

**A WEB BASED APPLICATION FOR JOB INTERVIEW PREPARATION AND EXAM
GUIDELINES**

BY

Md. Shahriar Kobir
ID: 171-15-1252

This Report Presented in Partial Fulfillment of the Requirements for the Degree of
Bachelor of Science in Computer Science and Engineering

Supervised By

Mohammad Jahangir Alam
Sr. Lecturer
Department of CSE
Daffodil International University

Co-Supervised By

Md. Sabab Zulfiker
Lecturer
Department of CSE
Daffodil International University



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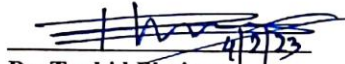
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APPROVAL

This Project/internship titled “A WEB BASED APPLICATION FOR JOB INTERVIEW PREPARATION AND EXAM GUIDLINES”, submitted by Md. Shahriar Kobir, ID No: 171-15-1252 to the Department of Computer Science and Engineering, Daffodil International University has been accepted as satisfactory for the partial fulfillment of the requirements for the degree of B.Sc. in Computer Science and Engineering and approved as to its style and contents. The presentation has been held on 01 February 2023.

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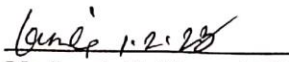
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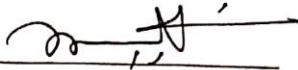
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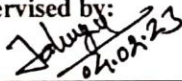
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Jahangirnagar University

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DECLARATION

I hereby declare that this project has been done by me under the supervision of **Mohammad Jahangir Alam**, Department of CSE, Daffodil International University. I also declare that neither this project nor any portion of this project has been submitted to any other institution for the award of a degree or diploma.

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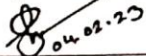


Mohammad Jahangir Alam

Sr. Lecturer

Department of Computer Science and Engineering
Daffodil International University

Co-Supervised by:

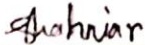


Md. Sabab Zulfiker

Lecturer

Department of Computer Science and Engineering
Daffodil International University

Submitted by:



Md. Shahriar Kobir

ID: 171-15-1252

Department of Computer Science and Engineering
Daffodil International University

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ABSTRACT

In this project, I have built an online portal (web application) for job preparation. There will be an extensive collection of books and other reading materials for all job fields. A question bank will be available with previous years' job interview questions. There will also be an online quiz option where users will be able to take quizzes with multiple choice questions to test their knowledge. The quiz scores will be saved in the database. So the users can compare their scores on the top chart. There will be a job circular section as well where we can find the latest job posts and links to apply to those jobs. In short, this online portal will allow users to find necessary study materials, and questions for their job interview preparation and also help them test their knowledge against other users on the platform. When they are ready, they can find suitable jobs here

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CHAPTER 1

INTRODUCTION

1.1 Introduction

We are all aware that one of the five essential human rights is the right to an education. Being a student at this time is challenging because to the COVID-19 epidemic, which has prevented millions of pupils from attending class. However, all of our universities, colleges, and institutions are transferring the whole educational system online as a result of the choice made by our government.

We now have chosen to build an online web platform that would allow us to study more efficiently than previously. We may access any study resources from our application on this platform, including notes, PDF books, questions, and recommendations. We wish to provide a venue where our students may take online MCQ tests.

"Electronic Learning" is the expanded term for "E-Learning," which includes all forms of technologically assisted learning. Technology is used in e-learning, which enables people to be able to learn at any and from any place. This website serves as an e-learning platform for digital learning.

1.2 Motivation

Around the world, technology is playing a bigger role in the field of education. It has been thoroughly investigated and demonstrated that using e-learning technologies alone in the classroom is beneficial. Studies have shown that stimulating the senses improves learning [1]. Engaging the senses, especially the visual sense, can enhance learning. The effects of this pandemic have also been felt in Bangladesh. Since the outbreak of the pandemic, our educational system has changed and incorporated the online learning technology. We came up with the notion of creating an online-based website platform that would be beneficial and useful to all areas of our student's nation because all levels of students conduct their studies via various online platforms. One can learn new things, get answers to questions, and even advertise their course on our website.

1.3 Objective

Our prime objective is to

- Create a space where our students can study online.
- Maintain all of our students informed and provide them with study materials.
- Give proper tools to students for self-learning and self-evaluation.

1.4 Expected Outcomes

- Books and notes for education that cover every topic needed for job preparation.
- Question Bank including questions for government and private jobs.
- Short quiz for a different subject.
- The site's main administrator has the authority to alter, publish, or delete any content.

1.5 Project Management and Finance

Making plans and organizing a company's resources to move a specific task, event, or responsibility closer to completion are both aspects of project control. Assets under control include people, money, technology, and expensive property, and it may consist of a one-time task or an ongoing activity [2]. Project management is frequently associated with industries like engineering, production, and more recently, healthcare and information technology (IT), which frequently require a complex mix of components to be finished and put together in a specific way in order to produce a usable product. Regardless of the business, the assignment supervisor tends to have kind of an equal job: to aid in outlining the hopes and objectives of the assignment and choosing when and by whom the various assignment components are to be completed. To ensure that finished additives meet a high standard, they also develop nice manipulate assessments.

Regardless of the organization, the project manager tends to have the same type of job: to assist in defining the project's goals and desires and to determine when and by whom the various project components are to be completed. They also develop top-notch control tests to make sure that finished components adhere to a high standard.

1.6 Report Layout

1.6 Report Layout

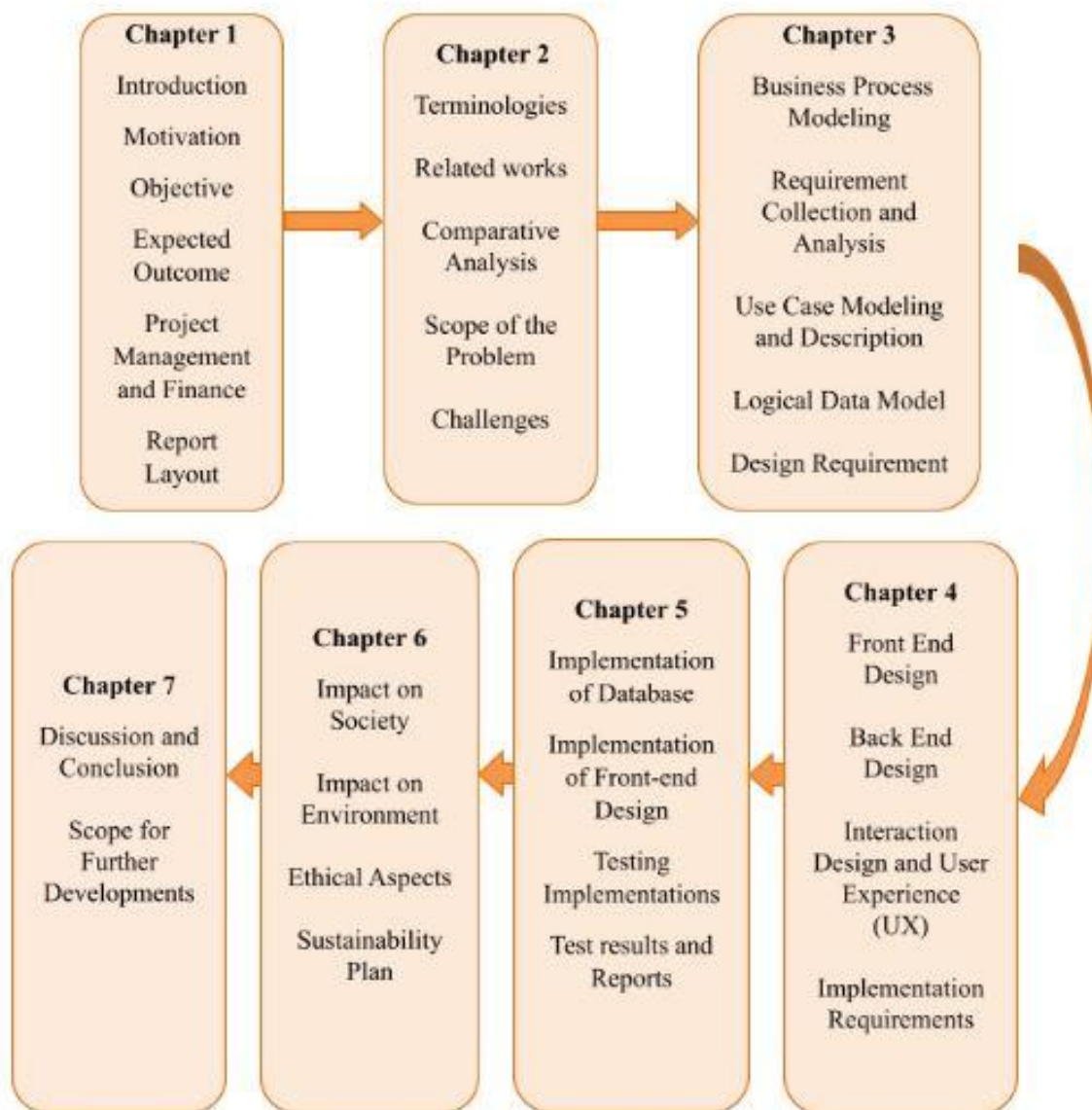


Figure 1.6.1: Report Layout

CHAPTER 2 BACKGROUND STUDY

2.1 Terminologies

A website or gateway for educational materials and resources known as an online learning platform gives students access to all the information they require in one place, including lectures, sources, opportunity to network and communicate with other students, and more. Additionally, it is a fantastic way for both the student and the teacher to monitor the student's progress. We should become accustomed to learning online using these kinds of online learning platforms in this age of advanced technology, where both students and teachers can broaden their horizons.

2.2 Associated Works

There are a few online platforms that are related to our platform because we are developing an online learning platform. However, we are developing some additional features and a combination that will be extremely helpful to all types of students and professionals alike. Some of the related websites include 10 Min School, a Bangladesh-based online learning and practice platform. It is currently the largest online platform in our nation [7].

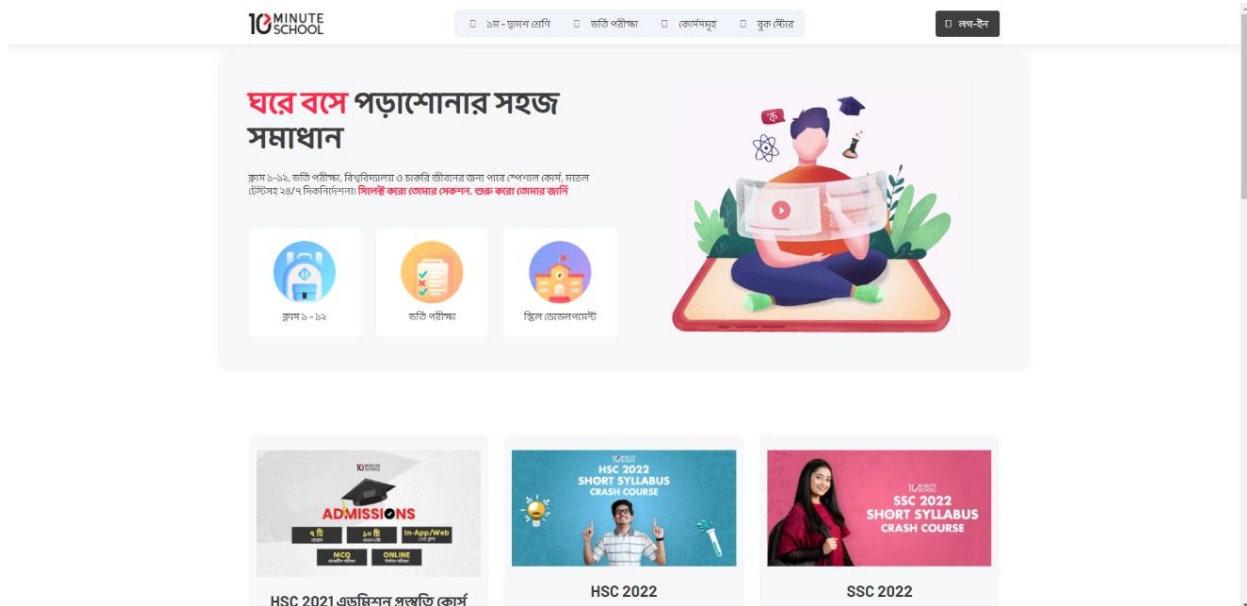


Figure 2.1.1: 10 Min School Website

Shikhhok.com is one of the earliest academic internet sites in Bangladesh according to Dr. RagibHasan, a laptop technology professor at the University of Alabama in Birmingham. The Shikhhok.com project aims to provide Bengali-language guides and free online instruction to underprivileged students in rural Bangladesh and India [8].

শিক্ষক
বাংলায় অনলাইনে মুক্ত জ্ঞানের মেলা

Home **কোর্স তালিকা** আমাদের কথা **শিক্ষক হতে চান?** About Us Search

শিক্ষক হতে চান?
আপনি কি শিক্ষক.কম সাইটে কোনো একটি কোর্স পড়াতে চান?
Get a PDF version of this Print webpage PDF

আপনাকেই খুঁজছি আমরা!

কী বিষয়ের উপরে কোর্স?
আসলে আমরা সব বিষয়ের উপরেই কোর্স এখানে পড়ানোর সুযোগ রাখছি। অর্থাৎ বিজ্ঞান, প্রকৌশল, কলা, বাণিজ্য, সমাজবিজ্ঞান, ইতিহাস, ভাষা, সবই কিছুই এখানে আপনি পড়াতে পারবেন।
(শিক্ষক.কম একটি অবাণিজ্যিক সাইট যেখানে পড়াতে বা পড়াতে কারোরই কোনো বাধা নেই। এখানকার সব কোর্স সবার জন্য উন্মুক্ত ও বিনামূল্যের।)

কোন পর্যায়ের কোর্স?
বিশ্ববিদ্যালয়, কলেজ, এমনকি স্কুল পর্যায়ের কোর্স সবই এখানে পড়ানো যাবে। আর প্রথাগত শিক্ষা ছাড়াও অন্যান্য বিষয়, যেমন চাকুরিজীবীদের জন্য বা রান্নার জন্যও এখানে কোর্স পড়াতে পারবেন।
মোদ্দা কথা আপনি নিজে যা জানেন, তা অন্যকে শেখাতে চাইলে সেটাই যথেষ্ট!

কী করতে হবে?
এখানে কোর্স পড়াতে হলে চটপট নিচের জিনিষগুলো তৈরী করে ফেলুন, তার পর পাঠিয়ে দিন রাগিব হাসানের কাছে। (ইমেইল ঠিকানা ragibhasan অ্যাট gmail.com, ফেইসবুক আইডি http://www.facebook.com/ragibhasan)

- ১) কোর্সের শিরোনাম
- ২) কোর্সের সংক্ষিপ্ত বর্ণনা (১/২ প্যারাগ্রাফ)
- ৩) কাদের জন্য কোর্স? (স্কুল, কলেজ, বিশ্ববিদ্যালয়, সবার জন্য)

পুরস্কার
২০১৩ গুগল রাইজ এওয়ার্ড
২০১৩ ISIF Award
২০১৩ দ্য বেস ইউজার এওয়ার্ড
২০১৪ ইন্টারনেট সোসাইটি (ISOC) কমিউনিটি গ্রান্ট

গ্রাহক হন
নতুন লেকচার আসামাত্র ইমেইলে পেতে হলে এখানে আপনার ইমেইল ঠিকানাটি দিন।
Email Address
Email Address
গ্রাহক হন

কোর্স তালিকা
ফ্রিল্যান্স কর্নার
CCNA পরিচিতি
ওয়ার্ডপ্রেস ফর বিগিনারস
ফ্রিল্যান্সিং
বেসিক ওয়েবসাইট ডিজাইন
ওয়ার্ডপ্রেস পরিচিতি
বেসিক অ্যাডবি ফটোশপ গ্রাফিক্স ডিজাইন
জাভাস্ক্রিপ্ট পরিচিতি
মোবাইল এপ্লিকেশন ডেভেলপমেন্ট
অ্যান্ড্রয়েড এপ্লিকেশন ডেভেলপমেন্ট
অ্যান্ড্রয়েড এপইনভেন্টর ডেভেলপমেন্ট
আইওএস এপ্লিকেশন ডেভেলপমেন্ট
আইফোন এপ্লিকেশন

Figure 2.1.2: Shikhhok Website

A totally specialized internet-based website is Study Press.org. Its extensive collection of continuously updated questions allows students to self-check. The aggressive exam preparation is the focus of this website. Students can find any previous questions from the challenging national exams like BCS, Bank Job, etc. [9].

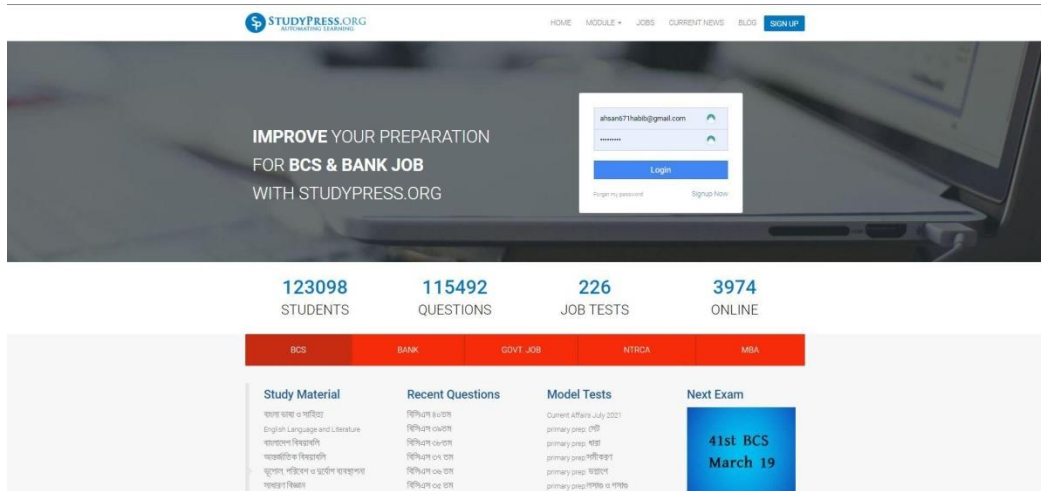


Figure 2.1.3: Studypress.org Website

Amarpathshala.com is a website with over 12000+ videos covering all subjects for grades 1 through 12, as well as professional and skill development courses from trained instructors, all in one location, completely free of charge from anywhere in the world [10].

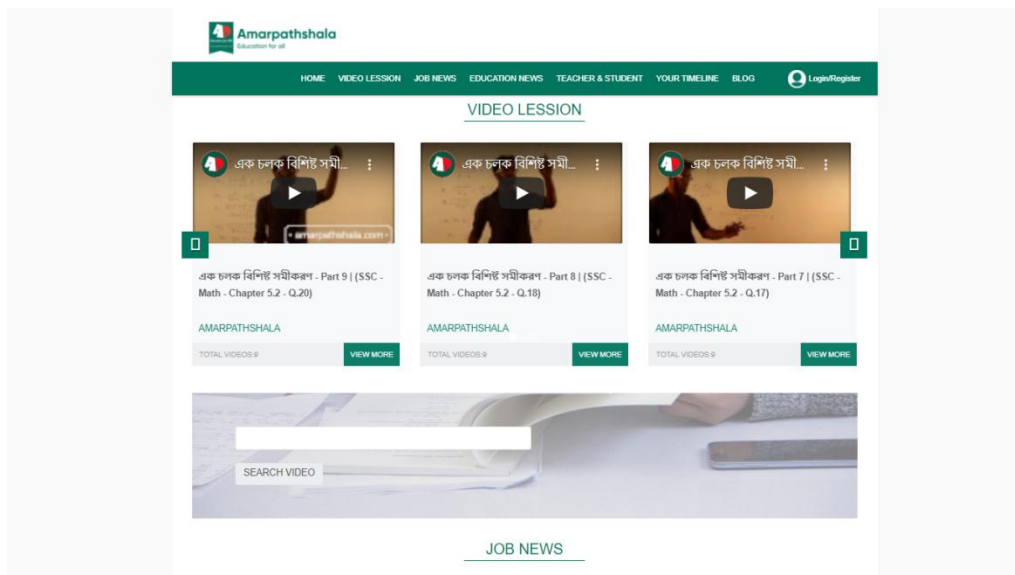


Figure 2.1.4: Amarpathshala.com Website

2.3 Comparative Evaluation

We have previously covered three different online marketplace websites in our nation. A blog-style learning platform called "shikkhok.com" offers only blog posts based on various subjects. A website with video tutorials for learning is called "10minschool.com." Additionally, "stdupress.org" is a platform that offers an e-text exam and question bank for various subjects. But we have a lot more features in our "BD-Jobs."

Feature	10 Minutes School	Shikkhok	Studypress	Amar pathshala	BD-Jobs
Quiz	No	No	No	No	Yes
Question Bank	No	No	Yes	No	Yes
PDF Book	Yes	No	No	No	Yes
Job Circular	No	No	No	Yes	Yes

Table 2.3.1: Comparative Analysis

2.4 Size of the Problem

Our primary goal is to make it as easy as possible for job candidates to find the resources they need on our website, including PDF books, questions, and circulars. Only users of computers and mobile devices will be able to access and use this platform for learning because it will be online. Since our website is an online learning platform, nobody can access it without a working internet connection.

2.5 Difficulties

We must tackle the following challenges in order to provide the best user experience possible:

- To create an intuitive, easy-to-use platform that allows anyone to navigate and find resources.
- Must maintain accuracy for some resources that we will add to our site and which will be updated every day or month.
- For our project, data security is also crucial.
- Data entry and resource gathering are frequently required to advance our project.
- For the first time, marketing and advertising of our website are also crucial components if we are to reach our intended audience.

CHAPTER 3

SPECIFICATIONS FOR REQUIREMENTS

3.1 Modeling business processes

BPM, commonly referred to as "business process modeling," is the graphical depiction of any company's or website's business model or process, as well as the associated workflows. After completing a successful payment through the payment gateway, we have demonstrated in our BPM how a user may access both our free and premium content. The materials available here include classes, blog entries, PDF books, online tests, job announcements, and more.

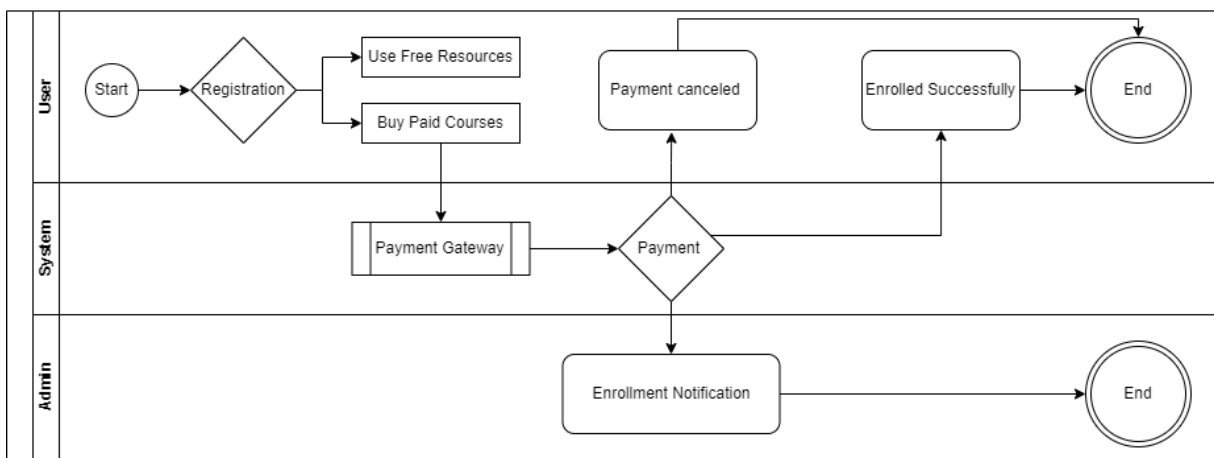


Figure 3.1.1: Business Process Modeling

3.2 Software Development Life Cycle – Waterfall Model

The Waterfall Model was the initial Process Model that was presented. Another name for it is "linear-sequential life cycle model." It is really simple to understand and utilize. A waterfall model has no phase overlap; each stage must be accomplished before the next one can begin.

The waterfall technique was the first SDLC model in software engineering that was extensively utilized to guarantee project success. Using "The Waterfall" methodology, the entire software development process is divided into discrete phases. In this waterfall paradigm, the outcomes of one phase often serve as the input for the next stages in turn.

The graphic below shows the many components of the waterfall model.

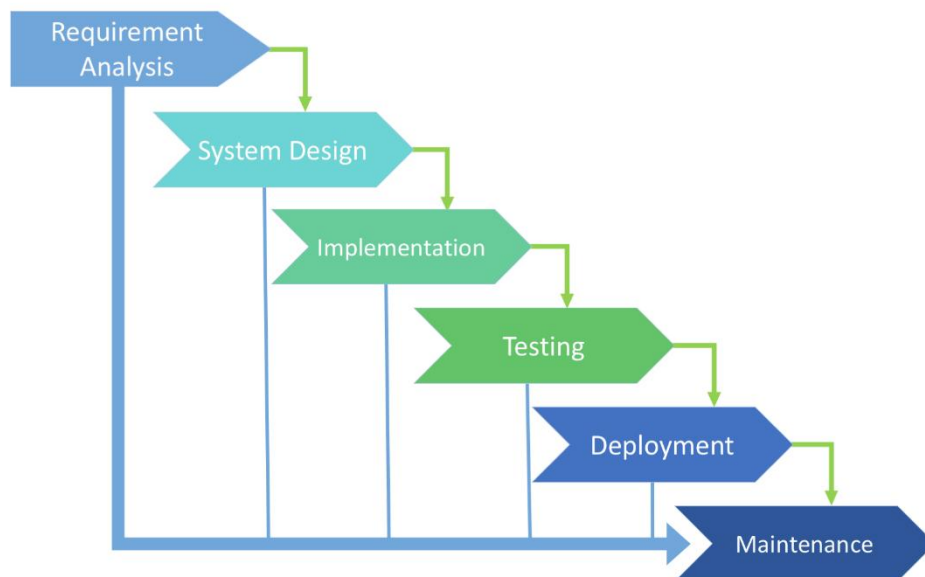


Figure 3.1.2: The sequential phases in Waterfall model

Requirement Analysis:All prospective system needs are gathered and listed in a document describing the requirements at this phase. I gather every necessity to form the give-up user.

System Design:The preceding phase's required specifications are analyzed in this phase, and the proposed system is generated. As the application database, I utilized MongoDB. For the backend server, I used Express JS and Node JS. I built a REST API with Express JS and a JWT-based authentication system. The front-end web application, I used the Material UI Component framework and React JS. This system design helps in figuring out the system's general architecture, as well as the necessary tools and components.

Implementation:The system is initially constructed as a series of brief programs known as units using feedback from the system design. To advance my project, I'm injecting an application server and all this code. The next stage is combining these components.

Testing:The process of creating and assessing each unit's functioning is known as unit testing. Each unit generated during the implementation phase is tested before being incorporated into a system. After integration, the entire system is checked for flaws and defects.

Development:According to research, the project is either made available to clients or placed on the market once functional and non-functional testing is finished.

Maintenance:On rare occasions, issues occur in the client environment. Patches are released to fix specific issues. Furthermore, updated versions of the product are released. Maintenance is carried out to effect these modifications in the consumer's environment.

All of these stages are interconnected, therefore the process is seen as flowing gradually downhill (like a cascade) through the phases. The phrase "Waterfall Model" describes a procedure in which each stage is finished and approved before going on to the next. In this paradigm, phases do not overlap.

3.3 Requirement Collection and Analysis

This assignment focuses on the analysis, design, development, implementation, and evaluation of control devices for e-learning in order to provide a user-friendly environment for future college students to receive knowledge at any academic level and to close the gap between teachers and students. For our website to function, some fundamental prerequisites and collections are required. These include the following:

- Quizzes
- Question Bank
- PDF Books
- Job Circular
- Track student performance

3.4 Use Case Modeling and Description

A use case is a method for organizing and identifying system needs in a system. We created a use case diagram from figure 3.3.1 that details our actors and their functions.

The user, moderator, teacher, and admin are the actors in this scene.

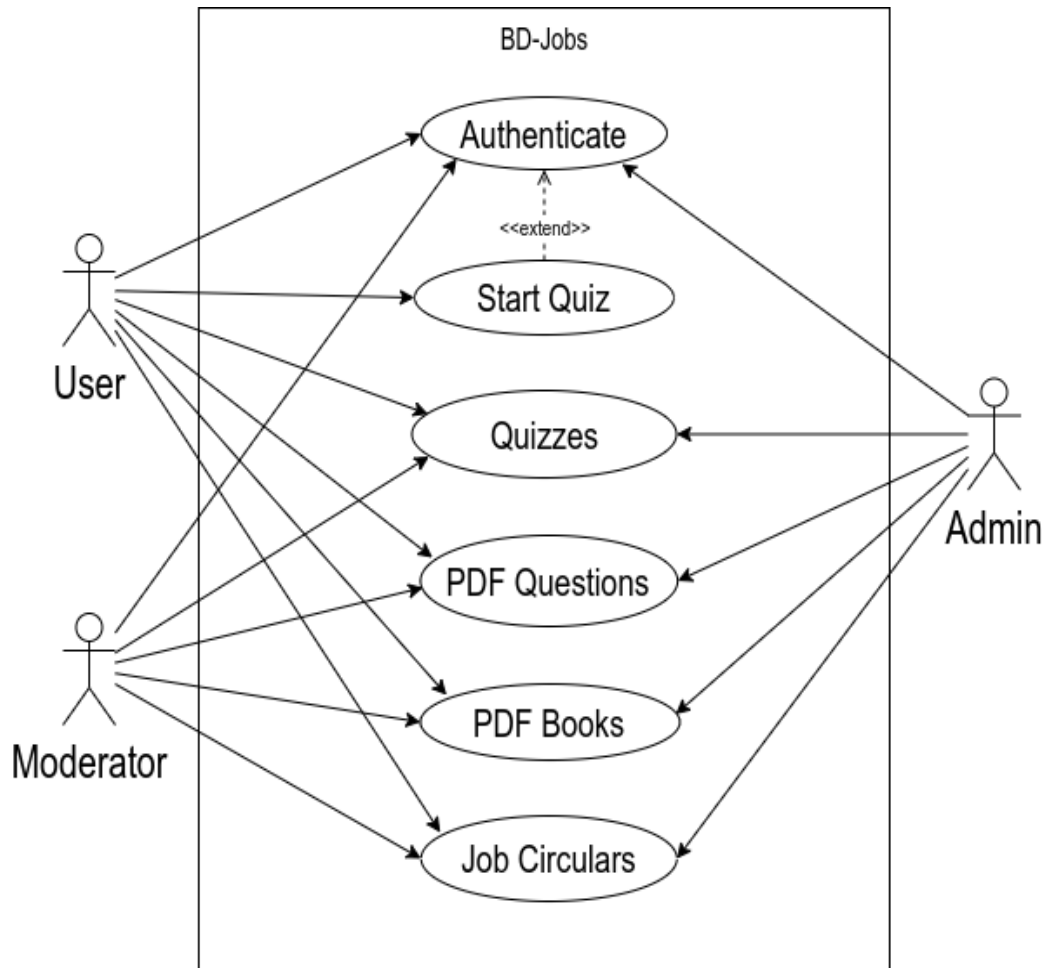


Figure 3.4.1: Use Case Modeling Description

3.4.1 Use Case Description

Here are some examples of our model's use cases.

Use Case	Sign in
Primary Actor	Student, Moderator, Admin
Secondary Actor	Null
Pre-condition	Null
Scenario	<ul style="list-style-type: none"> ● Enter name ● Enter username ● Enter valid email ● Enter password ● Enter confirm password
Post-condition	<ul style="list-style-type: none"> ● Signed up successfully or failed ● Login

Table 3.4.1.1: Use Case User Description Join now

Use Case	Login
Primary Actor	Student, Moderator, Admin
Secondary Actor	Null
Pre-condition	Sign up
Scenario	<ul style="list-style-type: none"> ● Enter valid email ● Enter password
Post-condition	<ul style="list-style-type: none"> ● Login successfully or failed ● Dashboard

Table 3.4.1.2: Use Case Description for User Login

Use Case	Profile setting
Primary Actor	Student or user
Secondary Actor	Null
Pre-condition	Login
Scenario	<ul style="list-style-type: none"> ● Update profile photo ● Update full name ● Update date of birth ● Update email ● Update Password ● Delete account
Post-condition	<ul style="list-style-type: none"> ● Update successful ● View profile

Table 3.4.1.3: Use Case Description for User Profile Setting

Use Case	Give Quiz
Primary Actor	Student or user
Secondary Actor	Null
Pre-condition	Login, enrolled
Scenario	<ul style="list-style-type: none"> ● Choose the subject ● Start Quiz ● Answer quiz within given time
Post-condition	<ul style="list-style-type: none"> ● Quiz marks ● Quiz page

Table 3.4.1.4: Use Case Description for Quiz

Use Case	Resource Add
Primary Actor	Moderator, Admin
Secondary Actor	Null
Pre-condition	Login
Scenario	<ul style="list-style-type: none"> ● Enter resources (course, PDF, question, videos etc.) title ● Enter resource price (if any) ● Enter description (if any) ● Enter link (PDF, videos etc.)
Post-condition	<ul style="list-style-type: none"> ● Resources added successfully or failed ● View resources ● Download resources

Table 3.4.1.5: Use Case Description for Adding Resource

3.5 Logical Data Model

A popular language for modeling motives is called Unified Modeling Language (UML). The main goal of UML is to lay forth a popular method for visualizing how a machine has been created. This 3.5.1 picture displays the UML class diagram for the whole project.

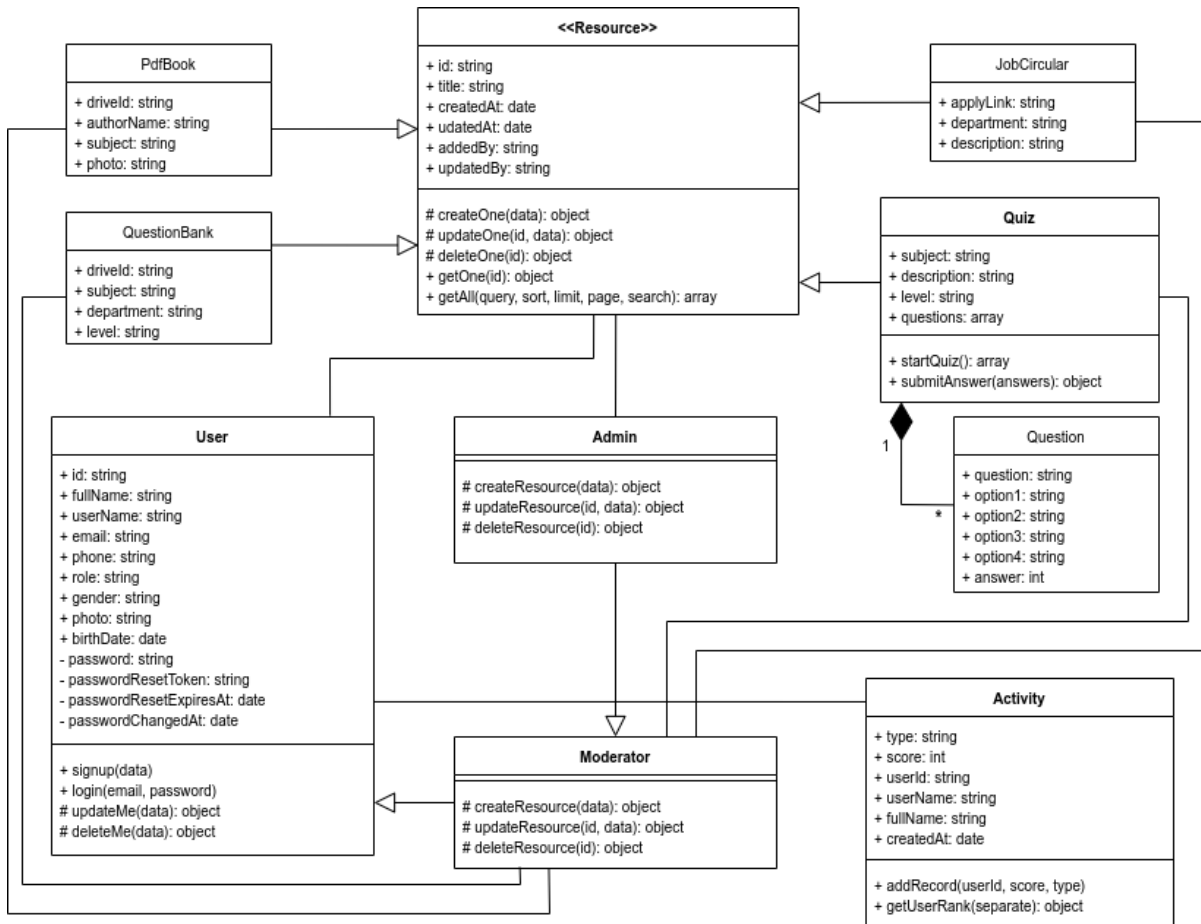


Figure 3.5.1: UML Class Diagram

3.6 Design Requirement

Module	Objective	Requirement Analysis
Admin	Admin Activities	<ul style="list-style-type: none">● Admin can manage user role● Admin can edit/delete user role● Admin can see the list of available resources● Admin can modify and add resources.
Moderator	Moderator Activities	<ul style="list-style-type: none">● Moderator can add PDF books● Moderator can add question bank● Moderator can add job circular● Moderator can add quizzes
User	User Activities	<ul style="list-style-type: none">● User can register & login with valid email● User can update their profile● User can participate in quizzes● User can get resources like PDF books, question bank● User can find job circular

Table 3.5.1: Design Requirement Analysis Table

CHAPTER 4

DESIGN SPECIFICATION

4.1 Front-end Design

An internet site's front end layout is its external design. It improves the readability and comprehension of an online website for humans. The entirety of a web page's front-end layout is what users see. For the front end of an internet site's layout, languages like HTML and CSS are employed. It provides a way for customers and the server to interact. The frontend layout is the most crucial component in building an online presence [3]. A top-searching and simple-to-use user interface on a website nowadays not only attracts visitors but also makes it possible for them to communicate with the server without difficulty. We have made an effort to develop a simple and straightforward method of applying the frontend result on our device. It makes it simple for the user to interact with the gadget.

We used well-known frameworks and libraries in our project to greatly improve the usability of the front end. As follows:

- **React Framework:** A popular JavaScript library for creating interactive user interfaces is React [11]. It gives us perspective and aids in deciding how to relax our front-end architecture.
- **Material UI Library:** With the help of the package Material UI [12], we can import and utilize several components to design a user-friendly UI for our React apps.
- **Axios Library:** When using a browser that supports the promise API, Axios [13] is a JavaScript library that is used to send HTTP requests to the NodeJS server. It can also reject requests.

Home page:The homepage of our web application BD-Jobs will be displayed to our user like this 4.1.1 figure. This homepage displays all of our website's features, including blogs, courses, PDF books, questions, seminar videos, and job postings. Anyone may access the other pages or detailed information on any particular feature.

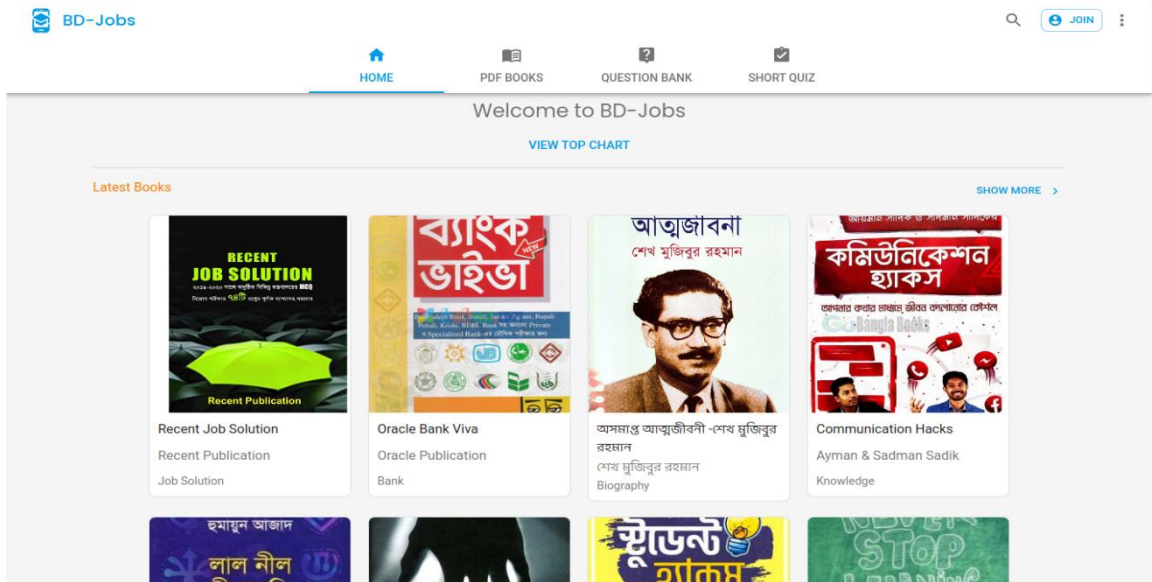


Figure 4.1.1: Home Page

Changing our website's theme:By choosing the profile icon in the top left corner, every user can choose the theme, which can be either dark or bright in color. 4.1.2 Figure.

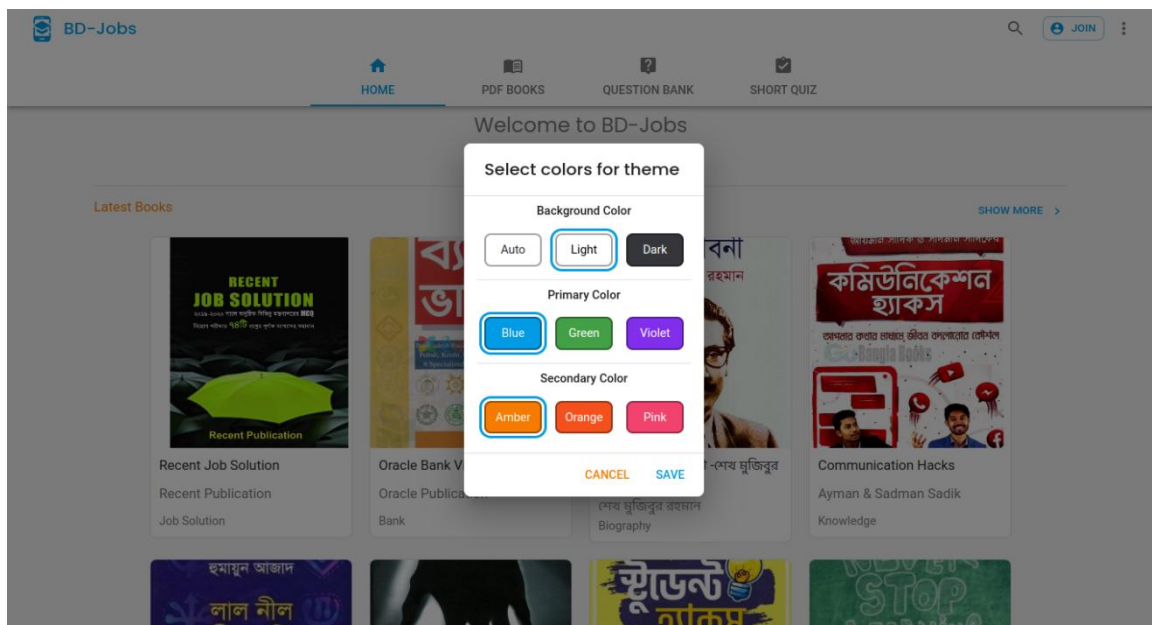


Figure 4.1.2: Changing theme of our site

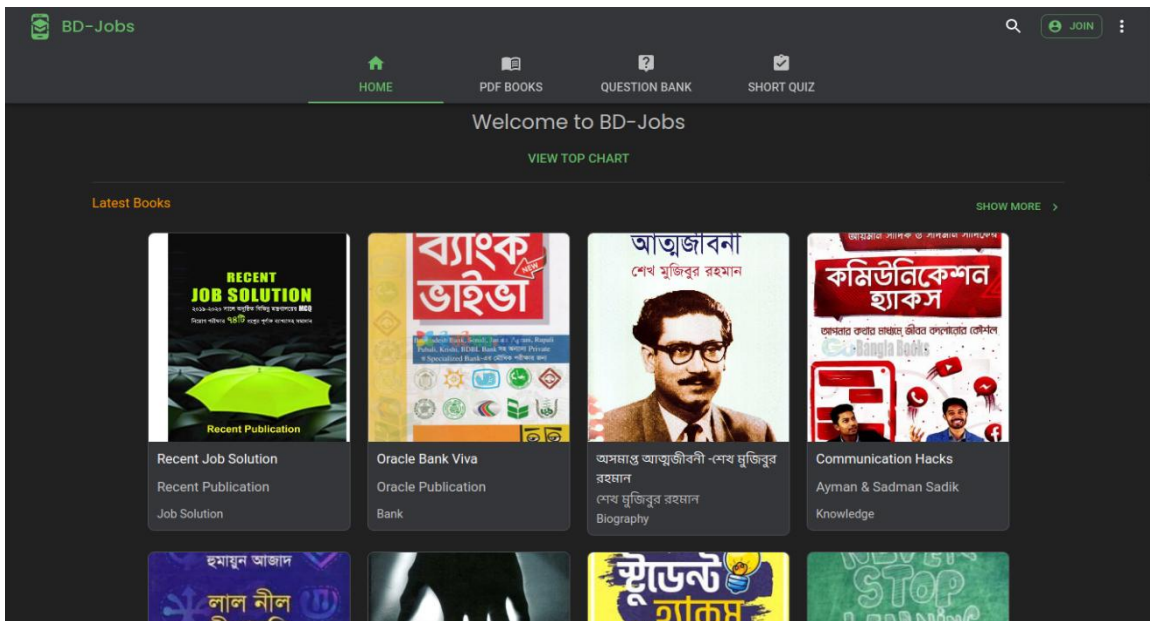


Figure 4.1.3: theme Chang

Theme change:Our entire site will appear like this if we change the theme to dark. 4.1.3.

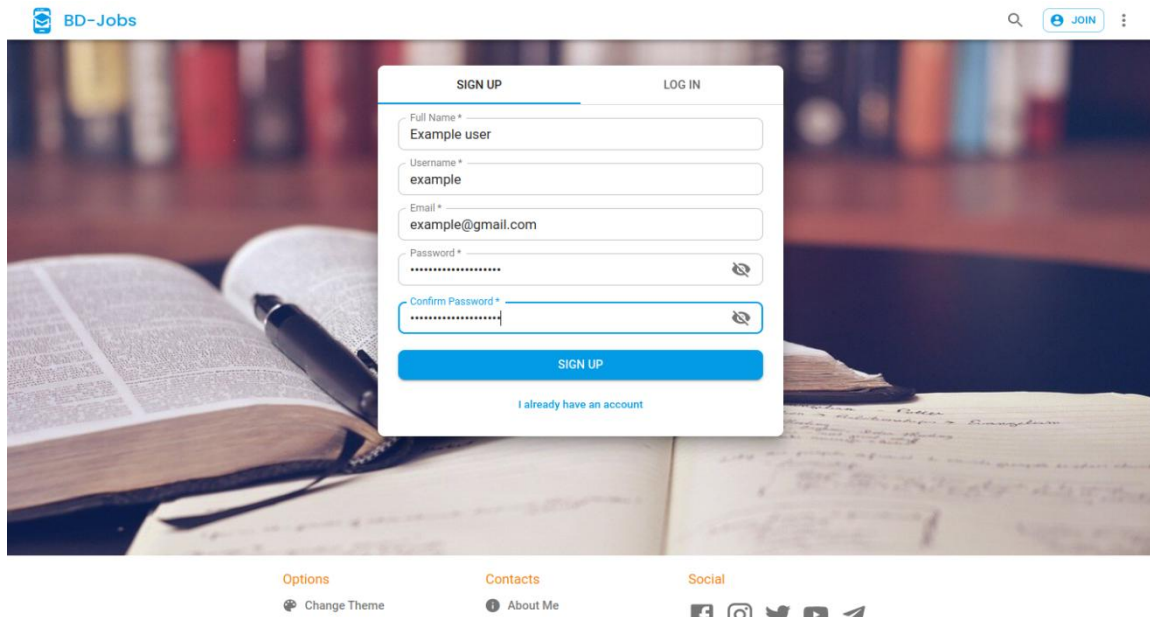


Figure 4.1.4: sign up page

Sign up Page: This 4.1.4 figure demonstrates the Sign-Up page for our website BD-Jobs.

Log in Page: This 4.1.5 figure shows our Login page for our website BD-Jobs.

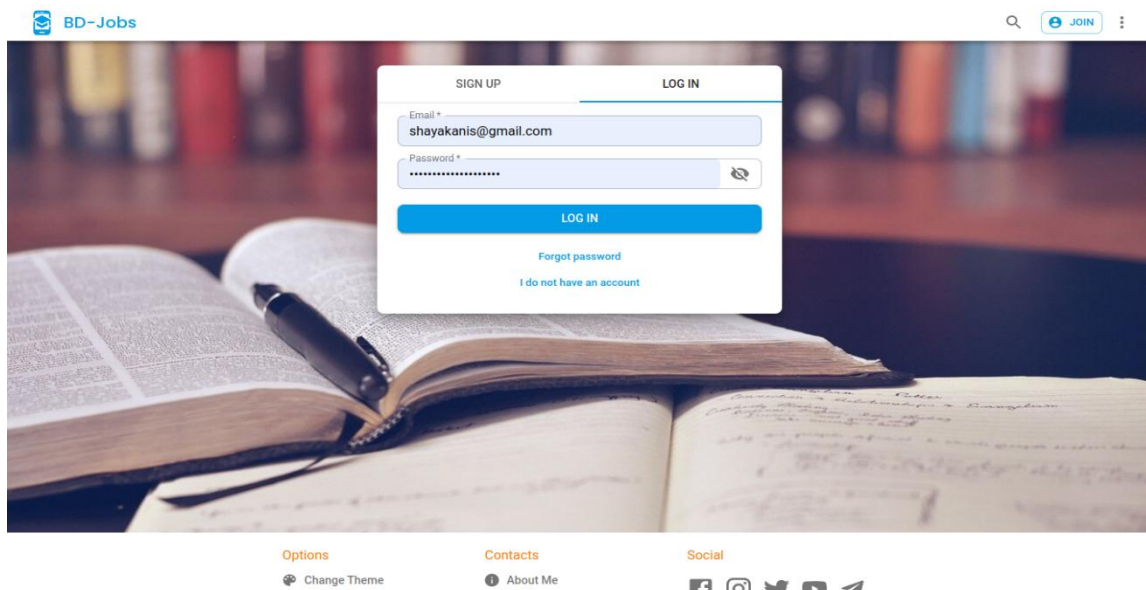


Figure 4.1.5: Login page

Profile page: If we navigate to my profile page shown in figure 4.1.6, we can see various boxes where I may modify my profile photo, email address, password, and add my gender and birth date. A user can also remove their account using a function that is available. In addition, I can view the blog posts I have made to the website and the courses I have taken.

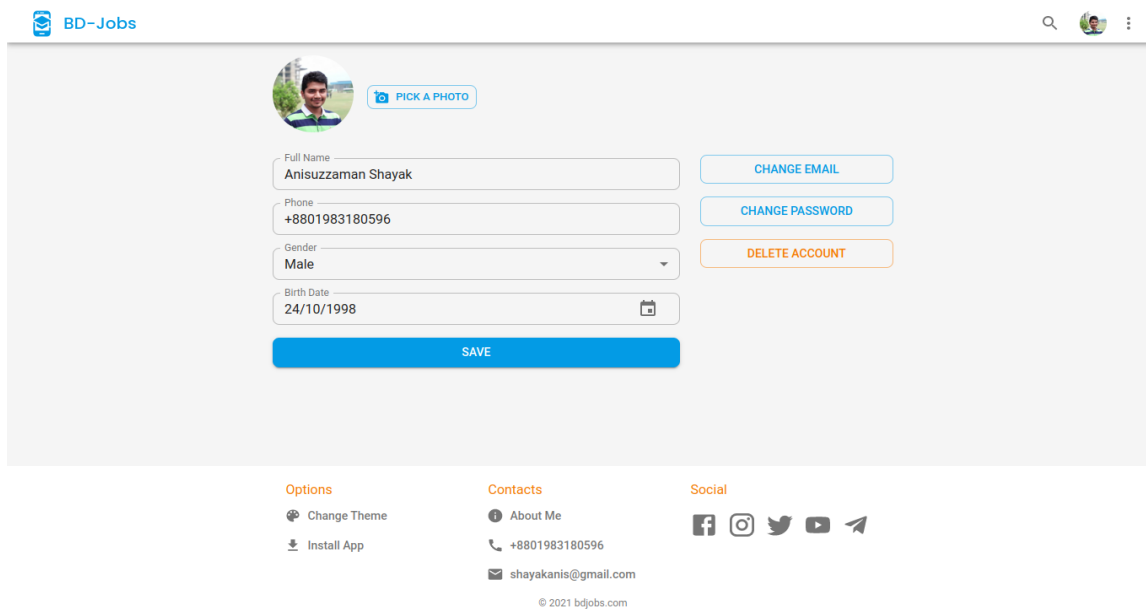


Figure 4.1.6: Profile page

PDF Book Page: There are several PDF books on this website, which has 4.1.7 as its version. Any user on our site has the ability to search by book title. After then, he or she can either download this PDF book or read it online on our website.

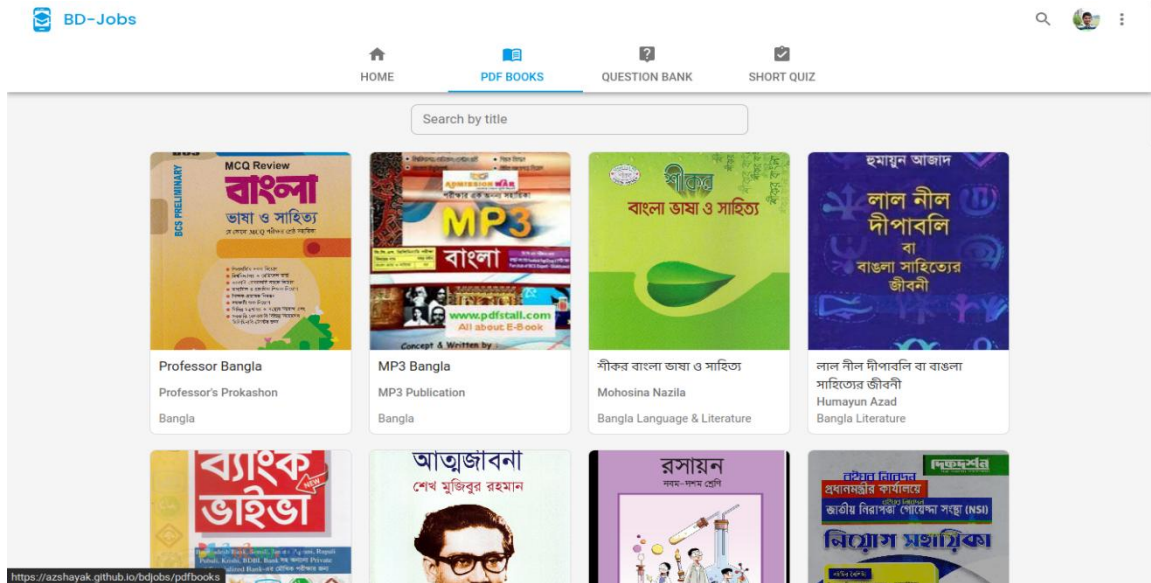


Figure 4.1.7: PDF Book Page

PDF Book Page: By clicking the "DOWNLOAD" button in the top right corner, users may quickly download any PDF book and read it in that format. Additionally, the user has the option to zoom in and out of the PDF while viewing it in 4.1.8.



Figure 4.1.8: PDF Book Page

Question Bank Page: There will be a long list of questions, similar to 4.1.9, on our question bank website. There are two ways we might look for a certain question.

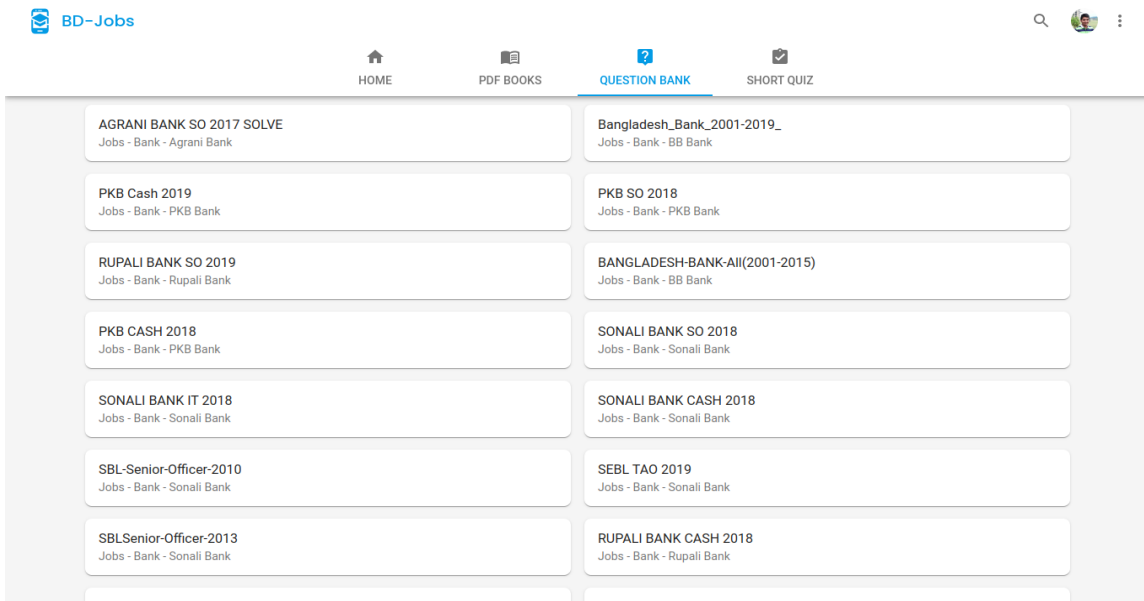


Figure 4.1.9: Question Bank Page

Read or Download Questions: The user may view any PDF questions in that form or download them quickly by pressing the "DOWNLOAD" button in the top right corner, as illustrated in Figure 4.1.10. The user may also zoom in and out of the PDF if desired.

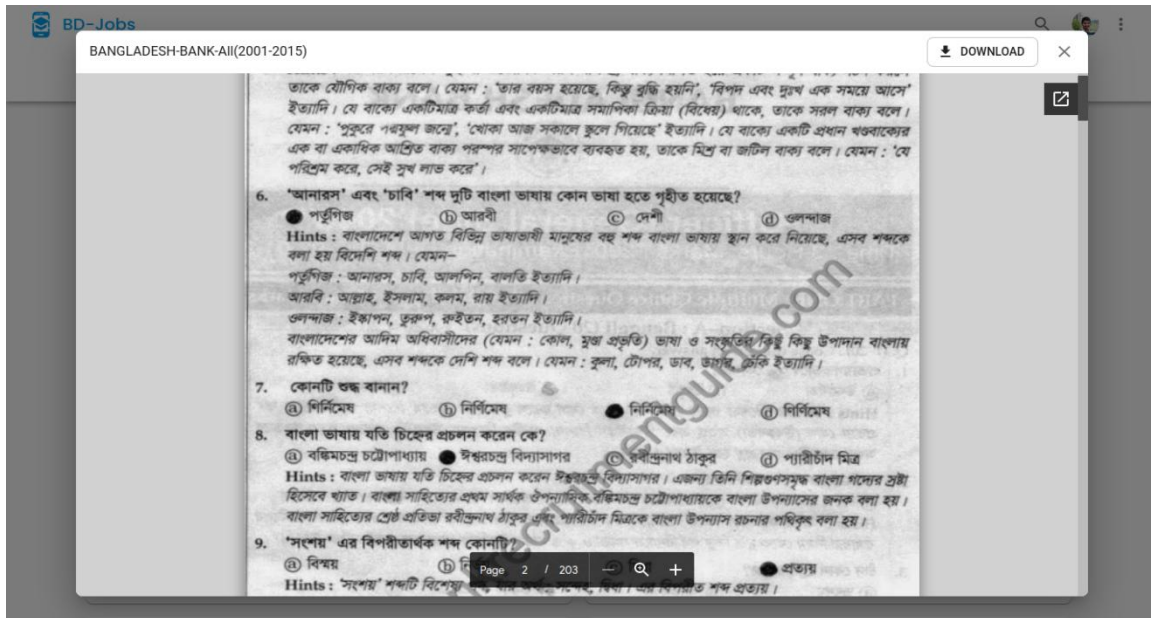


Figure 4.1.10: Read or Download Questions

Online Quiz Selection Page: This 4.1.11 figure shows our quiz page, where users may choose a level, department, and subject for a specific quiz before deciding whether or not to take it.

BD-Jobs

HOME PDF BOOKS QUESTION BANK SHORT QUIZ

This week's toppers

Your score this week : 0

Start new quiz

Level
Jobs

Department
Govt. Job

Subject

START

Options
Change Theme
Install App

Contacts
About Me
+8801983180596
shayakanis@gmail.com

Social
Facebook Instagram Twitter YouTube Telegram

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Figure 4.1.11: Online Quiz Selection Page

Online Quiz Answering Page: This 4.1.12 picture depicts the quiz page, in which the user can select one of four answers.

BD-Jobs

HOME PDF BOOKS QUESTION BANK SHORT QUIZ

Bangladesh Affairs Quiz- 1 (Time : 1 minutes)

Jobs - Govt. Job - Bangladesh Affairs

'A search for identity' - বইটি কার লেখা?

A. কবির চৌধুরী

B. মেজর আব্দুল জলিল

C. মেজর রফিকুল ইসলাম

D. সিরাজুল ইসলাম চৌধুরী

নিম্নের কোন দুর্ঘটনা বাংলাদেশের জনগণের জীবিকা পরিবর্তনের ক্ষেত্রে দীর্ঘস্থায়ী প্রভাব ফেলতে পারে?

A. ভূমিকম্প

B. সমুদ্রের জলস্তরের বৃদ্ধি

C. ঘূর্ণিঝড় ও জলোচ্ছ্বাস

D. যারা বা বন্যা

সার্ক দুর্ঘটনা বারম্বারনা কেন্দ্র কোথায় অবস্থিত?

A. নতুন দিল্লি

Time remaining : 0h 0m 23s

Figure 4.1.12: Online Quiz Answering Page

Online Quiz Result Page: This 4.1.13 graphic shows the quiz page where users may view the quiz's results.

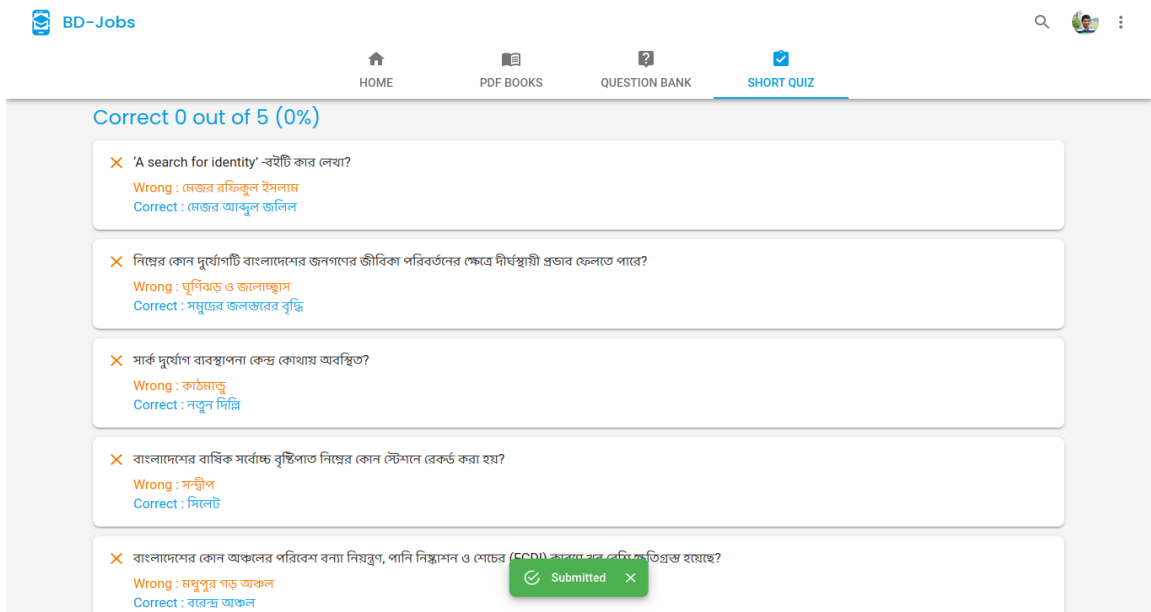


Figure 4.1.13: Online Quiz Result Page

Job Circular Page: Users may locate any job by searching by title or by choosing the department segment (like, EEE, CSE, and Medical etc). It will display the title of the employment circular seen in Figure 4.1.14.

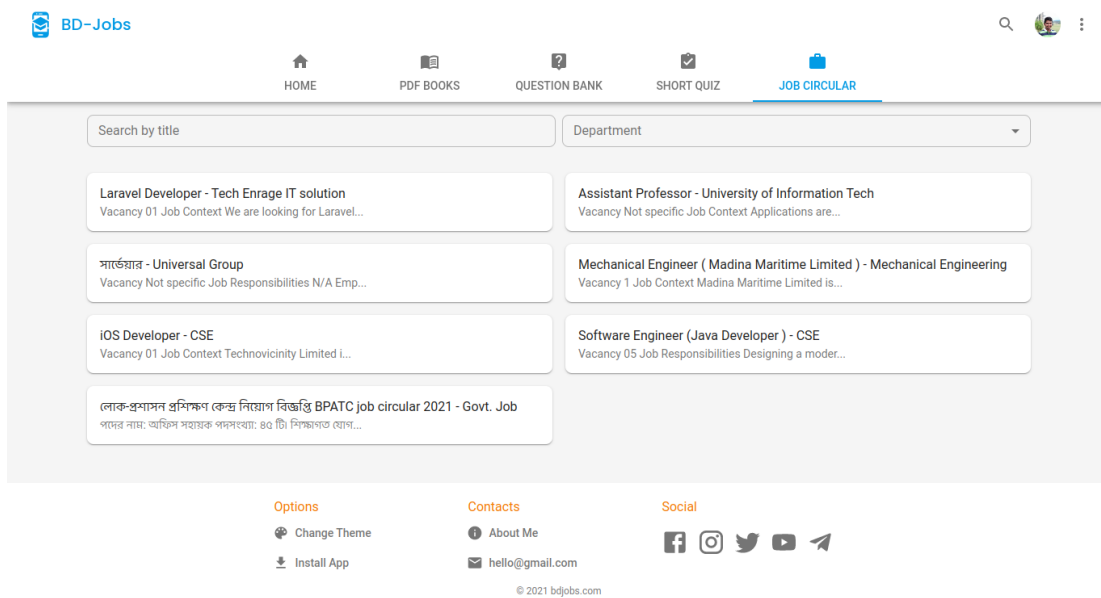


Figure 4.1.14: Job Circular Page

Job Circular Description Page: If a user wishes to examine a circular in greater depth, he or she may see the job opening, description, pay, last date for submission, and ultimately the link for online application in figure number 4.1.15. It will take him/her to the real job document submitted for the next step.

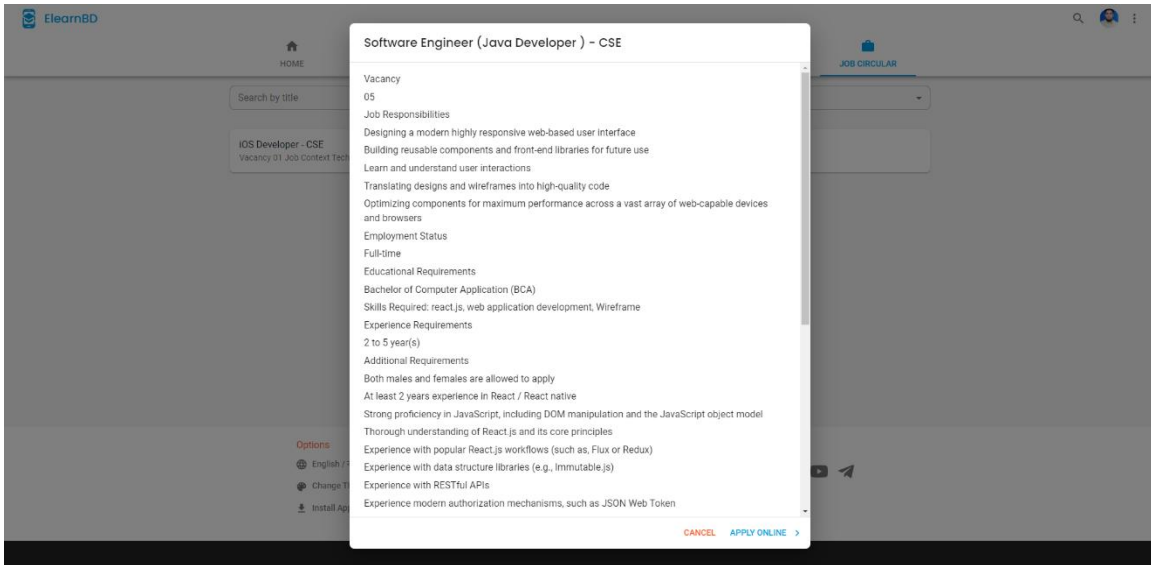


Figure 4.1.15: Job Circular Description Page

Administrator Add PDF Books Page:Figure 4.1.16 demonstrates how an administrator can include PDF books from all categories.

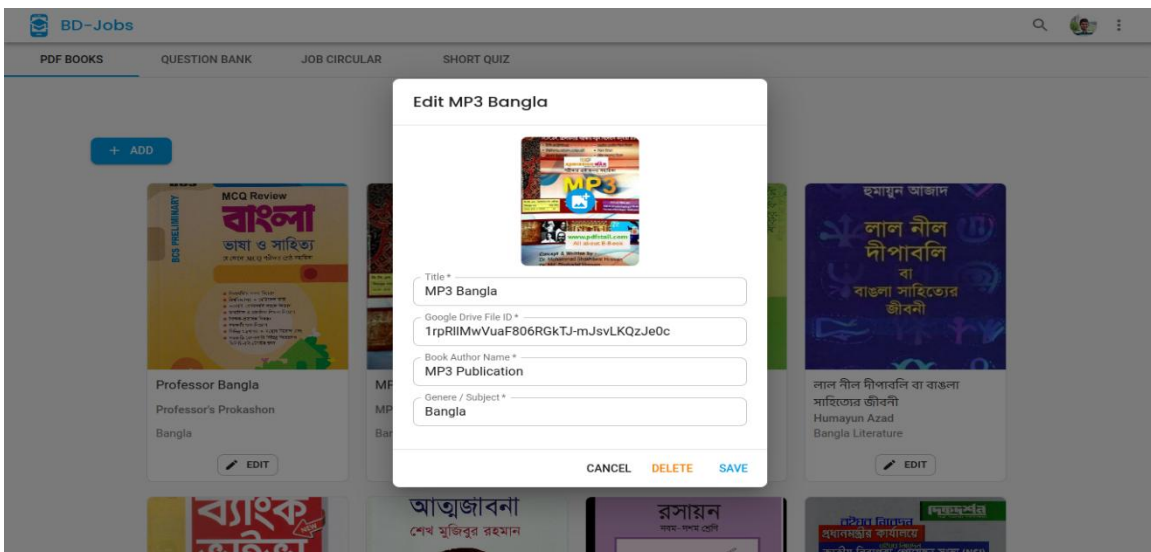


Figure 4.1.16: Admin Adding PDF Books Page

Admin Adding PDF Question Page:Figure 4.1.17 demonstrates how a manager can include PDF questions (title, drive link, level, department and subject).

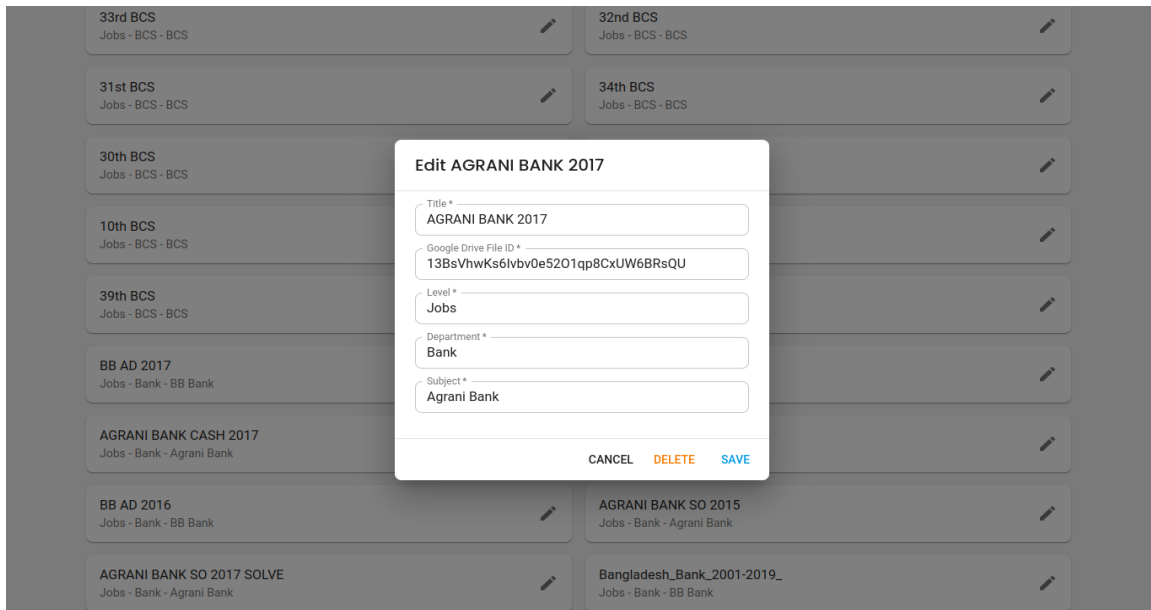


Figure 4.1.17: Admin Adding PDF Question Page

Admin Adding Job Circular Page:Figure 4.1.18 demonstrates how an administrator may include courses and course materials (title, department, online apply link and job description).

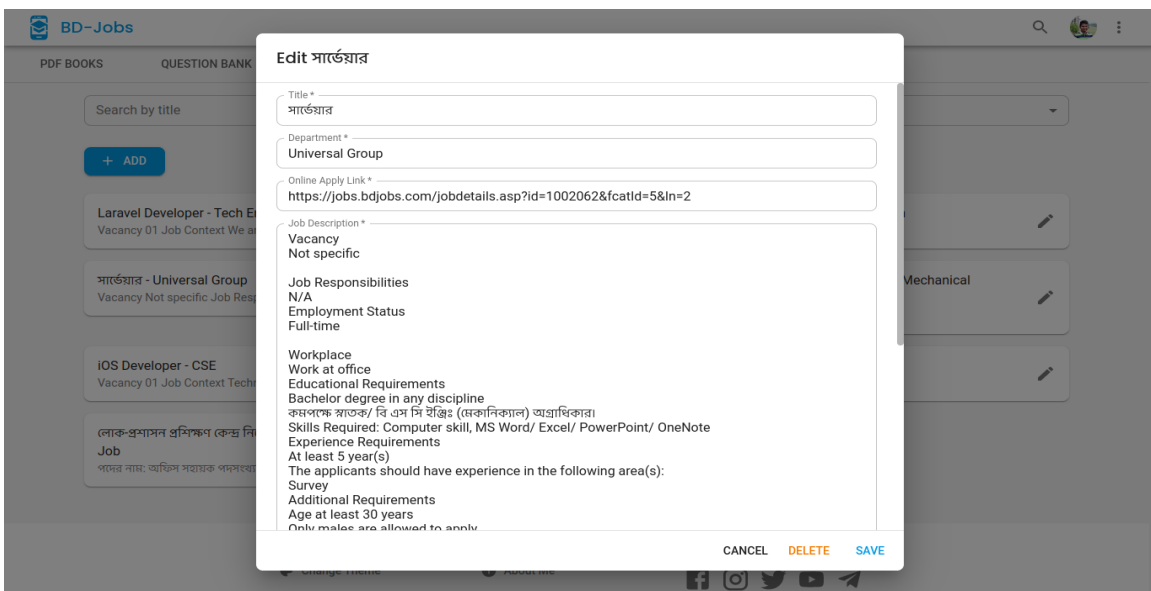


Figure 4.1.18: Admin Adding Job Circular Page

Admin Adding Online Quiz Page:Figure 4.1.19 demonstrates how a manager might include questions for an online test (level, department, subject, quiz title, quiz time and questions).

The screenshot shows the 'Admin Adding Online Quiz Page' interface. At the top, there is a navigation bar with 'PDF BOOKS', 'QUESTION BANK', 'JOB CIRCULAR', and 'SHORT QUIZ'. The 'SHORT QUIZ' section contains a form with the following fields: 'Level' (Jobs), 'Department' (Govt. Job), 'Subject' (Bangladesh Affairs), 'Quiz Title' (Bangladesh Affairs Quiz- 1), and 'Quiz Time (minutes)' (1). Below the form, there are two questions. Question 1 asks 'A search for identity' -বইটি কার লেখা? with options A: কবির চৌধুরী, B: মেজর আব্দুল জলিল, C: মেজর রফিকুল ইসলাম, and D: সিরাজুল ইসলাম চৌধুরী. The answer is B. Question 2 asks 'নিম্নের কোন দুর্ঘটনাটি বাংলাদেশের জনগণের জীবিকা পরিবর্তনের ক্ষেত্রে দীর্ঘস্থায়ী প্রভাব ফেলতে পারে?'.

Figure 4.1.19: Admin Adding Online Quiz Page

4.2 Back-end Design

The back-end layout is the inner logical structure of a website. It is also known as server aspect design. The back-end design makes it easier to create a dynamic website. It specifies how the online web site must function. Back-end designers are internet developers that provide the internet security, form, and content material of the website online. The back-end is the most complicated and important aspect of web development. The entire internet is mostly based on total gadget that is dependent on the back-end or server element. A back-end developer must deal with a variety of sophisticated stages such as authentication, session, record validation, database administration, record passing, security, and so on [4].Our project's back-end is built using NodeJS, a well-liked back-end server [14]. Because NodeJS is single-threaded, we are aware that it is renowned for its non-blocking, event-push servers. The traditional webpages and back-end API services are the major uses of it.

To test our requests and answers, we worked together on our project using postman, an open-source platform, and the MongoDB [15] database, a NoSQL database. Every area has an API that we created, and the back end is displayed in the images below.

Sign-up API:The request and answers for registering a user are displayed in figure 4.2.1.

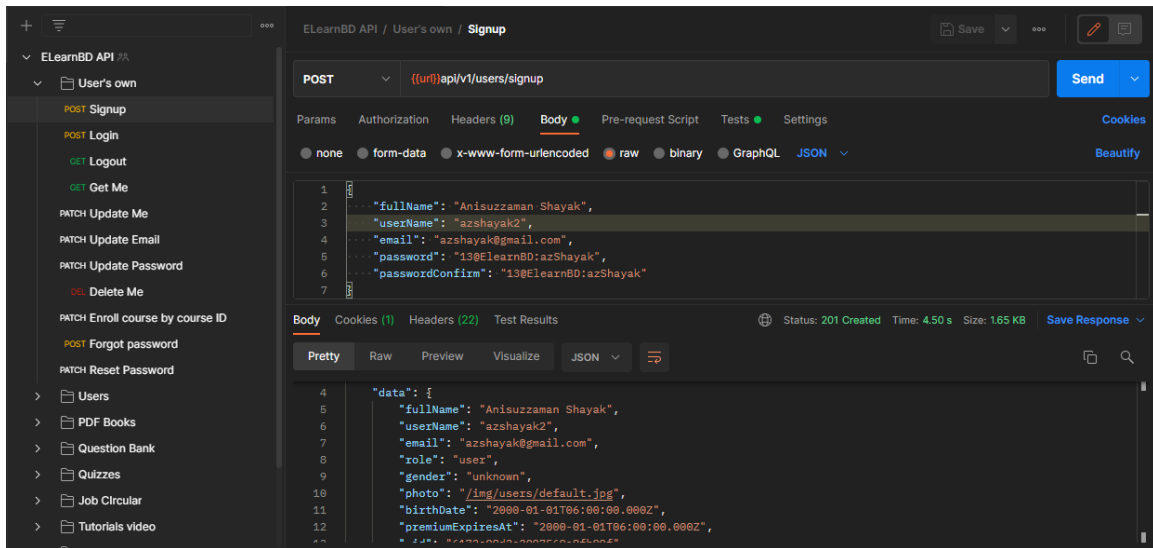


Figure 4.2.1: Sign up API

Login API: This 4.2.2 figure displays the login request and responds for a user.

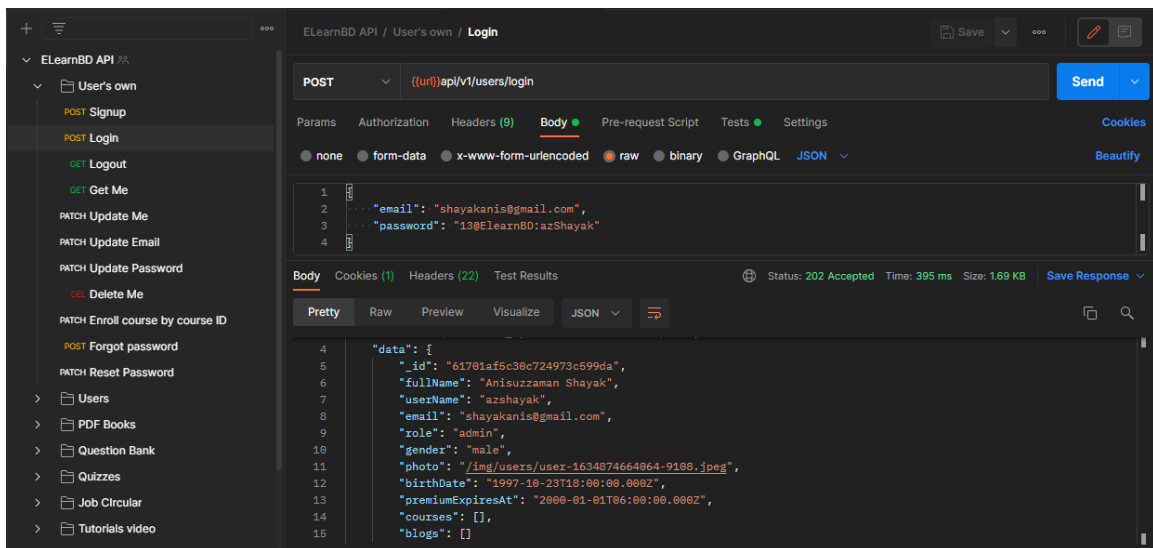


Figure 4.2.2: Login API

Forgot Password API: This 4.2.3 figure shows the reset password system. When a user forgets his/her password this is how they or can recover their password.

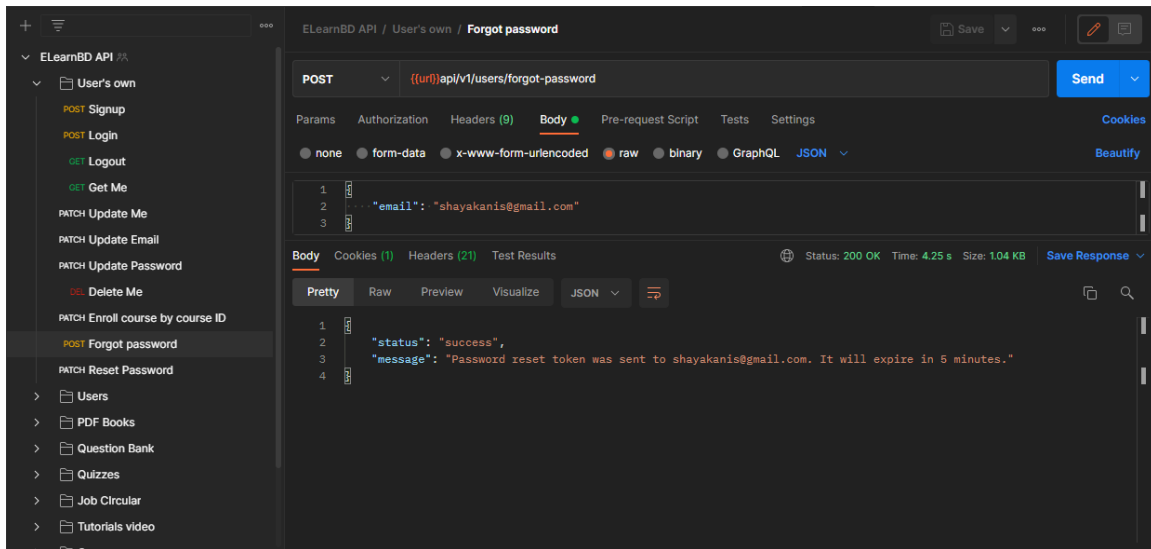


Figure 4.2.3: Reset Password

Quiz Add API:An administrator or supervisor can add quiz questions, as shown in figure 4.2.4.

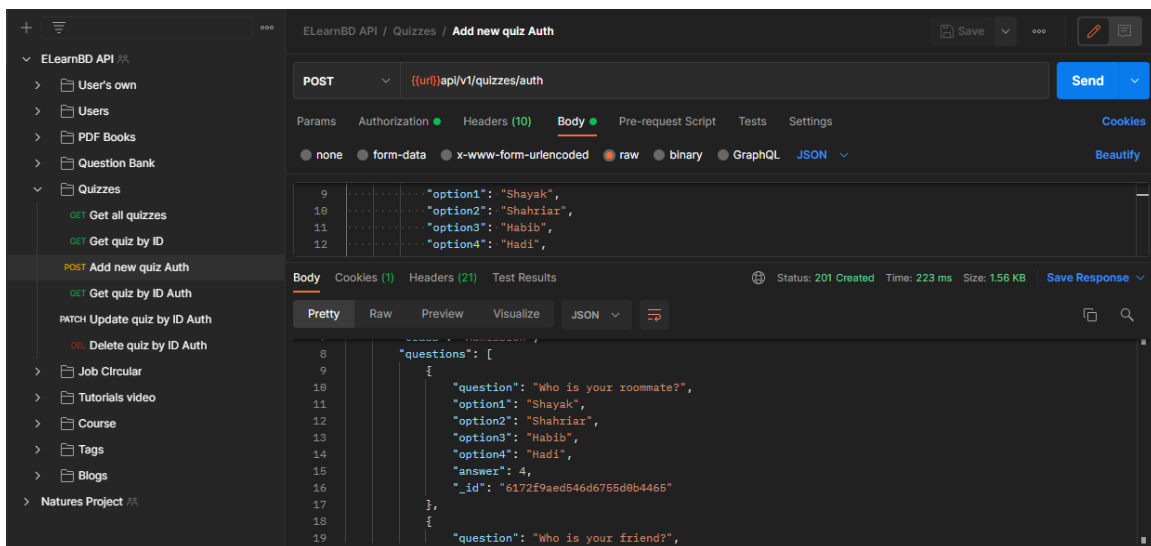


Figure 4.2.4: Quiz Add API

Question Bank API:The procedure for getting all the topics from our database is depicted in Figure 4.2.5.

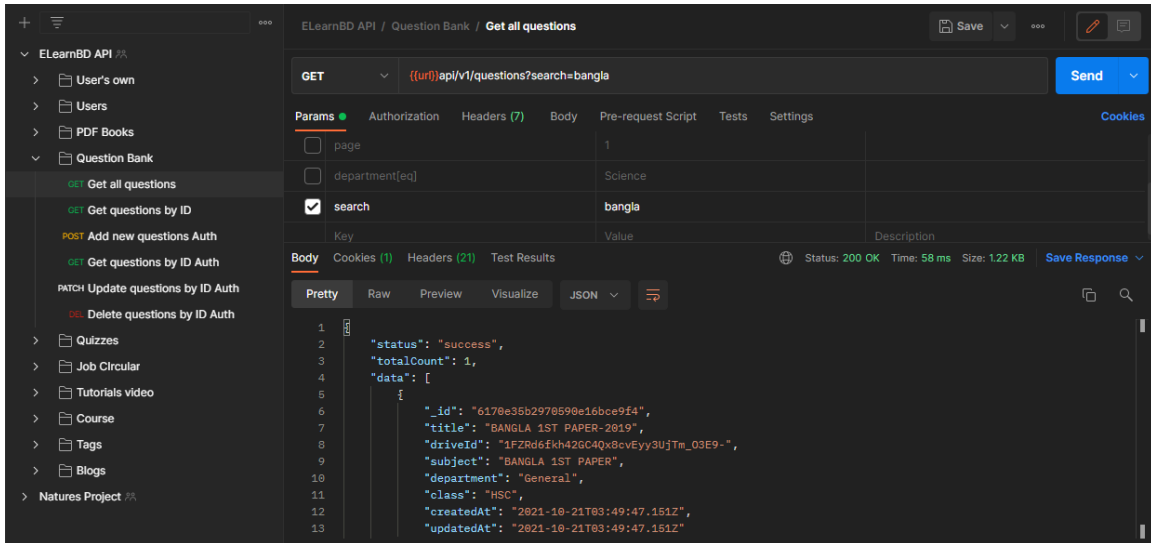


Figure 4.2.5: Question Bank API

Get All Books API: This 4.2.6 figure shows how a user can get all the PDF books from our site.

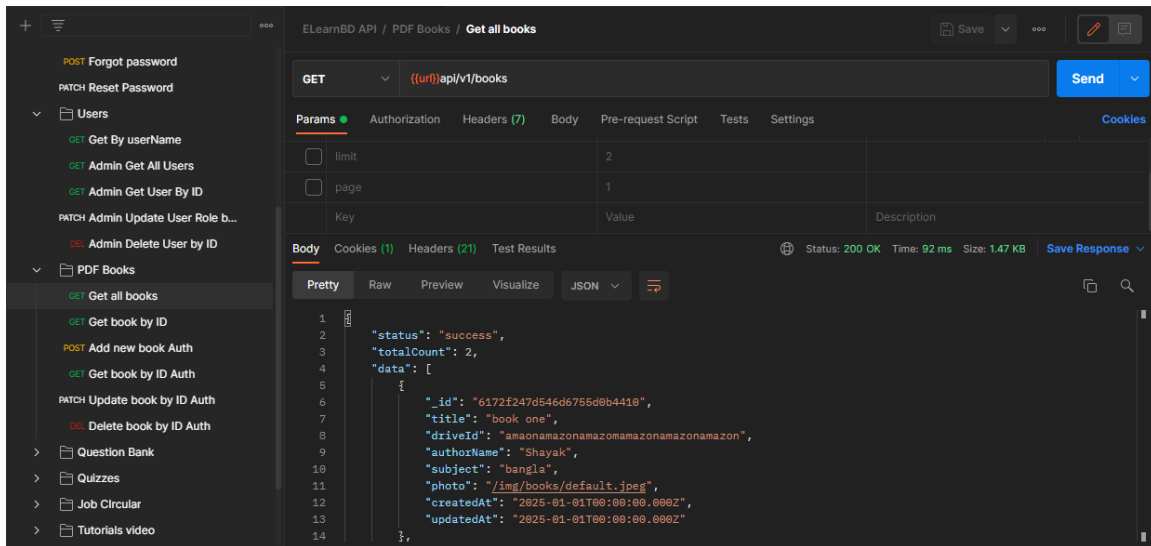


Figure 4.2.6: Get All Books API

Add Job Circular API: This 4.2.7 diagram illustrates the steps involved in adding a fresh job posting to our website.

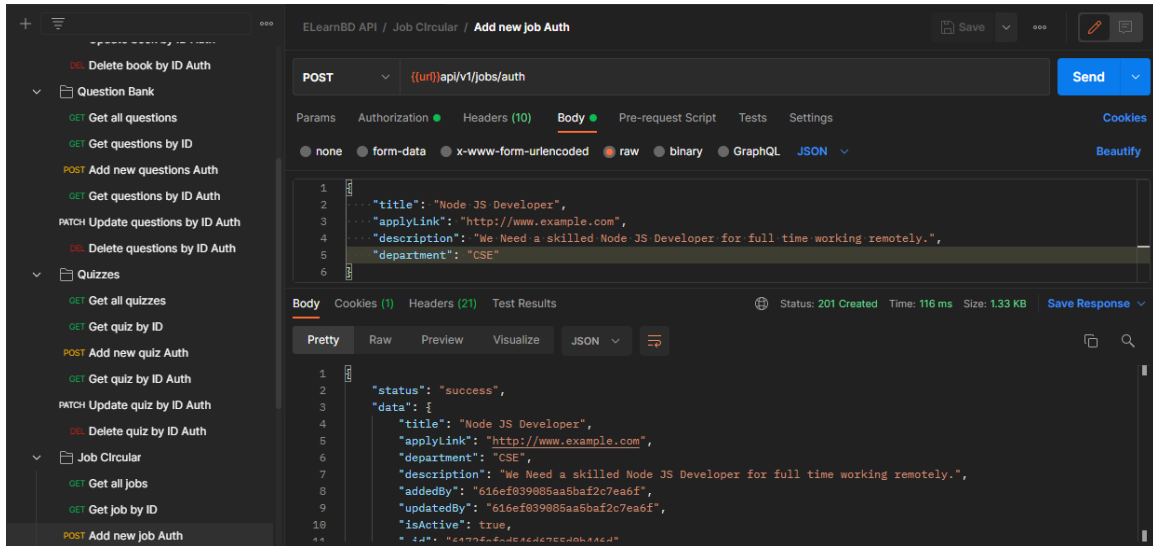


Figure 4.2.7: Job Circular API

Update Password API: How a user can change their password on our site is depicted in figure 4.2.8.

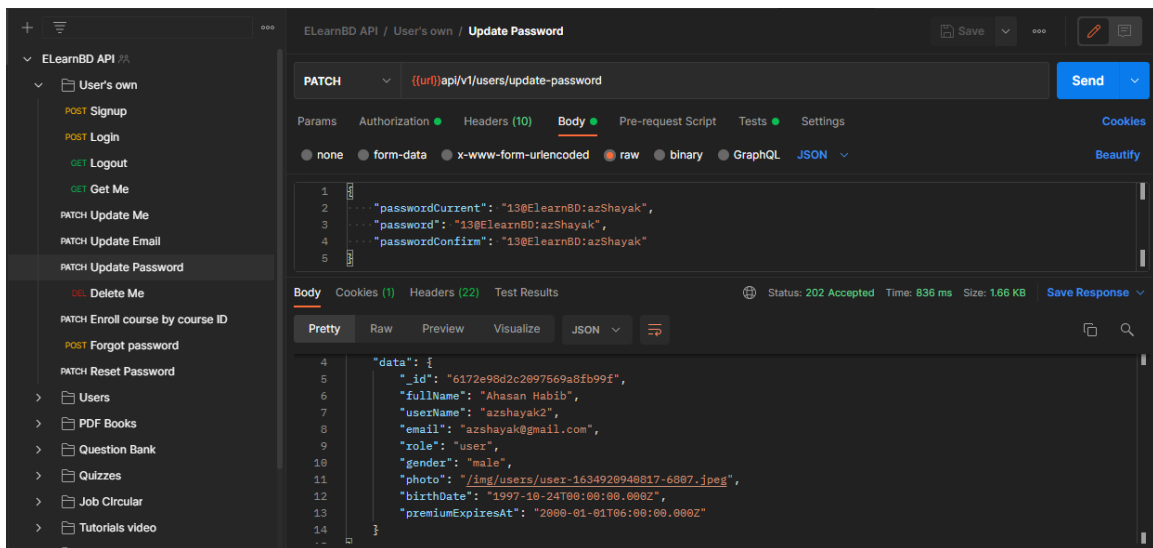


Figure 4.2.8: Update Password API

Update Mail API:The procedure for updating a user's mail is depicted in Figure 4.2.9.

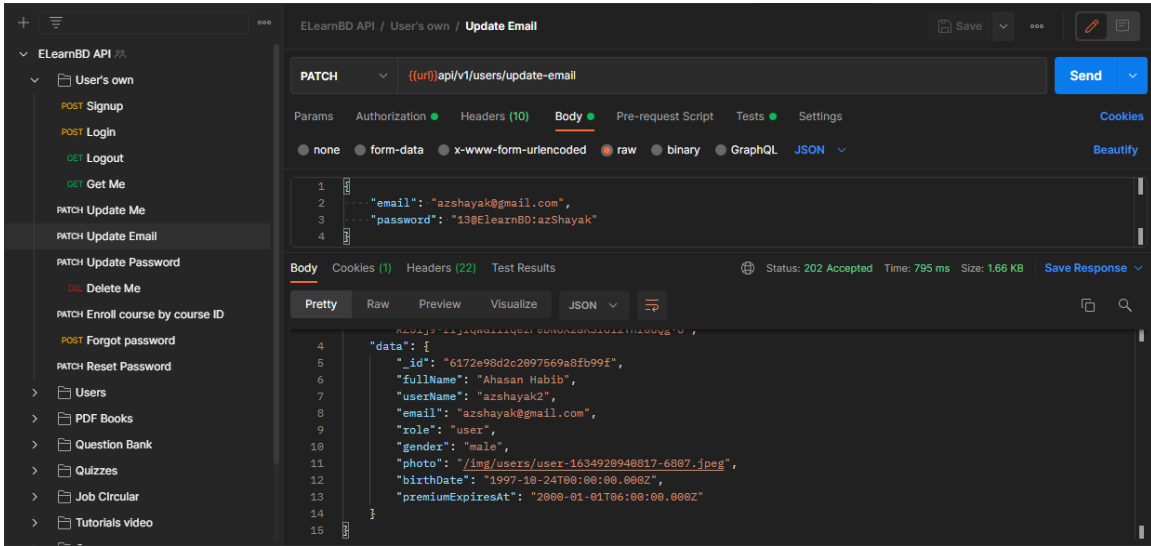


Figure 4.2.9: Update Mail API

Update Profile API: This 4.2.10 figure shows how a user can update their profile on our site.

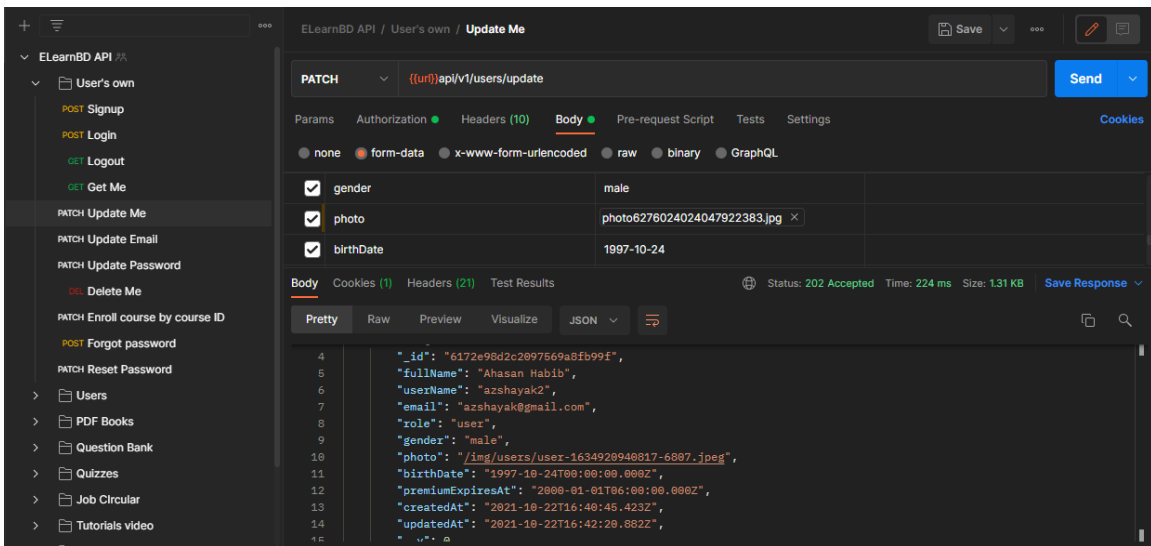


Figure 4.2.10: Update Profile API

4.3 Interaction Design and User Experience (UX)

In order for any user to quickly browse through all of our features from our website as we designed We aimed to create the design incredibly user-friendly for an online education platform, a web-based software for school-level to professional-level students or users. Simply entering a certain term into one of our sites will allow anyone to quickly locate all the features or whatever it is they are looking for. We built our site utilizing a tab view to modify the display or functionality in a very simple way; we don't use any drop-down menus. We created two themes, one with a standard white background and the other with a dark (black) backdrop that may easily be altered. Overall, we worked hard to create an amazing user experience (UX) for our users that would make it easy for them to search and learn.

4.4 Implementation Requirements

- React framework, Material-UI, and Axios libraries are used to create the front-end website.
- Using NodeJS, the Express framework, and the MongoDB database, the back-end server was created.
- Postman [17] was used by us to test our API.
- Modern JavaScript is used for client-side validation and verification.
- A variety of error messages should be displayed if any erroneous data is entered into the form.
- We do not utilize a SQL database since it makes processing queries much simpler.

CHAPTER 5

IMPLEMENTATION AND TESTING

5.1 Implementation of Database

We have deployed MongoDB as our database on our BD-Jobs website. MongoDB is a well-known document-oriented database that makes it possible to store any form of data in files that resemble JSON and have a configurable structure. It assumes that it can maintain our data without worrying about the quantity of fields or the kind of fields that need to maintain values. In every way, MongoDB files resemble JSON [16] objects. The eight components that make up our architecture for the BD-Jobs system are BD-Jobs database schema implementation and our database collection in the mongo dB atlas database. Our entities are:

- User
- Quiz
- Question
- Book
- Job

Now that we have our specific entities, we need to link them together to represent their relationship:

- Users may participate in a quiz (M to M).
- A user looks for a job announcement (one to many).
- User looking for books in PDF (1 to many).
- User searching the question bank from past exams (1 to many).

5.2 Implementation of Front-end Design

- Authenticated user profiles: Users will be able to log in as registered users with their own, editable profiles after completing the registration procedure.
- Dashboard: There will be a dashboard page that displays the many capabilities we are offering to users, educators, and others.
- Filtering: A necessary tool for selecting an efficient search strategy (manual, keywords, and categories).
- Admin panel: A tool for managing a website, involving participation in lessons, exams, books, tutorials, etc.

5.3 Implementation testing

The results of an application's tests and reports are critical in establishing whether or not the application is ready for launch. This may be identified by carefully examining each trait. To ensure the feature functions as planned, we must do several forms of testing. There are several forms of testing, such as

- Testing for functionality
- Usability Evaluation
- Web User Interface Testing
- Testing for Compatibility
- Performance Evaluation
- Security Examination

After successfully completing these tests, we can guarantee that our application will launch. We tried these on many phones, tablets, and computers. Finally, we used the findings and advantages of the usability testing:

- Best user interface for interaction;
- User-friendly.
- The system is simple to search and utilize.
- Users are more likely to accept the application.
- Good application quality across the board.

Since the moment we first began to create our front-end, we have tested our web application on several occasions. In order to ensure that our online application would function without errors, we tested it more than 30 times on various desktops, mobile devices, and tablets while using various user accounts. Even so, we strived to fix any issues that we discovered after each test in order to finish the project.

5.3.1 Login Test Case

Conditions	Email	F	T	F	T
	Password	F	F	T	T

Table 5.3.1: Login Test Case

Actions	Result	Error: Please enter a valid email and password	Error: Please enter valid email and password	Error: Please enter valid email and password	Successfully Logged in
	Expected Result	Error: Please enter a valid email and password	Error: Please enter valid email and password	Error: Please enter valid email and password	Successfully Logged in

Table 5.3.1: Login Test Case

5.3.2 Change Password Test Case

Conditions	Old Password	F	T	F	T
	New Password	F	F	T	T
Actions	Result	Error: Please enter valid password	Error: Please enter valid password	Error: Please enter valid password	Password Changed
	Expected Result	Error: Please enter valid password	Error: Please enter valid password	Error: Please enter valid password	Password Changed

Table 5.3.2: Change Password Test Case

5.3.2 Case Study Evaluation

Test Case	Test Input	Expected Outcome	Obtained Outcome	Pass/Fail	Tested on
1. Registration	Valid email, username, password	Successfully registered	Successfully registered	Pass	25-04-2022
2. Login	Login via mobile, pc, tab	Successfully login	Successfully login	Pass	25-04-2022
3. Password	Incorrect password or empty field	Warn the incorrect password or field is empty	Show warning	Pass	25-04-2022
4. Profile settings	View profile, update profile information	Show and update profile information	Show and update information successfully	Pass	25-04-2022
8. Give Quiz	Select subject and start quiz	Answer submitted	Show quiz marks	Pass	25-04-2022
9. Search	Search any keyword in the search bar	Show the searched output	Show the searched output	Pass	25-04-2022

Table 5.3.2: Test Case Evaluation

5.4 Test Results and Reports

An application's test findings and reports are an essential component in determining if the application is ready for launch or not. This may be discovered by analyzing each characteristic. Testing of the Passwordious kind is necessary to ensure that the feature performs as intended. There are several forms of testing, such as:

- Security, Regression, and Functionality
- Scalability & Performance
- System interoperability and usability
- Disaster recovery and localization
- Installing or upgrading.

After successfully completing these tests, we approve the launch of our application. We tried these on many phones, tablets, and computers. Finally, we used the findings and advantages of the usability testing:

- Best user interface for interaction
- Users find it simple to use.
- Searching and using the system are simple.
- Users are more likely to accept application.
- Good application quality across the board.

Chapter 6

Impact on Society, Environment and Sustainability

6.1 Impact on Society

Today's students of all levels may complete their homework or preparation on their own time thanks to the convenience and adaptability of online learning. Our educational platform will positively affect our society. If we use this educational platform to communicate certain arguments that could have an influence on society, they might be as follows:

- By developing virtual laboratories or projects for college or university students, as well as creating animated movies of course material, online learning platforms are making courses or videos interactive in some way. Numerous ways.
- Students now participate in virtual class discussions using our learning platform, as opposed to having noisy discussions in actual classes on campus.
- One doesn't need to go outside for lessons to buy books or look for study materials while using online learning systems. Through our websites, they can simply find the courses, PDF books, or question banks they want and purchase or download them.
- By answering honestly in online quizzes, one may quickly assess their level of knowledge on a given subject. He or she will become accustomed to taking online exams in this way, which might be helpful in the future.
- Students may also wish to control the many forms of an online learning environment. The kids can obtain the social connection they need as well as achieve achievement through hard work and determination.

6.2 Impact on Environment

Since the COVID-19 epidemic, the idea of online learning has gained popularity, and from that point on, it has been a subject for students to pursue their studies remotely. If we discuss the advantages and disadvantages of online learning environments, the environmental advantages must be well recorded and considered as our educational system develops.

Some significant environmental benefits of online learning are listed below.

- Online education lowers emissions from transportation and environmental pollution. Online education reduces CO₂ emissions from our environment by up to 148 pounds on average each semester, according to a research.
- It cuts down on energy use. We are aware that employing technology, lighting, and cooling systems in educational facilities requires a significant amount of power. Therefore, cutting back on energy use can help institutions save money while lowering their carbon footprint.

- It saves forests and reduces paper waste. Since digital content like videos, PDFs, and virtual tests dominates online learning, as well as electronic textbooks and assignments. As a result, fewer trees are cut down and less paper is utilized.
- Online learning environments conserve natural resources like water. Nevertheless, a learner will need water when engaging in virtual learning. However, it is far smaller than a commercial structure like a college, varsity, or coaching facility.
- It lessens food and plastic waste. Staying home instead of going to school or college can reduce the excessive consumption of food and plastic. It can also maintain our surroundings clean in this way.

6.3 Ethical Aspects

E-learning settings require policies that strike a balance between the unique expectations of contributors and consideration for how customers view ethics at some point throughout online learning. The battleground has been permanently altered by the advent of the digital age. One of the most significant and obvious effects of any invention in recent history has been the Internet and the rapid advancement of conversation technology [5]. Online shopping, communication, and self-education have all changed as a result of web technology. Within the educational community, there is a widespread belief that the traditional teaching-learning paradigms are unable to meet the brand-new challenges brought about by the use of developing technology. E-learning offers all the tools required to handle these challenging situations. Anyone, anywhere in the globe, can access online learning; all they need is access to a web browser. E-learning is the delivery of information, communication, instruction, and training through the internet. Another incredible example of the many online learning platforms is e-learning [6]. While the increase in Internet usage throughout the world has provided our schools, colleges, and institutions with many benefits, it has also exacerbated long-standing problems with plagiarism, cheating, privacy invasion, and spying online.

6.4 Sustainability Plan

Construction of a regular, self-reliant e-learning platform at bd-jobs.com. Our technological staff is used to help lead it. The platform works well for this proposal's goals and breadth. It is suitable for unique styles of gadgets (mobile, tablet, laptop, and desktop). It can accommodate over 1000 students at once. It is operational around the clock 24/7. Additionally, it has been developed and organized so that students may access resources including films, webinars, downloaded booklets, exercises, and quizzes. Students can participate in forums. It enables the development of a learning network among a select group of students.

CHAPTER 7

Conclusion & Future Scope

7.1 Discussion and Conclusion

The examiner illustrates that college students may benefit from e-learning regardless of their prior experience. The efficacy of studying, however, might differ amongst college students. The test reveals a few factors to consider when evaluating the efficacy of online learning. In the life of a few factors, it practically appears that some college students find e-learning helpful, and that for just one variable, e-learning may no longer be similarly helpful to others. The analysis takes a small number of constrained variables into account. By layering a wide range of factors, more research may continue. The findings of the test demonstrate that students believed e-learning to be less time-consuming, simple to use, and cost-effective. It didn't demonstrate the extent to which online learning is cost- and time-effective. Another significant issue is that college students' self-efficacy is also crucial for obtaining benefits from e-studying. College students who have a thorough comprehension of the time period can benefit from things that others cannot. However, this project no longer remembers this difficulty. More research might be done to look at the impact of a student's maximum potential and their perception of how well e-learning works.

7.2 Potential for Future Developments

During the course of this project's development, we encountered several difficulties. Thankfully, we were able to overcome the majority of the obstacles, but there are still certain problems that we were unable to resolve because of time restrictions, technical difficulties, a lack of funds, and a lack of prior industry expertise. The following list includes a few restrictions:

- Since we did not get an SSL certificate, we were unable to deploy HTTPS cookies on our website.
- We choose not to display advertisements on our website since doing so lessens user experience. We thus lost a sizeable portion of our revenue.
- We chose against including similar to how we handled it for levels and departments, a drop-down menu for subjects since handling the state for so many subjects for each department proved to be exceedingly challenging.
- We discovered several issues with the text indexing of the MongoDB database, but we were unable to identify a fix. Inaccurate search results can occasionally be the result of this issue.
- We have been putting six months on this project. None of us had previously worked on such significant projects. Due to a lack of preparation and understanding, we were unable to finish several features before the deadline.

There are many upcoming goals for our project, we require to include various features help improve the usefulness of our project; some of them are given below.

- We intend to include some amusing and admirable topics in our work so that people will enjoy utilizing it more.
- We'll be adding certain features, including the ability for users to access any files or papers they've contributed for earlier courses.
- The users will be required to maintain their focus throughout the running courses thanks to the regular attendance system we'll be implementing.
- We'll give users some weekly assignments so they can assess their performance.

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