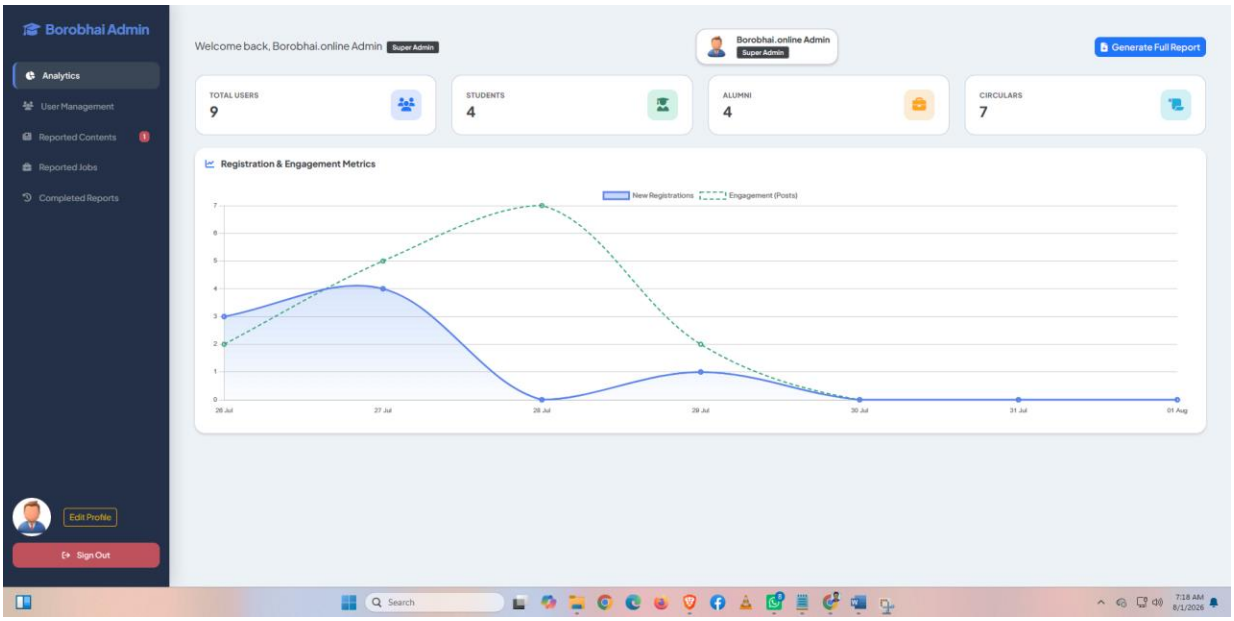



**Fig 5.14(a): Admin Dashboard Interface — Analytics View**

Administrators can also generate a downloadable PDF summary of platform activity, including total users, role distribution, job circulars, and report statistics. **Fig 5.14(b)** presents the generated PDF report, which organizes these key platform statistics into a structured and downloadable format. This feature helps administrators review and maintain an overall record of platform activities.

## Borobhai.online — Admin Report

Generated by Borobhai.online Admin on 01 Aug 2026, 7:19 am

### Summary

| | | | |
|---|---|---|---|
| **9** TOTAL USERS | **4** STUDENTS | **4** ALUMNI | **0** TEACHERS |
| **7** JOB CIRCULARS | **1** PENDING REPORTS | **7** RESOLVED REPORTS | **0** SUSPENDED USERS |

### User List (9)

| # | NAME | EMAIL | ROLE | STATUS | JOINED |
|---|---|---|---|---|---|
| 1 | ABZ Mahmud Khan | shahidul.shovon.work@gmail.com | Alumni | Active | 26 Jul 2026 |
| 2 | Arman Khan Joy | calude.test.user@gmail.com | Alumni | Active | 26 Jul 2026 |
| 3 | Ayesha Akter 7020 | akhiakteras123@gmail.com | Student | Active | 27 Jul 2026 |
| 4 | Borobhai.online Admin | borobhai.online@gmail.com | Admin | Active | 11 Jul 2026 |
| 5 | Jeeyan Haque | developer.shovon33@gmail.com | Alumni | Active | 27 Jul 2026 |
| 6 | Sajal Ahmed | sajalahmed306@gmail.com | Alumni | Active | 27 Jul 2026 |
| 7 | Shahidul Islam Khan | islamkhans148@gmail.com | Student | Active | 29 Jul 2026 |
| 8 | Shahidul Islam Shovon | shahidul.webdev@gmail.com | Student | Active | 26 Jul 2026 |
| 9 | Umme Ertiza | ertiza171@gmail.com | Student | Active | 27 Jul 2026 |

**Fig 5.14(b): PDF Report Generated from the Admin Dashboard**

## 5.4 System Testing

Testing is a critical phase in verifying that Borobhai.online functions correctly, satisfies the specified requirements, and performs reliably under expected usage conditions. Several types of testing were carried out, including functional testing, validation testing, user acceptance testing, and performance testing.

### 5.4.1 Functional Testing

Functional testing was conducted to verify that the major modules of the Borobhai.online system perform according to the specified requirements. The testing covered key functions, including user registration, authentication, profile management, networking, messaging, job posting, AI-based scam detection, notifications, reporting, and administrative operations. The results confirmed that the tested functions worked as expected under the defined test conditions. **Table 5.3** presents the functional testing results for the major system modules and their corresponding test cases.

| Test Case | Test Scenario | Expected Result | Status |
|---|---|---|---|
| User Registration | Register with valid role, name, email, and password | Account created; verification prompt shown | Pass |
| Duplicate Email Check | Register with an already-used email | Registration blocked with an appropriate error | Pass |
| Login Authentication | Login with valid/invalid credentials | Valid login succeeds; invalid login is rejected | Pass |
| Account Verification | Complete email/ID verification with OTP | Account marked as Verified | Pass |
| Profile Update | Edit education, experience, certifications | Changes saved and reflected instantly | Pass |
| Post Creation | Create a post with text/media and a privacy level | Post appears in feed according to privacy setting | Pass |
| Job Posting Quota | Post jobs beyond the conFigd monthly limit | Submission blocked once quota is reached | Pass |
| Duplicate Job Detection | Submit an identical job listing twice | Second submission blocked with a link to the existing post | Pass |
| AI Job Screening | Submit a job with suspicious content | Job withheld and routed to Admin review queue | Pass |

| Test Case | Test Scenario | Expected Result | Status |
|---|---|---|---|
| Job Application | Apply to a published job as a Student | Application recorded and visible in “My Applications” | Pass |
| Messaging | Send/edit/delete a message between connected users | Message delivered and updated in real time | Pass |
| Report Submission | Report a post/job/user with a reason | Report appears in the Admin review queue | Pass |

**Table 5.3: Functional Testing Results**

### 5.4.2 Validation Testing

Validation testing was conducted to ensure that the system correctly handles invalid, incomplete, or incorrect input data before processing the request. The tested forms successfully prevented invalid submissions and displayed appropriate validation messages. **Table 5.4** presents the validation testing results for the major input forms and their corresponding test cases.

| Form/Field | Invalid Input Scenario | Expected Result | Status |
|---|---|---|---|
| Registration Form | Empty/invalid fields | Inline validation error; submit button remains disabled | Pass |
| Password Field | Password shorter than 8 characters | Validation error shown | Pass |
| Email Field | Malformed email address | Validation error shown | Pass |
| Job Posting Form | Missing required fields (title, description) | Form rejects submission with error highlights | Pass |
| File Upload | Unsupported file type / oversized file | Upload rejected with an appropriate message | Pass |

**Table 5.4: Validation Testing Results**

### 5.4.3 User Acceptance Testing (UAT)

User Acceptance Testing (UAT) was conducted with a group of student and faculty testers to evaluate the usability and overall acceptance of the system. The testers rated each major module using a 5-point usability scale and provided qualitative feedback based on their experience. **Table 5.5 presents the UAT results, including the usability ratings and feedback for the major system modules**

| Module | Average Rating (out of 5) | Feedback Summary |
|---|---|---|
| Registration & Verification | 5 | Intuitive; verification step increased confidence in the platform |
| News Feed | 5 | Familiar, social-media-like layout; easy to use |
| Job Portal | 5 | Testers appreciated the quota and scam-detection safeguards |
| Research Papers | 4 | Useful, though search filters could be more granular |
| Messaging | 5 | Fast and responsive; reactions and forwarding well received |
| Admin Dashboard | 4 | Clear analytics; testers wanted more export options |

**Table 5.5: User Acceptance Testing Results**

### 5.4.4 Performance Testing

Performance testing was conducted to evaluate the responsiveness and stability of key system operations under normal and moderately concurrent loads. The results showed that the major operations responded within an acceptable time under the tested conditions. **Table 5.6 presents the performance testing results for the selected system operations.**

| Metric | Result | Notes |
|---|---|---|
| Page Load Time (Feed) | < 2 seconds | Under normal load with moderate data volume |
| AJAX Response Time (Likes/Comments) | < 500 ms | Felt instantaneous to testers |
| Job Search & Filter | < 1.5 seconds | With pagination at 12 results per page |
| AI Job Screening Delay | Few seconds (intentional) | Mimics a realistic moderation queue |
| Concurrent Users (test load) | 50 simulated users | No noticeable degradation observed |

**Table 5.6: Performance Testing Results**

## 5.5 Results and Discussion

Implementation and testing of Borobhai.online have revealed that the system is able to meet the key functional requirements for the Alumni Networking Platform. All of the main modules, such as user registration, user verification, profile management, news feed, job portal, research papers, networking, messaging, notifications, and content moderation, were functioning correctly as part of functional testing.

The system proved to be able to work properly in case of invalid and incomplete input during validation testing. During User Acceptance Testing, positive feedback about usability and functionality was provided by the testers.

As can be seen from the above, the testing has proved that Borobhai.online is indeed able to provide a centralized platform for alumni networking and management.

### 5.5.1 Achievement of Project Objectives

The development and evaluation of Borobhai.online demonstrate that the major objectives defined for the project have been successfully achieved. The implemented features and testing results show that the system provides the required facilities for centralized alumni management, student–alumni interaction, career development, academic resource sharing, secure user management, and administrative control.

**1. Alumni and Student Networking**

The networking and messaging modules successfully enable students to connect with alumni, request mentorship, and build professional relationships within the university community.

**2. Career Development Support**

The Job Portal, protected by a posting quota, duplicate detection, and AI screening, provides a reliable channel through which alumni can share verified career opportunities with students.

**3. Academic Knowledge Sharing**

The Research Papers repository consolidates theses, project reports, and academic resources from individual profiles into a single, searchable library accessible to the entire community.

**4. Secure User Management**

Role-based access control, email/ID verification, and password hashing together ensure that only genuine, verified members of the university can access the platform's core features.

**5. Content Quality Management**

The combination of job-posting quotas, duplicate detection, AI scam screening, and the user-report workflow keeps the platform's content clean and trustworthy with minimal manual moderation effort.

### 5.5.2 Advantages of the System

- Centralizes alumni management, networking, career services, and research sharing in one platform.
- Reduces spam and fraudulent job postings through automated safeguards.
- Improves trust through mandatory account verification.
- Provides administrators with clear, actionable analytics and moderation tools.
- Built on a modular, maintainable Laravel MVC architecture that supports future growth.

### 5.5.3 Limitations of the System

- Requires an active internet connection for all operations.
- No native mobile application in the current version.
- AI moderation is currently limited to job postings rather than all content types.
- Large-scale, multi-university deployment has not yet been tested.

## 5.6 Chapter Summary

This chapter presented the implementation of Borobhai.online across fourteen functional modules, supported by real interface screenshots wherever available. It also presented the results of functional, validation, user-acceptance, and performance testing, all of which confirmed that the system meets its design objectives.

The testing results and user feedback indicate that the platform is stable, usable, and effective at fulfilling its core purpose — connecting students, alumni, teachers, and administrators through a secure, centralized digital environment. The next chapter concludes the report with a summary of contributions, limitations, and directions for future work.

# CHAPTER 6
# CONCLUSION AND FUTURE WORK

## 6.1 Introduction

This chapter concludes the overall development process of the proposed Borobhai.online , Alumni Networking Platform. It summarizes the project's main contributions, discusses the achievements of the implemented system, identifies existing limitations, and presents possible directions for future development.

The proposed system was developed to bridge the communication gap that typically exists among students, alumni, teachers, and administrators in a university setting. Traditional alumni management practices often lack centralized communication, career-support facilities, academic resource sharing, and efficient user-interaction processes. To address these challenges, Borobhai.online provides an integrated web-based platform that combines alumni networking, career development, academic collaboration, and administrative management into a single system.

The system was designed and implemented using modern web technologies, including Laravel 11, PHP, MySQL, Blade Template, Bootstrap 5, JavaScript, and AJAX, following an MVC architecture that ensures maintainability, scalability, and efficient system management.

## 6.2 Conclusion

The successful completion of Borobhai.online, Alumni Networking Platform demonstrates the effectiveness of building a centralized digital platform for managing university alumni relationships and student career-development activities.

The proposed system provides a well-organized environment where students, alumni, teachers, and administrators can interact efficiently. Students can create professional profiles, connect with alumni, search for job opportunities, apply for positions, access research materials, and communicate with other members. Alumni users can share career opportunities, upload academic resources, and provide professional guidance to students. Teachers can participate in academic knowledge exchange, while administrators can manage the entire platform through a centralized dashboard.

The system successfully implemented several important features, including:

- Secure user registration and authentication
- Email and Student/Alumni ID verification
- Role-based access control
- Profile management

- Social networking features
- News feed and post interaction
- Job posting and application management
- AI-assisted job moderation
- Research paper repository
- Messaging system
- Notification services
- Report management
- Administrative oversight

Implementation and testing results indicate that the system successfully meets the objectives defined at the outset of the project. Functional testing, validation testing, user acceptance testing, and performance testing confirmed that the developed modules operate correctly and deliver a reliable user experience.

By integrating networking, career development, and academic-resource management into a single platform, Borobhai.online offers a practical solution to improve communication and collaboration within a university community.

## 6.3 Contributions of the Project

The main contributions of the proposed project are described below.

### 6.3.1 Centralized Alumni Management Platform

This project provides a centralized digital environment for managing alumni information and activity. Instead of relying on traditional manual records, universities can maintain up-to-date alumni profiles and communication channels through a single platform.

### 6.3.2 Improved Student–Alumni Communication

The networking and messaging features allow students to communicate directly with alumni, improving professional interaction, mentorship opportunities, and knowledge exchange.

### 6.3.3 Career Development Support

The Job Portal module bridges the gap between students and employment opportunities. Verified alumni members can publish job and internship opportunities, helping students access career-related resources.

### 6.3.4 Academic Resource Sharing

The Research Papers repository provides a centralized space for storing and sharing academic documents. Students and teachers can access previous research papers, project reports, and educational resources.

### 6.3.5 Enhanced Platform Security

The project introduces multiple security measures, including:

- Authentication
- Authorization
- Account verification
- Password encryption
- AI-assisted moderation
- Content reporting system

These features improve the platform's reliability and protect users from unauthorized activity.

### 6.3.6 Automated Content Management

The integration of AI-based job moderation and duplicate job detection reduces spam and improves the quality of information shared through the platform.

### 6.3.7 Modular and Scalable Architecture

The Laravel MVC-based architecture allows future developers to modify, extend, and maintain the system efficiently. New modules can be added without significantly affecting existing functionality.

## 6.4 Limitations of the System

Although several important features have been successfully implemented, the proposed system has certain limitations that present opportunities for future development:

- The system requires an active internet connection to function effectively.
- Advanced AI recommendation features, such as personalized mentor matching, can be further improved.
- The current version does not include native mobile application support.
- Additional server optimization is required for large-scale deployment.

- The AI scam-detection system currently focuses mainly on job postings and is not yet extended to other content types.

These limitations provide clear directions for the future improvement of the system.

## 6.5 Future Work

The following future developments are proposed to further enhance the functionality and usability of Borobhai.online:

- Development of native Android and iOS mobile applications against the existing Laravel backend, extending the platform's reach beyond the web.
- Machine-learning-based alumni–student mentorship matching that automatically recommends connections based on department, skills, and interests.
- Expanded analytics for university administrators, including alumni career-outcome tracking and department-level engagement metrics.
- A richer AI moderation layer covering post and message content in addition to job listings.
- Integration with the university's registrar system for fully automated Student/Alumni ID verification, removing the manual lookup step.
- Event and reunion management tools to extend the platform's role in long-term alumni engagement.
- Cloud-based deployment and infrastructure scaling to support multiple universities.

## 6.6 Chapter Summary

This chapter presented the conclusion, key contributions, limitations, and future development opportunities for the proposed Borobhai.online, Alumni Networking Platform. The project successfully developed a centralized platform that connects students, alumni, teachers, and administrators within a unified digital environment. The system delivers important functionality, including professional networking, career support, academic resource sharing, secure authentication, job management, messaging, notification services, and administrative control. The implementation of modern technologies — Laravel 11, MySQL, Bootstrap 5, JavaScript, AJAX, and an MVC architecture — ensured that the system remains maintainable, scalable, and secure. Despite some limitations, the proposed system provides a strong foundation for future expansion. Additional enhancements such as mobile application development, advanced AI features, cloud deployment, and improved analytics can further increase the platform's effectiveness. Overall, Borobhai.online represents a practical and scalable solution for improving alumni management, student career development, and academic collaboration within a university community.

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