DIU BOOK VAULT: A WEB APPLICATION TO PROVIDE BOOKS TO THE STUDENTS OF CSE DEPARTMENT OF DAFFODIL INTERNATIONAL UNIVERSITY AT THEIR DOORSTEP

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

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DAFFODIL INTERNATIONAL UNIVERSITY DHAKA, BANGLADESH 28 JANUARY 2021

APPROVAL

This Project titled "DIU Book Vault, a web application to provide books to the students of CSE department of Daffodil International University at their doorstep", submitted by Tafsir Ahamed (ID: 171-15-9143) and Rakib Al Rashid (ID: 152-15-5936) 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 28.01.2021.

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DECLARATION

We hereby declare that, this project has been done by us under the supervision of **Ms. Farah Sharmin, Sr. Lecturer, Department of CSE,** Daffodil International University. We also declare that neither this project nor any part of this project has been submitted elsewhere for award of any degree or diploma.

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ABSTRACT

This project is titled "Diu Book Vault, a web application to provide books to the students of CSE department of Daffodil International University at their doorstep". These days students don't want to study books. Rather they prefer power point presentation or notes over books. Although Daffodil International University has a library but the new generation of students are not willing to go there and look for books manually. It seems very inconvenient to them. For this reason, we tried to develop a web application to provide all the students of Computer Science and Engineering department of Daffodil International University an online book store service where we can provide both soft and hard copy of all books of all courses and semesters recommended by our teachers and send them at their doorstep. Also, a student can have all the previous questions of each course of his bachelor program. This online service will be available 24 hours through this web application. Students can download pdfs of books, lend hard copy by ordering, find questions of previous semesters through this website. We tried to make the user interface very user-friendly so that the students can easily access this website without any hesitation. Any student of Computer Science and Engineering department of Daffodil International University who has a smart device and internet connection can use this application by login with their Daffodil International University email. For the first time login, students need to register with their name, Daffodil International University email, address and a subscription fee for 1 year of subscription. Students need to renew their subscription every year. Every student must give their information correctly. If an admin sees any activity of a student that violates the terms and conditions, admin can disable that student. It is a fully dynamic web application. To control the website, an admin panel is also built. Students will be registered by the admin. Admin will also add and remove books, confirm request for hard copy and update question bank. We also have a plan to improve the features and facilities more.

TABLE OF CONTENTS

CONTENTS	PAGE
Approval	i
Declaration	ii
Acknowledgements	iii
Abstract	iv
Table of Content	v-vi
List of Figures	vii
CHAPTER 1: INTRODUCTION	01-02
1.1 Introduction	01
1.2 Motivation	01-02
1.3 Objectives	02
1.4 Expected Outcome	02
CHAPTER 2: BACKGROUND	03-05
2.1 Introduction	03
2.2 Related Works	03
2.3 Comparative Studies	04
2.4 Scope of the Problem	04
2.5 Challenges	04

CHAPTER 3: REQUIREMENT SPECIFICATION	05-09
3.1 Business Process Modeling	05-06
3.2 Requirement Collection and Analysis	06
3.3 Use Case Modeling and Description	07
3.4 Logical Data Model	08
3.5 Design Requirements	09
CHAPTER 4: DESIGN SPECIFICATION	10-24
4.1 Front-end Design	10-18
4.2 Back-end Design	19-23
4.3 Interaction Design and UX	24
4.4 Implementation Requirements	24
CHAPTER 5: IMPLEMENTATION AND TESTING	25-28
5.1 Implementation of Database	25
5.2 Implementation of Front-end Design	26
5.3 Implementation of Interaction	26
5.4 Testing Implementation	26
5.5 Test Results and Reports	27-28
CHAPTER 6: CONCLUSION AND FUTURE SCOPE	29
6.1 Discussion and Conclusion	29
6.2 Scope for Further Developments	29

REFERENCES 30

LIST OF FIGURES

FIGURES	PAGE
Figure 3.1: Data flow Diagram	05
Figure 3.3: Use Case Modeling Diagram	07
Figure 3.4: Entity-Relationship Model	08
Figure 4.1: User login page	10
Figure 4.2: User Registration Page	11
Figure 4.3: User Home Page	12
Figure 4.4: Shopping Cart page	13
Figure 4.5: Question Bank page	14
Figure 4.6: User Account page	15
Figure 4.7: Change password page	16
Figure 4.8: Subscription page	17
Figure 4.9: Booklist Page	18
Figure 4.10: Book storage (pdf) Database	19
Figure 4.11: Cart Details Database	20
Figure 4.12: Order details Database	21
Figure 4.13: Question bank Database	22
Figure 4.14: User list Database	23

LIST OF TABLES

Table	PAGE
Table 01: A Test Case for The System	27-28

CHAPTER 1 INTRODUCTION

1.1 Introduction

Today in our digital world we all have internet and smart devices which offers advanced technologies with functionality. Nowadays students don't want to study hard copy books anymore. Rather they prefer to study soft copies in their smart phones or computers. As students, we cannot deny this fact. There are many useful web applications which provide online book store service. We noticed that there are some applications of such kind our country too. But there is no such application that fulfills all the demands of an online book store.

There are bunch of features in "DIU BOOK VAULT". Any student of Computer Science and Engineering department of Daffodil International University can register into the website with their DIU email and one year subscription fee. The fee will be taken through bKash. After registration the admin will give access to all kind of services such as downloading soft copy of books and questions, lending hard copy etc. This web application is designed for all kind of computers, smart phones and operating systems. Students can access to this website using any web browser. After accessing, they can sign up and become a member. Only registered members can access all the features of the application.

1.2 Motivation

Nowadays students don't want to study books. Rather they prefer power point presentation or notes over books. Although Daffodil International University has a library but the new generation of students are not willing to go there and look for books manually. It seems very inconvenient to them. For this reason, we will provide all the students of Computer Science and Engineering department of Daffodil International

University an online book store service where we can provide both soft and hard copy of all books of all courses and semesters recommended by our teachers and send them at their doorstep. Also, a student can have all the previous questions of each course of his bachelor program.

1.3 Objectives

- 1. To build one portal where a student can have any book either in soft copy or in hard copy in this 4 years of B.Sc life at their doorstep.
- 2. To create a solution where we will send the students their ordered/desired books at their doorstep just at the cost of transport.
 - A minimum subscription fee will be charged
 - Only a student has to pay compensation if any damage has been done to the books.
 - He / she can borrow books for 2 weeks.
- 3. The system will check the authenticity of a student by his/her DIU email ID.

1.4 Expected Outcome

- One web-based solution to provide books to each student of CSE department of DIU at their doorstep.
- Will be a reliable platform for students.
- Easily download soft copy of books
- Easily download previous semester questions
- Easy book lending system
- Faster delivery of books at doorstep
- No delivery charges. Only a compensation will be charged if there is any damage in books.

CHAPTER 2

BACKGROUND

2.1 Introduction

This is a web application that will provide an online book store service to the students of Computer Science and Engineering of Daffodil International University. At present web applications are more efficient and reliable for all type of students. Students want to study in their laptops or phones. They want a platform from where they can easily download pdf of their academic books and lend them if needed. There are some similar web and mobile applications but they don't provide all the services. Their maintenance service is poor and for this reason students face many difficulties to use. "DIU BOOK VAULT" is a totally unique, combined and user-friendly web application.

2.2 Related Works

- Campus Boi
- Boi Binimoy
- BookShopBD
- BoiBoiBoi.com

2.3 Comparative Studies

Comparatively, there is very few applications are available in the market. Moreover, the applications are not fully active. Most of them are for buy and sell books and some of them are mobile applications. And most importantly they don't provide soft copy of any academic or text books. They only provide hard copies. On the other hand, most of them have huge bugs in their websites. Moreover, those applications are not user friendly.

2.4 Scope of the Problem

The main scope of the problem is the source of easy ideas and information. We tried to make our application easier and user-friendly. We collected the data from google classrooms of our courses and other different online sources. We also contributed with our academic books.

2.5 Challenges

Requirement: The most challenging matter is to fulfill the design of the web application so that the students willingly use this app. Sometimes we fall in some bugs when the version will update at the time of developing this application. Sometimes there is some invisible error that is very much tough to find out and correct them. It needs to spend some hours.

Poor Communication: We are totally two members in our group to develop the website. Due to the pandemic, we had to work remotely on this project. So, there was a communication gap which was very difficult to deal with. Effective communications are very important to make this project successful.

Time Scheduling: Since we were working remotely, there was an issue with time scheduling. It was difficult to schedule a time suitable for both of us to work in the project.

Resources: Since both of us were staying at our village home, there was always difficulties to get the resources such as good internet connection.

CHAPTER 3

REQUIREMENT SPECIFICATION

3.1 Business Process Modeling

The project model we have used is given below. Business process modeling is used to represent the workflow of a system. On the other hand, a Data Flow Diagram is used to represent the flow of data in graphical way through an information system. The flow of data through a system to perform certain functions of a business is described by the logical data flow diagram. Our system DFD is shown:

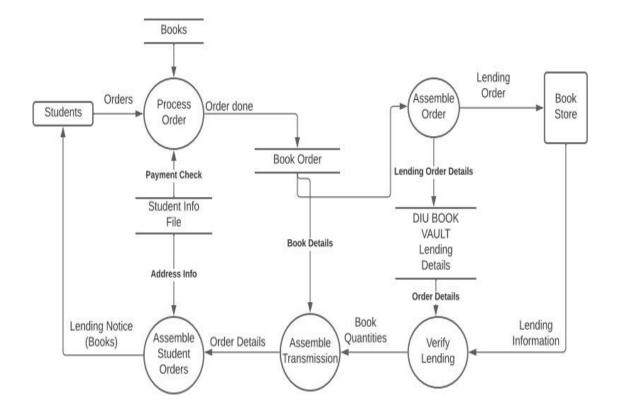


Figure 3.1: Data Flow Diagram

3.2 Requirement Collection and Analysis

The initial conditions of development have to be requirement collection and requirement

analysis. In every software development, there are basically two kinds of requirement:

Functional Requirement and Nonfunctional Requirement. Functional requirements are

those activities which are performed by software. Nonfunctional requirement defines the

personality of an application.

Functional Requirement: In our project, there are many functional requirements. There

is an authentic login, order books, download pdf, checkout, price confirmation.

Nonfunctional Requirement: Nonfunctional requirement usually depend on how much

user-friendly User Interface you are using. It is a must the User Interface to be user-

friendly so that the user finds it suitable to use.

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6

3.3 Use Case Modeling and Description

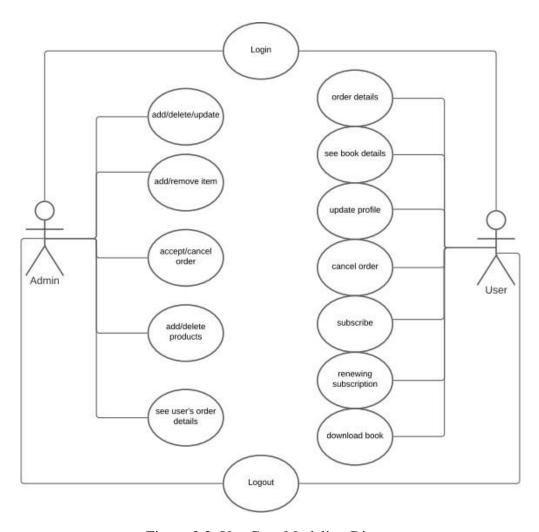


Figure 3.3: Use Case Modeling Diagram

User/Students can log in, register, update and delete their accounts. They also can see the order and book details, cancel order, subscribe, renew subscribe and also download book. If any user/student does not register, he/she cannot go through any action because at first an account must be created by the user/student. Admin can log in, add/delete/update anything, add/remove item, accept/cancel order, add/delete products and also can see user's order details.

3.4 Logical Data Model

Entity-Relationship Diagram (ERD) is a diagram which is used to show the relationship of entity sets stored in database. An entity is considered to be an object of a database. And entity set is the collection of all similar entities of an entire database. These entities have some attributes defines the properties of an entity set. The logical data model presents the Entity-relationship diagram called the ER diagram. Entity is an object or concept in which data is stored. The ER diagram of our system is given below:

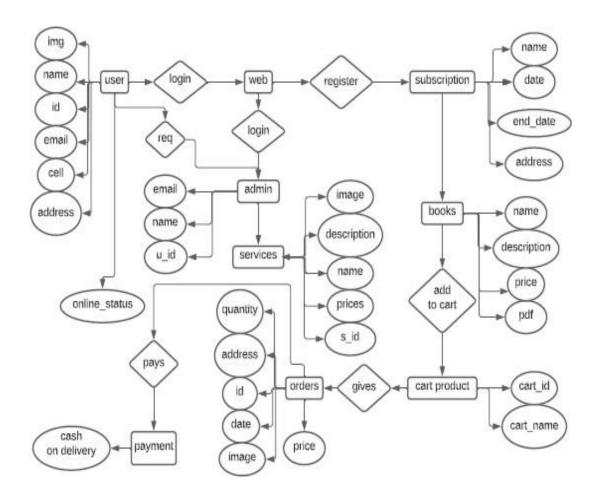


Figure 3.4: Entity-Relationship Model

3.5 Design Requirements

In any software development (Mobile or Web), there requires design requirement. The design requirement reproduce the overall design of the goals that the system expected to achieve. Our project design is completely unique. Some key points for the design requirement are given below:

Efficient: Running the application faster on any device is very important. We made our application very smoother and bug-free. We made this application design very light.

User-Friendly: This application is very much user-friendly. People will easily be able to access all of the features smoothly. The design is very soft and all the layouts are very well decorated.

Some extra features:

- User can see order details
- User can see book details
- User can update his/her profile
- User can cancel order
- User can renew subscription
- User can download books in pdf version
- Admin can add/delete/update product
- Admin can add/remove item
- Admin can accept/cancel order
- Admin can see user's order details

CHAPTER 4 DESIGN SPECIFICATION

4.1 Front-End Design

Front-End represents the visual part of an application. We have developed the front-end with react framework of java-script programming language [2]. Also, for the state management of the system has been handled by react redux [6].

In the user interface, we are using various layouts and various types of labels such as checkout, cart menu, button and custom fonts. As a result, it has turned into a simple but attractive system.

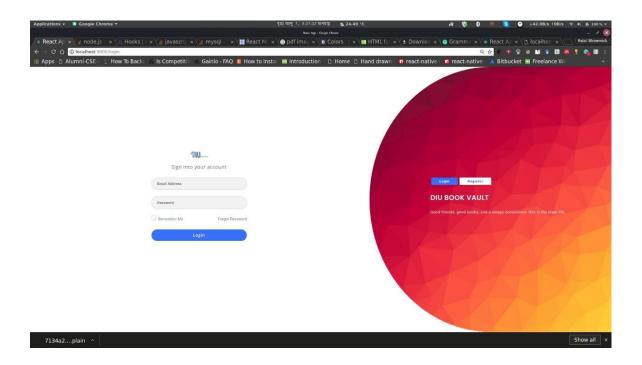


Figure 4.1: User Login Page

Figure 4.1 shows the user's login page. When a user will try to login this page will show. In this login page, the user will log in with DIU email and password. If they try with the invalid email and password, they will be notified else they will successfully log in.

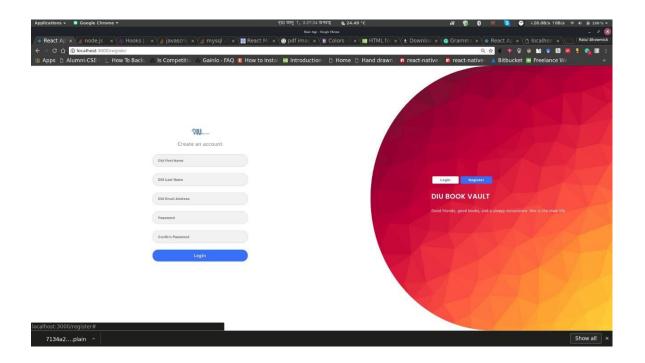


Figure 4.2: User Registration Page

Figure 4.2 shows the user registration page of the website. After giving the pin on the login page, the user needs to input some details there. This registration is for the first time only. Here only fill up the first name, last name, email and password. All details need to be correct information.

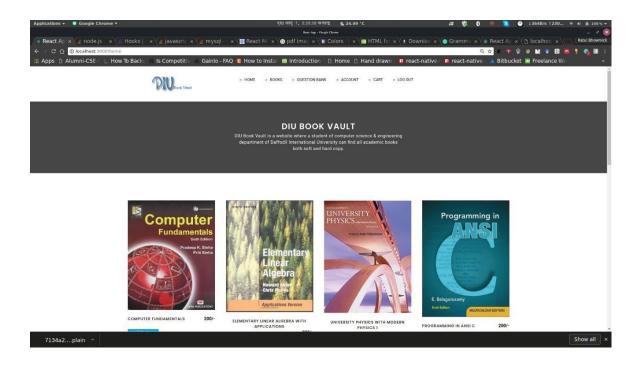


Figure 4.3: User Home Page

Here, figure 4.3 shows the Home page of the website. Here all activities are performed by the user. On the homepage, almost all the features can be found by the user. At the navigation, book section includes all the books which is required. All previous questions can be found in the Question bank section. Account section have all the information of the user. At last cart section has the checkout details. Also, after that user can search anything upon the homepage.

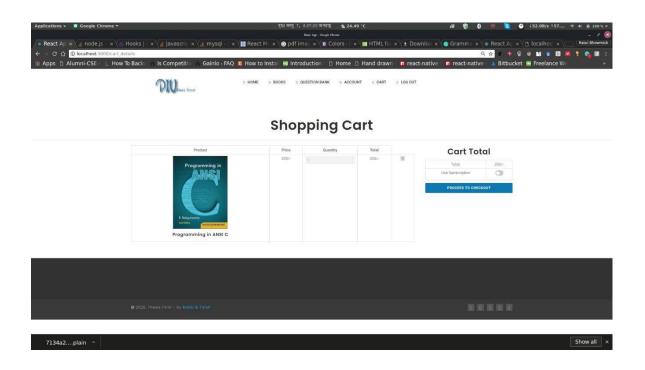


Figure 4.4: Shopping Cart Page

Here, figure 4.4 shows the Shopping Cart Page of the website, if a user wants to click on a book then the Shopping Cart Page will appear. In this page a user will get all the information about which book he/she wants to lend or buy.

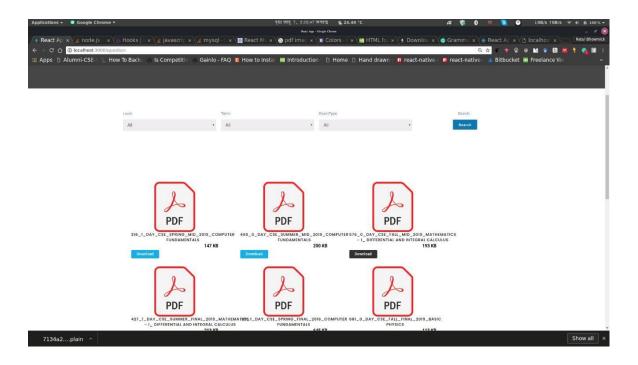


Figure 4.5: Question Bank Page

Figure 4.5 shows the Question Bank Page of the website. When user wants to get the previous semester question then he/she has to get into this page. This page will be appeared after clicking the Question Bank section in the navigation on the home page.

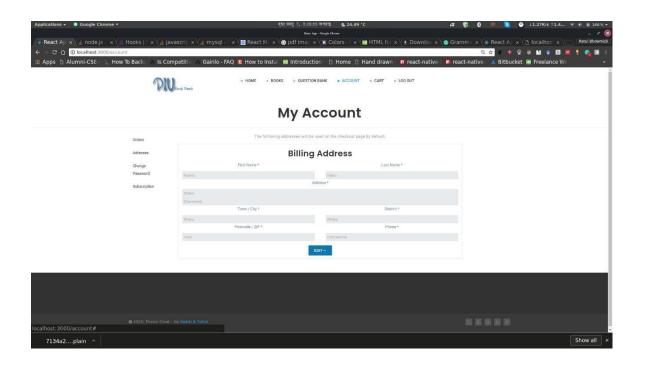


Figure 4.6: User Account Page

Figure 4.6 shows the User Account Page of the website. Here in this user account page, all the information of the users will be saved. He/she can update or edit anything if they want. Especially in this page, the billing address of the user will be shown and can be edited too.

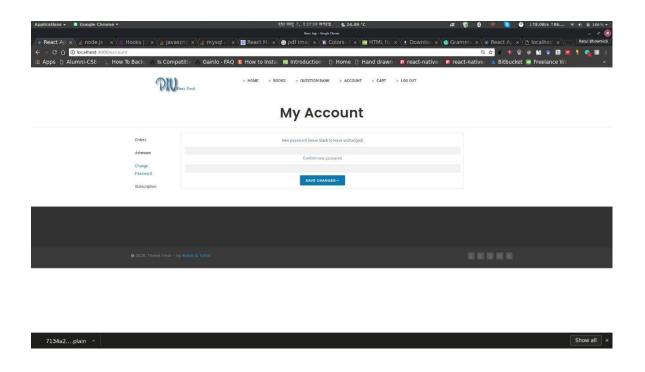


Figure 4.7: Change Password Page

Figure 4.7 shows the Change Password Page of the website. If a user wants to change the password then he/she has to be in the "my account" page and after that press the change password button. Then he/she has to input the old password, then new password. Thus, in this page, a user can change his/her password.

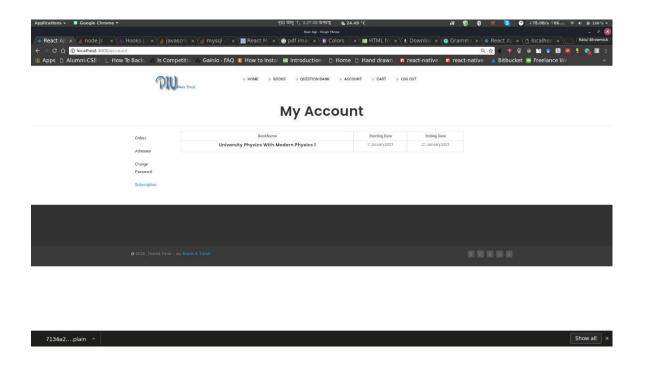


Figure 4.8: Subscription Page

Here figure 4.8 shows the Subscription Page of the website. A user can subscribe to our system for a certain time to take the offer about lending the books. In this page, when the subscription started and when the subscription will be ended these things will be appeared.

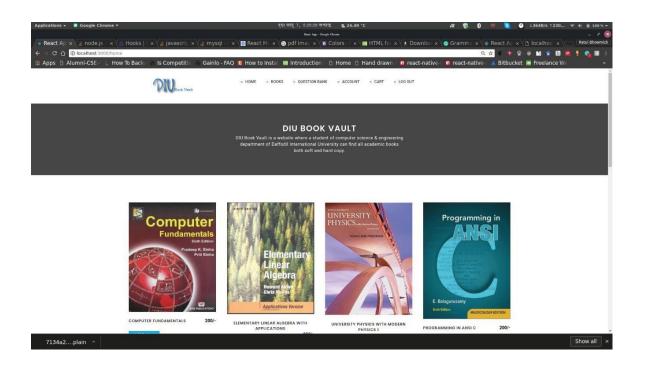


Figure 4.9: Book List Page

Here figure 4.9 shows the Book List Page of the website. All the books are available here. To select or to find any book, user have to select the dropdown menu that which level and which term books he/she wants. After selecting the level and term the required book will be appeared and after that he/she can download the pdf or can lend the hardcopy of the book by subscribing.

4.2 Back-End Operations

As we are developing a web application, we must consider some important backend operations. The database is the major of them because of all the tasks performed based on the database. For the database we used Node JS [5]. Node JS is an open-source, cross-platform, back-end, JavaScript runtime environment that executes JavaScript code outside a web browser [7]. Developers use Node JS to write JavaScript command line tools and for server-side scripting. Running server-side scripts helps to produce dynamic web page content before the user's web browser loads the page.

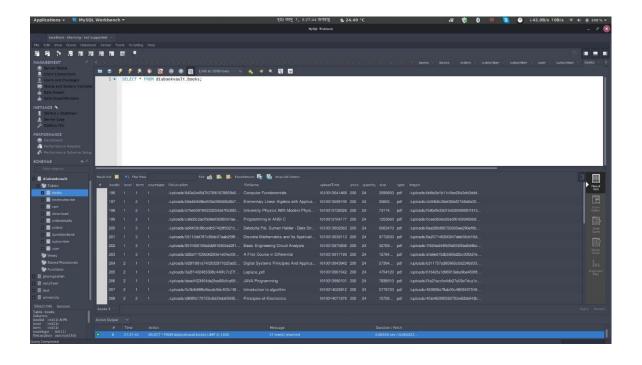


Figure 4.10: Book Storage Database

Figure 4.10 shows the Book Storage Database. Here all the softcopy of any book of the CSE department of Daffodil International University have been stored. Each and every book will be downloaded from this database.

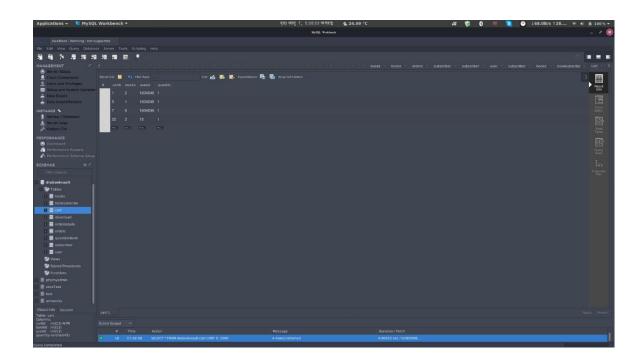


Figure 4.11: Cart Details Database

Here figure 4.11 shows Cart Details Database. All the cart details information is stored in this database. Every time user adds or deletes from the cart, then the information will be viewed through this database.

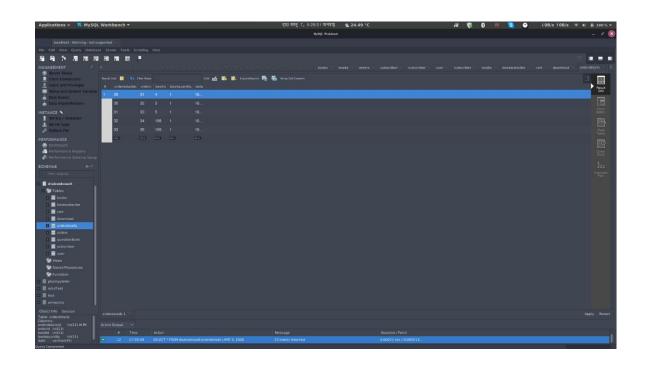


Figure 4.12: Order Details Database

Figure 4.12 shows the Order Details Database. When a user wants to place an order then he/she have to get the order details and these order details will be loaded from this database.

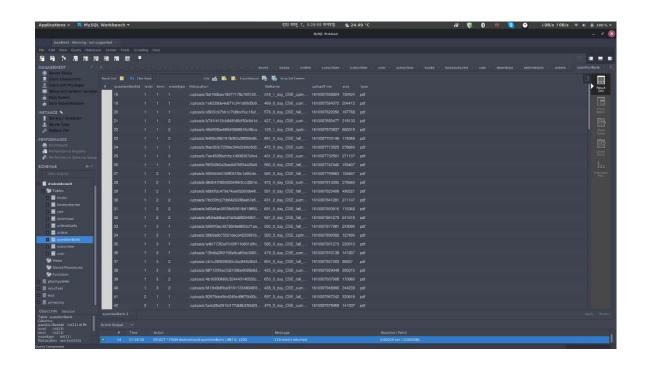


Figure 4.13: Question Bank Database

Here figure 4.13 shows Question Bank Database. All the previous semester questions have been stored here in this database. When a user wants to download a softcopy of any book then from this database the softcopy shall download.

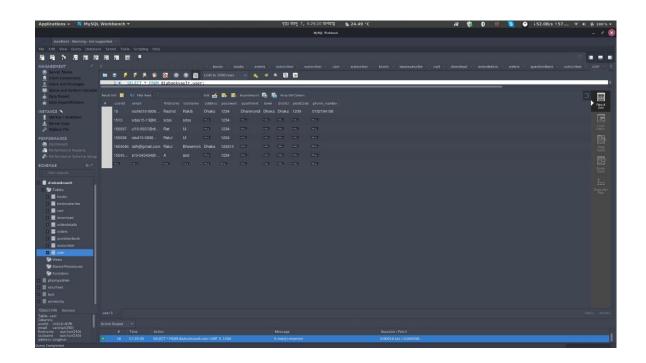


Figure 4.14: User List Database

Figure 4.14 shows the User List Database. Here in this section, all the information of the user has been stored. First name, last name, password, and email everything will be stored here in this database.

4.3 Interaction Design and UX

In this era each and every person wants a design where everything looks attractive. Also, the interactive design makes the app more user-friendly and attractive to the users. Interaction design's ultimate goal is the creation of products which enable the user so that they can achieve their objectives in the best way possible. Interaction design is the proper way that observes the interaction between a system and its user.

User experience is considered the overall experience including interaction design between a user and an application.

4.4 Implementation Requirements

To implement the project, we needed Visual Studio Code Editor to design the website with react programming language [1][2]. On the other hand, for the backend we needed a browser and Node JS platform [5]. Also, we run the project at localhost.

CHAPTER 5

IMPLEMENTATION AND TESTING

5.1 Implementation of Database

The main task is to create a database and tables to load the data dynamically. We basically implemented the backend with Node JS and MYSQL [5]. Node.js is an open-source, cross-platform, back-end, JavaScript runtime environment that executes JavaScript code outside a web browser [7]. Developers use Node JS to write JavaScript command line tools and for server-side scripting. Running server-side scripts helps to produce dynamic web page content before the user's web browser loads the page.

Also, we used Express JS framework. It is a free and open-source back end web application framework for Node.js which is designed or building web applications and APIs [8].

- Node JS
- MYSQL
- Express JS
- Body parser
- CORS

5.2 Implementation of Front-End Design

The front end of the website is fully designed using React JS framework. There are two main reasons to use React Js. React Js is used to develop single page applications and in React JS the file folder structure is very developer friendly. It allows to create reusable UI components. For these reasons we used React Js. We used Visual Studio Code for coding. We used various React CSS classes, React Bootstrap classes, forms, buttons, edit texts, navigation bar, icons, images and shopping carts. Then we related all the things together with class components by calling them. They play logical operations.

5.3 Implementation of Interactions

To get the feedback of our work we shared our idea and implementation to some of our friends, supervisor and some of other faculty. We shared our goals and visions. We took their suggestions and opinions seriously to improve our website. Then we discussed with our project members for a user-friendly interface, we used pictures and buttons with enough information so that the design is more interactive. We used all the things to make our website more user-friendly and interactive.

5.4 Testing Implementation

The system is tested basically for the correctness of our web application. Testing is an integral part of all types of application. Any software development consists of many stages and in every stage there are some bugs. If the bugs are identified in earlier stages it costs much less to fix them. That is the reason to test the application. System testing is

basically a series of outputs. There are some test cases of our web application are given below:

Table 01: A Test Case for The System

Test Case	Test Input	Expected	Obtained	Pass/Fail	Tested Date
		Outcome	Outcome		
1.Sing-up	Sign up with	Create	Account	Pass	06.01.2021
	correct	account	create		
	information	successfully			
2.Sing-up	Sign up with	Create	Account	Pass	06.01.2021
	incorrect	account	creation		
	information	unsuccessfully	unsuccessful		
3.Login	Login with a	Login	Successfully	Pass	06.01.2021
	valid	successfully	Login		
	Diu email				
	or valid				
	password				
4.Login	Login with	Login failed	Login failed	Pass	06.01.2021
	invalid				
	email				
	or an invalid				
	password				
5.Select	Select	Select	Successfully	Pass	06.01.2021
Semester	Semester	successfully	selected		

6.Download	Download	Download	Successfully	Pass	06.01.2021
Pdf book	Pdf book	Successfully	downloaded		

7.Change	Change	Change	Password	Pass	06.01.2021
Password	Password	Password	changed		
		Successfully	successfully		
8.Place	Place order	Place order	Order placed	Pass	06.01.2021
order		successfully	successfully		
9.Download	Download	Download	Question	Pass	06.01.2021
question	question	question	downloaded		
		successfully	successfully		
10. Cart	Add to cart	Add to cart	Book added	Pass	06.01.2021
		successfully	to cart		
			successfully		
11. Open in	Tap to open	Link open in	Successfully	Pass	06.01.2021
browser	in browser	browser	opened		

CHAPTER 6

CONCLUSION AND FUTURE SCOPE

6.1 Discussion and Conclusion

Nowadays students are not interested to study hard copy of books anymore. Rather they prefer to study pdfs or PowerPoint presentations in their smart phones or computers over books. For this generation of students, our website will be very serviceable and useful. Many students ask their teachers and friends for soft copy of books and notes before examinations. Most of the time they don't get those documents in time. As a result, they cannot do well in the examinations. So, to remove all these difficulties and fulfill all the needs of the students our web application can be very effective. On the other hand, our service can bring back the reading habit of students. It will help them with their studies.

6.2 Scope for Further Developments

In this sector, there is a huge scope for further development. Online book store services are getting popular day by day. Students' demands for this type of web applications are increasing as it helps them a lot with their studies. So, there are many scopes for the further developments of our website. Some of them are given below:

- Mobile application for both android and IOS operating system
- Service for all the students of all departments of Daffodil International University
- Service for all the students of all private universities in Bangladesh
- Service of non-academic books alongside academic books
- Upgrade day by day by adding more new features

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