DIU Online Payment System

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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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APPROVAL

This Project titled **"DIU Online Payment System**", submitted by MD. Safiqul Alam Sohel and MD. Hasan Reza 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 (BSc) and approved as to its style and contents. The presentation has been held on April 07, 2018.

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We hereby declare that, this project has been done by us under the supervision of **Mr. Md. Sadekur Rahman , 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 report focuses on online payment system of Daffodil International University. The initial plan is to change the traditional system of university payment using the system. The prime target of this system is making every client comfortable with their payment procedure. This system will help to manage the account system. In this system database will store all the information about their clients according to email and id. On that system student can do their own payment by themselves. Account management will receive details about their payments and confirm the payment at once. The expected outcomes yield towards when student do their transaction in just a few minutes at anywhere anytime before the last date of payment and they can receive their clearance at a short time. It will be a upcoming era in Bangladesh, as we know that no other university in Bangladesh have their own online payment system. The technique from authentication values generates a baseline from mobile verification. The gateway of payment procedures can be done with Mastercard, Visa, Bkash, Dbbl ect.

TABLE OF CONTENT

CONTENTS	PAGE NO
Approval	Ii
Declaration	Iii
Acknowledgements	Iv
Abstract	V
CHAPTER	
CHAPTER 1: INTRODUCTION	**01-03**
1.1. Introduction	01
1.2. Motivation	01
1.3. Object	02
1.4. Expected Outcome	02
1.5. Report Layout	03
CHAPTER 2: BACKGROUND	**04-06**
2.1. Background	04
2.2. Related Works	04
2.3. Challenges	04
CHAPTER 3: REQUIREMENT SPECIFICATION	**07-18**
3.1. Business Process Modeling	07
3.1.1. Flow Chart of the Propose System	07

3.2. Requirement Collection and Analysis 08

3.2.1. Requirement Collection 08

3.3. Use Case Modeling and Description 08

3.4. Activity Diagram 09

3.5. Logical Data Model 11

3.5.1. Entities 11

3.5.2. Attributes 12

3.5.3. Entity Relationship Diagram 14

3.6. DFD (Data Flow Diagram) 17

3.6.1. DFD Level-0 17

3.7. Design Requirements 18

CHAPTER 4: DESIGNE SPECIFICATION 19-27

4.1. Front-End Design 19

4.2. Back-End Design 20

4.3. Interaction Design and UX 20

4.4. Implementation Requirements 27

CHAPTER 5: IMPLEMENTATION AND TESTING 28-32

5.1. Implementation of Database 28

5.2. Implementation of Front-End Design 28

5.3. Implementation of Interaction 29

5.4. Testing Implementation 30

5.4.1. Testing 30

5.4.2. Unit Test 30

5.4.3. Integration Test 31

5.4.4. Validation Test 31

5.4.5. System Test 31

5.5. Test Result and Reports 31

CHAPTER 6: CONCLUSION AND FUTURE SCHOPE **33-34**

6.1. Conclusion 33

6.2. Limitation 33

6.3. Scope for Further Developments 34

REFERENCES **35**

APPENDICES **36-37**

Appendix A: Project Reflection 36

Appendix B: Related Diagrams 37

LIST OF FIGURES

FIGURES	PAGE NO
Figure 3.1: Flow Chart of the System	07
Figure 3.2: Use Case Diagram of the System	09
Figure 3.3: Activity Diagram of the System	11
Figure 3.4: ERD of the System	16
Figure 3.5: DFD Level-0 of the System	17
Figure 4.2.1.: Backend Design Screen Shot	20
Figure 5.2.1: Screen shot of text mode	28
Figure 5.2.2: Screen shot of design mode	29
Figure 5.3: Screen shot of connection code	29
Figure A.1: Screen Shot of Directory File	35

LIST OF TABLES

TABLES	PAGE NO
Table 3.1: Entities and their Attributes	12
Table 3.2: Attribute of Login	12
Table 3.3: Attributes of User Details	13
Table 3.4: Attributes of Choose Sem	13
Table 3.5: Attributes of Choose Sub	13
Table 3.6: Attributes of Payment	14
Table 4.1. : Screen List	19
Table 4.3.: Screen Shots	21

CHAPTER 1

INTRODUCTION

1.1. Introduction:

A payment system is any system used to settle financial transactions through the transfer of monetary value, and includes the institutions, instruments, people, rules, procedures, standards, and technologies that make such an exchange possible. A common type of payment system is the operational network that links bank accounts and provides for monetary exchange using bank deposits.

What makes a payment system a system is the use of cash-substitutes; traditional payment systems are negotiable instruments such as drafts and documentary credits such as letters of credit. With the advent of computers and electronic communications a large number of alternative electronic payment systems have emerged. These include debit cards, credit cards, electronic fund transfer, direct credits, direct debits, internet banking, and e-commerce payment system. Some payment systems include credit mechanisms, but that is essentially a different aspect of payment. Payment systems are used in lieu of tendering cash in domestic and international transactions and consist of a major service provided by banks and other financial institutions.

1.2 Motivation:

It's a matter of regret that in the era of modern technology students are really think everything in online. To get rid of this situation we're thinking about reducing time by ensuring proper payment. Being a student we have to register every semester. Using the help of modern technology students can reduce to register and payment. This is the behind scene of our doing this project in which by one time input admin can cheek payment and registration properly.

From the thinking of digital Bangladesh to make our students more flexible about taking their semester courses and pay their money is the motivation of our project.

1.3 Objectives

The main objective of the project is to provide online registration and online payment for the university students. On the other hand hassle of registration and payment is one of the big reasons of irregular schedule of every varsity. By this system admin can cheek and confirm payments very easily in online.

System will calculate the payable amount according to the taking courses. Students can choose their semester and the particular courses of the semester. Students can pay money online by some payment method.

Admin will create courses according to the semester and they will also fix the fee of the courses. Admin will cheek the payment and confirm it by online.

1.4 Expected Outcomes:

After completing the project we expected that every university will try to make their registration and payment system by online. We expect using this project every varsity can be more reliable and they can ensure every student about their successful payment daily.

We expect using this project every student will be more flexible about their course registration and payment system.

Among of the lot of expectation we expect a good and faster communication between University and student.

1.5 Report Layout

- Chapter 1 contains the introduction, motivation, objective, expected outcomes about the project.
- Chapter 2 is all about background of this application. In this chapter relevant works, comparative analysis and scope of the problem is described.
- Chapter 3 is about requirements of the application. It includes requirement collection, analysis, data modeling, logical data modeling and design requirements.
- Chapter 4 will talk about design of the project. It includes screen design, backend design and interaction design.
- Chapter 5 contains the information regarding implementation & testing of the project.
- And finally chapter 6 is having conclusion and further scope of the developments.

CHAPTER 2

BACKGROUND

2.1 Background

Before starting the project we've to study a lot for make sure about the project, its necessity, existing systems, competitor and lots of marketing analysis as well as the challenges for our project. As we've fixed our vision about the project and a kind of social work we always kept in mind that "Great works comes with great responsibilities". So we have to prepare first of all and that's why we need to do background studies. In this chapter we're going describe our background studies and how we prepared for this project as well as everything that we need to do for making this project successful.

2.2 Related Work

From the very beginning of this project we worked for searching and fixing our competitor. We've to focus some issues like, what they do for time consume, How they do it, is it works perfectly, How reliable the existing system is, Can it make for all varsity and so on. We always thinking about perfection as it is related with a student's life.

After all these market research we were very disappointed about our result. When very big Universities invest a lots of amount for their different purpose they can't even manage something like this product. Almost everywhere we see they're using traditional registration and payment system. We were very anxious after seeing the report where we saw that many varsities passed one fourth time of a semester for this registration and payment. So here we came with our plan.

2.3 Challenges

While working on the project we figure out some challenges which is too risky and we must have to do it. As we believed that without challenge and risk we can't gain anything, so we took those challenges very seriously. These are some major challenges but not limited to -

- Making the whole system user-friendly, so that no one faces any problem using it.
- To get permission from the banks.
- Had to figure out our problems and expected outcome which was too much tough to finalize.
- And finally most important thing is ensuring the data security so that no one can misuse those.
- To categorize problems and working process was a big issue

CHAPTER 3

REQUIEREMENT SPECIFICATION

3.1. Business Process Modeling

Business processing model [2] is the process of identifying processes and representing it with process model like flow chart, activity diagram. For this system flow chart has been build which is given below.

3.1.1. Flow chart of the proposed system

Sometime it is more effective to visualize something graphically then it is to describe. Again, flow chart explains a process clearly through symbols and text. After analysis, our flow of process we create our flow chart for our system.

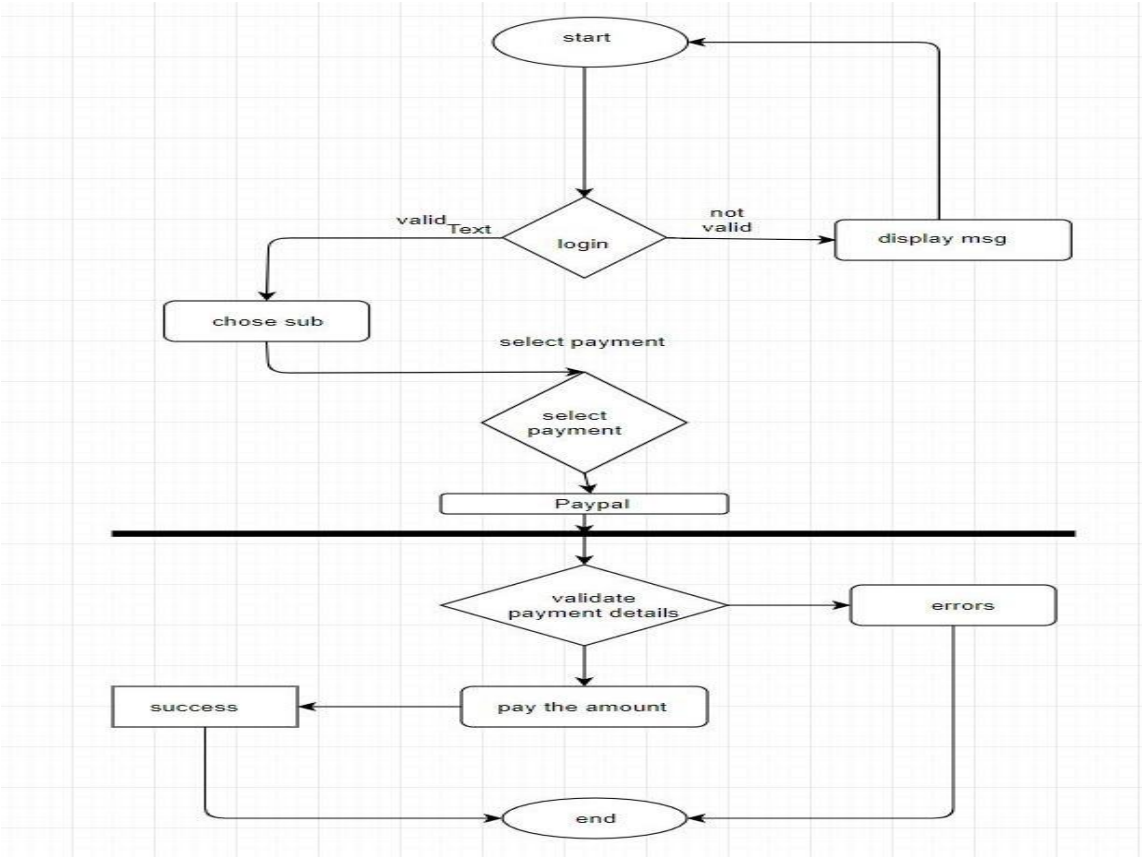

Figure 3.1: Flow Chart of the System

The above flow chart shows the overall system.

3.2. Requirement Collection and Analysis

3.2.1. Requirement collection

There are many ways to collect requirements. But in our case, we used the below methodologies.

- **Interview**: Interview was taken of different Users and department assistants for their requirements. What kind of features they want to have, which information will help them if got etc. were collected from interviews.

3.3. Use Case Modeling and Description:

To identify, clarify, and organize system requirements, Use Case model is mostly needed. It is made up of a set of possible sequence of interaction between actors and systems in a particular environment for a particular goal [9].

A use case diagram contains four components.

The boundary, which defines the system of interest in relation to the world around it. The actors, usually individuals involved with the system defined according to their roles. The use cases, which the specific roles are played by the actors within and around the system.

The relationships between and among the actors and the use cases.

In our report we keep use case model because –

- we want to models the goal of system and actor interactions
- we also describe main flow using it
- we want to organizes functional requirements
- we want to record paths from trigger event to goal

For our system we have 1 Use Case Model

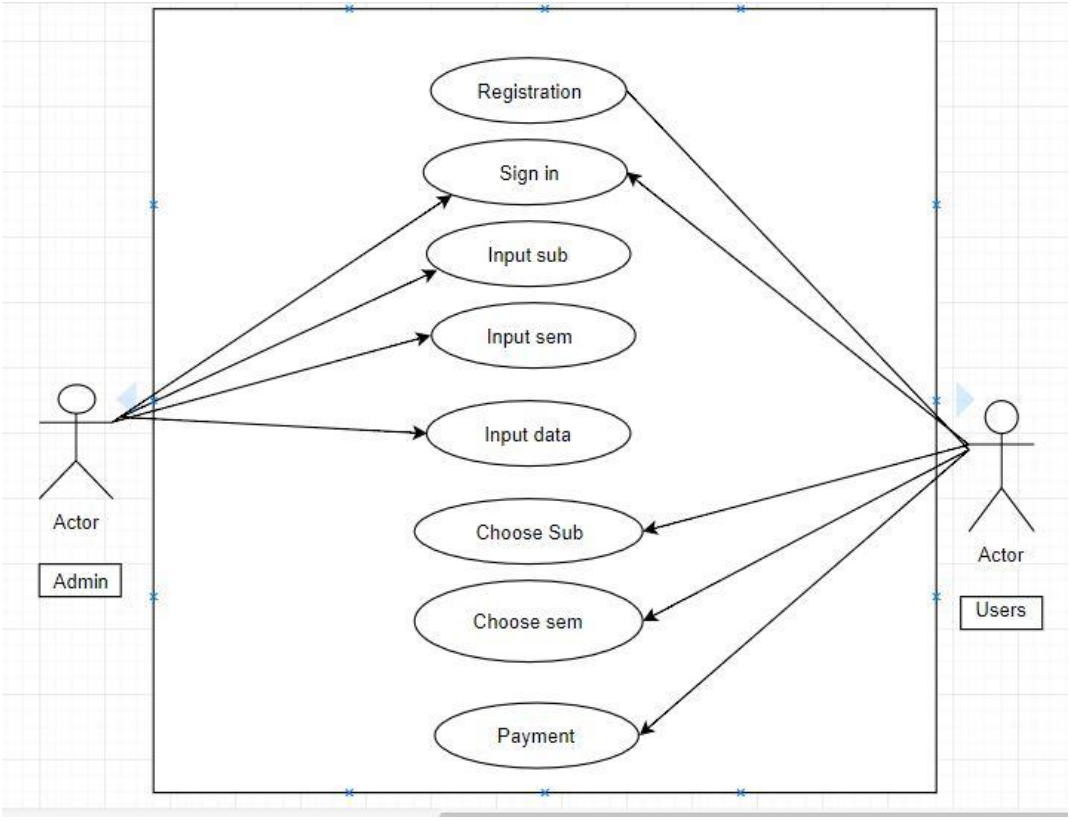

Figure 3.2: Use Case Diagram of the System

3.4. Activity Diagram:

Activity diagram is another important diagram in UML to describe the dynamic aspects of the system.

Activity diagram is basically a flowchart to represent the flow from one activity to another activity. The activity can be described as an operation of the system .

The control flow is drawn from one operation to another. This flow can be sequential, branched, or concurrent. Activity diagrams deal with all type of flow control by using different elements such as fork, join, etc.

The basic purposes of activity diagrams are similar to other four diagrams. It captures the dynamic behavior of the system. Other four diagrams are used to show the message flow from one object to another but activity diagram is used to show message flow from one activity to another.

Activity is a particular operation of the system. Activity diagrams are not only used for visualizing the dynamic nature of a system, but they are also used to construct the executable system by using forward and reverse engineering techniques. The only missing thing in the activity diagram is the message part.

It does not show any message flow from one activity to another. Activity diagram is sometimes considered as the flowchart. Although the diagrams look like a flowchart, they are not. It shows different flows such as parallel, branched, concurrent, and single.

The purpose of an activity diagram can be described as −

- Draw the activity flow of a system.
- Describe the sequence from one activity to another.
- Describe the parallel, branched and concurrent flow of the system. [

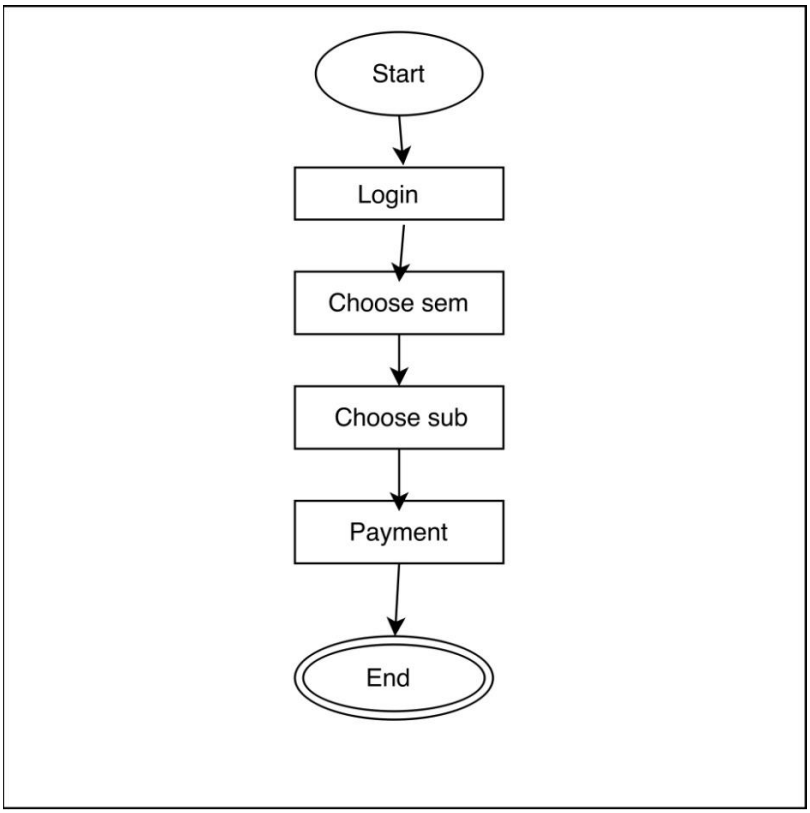

Figure 3.3: Activity Diagram of the System

3.5. Logical Data Model

After performing analysis on the business rules and data to discover attributes of, and relationships between data elements we developed an ERD (Entity-relationship model) which is detail, logical representation of the data of our system.

3.5.1. Entities

After analyzing data we got the following entities which are represented as rectangular in ERD Diagram:

Login: Valid User id of a doctor or assistant.

- ChooseSem: Users will choose their sem.
- ChooseSub: Users will choose their sub.
- Payment: Users could do payment after choose their sem and sub.

3.5.2. Attributes:

An attribute is a property or characteristic of an entity. After analyzing the entities we get these associated attributes.

Table 3.1: Entities and their Attributes

Entity Name	**Attributes**
Login	email, id, password
Choose sem	sem_title, sem_id
Choose sub	sub_cost, sub_code, sub_id, sub_sem, sub_title, sub_dept
Payment	pay_id, ip_add,

Now the attribute of different entity are described below.

Table 3.2: Attribute of Login

Attribute Name	**Description**
Id	Unique id, automatic generated.
Email	Email of the user.
Password	Password of the user.

Table 3.3: Attributes of Users Registration

Attribute Name	**Description**
Id	Unique id, automatic generated.
User Name	Name of users
Email	Email of users
Password	Password of users

Table 3.4: Attributes of Choose semester

Attribute Name	**Description**
sem_id,	Unique id, automatic generated.
sem_title	Sem's title, given from dept.

Table 3.5: Attributes of Choose Subject

Attribute Name	Description
sub_id	Unique id, automatic generated.
sub_cost	Fix cost from dept
sub_code	Fix cost from dept
sub_sem	Fix cost from dept
sub_title	Fix cost from dept
sub_dept	Fix cost from dept

Table 3.6: Attributes of Payment

Attribute Name	Description
pay_id	Unique id, automatic generated.
ip_add	Unique ip form Users.

3.5.3. Entity Relationship Diagram

ERD that means the Entity Relationship Diagram is basically a snapshot or summary of various data structure. Here ERD is designed to show the entities present in our database and as well as the relationship between tables. We use ERD for visual representation high flexibility, making simple to understand and for the effective communications between the key entities and their relationship with each other.

The image below shows four boxes that represent the four entities involved in the system:

Login, Registration, ChooseSem, ChooseSub, Payment,

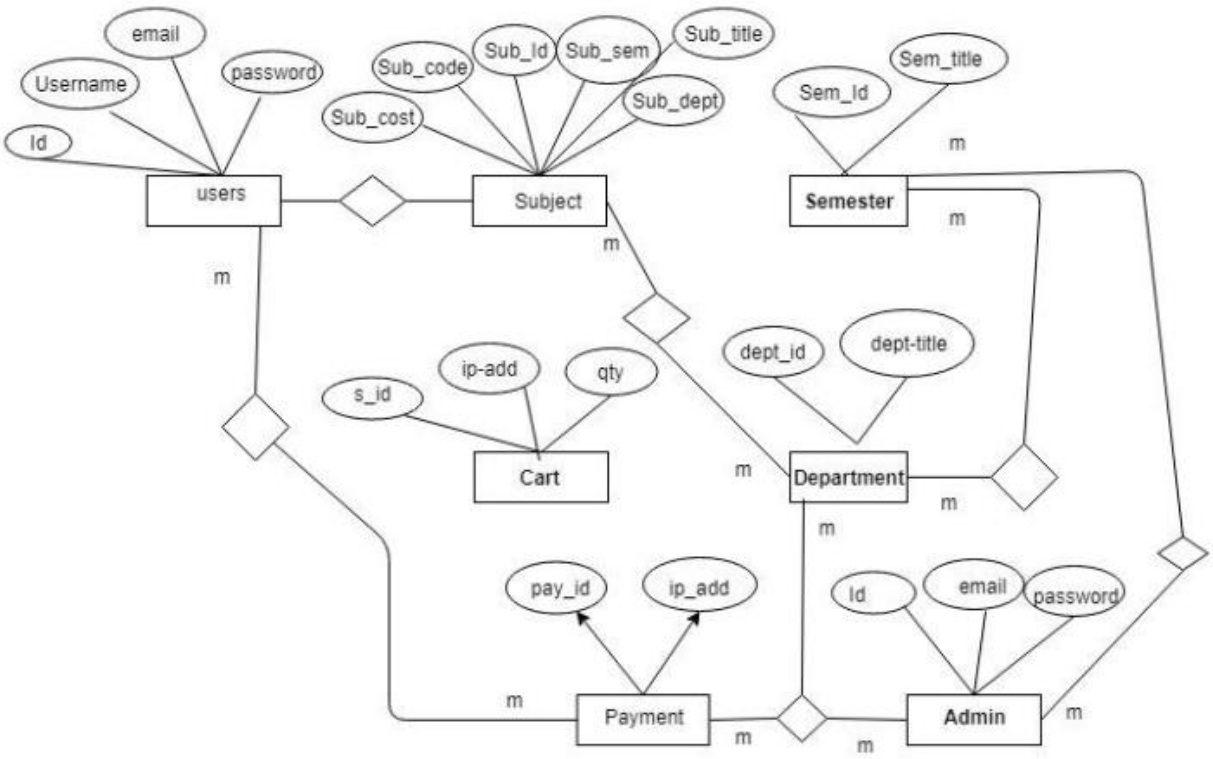

Figure 3.4: ERD of the System

3.6. DFD (Data Flow Diagram)

A data flow diagram (DFD) maps out the flow of information for any process or system. It uses defined symbols like rectangles, circles and arrows, plus short text labels, to show data inputs, outputs, storage points and the routes between each destination.

Data flowcharts can range from simple, even hand-drawn process overviews, to in-depth, multi-level DFDs that dig progressively deeper into how the data is handled. They can be used to analyze an existing system or model a new one.

In our system we give a DFD Level.

3.6.1. DFD Level- 0:

A context diagram is a top level (also known as "Level 0") data flow diagram. It only contains one process node ("Process 0") that generalizes the function of the entire system in relationship to external entities. DFD Layers. Draw data flow diagrams can be made in several nested layers.

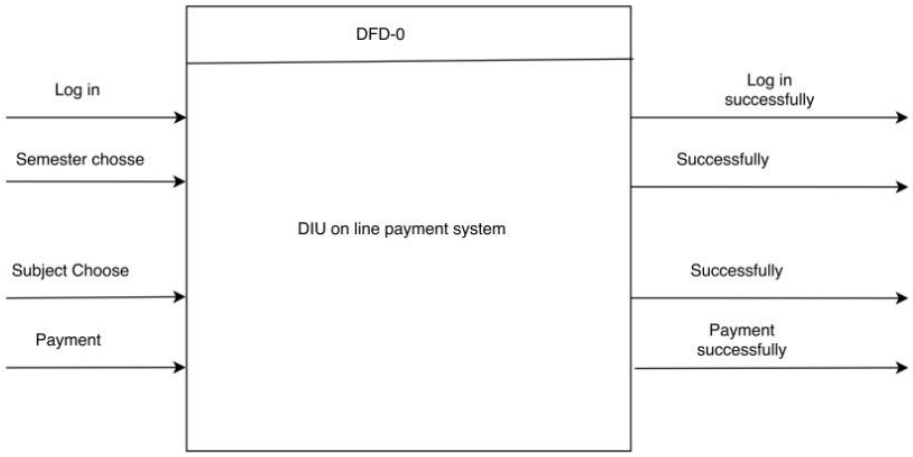

Figure 3.5: DFD Level-0 of the System

All figures are drawn by using draw.io. [10]

3.7. Design Requirements:

- HTML
- CSS
- Java Script

CHAPTER 4

DESIGN SPECIFICATION

The chapter includes details of front end design (Screen Design), back end design (Database Design) etc.

4.1. Front End Design

Here is the list of screen of the system.

Table 4.1.: Screen List

	Home Screen
	Signup Screen
	Login Screen
	Dashboard
	All Subject
	Selected Subjec
	Checkout

4.2. Back End Design:

As our system is a dynamic application that is sum of design, structure and functionality. So back end design plays a very monumental rule in our system. The technology and programming is a system that user does not see but make the system run in the backend.

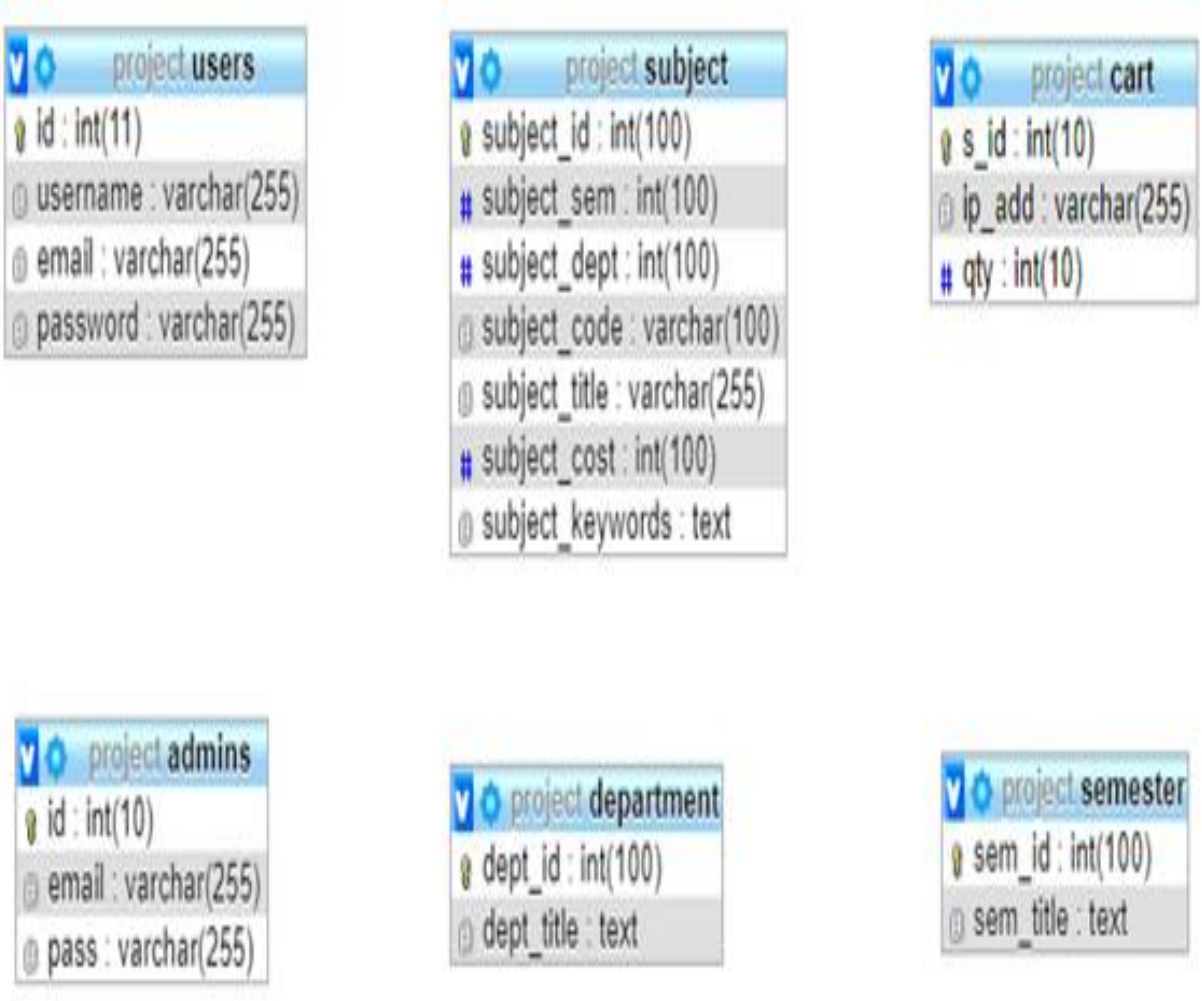

Figure 4.2.1.: Backend Design Screen Shot

4.3. Interaction Design and UX

Interaction design is the process of designing screen which is view and will be used by client. User Experience matters here. Below are the screen shot of screens.

Home Screen:

Figure 4.3.1: Home screen

Login Screen:

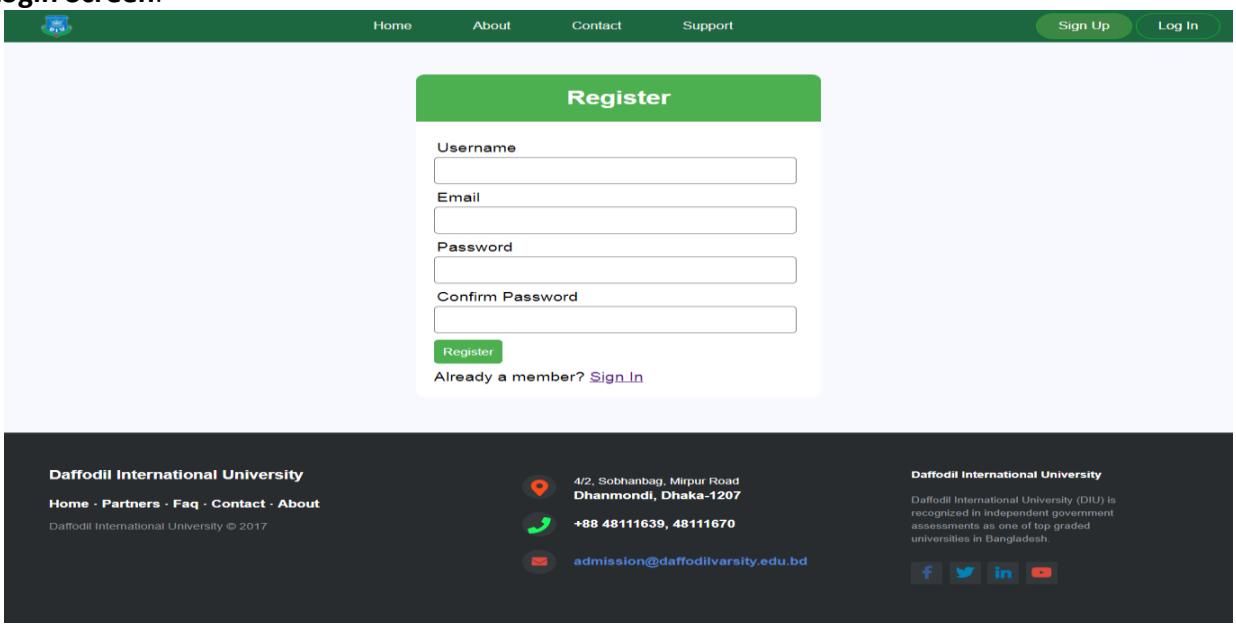

Figure 4.3.2: Sign Up Page

Login screen:

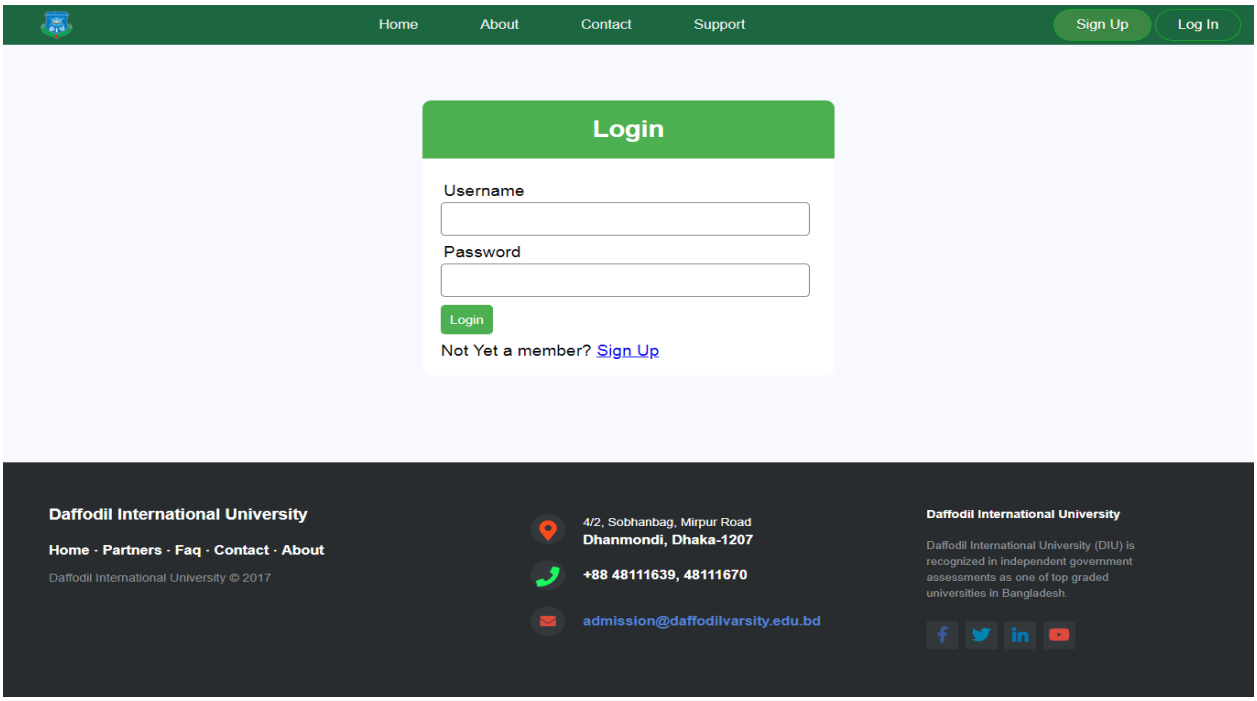

Figure 4.3.3: Login Page

Dashboard:

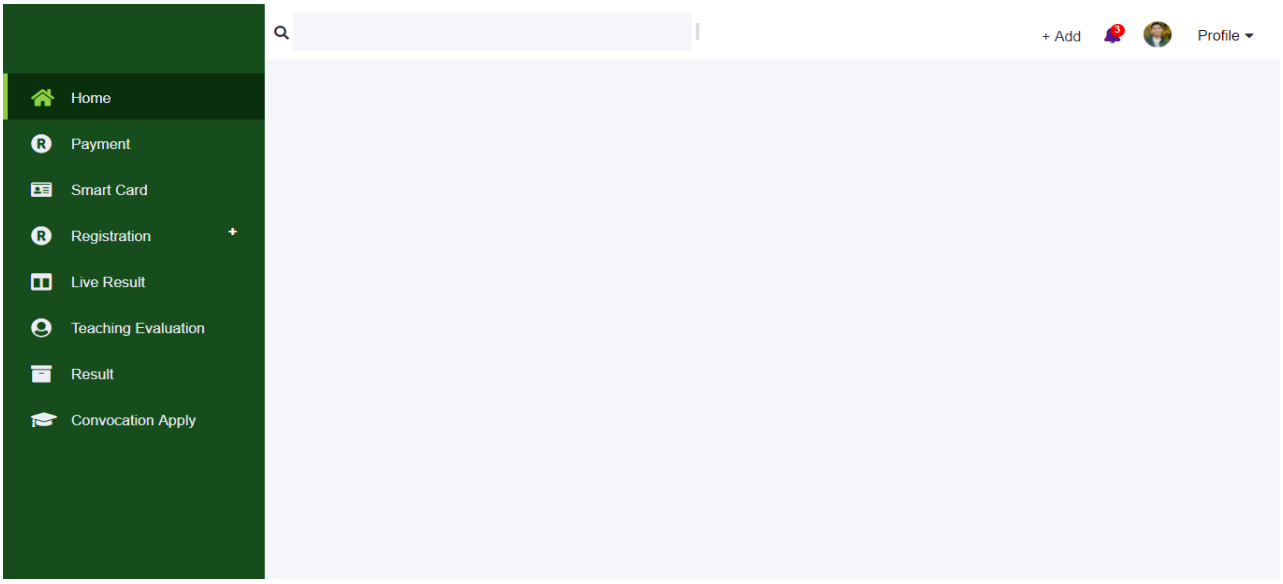

Figure 4.3.4: Dashboard

All Subject:

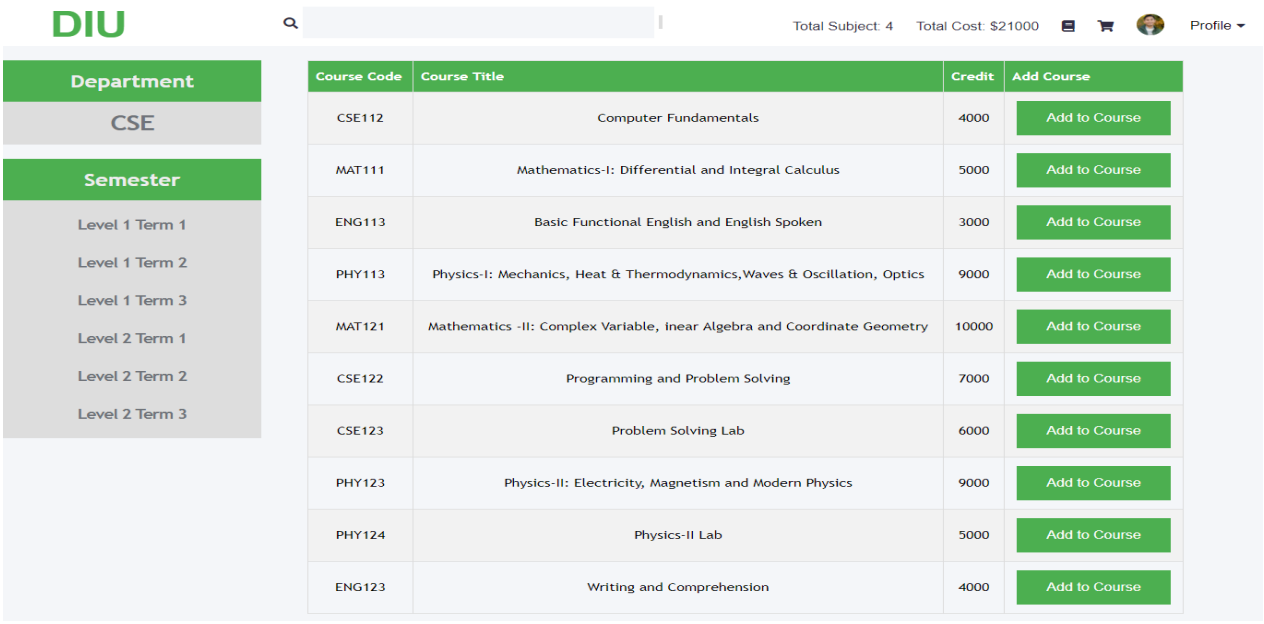

Figure 4.3.5: All Subject

Selected Subject:

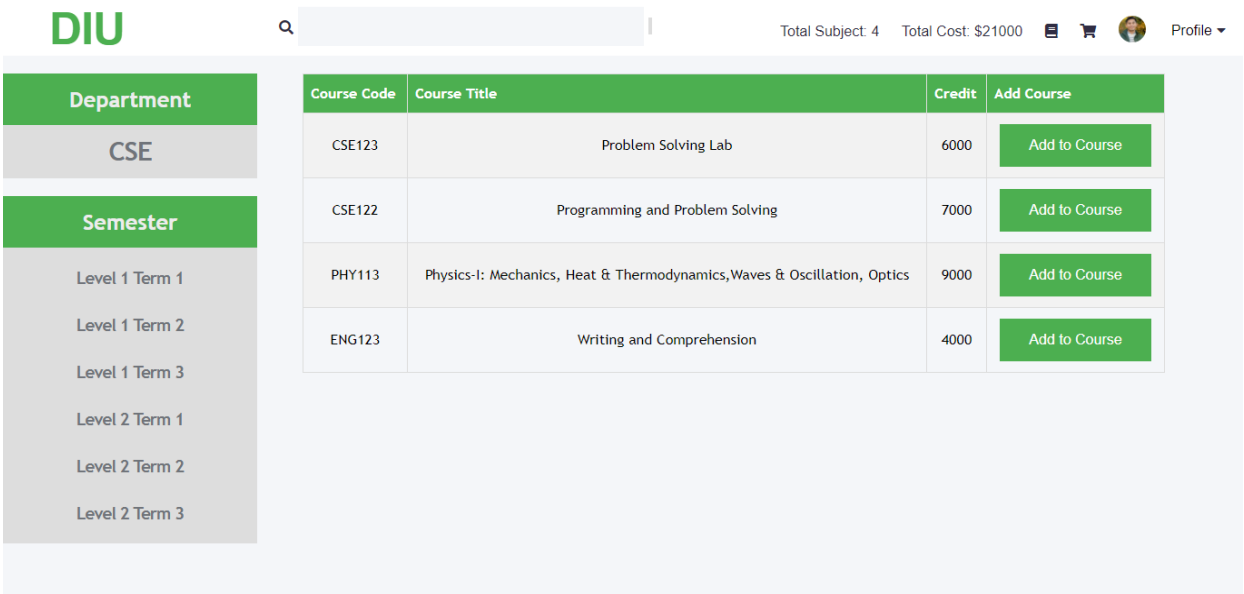

Figure 4.3.6: Selected Subject

Checkout:

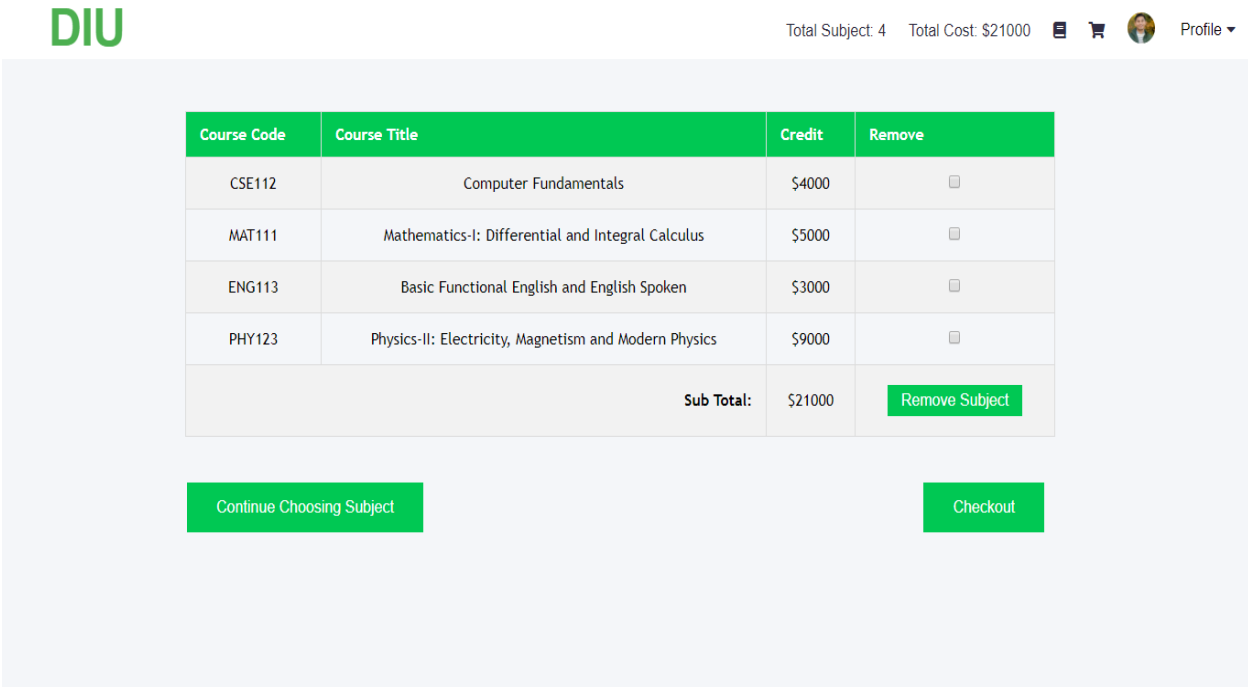

Figure 4.3.7: Checkout

4.4. Implementation Requirements

Frontend implementation requirements

As this is a web application and our target is to build it for web first. So, requirements are Sublime Text for web programming.

Backend implementation requirements

- For local data storing we used MySQL as database.
- For hosting we used Server and Host

Summary Tools & Language

- Sublime Text
- MySQL
- PHP
- HTML
- Java Script

CHAPTER 5

IMPLEMENTATION AND TESTING

5.1. Implementation of Database:

Implementation of Database happened in one place.

- Remote Database.

5.2. Implementation of Front-End Design:

Front end developers use HTML, CSS, and JavaScript to code the website and web app designs created by web designers. The code they write runs inside the user's browser (as opposed to a back end developer, whose code runs on the web server).

Sample file for one design is given below:

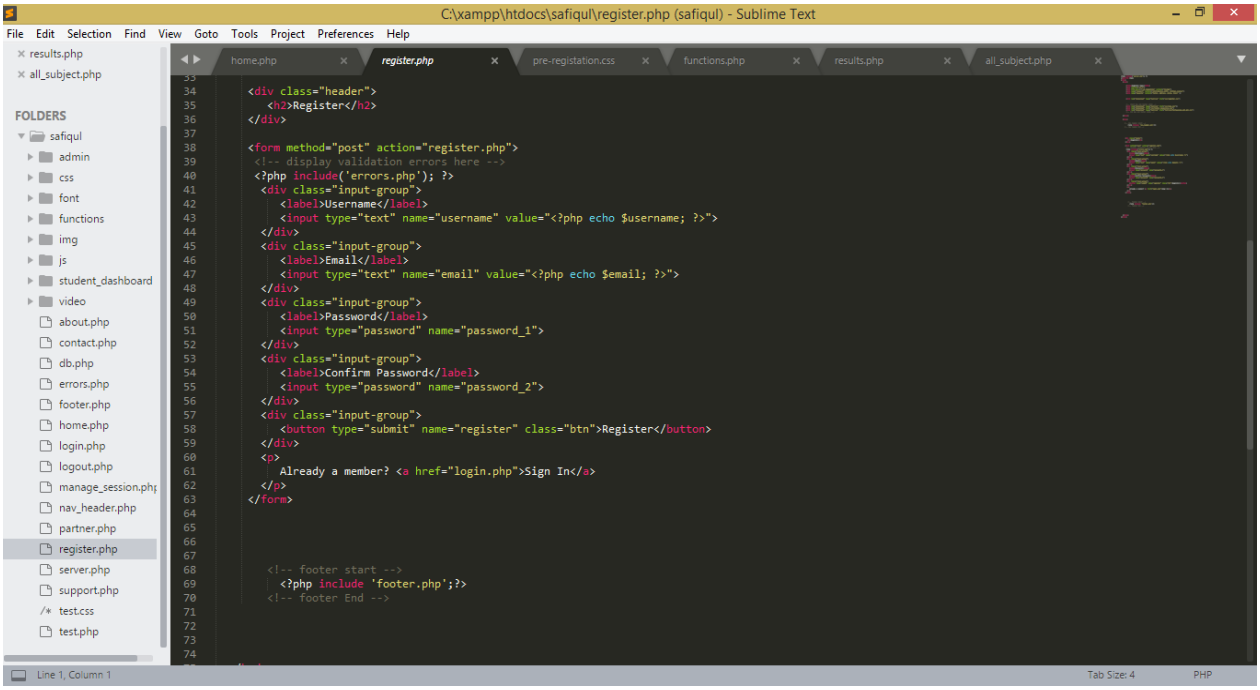

Figure 5.2.1: Screen shot of text mode

The above screen shot is text mood, design mood is like below.

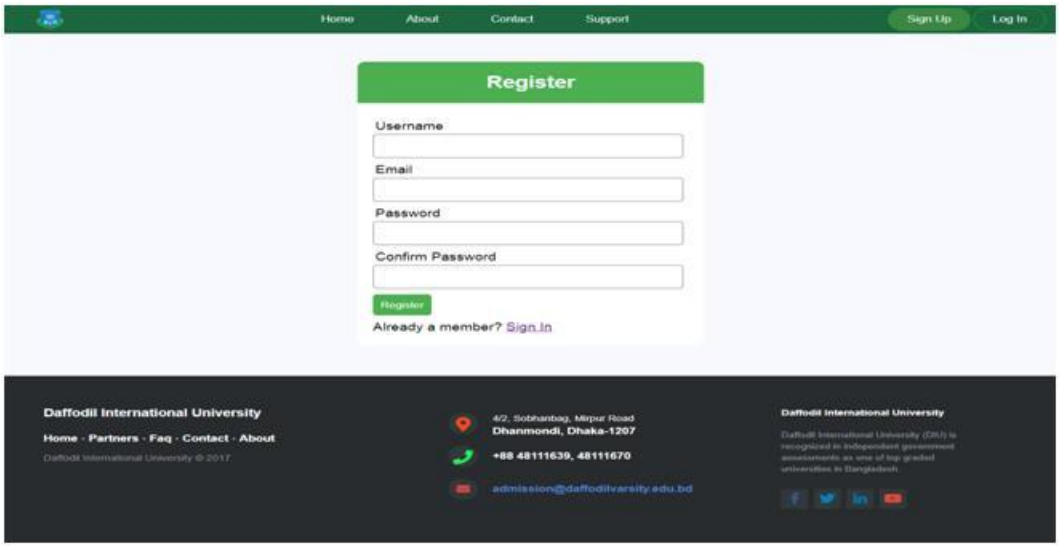

Figure 5.2.2: Screen shot of design mode

5.3. Implementation of Interactions

This project has two layers –

i. View layer: Which is user screen.
ii. Database layer: Where data is stored.

Every event in the user interactions is having a code behind it.

```php
<?php
    //connect to the database
        $con = mysqli_connect("localhost","root","","project");

        if(mysqli_connect_errno()){
                echo "Failed to connect to MySQL: " . mysqli_connect_error();
                }


?>
```

Figure 5.3: Screen shot of connection code

5.4. Testing Implementation

Quality assurance is concern with the product quality. It's to gain insight and confidence that product quality is meeting its goal. So, to meet the quality of a product, it's need to test the product again and again using different testing techniques and identify problems to solve them.

5.4.1. Testing

Here in our project we use different methods to test our system to identify bugs those are discussed below.

5.4.2. Unit Test

Unit testing makes heavy use of white-box testing techniques. We followed unit test techniques in code level. Unit testing is the most efficient method to find errors. In our project we used unit testing to find errors in a particular module. Each module code is written and checked with different inputs and error method. [5]

The following check list was used for unit test:

- Number of input parameters equal to number of arguments or not.
- Parameter and argument attributes match or not.
- Parameter and argument unit systems match or not.
- Number of arguments transmitted to called modules equal to number of parameters or not.
- Database connection checking before performing any operation on database.
- Database field which does not allow null value for those checking of form values was done in code and default values was used to remove database error.
- Global variables which were used in one module were checked weather those are consistent for that module or not.
- Initializations of variables were checked for erroneous initialization.
- Some database error like integrity constraint are taken under exception and handled properly by warning users with proper error message.
- Any textual errors in output were removing by checking output values for different input.

All these techniques were used on individual module of code and errors were removed. Those errors which could not remove were handled under exception.

5.4.3. Integration Test

Integration testing addresses the issues associated with the dual problem of verification program construction. Black box test case design is used over here. All the unit tested code are then combined together and compiled for errors. Suppose in a form there are several different buttons to insert or update or delete. First each button's procedure added and tested and then all the buttons functionality were checked altogether. As well as after finishing one form, all the forms integrated together and checked. [6]

5.4.4. Validation Test

Validation test provides final assurance that software meets all functional requirements. Validation test was done by checking final software in different environment using various inputs. [7]

5.4.5. System Test

System testing verifies that all elements mesh properly and that overall system function/ performance are achieved. System testing was done by using our web application in different browsers.

Using the above testing techniques we removed errors from code. Those errors which could not be removed were handled by the exception handler by generation meaning full message for the users. After this we can assure the quality of the product. It is efficiently workable in different environments and able to fulfill the user's requirements for which software is built.

5.5. Test Results and Reports

Bugs mean faults or error of software. In the development process of software or after implementation of software, developer faces so many errors which may be code error, user input error, network failure error. Bugs are removed by debugging and fixing the code error. If there are some errors except code error which can't be removed are usually handled by exception handler.

In our project we faced so many bugs. Some of them are given here:

- "Connect failed because target host or object does not exist". This error occurs when database server is not available for use. If the intermediate network line doesn't work properly this error occurs at connection time. This only removed by establishing proper network connection between server and client.
- The parse error occurs if there is a syntax mistake in the script; the output is Parse errors. A parse error stops the execution of the script. There are many reasons for the occurrence of parse errors in PHP. The common reasons for parse errors are as follows:

  Common reason of syntax errors are:

  - Unclosed quotes
  - Missing or Extra parentheses
  - Unclosed braces
  - Missing semicolon

CHAPTER 6

CONCLUSION & FUTURE SCOPE

6.1. Conclusion:

Finally, by doing this project we learned a lot about our academic curriculum as social responsibility. While developing this project we were very concerned about our learning which will helps us for our better future.

As this project relate with payment issues so we have to pay a lot of attention about authenticity of every single functionality. Moreover we've to run here and there for master card, debit card, paypal etc. We combined our knowledge what we gathered. After successfully complete the project we tested it again and again with some professionals and seeing its working properly is the biggest achievement to us from this project.

After all this we'll be success if this project can play a vital role in our varsity registration and payment sector and if people can get benefit using this.

6.2. Limitation

We have successfully implemented the system 'Online payment system'. But there is also some limitation in our project. Some features are lacking here.

- We cannot optimize the category properly.
- The system is not prepared for specific banks.
- Security issues.

In near future we will add more features and try to fix all kinds of limitation.

6.3. Scope for Future Development

Though every development extends on people's demand, but we've some plan about future development which engage mass people this. Some of our planning about this is given below but these are not limited -

- **Scope for all banking and card system:** Students can pay their payable amount from any bank or using any kind of payable card.
- **Scope for all departments:** we will try to cover all university and all departments of those universities.
- **Fully secured:** This system is all about payment system and there will be so many information of bank account of a student. So, we will try to maintain hardest security system.

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Appendices

Appendix A: Reflection

A.1. www directory file

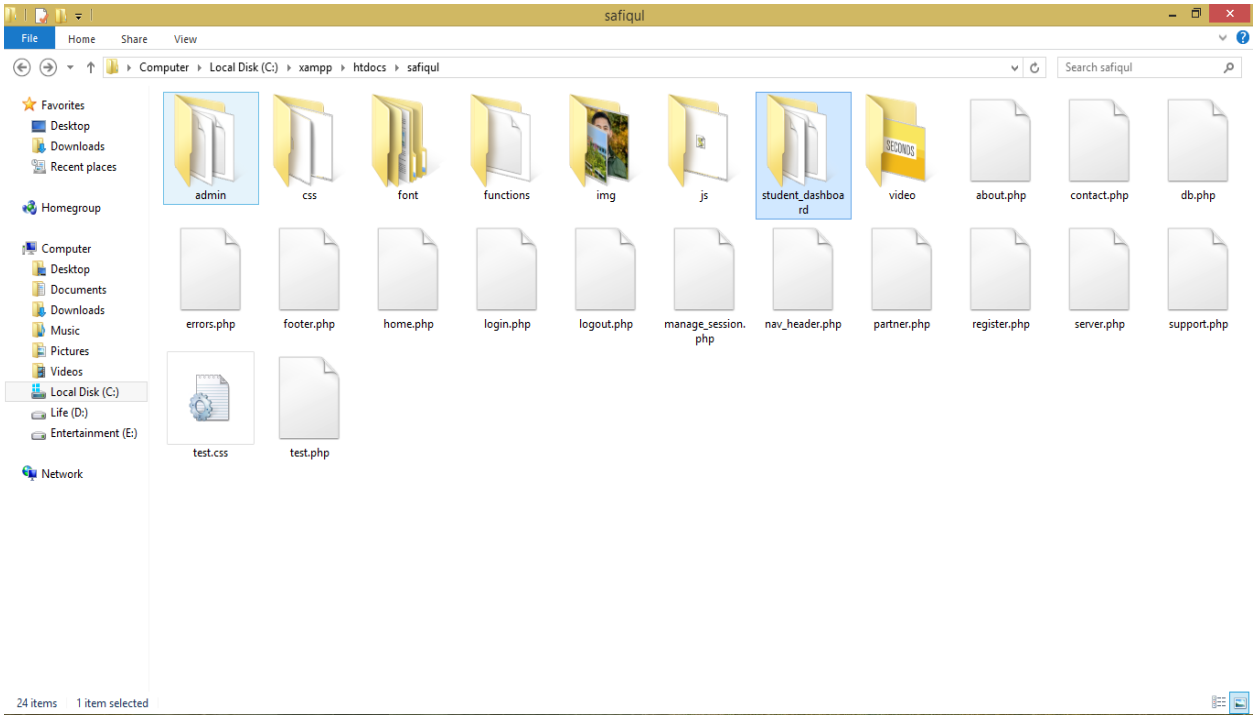
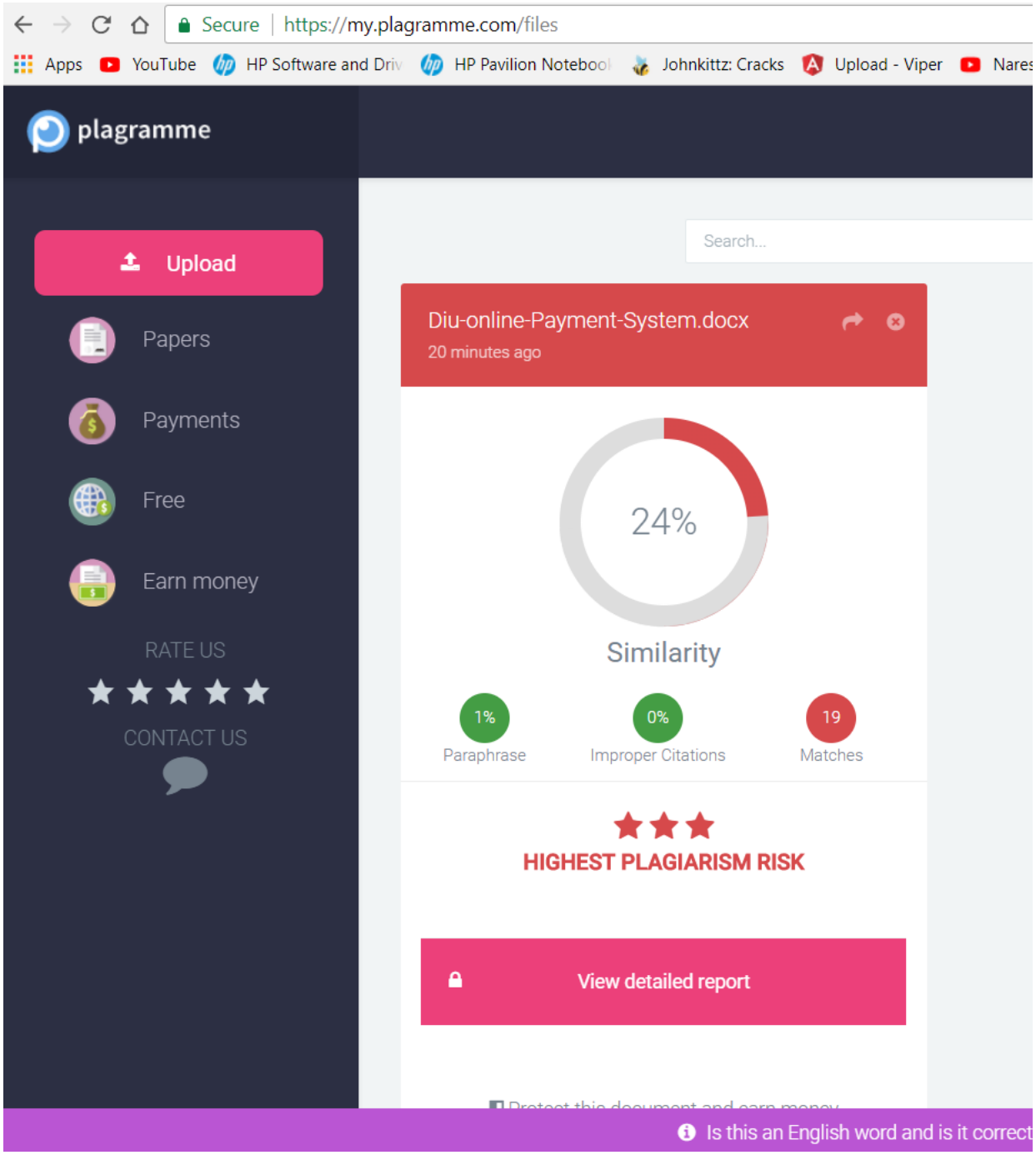


Figure A.1: Screen Shot of Directory File



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