Sukkur IBA University

Software Design Specification Document

For

Schools Hub – Bridge Between Schools and Parents

Version1.0

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Submission Date	23 May 2024

Supervisor Signature

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1. INTRODUCTION OF DESIGN DOCUMENT:

1.1 Purpose:

This document's purpose is to provide a high-level design framework around which to build our project which is a web platform and it will be used to revolutionize the process of selecting the desired educational institution for children by creating a comprehensive and user-friendly interface that connects schools with prospective parents.

1.2 Project Scope:

The project aims to develop a comprehensive web platform connecting schools with parents to simplify the school selection process. It includes school and user profiles, search and filtering capabilities, AI-based recommendations, reviews, and ratings. The project emphasizes security, scalability, and potential third-party integrations within defined boundaries, such as not endorsing specific schools and focusing on a specific geographic region initially. The project timeline will follow a phased development approach.

1.3 Definitions, Acronyms and Abbreviations:

NOTE: HERE WILL BE ALL DEFINITIONS, ACRONYMS AND ABBREVATIONS WHICH ARE INCLUDED IN THIS PAPER

E.g.

SDS – Software design specification

SDLC – Software design life cycle

OS – Operating System

2. DESIGN CONSIDERATION:

- **User Experience (UX):**

  The design must prioritize a user-friendly interface for parents, guardians, and schools. Intuitive navigation, clear information presentation, and responsive design are essential

for a positive user experience. We will be using Javascript, ReactJS and TailwindCSS for better user experience.

- **Scalability:**

  The architecture should be designed to handle potential growth in the number of schools, users, and content. Scalability measures, such as load balancing and efficient database management, should be implemented. We will mongoDB database, NodeJS and ExpressJs for handling scalability of our platform.

- **Security:**

  Robust security measures are critical to protect user data and ensure platform integrity. This includes data encryption, secure user authentication, and continuous monitoring for vulnerabilities. We will use multiple and different modules to handle security on our platform like OAuth, JWT, Validation etc.

2.1 Assumptions:

We have following assumptions for our system such as:

- Users will have access to a stable internet connection to use the platform effectively.
- Schools will actively create and update their profiles with accurate and up-to-date information.
- Users will provide accurate and honest reviews and ratings.
- The recommendation engine will improve over time as more data is collected and analyzed.
- Users will adhere to community guidelines and platform rules.

2.2 Constraints:

2.2.1 Software Constraints

i. The software (web application) needs to be designed using MERN with NoSQL as a database.

ii. The software will be user-friendly.

iii. The software will be interactive.

iv. The software will be deployed initially in localhost and can be shifted later on to the cloud.

2.2.2 Hardware Constraints

i. User should have a desktop, laptop, mobile or any other device for accessing our platform on browsers.

2.2.3 Cultural Constraints

i. The software product will be in the English language

2.2.4 User Constraints

i. All the users should be authorized

2.3. Document Convention

The font of the document is the Times New Roman and font size will be 12. The headings will be selected from styles i.e., Heading 1 or Heading 2. The line space is 1.5 after every heading and the text is justified.

3. ARCHITECTURE OVERVIEW

In our project, the architecture is every simple. It has 3 type of user which are parent/child, school, and an admin as depicted in Fig. 1. The role of parent is to find desired school for the better future of their children. Parent can use available features to filter out the desired schools that are fulfilling the needs and conditions of parents. The role of schools is to manage and update their profile up to date information. Finally, the role of admin is to manage all the school's profile registration and also managing the end user data.

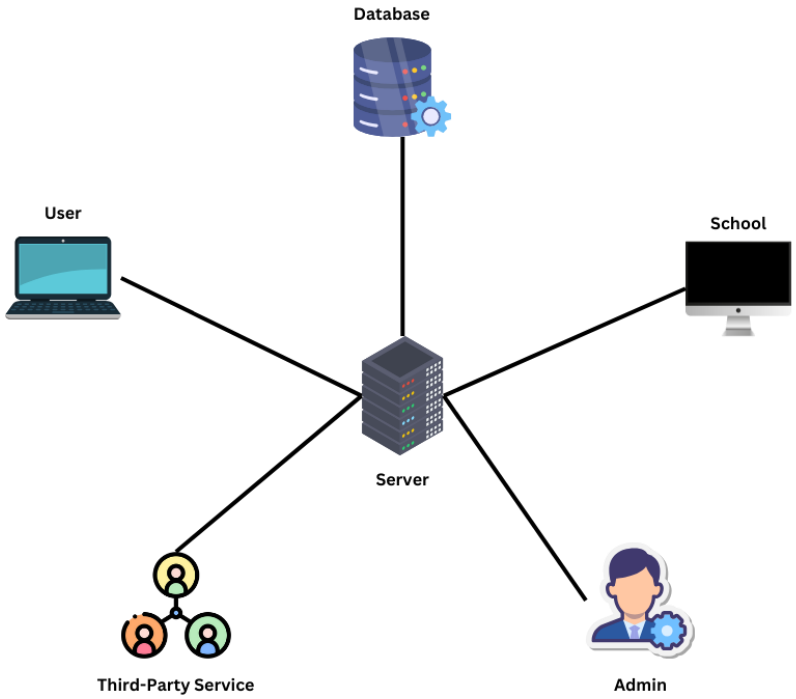

Figure 1 Architecture Overview

3.1. Architecture Design Diagram

The architecture design of our innovative web platform for selecting educational institutions is thoughtfully designed to deliver a robust, scalable, and user-friendly solution that bridges the gap between schools and prospective parents. This architecture (as shown in Fig. 2) encompasses a range of technologies and components to ensure the platform's efficiency, security, and seamless user experience.

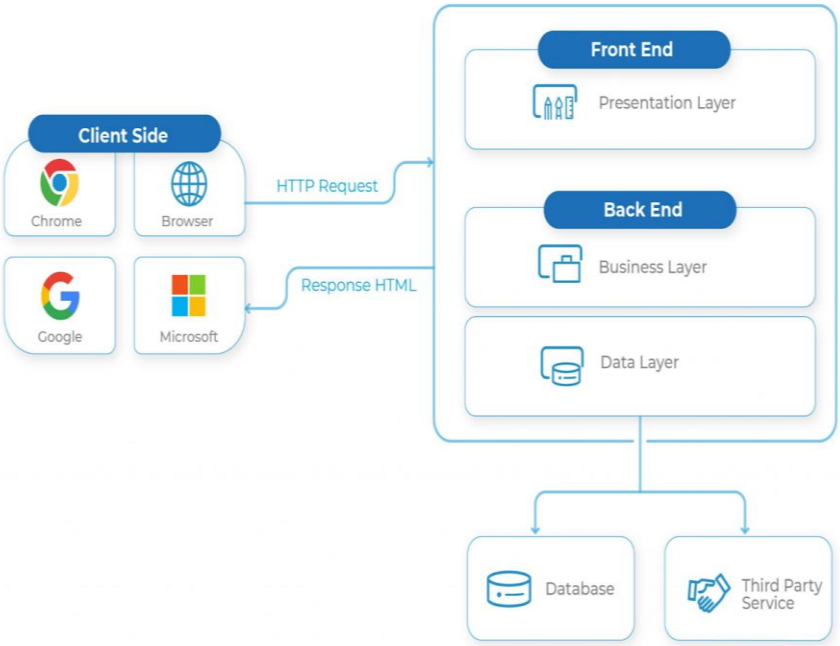

Figure 2 Web Application Architecture [1]

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4. DETAILED SOFTWARE DESIGN

4.1. Use Case Models

In our system there are three types of users, and they are parent/child, schools and admin. So, each user has different use cases, and they are shown in Fig. 3. Admin will have the main role that he will be managing every user's account and will be able to see all information. Parents will

have all access to the schools data and available features on our platform. School have access to manage and update their profiles, can also view user reviews.

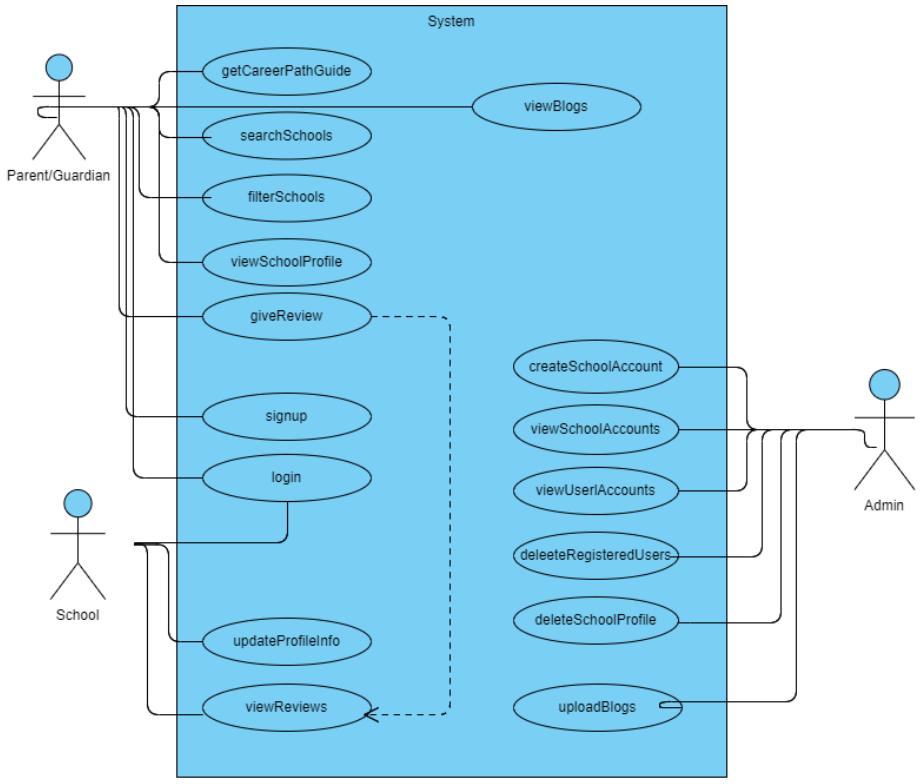

Figure 3 Use Case

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4.2. Class Diagram:

The class diagram for the educational institution selection platform illustrates the core components and relationships within the system. It primarily focuses on representing the key classes and their interactions. This class diagram in Fig. 4 illustrates the key components of the platform, their relationships, and the central role of the User class. It serves as a foundation for

the software development and helps in visualizing how data and interactions flow within the system.

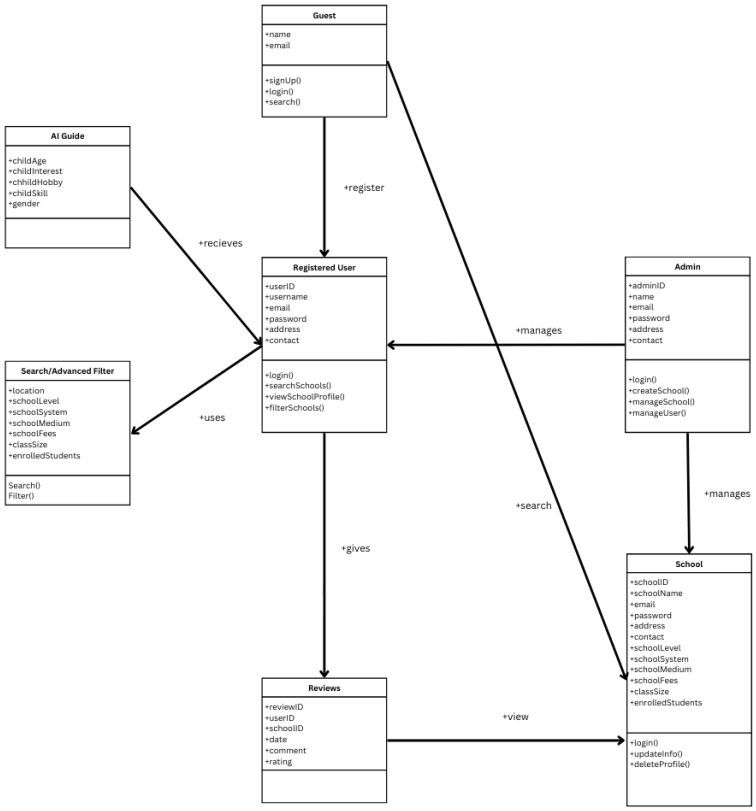

Figure 4 Class Diagram

4.3. Sequence Diagram:

1. **Use Case Scenario:** User Sign up

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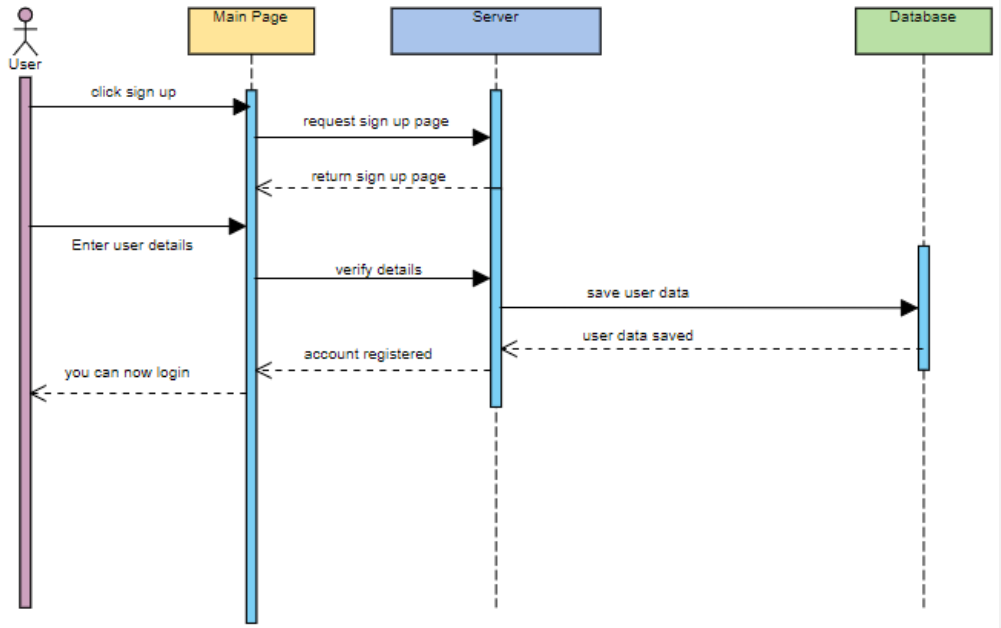

Figure 5 User Login

2. **Use Case Scenario:** User Login

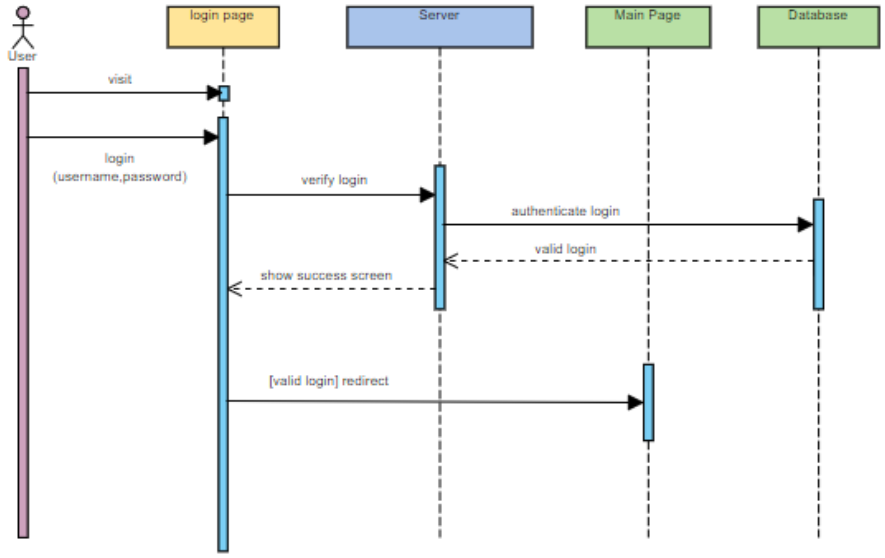

Figure 6 User Login

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3. **Use Case Scenario**: Searching Desired School:

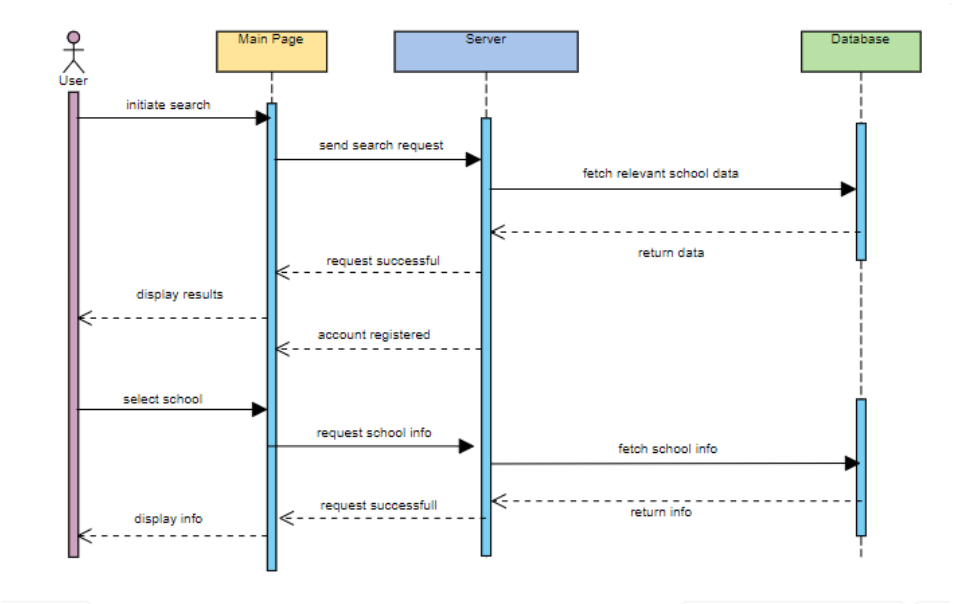

Figure 7 Search and filter School

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4. **Use Case Scenario:** AI Recommendations

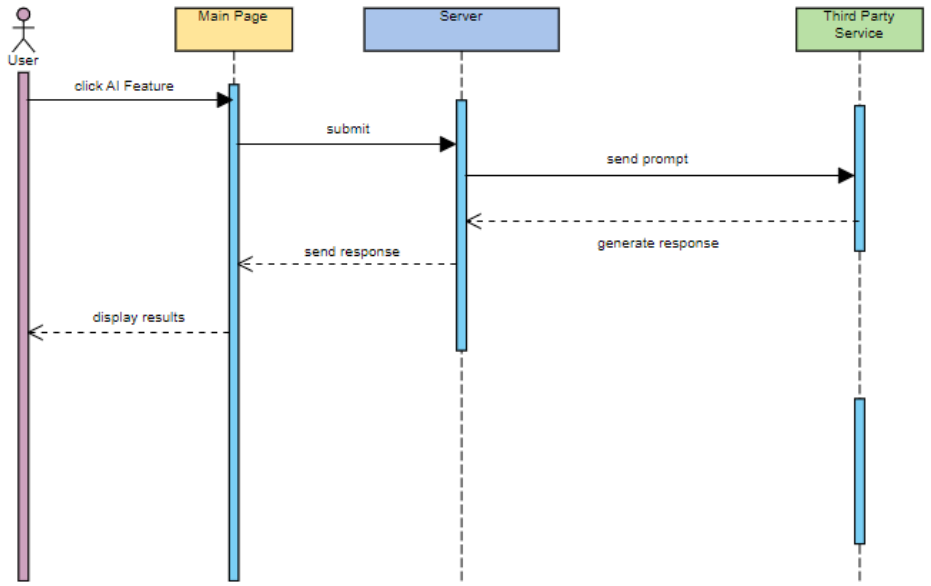

Figure 8 AI Feature

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4.4. Entity Relationship Diagram (ERD)

Entity-Relationship Diagram (ERD) in the Fig. for the School-Hub project involves identifying the entities and their attributes. Here's a simplified ERD highlighting the entities and their attributes:

➢ Main Entities:

1. **User**
2. **School**
3. **Review**
4. **Admin**

➢ Relationships:

- **User-Review Interaction**: Users can create reviews and ratings for school.

  - User (1) ---< Review (1)

- **School-Review Interaction**: Schools can view multiple reviews.

  - School (1) ---< Review (*)

- **School-Admin Management**: Admins manage and oversee school profiles.

  - Admin (1) ---< School (*)

- **User-Admin Management**: Admins manage and oversee school profiles.

  - Admin (1) ---< Users (*)

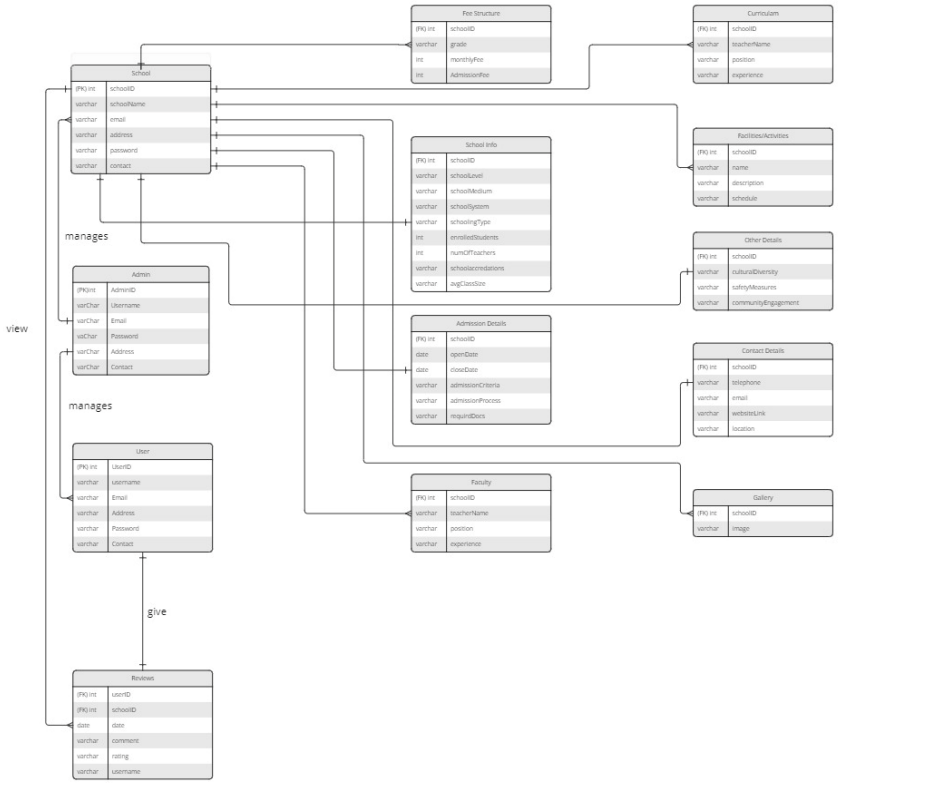

Figure 9 ERD diagram

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5. INTERFACE DESIGN

➢ Landing page Design:

The Landing Page is the platform's first impression, capturing the essence of its mission. It features an inviting layout with a search bar for quick access to school profiles. The design emphasizes user testimonials, etc. It provides an overview of the platform's features and benefits, encouraging users to explore further. The design is visually appealing and responsive for various devices, ensuring a strong user engagement from the outset.

Figure 10 Home Page Design

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➢ Login/Sign up Form:

The Login/Signup forms are the entry points for users to access the platform. The design is user-friendly, with clear fields for entering credentials or registration information. The design aims to provide a seamless and secure onboarding experience for users.

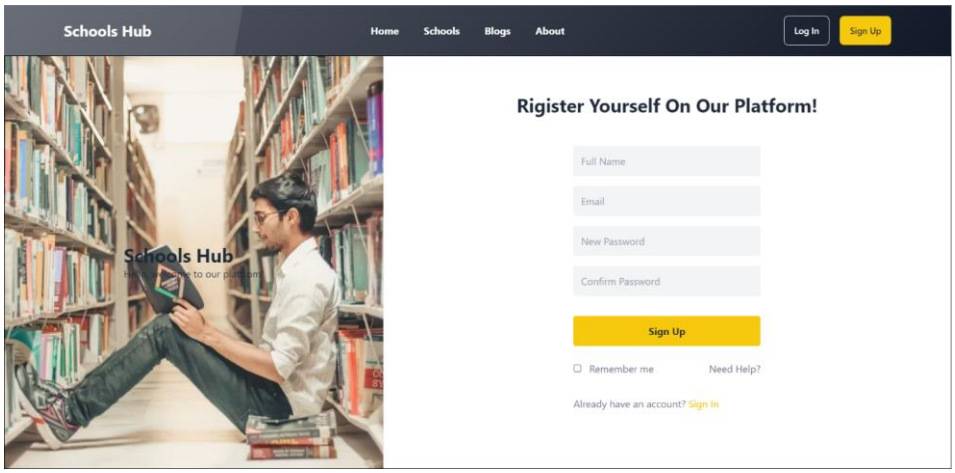

Figure 11 Sign up Form Design

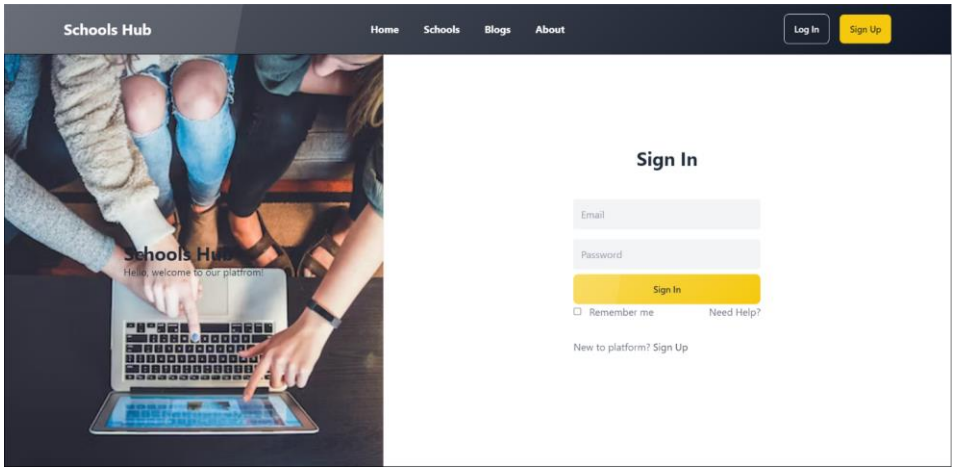

Figure 12 Login Form Design

➢ School Profile:

The School Profile Page displays the complete detailed profile of the school, the user can find the updated information about the school i.e. tuition fees, contact, admission procedure, faculty information, gallery, etc.

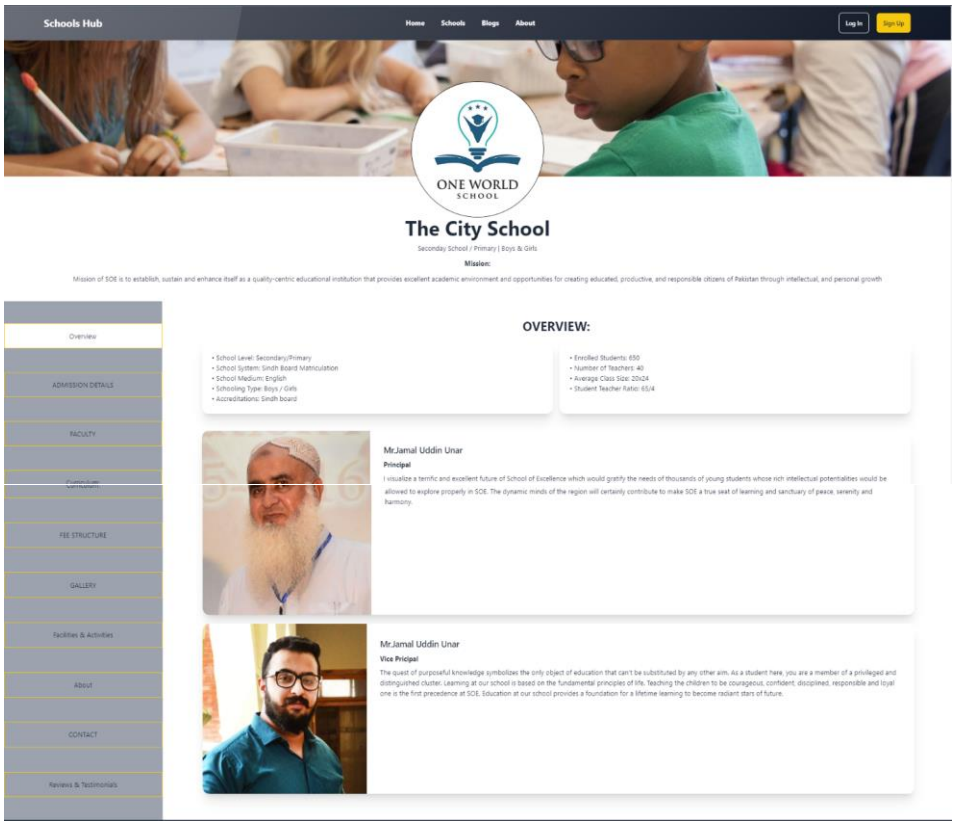

Figure 13 User Interface Design

➢ Schools List Page:

The Schools List page is the page where all the available schools profile are displayed, the user can browse through all the schools profiles and can then view the detailed profile of the selected school.

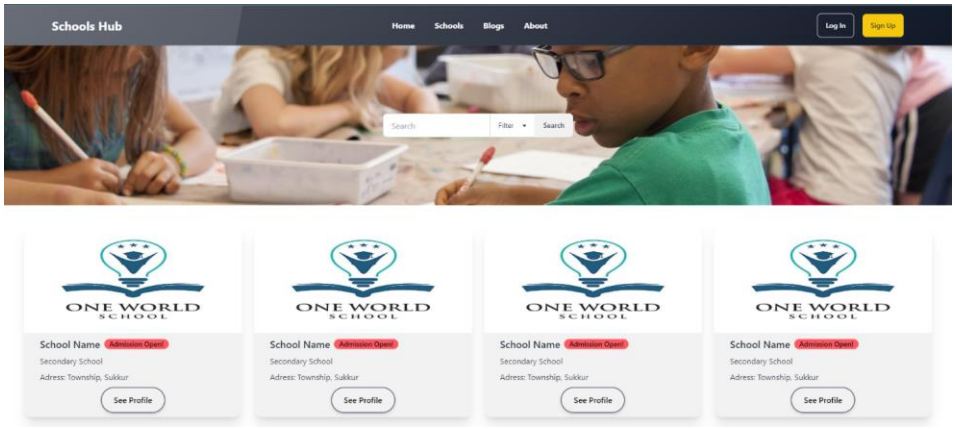

Figure 14 Schools List page

6. TEST CASES

Sign Up Test Case
Test Case ID: T1
Module Name: Sign Up screen
Test Title: Registering the user
Description: Test the signup page of School Hub
Pre-conditions: The user has properly filled the required fields

Step	**Test Steps**	**Test Data**	**Expected Result**	**Actual Result**	**Status (Pass/Fail)**	**Notes**
1	Navigate to Signup page		User should be able to Signup	User is navigated to	Pass	
2	Entered username	Username= abcd	Login Screen to be displayed	Login screen displayed successful	Pass	
3	Entered email	User= example@gmail.com		Signup		
4	Entered password	Password: 1234				
5	Click on Signup button			Signup Successful		

Post-conditions:

The user's information has successfully been added into the database and user is registered.

Log In Test Case of School Hub	
Test Case ID: T2	
Module Name: Login screen	
Test Title: Verify login with valid username and password	
Description: Test the login page of School-Hub	
Pre-conditions: User has valid username and password	

Step	**Test Steps**	**Test Data**	**Expected Result**	**Actual Result**	**Status (Pass/Fail)**	**Notes**
1	Navigate to login page	User= example@gmail.com	User should be able to login		Pass	
2	Provide valid password	Password: 1234				
3						
4	Click on Login button			Login Successful	Pass	

Post-conditions:

User is validated with database and successfully login to account. The account session details are logged in database.

Searching for a School Test Case
Test Case ID: T3
Module Name: Searching School
Test Title: User Searches for a School
Description: User will Search for a School
Pre-conditions: The account session details are logged in database and main dashboard is appeared to the authentic user.

Step	**Test Steps**	**Test Data**	**Expected Result**	**Actual Result**	**Status (Pass/Fail)**	**Notes**
1	Click on to the Search Bar at the top of page	Keywords, Apply filter.	User should be able to see multiple Schools as per Search	Multiple schools appear as per Search results	Pass	
2	User selects any available School	Selecting any School	School info Should be displayed to the user	Detailed info page appears of selected School	Pass	

Post-conditions:
User searches for the desired School and selected one of the displayed results and the info gets displayed.

References:

[1] William, "Clickittech.com," DevOps, 10 March 2022. [Online]. Available: https://www.clickittech.com/devops/web-application-architecture/.