Dakhla –AI-Assisted University Admissions Platform

Final Year Project Report

Submitted by
Muhammad Nauman Arif (2514-2022)
Ismail Dad Khan (2927-2022)
Hamza Ali Khan (2508-2022)

Supervisor(s)
Dr. Umer Farooq

In partial fulfilment of the requirements for the degree of
Bachelor of Science in Computer Science
2022

Faculty of Engineering Sciences and Technology

Hamdard University, Main Campus, Karachi, Pakistan

Certificate of Approval

Faculty of Engineering Sciences and Technology

Hamdard University, Karachi, Pakistan

This project "**Dakhla – AI-Assisted University Admissions Platform**" is presented by **Muhammad Nauman Arif, Ismail Dad Khan, Hamza Ali Khan** under the supervision of their project advisor and approved by the project examination committee, and acknowledged by the Hamdard Institute of Engineering and Technology, in the fulfillment of the requirements for the Bachelor degree of **Computer Science**.

_____
Dr. Umer Farooq
(Project Supervisor)

_____
In-charge FYP-Committee

_____
(Project Co-Supervisor)

_____
Dr. Umer Farooq
(Chairman DOC)

_____
Eng. Prof. Aamer Saleem
(Dean, FEST)

Authors' Declaration

We declare that this project report was carried out in accordance with the rules and regulations of Hamdard University. The work is original except where indicated by special references in the text and no part of the report has been submitted for any other degree. The report has not been presented to any other University for examination.

Dated:

Authors Signatures:

_____

M. Nauman Arif

_____

Ismail Dad Khan

_____

Hamza Ali Khan

Plagiarism Undertaking

We, Muhammad Nauman Arif, Ismail Dad Khan, Hamza Ali Khan solemnly declare that the work presented in the Final Year Project Report titled Dakhla – AI-Assisted University Admissions Platform has been carried out solely by ourselves with no significant help from any other person except few of those which are duly acknowledged. We confirm that no portion of our report has been plagiarized and any material used in the report from other sources is properly referenced.

Dated:

Authors Signatures:

_____
M. Nauman Arif

_____
Ismail Dad Khan

_____
Hamza Ali Khan

Acknowledgments

In the name of **Almighty Allah**, the Most Gracious, the Most Merciful. We bow our heads in gratitude to Him, the source of all knowledge and wisdom, for bestowing upon us the health, strength, and determination to undertake and successfully complete this Final Year Project. It is only through His will and blessings that we were able to navigate the complexities of this endeavour and reach this milestone.

We would like to express our deepest sense of gratitude and sincere appreciation to our distinguished project supervisor, **Dr. Umer Farooq**, for his unwavering support, inspiring guidance, and scholarly advice throughout the development of **Dakhla**. His keen interest in our work, constructive criticism, and availability for consultation were instrumental in refining our ideas and keeping us on the right track. His mentorship extended beyond technical advice, teaching us the value of perseverance and professional integrity.

We are also deeply indebted to the **Department of Computing** and the **Faculty of Engineering Sciences and Technology (FEST)** at **Hamdard University**. We extend our thanks to the Project Coordinator and the Evaluation Committee for their timely feedback and for providing a conducive environment equipped with the necessary resources and facilities that facilitated our research and development work.

No achievement is possible without the support of one's family. We dedicate this work to our **beloved parents**, whose endless love, sacrifices, and prayers have been our greatest strength. Their encouragement during late nights of work and moments of difficulty gave us the motivation to keep moving forward. We also thank our siblings and friends for their understanding and moral support during this demanding period.

Finally, this project is the result of the collaborative effort and shared vision of our team—**Muhammad Nauman Arif**, **Ismail Dad Khan**, and **Hamza Ali Khan**. We acknowledge the hard work, cooperation, and mutual respect that existed within our group, allowing us to combine our individual strengths to create a solution we are truly proud of.

Document Information

Table 1: Document Information

Customer	Hamdard University
Project Title	Dakhla – AI-Assisted University Admissions Platform
Project Code	FYP-020/FA25
Document Name	Final Year Project Report
Document Version	1.1
Document Identifier	FYP-020/FA25-FYPR
Document Status	Initial Draft
Author(s)	Muhammad Nauman Arif (2514-2022) Ismail Dad Khan (2927-2022) Hamza Ali Khan (2508-2022)
Approver(s)	Dr. Umer Farooq
Issue Date	23/DEC/2025

Definition of Terms, Acronyms, and Abbreviations

Table 2: Definition of Terms, Acronyms, and Abbreviations

Term	Description
API	Application Programming Interface - A set of protocols for building software applications
JWT	JSON Web Token - A compact, URL-safe means of representing claims to be transferred between two parties
ORM	Object-Relational Mapping - A programming technique for converting data between incompatible type systems
REST	Representational State Transfer - An architectural style for distributed hypermedia systems
RBAC	Role-Based Access Control - An approach to restricting system access to authorized users
CRUD	Create, Read, Update, Delete - Basic data operations
SPA	Single Page Application - A web application that interacts with the user by dynamically rewriting the current web page
DakhlaBot	AI-powered chatbot integrated into the Dakhla platform
HEC	Higher Education Commission - Pakistan's regulatory body for higher education
SRS	Software Requirements Specifications
SDS	Software Design Specifications
API	Application Programming Interface - A set of protocols for building software applications

Abstract

The university admissions process in Pakistan is currently characterized by fragmentation and inefficiency, requiring students to manually navigate multiple decentralized sources to gather information regarding programs, eligibility criteria, and deadlines. This lack of centralization often leads to confusion, missed opportunities, and administrative burdens for both students and educational institutions.

This project presents **Dakhla**, a centralized, AI-assisted university admissions platform designed to streamline and automate the enrollment lifecycle. The system provides a unified web portal where students can search and compare universities, receive personalized academic recommendations via an AI engine, and utilize the **DirectApply** feature to submit a single application to multiple institutions. Additionally, the platform integrates **DakhlaBot**, an intelligent chatbot for real-time user assistance, and an **AI-driven Assessment Module** that facilitates secure, automated entrance exams with anti-cheating mechanisms.

Developed using the **Agile methodology**, the platform employs a modern technology stack comprising **React.js** for the frontend, **Python (Flask)** for the backend, and **PostgreSQL** for data management. By bridging the digital gap between applicants and universities, Dakhla aims to enhance transparency, accessibility, and efficiency in the higher education sector of Pakistan.

Keywords:

- Centralized Admissions
- Artificial Intelligence
- Educational Technology
- Recommendation System
- Web Application
- DirectApply.

Table of Contents

Contents

CHAPTER 1

INTRODUCTION

1.1 Motivation

The university admissions process in Pakistan is currently fragmented and inefficient. Students are often required to visit multiple university websites to gather information about programs, deadlines, and eligibility criteria, managing everything manually. This lack of a centralized source leads to confusion, missed opportunities, and poor decision-making—especially for students in underserved or rural areas.

The primary motivation behind Dakhla is to bridge this gap by centralizing admissions data and simplifying the student journey. By providing a unified platform, the project aims to empower students with AI-assisted tools for searching and comparing universities, while simultaneously enabling institutions to manage applicants more effectively.

1.2 Problem Statement

University admissions in Pakistan are disjointed, time-consuming, and heavily manual. Students must visit multiple university websites to gather admission information, while universities lack a centralized system to manage and attract applicants.
Specifically, the current system faces the following issues:

- **Decentralized Information:** Students typically have to navigate numerous sources to find accurate data regarding eligibility, fees, and deadlines.
- **Manual Application Overload:** The process requires repetitive manual data entry for every university application, increasing the risk of errors and missed deadlines.
- **Lack of Institutional Tools:** Universities often lack efficient tools to filter, assess, and manage applicants centrally.

Dakhla resolves these issues by building a centralized and intelligent admission management system that simplifies exploration, comparison, and application submission.

1.3 Goals and Objectives

The primary objective is to design and develop a centralized, AI-assisted web platform that streamlines the university admissions process in Pakistan.
The specific objectives of the project are:

- **Centralized Directory:** To provide a unified platform where students can explore detailed, up-to-date information about universities, including available programs, eligibility criteria, and fee structures.
- **AI Recommendations:** To implement an AI-driven recommendation system that suggests suitable universities based on a student's academic background and preferences.
- **Intelligent Chatbot:** To integrate a chatbot (DakhlaBot) that assists users in navigating the platform and answers admission-related queries in real-time.
- **DirectApply Module:** To enable students to submit a unified application profile to multiple universities from within the platform.
- **University Dashboard:** To build a dashboard for institutions to manage program listings, review applicant profiles, and communicate with students.

1.4 Project Scope

The scope of the project defines the boundaries of the system to be developed.

In Scope:

- **Centralized University Directory:** Searchable and filterable listings of universities with programs, eligibility criteria, deadlines, and fees.
- **Student Account and Dashboard:** Personalized dashboard to manage academic profiles, saved universities, application status, and recommendations.
- **AI-Based Recommendation System:** Suggests suitable universities based on academic background, preferred discipline, and location.
- **Dakhla Assessment Module:** An AI-generated entrance exam module with automated grading and anti-cheating features.
- **Intelligent Chatbot (DakhlaBot):** Provides instant responses and navigation support.
- **DirectApply Module:** Enables submission of one reusable application form to multiple universities.
- **University Dashboard:** Allows institutions to manage program listings, view filtered applicant profiles, and engage with prospective students.
- **Automated Data Scraping:** Periodically updates university data through scheduled crawlers.

Out of Scope:

- **Native Mobile Applications:** No native apps for Android or iOS will be developed; the platform will be mobile-responsive.
- **Payment Gateway Integration:** The system will not process application fees directly.
- **Official Database Integration:** No real-time API connections to government or HEC databases for automatic credential verification will be implemented.
- **Offline Operation:** The system will require an active internet connection.

CHAPTER 2

RELEVANT BACKGROUND & DEFINITIONS

2.1 Project Background

The university admissions process in Pakistan is currently decentralized and inconsistent. Students are required to visit multiple university websites to gather essential information regarding programs, eligibility criteria, deadlines, and fee structures. This fragmentation results in significant confusion, wasted effort, and missed opportunities, particularly for students from underserved or rural areas who may lack easy access to career counselling.

Currently, platforms like **Ilmkidunya** [1] and **Eduvision** [2] provide lists of programs and deadlines, but they function primarily as static content aggregators. They lack interactive features such as user-specific recommendations, direct application submission, or institutional dashboards.

Dakhla is designed to address these specific challenges by providing a unified, AI-assisted platform. It centralizes verified university data, automates the comparison of programs, and enables direct applications through a single profile. For institutions, it offers a dedicated dashboard to manage programs, filter applicants, and communicate with prospective students, thereby making the admission process efficient and transparent for all stakeholders.

2.2 Relevant Definitions

This section defines the key domain-specific concepts and technologies used within the Dakhla system to ensure a clear understanding of the project's technical and functional landscape.

2.2.1 Domain Concepts

- **Centralized Admission System:** A unified portal where data from multiple educational institutions is aggregated, allowing students to search, compare, and apply from a single point of entry.
- **DirectApply Module:** A core feature of Dakhla that allows students to fill out one reusable application form (including personal, academic, and contact details) and submit it to multiple participating universities simultaneously.
- **Recommendation Engine:** An AI-driven system that analyses a student's academic profile (marks, interests, city) and suggests the most suitable universities and programs.
- **Assessment Module:** A feature allowing universities to create and administer AI-generated entrance exams with automated grading and anti-cheating mechanisms.

2.2.2 Technical Technologies

- **React.js (Presentation Layer):** A JavaScript library used to build the user interface. In Dakhla, it is used to create a Single Page Application (SPA) that ensures a responsive and seamless user experience.
- **Flask (Application Layer):** A lightweight Python web framework used for the backend. It handles business logic, API endpoints, and integration with AI services.
- **PostgreSQL (Data Layer):** An open-source relational database management system used to store structured data such as user profiles, university details, and application records. It is chosen for its robustness and support for complex queries.
- **Supabase:** A backend-as-a-service platform that provides the hosted PostgreSQL database and authentication services for the Dakhla platform.
- **JWT (JSON Web Token):** A standard method used for securely transmitting information between the client and server as a JSON object. Dakhla uses JWT for stateless user authentication and session management.

CHAPTER 3

LITERATURE REVIEW & RELATED WORK

3.1 Literature Review

Centralized university admissions platforms have played a transformative role in streamlining higher education enrollment in various countries. Among the most prominent examples is the **UCAS (Universities and Colleges Admissions Service)** [3] used in the United Kingdom. UCAS allows students to apply to multiple universities through a single online application, offering structured features such as deadline management, program comparison, document submissions, and real-time tracking of application statuses.

Similarly, the **Common Application (Common App)** [4] in the United States simplifies the admissions process by allowing students to submit one standardized profile to hundreds of colleges. The platform also supports additional institution-specific questions and documents, making it both flexible and scalable. These systems improve accessibility, enhance transparency, and reduce the administrative burden for both students and academic institutions.

Academic research also highlights the effectiveness of AI-based chatbots in admissions by automating queries, reducing administrative workload, and improving user experience.

3.2 Related Work

In the Pakistani context, several platforms exist that attempt to support university admissions, including:

- **Ilmkidunya:** Provides lists of available programs, admission deadlines, and general guidance.
- **Eduvision:** Offers career planning resources and university guidance.
- **eAdmissions.pk & University Pages:** Mainly provide static admission information with basic filtering by city or program.

3.3 Gap Analysis

While platforms like Ilmkidunya [1] and Eduvision [2] provide valuable information, their scope is largely limited to content aggregation. They do not offer features like user-specific recommendations, direct application submission, or institutional interaction. Specifically, these existing local platforms lack:

- **Interactivity:** No real-time data updates or AI-based assistance.
- **Centralized Management:** No centralized student profile management or direct application capabilities.
- **Institutional Tools:** Universities lack efficient tools on these platforms to filter, assess, and manage applicants.

This gap indicates a clear opportunity for innovation. Dakhla addresses these limitations by offering a centralized admissions solution with verified data, direct applications, AI-powered recommendations, and chatbot assistance.

REFERENCES

[1] Ilmkidunya, *Admissions in Pakistani universities*, 2024.
[2] Eduvision Pakistan, *Career planning and university guidance*, 2024.
[3] UCAS Ltd., *How to apply through UCAS*, 2024.
[4] Common Application Inc., *Apply to college with Common App*, 2024.

A0. DOCUMENT CHANGE RECORD

Date	Version	Author	Change Details
23/DEC/2025	1.0	Hamza Ali Khan	Initial Draft