Independent University **Bangladesh (IUB)**

IUB Academic Repository

Internship Reports Summer 2022

2022-09-14

Develop E-Commerce Website at Xarray.IO

Fahima, Sultana

Independent University, Bangladesh

https://ar.iub.edu.bd/handle/11348/783

Downloaded from IUB Academic Repository



An Undergraduate Internship/Project on Topic

By

Sultana Fahima

Student ID: 1731661

Summer, 2022

Supervisor:
Mr. Bijoy Rahman Arif
Lecturer
Department of Computer Science & Engineering
Independent University, Bangladesh

September 14th, 2022

Dissertation submitted in partial fulfillment for the degree of Bachelor of Science in Computer Science

Department of Computer Science & Engineering

Independent University, Bangladesh

Attestation

This is to certify that the report titled" Sixteen Clothing" is completed by me, Sultana Fahima (1731661), submitted in partial fulfillment of the requirement for the Degree of Computer Science and Engineering from Independent University, Bangladesh (IUB). It has been completed under the guidance of Mr. Bijoy Rahman Arif sir (Supervisor). During my internship I experienced industry level work for the first time. All sources used for this project and report are duly accepted into it.

Write your Name Here

Sultana Fahima

Name

September 14th, 2022

Date



Signature

Acknowledgement

First of all, I would like to thank Almighty Allah (SWT) for his kindness in completing my internship report on time. I would like to extend my gratitude to the Faculty of Computer Science and Engineering department for maintaining internship debt in the graduation program curriculum, once giving me a wide range of taste of industry-oriented activities and the field work in my interest. I would like to say a special and heartfelt thanks to my Supervisor, Mr. Bijoy Rahman Arif, Lecturer, Department of Computer Science and Engineering, Independent University, Bangladesh, who encouraged me and guided me on this progress with his guidance, helpful instructions, encouraging suggestions, and thoughtful advice on time, to follow this application and update report accordingly. I would extend my gratitude to my office supervisor, Mr. Alif Zaman the Secretary of Xarray.IO from the center of my heart for his good support, guidance and uplifting my confidence, instructing, advising and encouraging me to do my work proficiently at Xarray.IO. I feel proud and satisfied that I have been closely monitored by the Web Application Development team and received direct advice from my supervisor. Here, with daily reporting, psychological and professional support enhanced my knowledge during internship.

Letter of Transmittal

Mr. Bijoy Rahman Arif
Lecturer
Department of Computer Science and Engineering
School of Engineering and Computer Science
Independent University, Bangladesh

Subject: Submission of internship report for the completion of graduation.

Dear Sir,

I am submitting my reading report, which is a part of the bachelor program of Computer Science and Engineering curriculum. It is a great achievement to work under your effective monitoring. The report is based on," Xarray.IO" Internship. I had the opportunity to work at Xarray.IO for three months, under the supervision of Mr. Atif Alam, Founder and MD at Xarray.IO. This training has given me both academic and operational exposure. The internship has given me the opportunity to improve the network and business environment. I tried to make this report as informative as possible with the information I have gained during my internship. In order to prepare a formal internship report, I followed the guidelines and explained the required fields in sufficient detail, however, I sincerely believe that this report will serve the purpose of my learning program.

I will be very honored if you are kind enough to receive this report and provide your important judgment. It would be my great pleasure if you found this report helpful too. The information given here to have a clear view of the matter.

Sincerely Yours,

Sultana Fahima
ID: 1731661
Department of Computer Science and Engineering
Independent University, Bangladesh

Evaluation Committee

Bijoy Rahman Arif

Signature

September 25, 2022

Name: Bijoy Rahman Arif

.....

Supervisor

Sabrina Alam

Signature

Sabrina Alam

Name

.....

Panel Member-1: Sabrina Alam

Mohammad Motiur Rahman

Signature

Mohammad Motiur Rahman

Name

.....

Panel Memebr-2: Mohammad Motiur Rahman

.....

Signature

.....

Name

.....

Convener/Head of the Department: Dr. Mahady Hasan

Dr. Mahady Hasan
Head, Department of CSE
School of Engineering & Computer Science
Independent University, Bangladesh (IUB)

Abstract

Internship is defined as the acquisition of practical information for various organizations that contributes to the building of a connection between theory and practice information. It is very important because this is the first time you have a student with the ability to do something with information from various organizations. When I was given an internship at Xarray.IO, I had the opportunity to work and study with a team of engineers. The purpose of this project was to create a web application using Laravel framework with livewire technologies enabling the framework to have the ability to work in real-time. This report covers every project I learned during my study period. I had to complete my study periods before working on any project, and this time, I was assigned to improve the landing page, dashboard, the action of different parts and certain background codes. It was almost like a skill check before one real shared project. I have given the details and information about what I have gained and the work I did as a qualified student at Xarray.IO, in this port. I have worked on a Prototype of an ECommerce Website where most of my work involves development of the whole prototype project.

Contents

Attestation i

Acknowledgement ii

Letter of Transmittal iii

Evaluation Committee iv

Abstract v

1. Introduction 1
1.1 Overview/Background of the Work 1
1.2 Objectives 1
1.3 Scopes 2

2. Literature Review 3
2.1 Relationship with Undergraduate Studies 3
2.2 Related works 4

3. Project Management & Financing 5
3.1 Work Breakdown Structure 5
3.2 Process/Activity wise Time Distribution 6
3.3 Gantt Chart 7
3.4 Process/Activity wise Resource Allocation 9
3.5 Estimated Costing 11

4. Methodology 12

5. Body of the Project 13
5.1 Work Description 13
5.2 System Analysis 14
5.2.1 Six Element Analysis 14
5.2.2 Feasibility Analysis 15
5.2.3 Problem Solution Analysis 17
5.2.4 Effect and Constraints Analysis 17
5.3 System Design 18
5.3.1 Rich Picture 18
5.3.2 UML Diagrams 19
5.3.2 Activity Diagrams 22
5.4 Product Features 30
5.4.1 Input 30
5.4.2 Output 31
5.4.3 Architecture 31

6. Results & Analysis **33**
6.1 Software Testing 33

7. Project as Engineering Problem Analysis **39**
7.1 Sustainability of the Project/Work 39
7.2 Social and Environmental Effects and Analysis 40
7.3 Addressing Ethics and Ethical Issues 41

8. Lesson Learned **42**
8.1 Problems Faced During this Period 42
8.2 Solution of those Problems 43

9. Future Work & Conclusion **44**
9.1 Future Works 44
9.2 Conclusion 45

Bibliography **46**

Chapter 1

Introduction

Internship is a learning experience in the professional job field. It offers mostly practical work based on real life scenarios related to the student's (internee's) major subject or career interest. Also, an internship provides a student an opportunity to relate their theoretical knowledge with the tough real-world environments. Through internship, a person can gain enough skill for getting a job related to that field in the future. For me, it also gave the opportunity to observe, learn and practice under a professional's supervision in that field. Being a student of Independent University, Bangladesh (IUB), I must complete my internship from a reputed company in a respected field so that I can get a better job in future in that same field or another. I worked for around 3 months.

1.1 Overview/Background of the Work

As an intern, I faced multiple challenges other than learning new programming languages. For example, managing time for every task and reporting it to my supervisor. I started my internship at Xarray.IO on 1st June 2022 as a Web Development (Intern) and was given the task to contribute to Xarray's official website and also develop a prototype of an Ecommerce website. This application is unique in the way of creating an account by using only email and password. The user can then easily shop different products from the page.

1.2 Objectives

Project objectives are what we plan to reap by the cease of our undertaking. The goals of an assignment are particular, measurable and should meet time, finances and most importantly meet the customer's necessities. the principal goals of this software are described beneath:

- Creating account using email: The following user can create his/her account using only email and password.

- Main Dashboard: The user's front page will display the products available in the shop and also the quantity and price of product items. From this page users will be able to search for products and click the add to cart button.

- Page Interface: The main Page will consist of the name of the user on the upper right of the following user who is logged in their page. If the user is not logged in then they won't be able to see their name on the upper right. The background is created by different pictures of similar kinds of products. And the whole background color will be white.

- Cart Interface: There will be an icon on the upper right side of the front page just beside the user's name. And if the user adds any item to the cart the number of items will be displayed beside the cart icon. Inside the cart page the items will be shown alongside the price and quantity and also a "Delete" button in case if the user wants to delete that specific item from the cart.

- Admin Dashboard: When only the admin user logs into their account they will be able to view their dashboard. On the upper right corner, they will have their name and logout button. Middle left section there are option of different tasks that only admin shall be able to perform.

1.3 Scopes

This web application will have user authentication for the people who have active account on it. This means that only the user will have their designated account only.

The entire application will load its contents Statically i.e., the information will be updated as much as the admin uploads. The information includes: User's primary information (User name, account email, password), Products information, Cart, Order info.

There will be no chance of secondary login, if any, as the user must need to logout from the following logged in account and then log in on different account.

Chapter 2

Literature Review

2.1 Relationship with Undergraduate Studies

Literature review is a short summary of a studies paper primarily based at the same subject matter. It encompasses numerous varieties of books, papers, article, and so on. which means it is basically explains the modern-day take a look at with the vital records that might be useful for the ongoing venture of that equal subject matter.
Similarity with the undergraduate education:

- Database management system (CSE303): The following web application (E-Commerce) requires database to store and manipulate various types of important data that is needed to run the application. This course helped me to design the entity relation diagram (ERD) and enhanced entity relation diagram (EERD), relational database and, if needed, normalize the relational schema to simplify the database and make it more efficient.
- Object oriented programming (CSE213): To build the database, the data first need to be created. And this is done with the concept of object-oriented programming. CSE213 or Object-oriented programming is a course that teaches students how to create data types (classes) and use inheritance, polymorphism, etc. to implement real world system into efficient programming. This course taught me how a user can become a datatype and use inheritance to build multiple users that fall under the same type of users. Also, how to implement each type of users' ability as method of a class.
- Web application (CSE309): The following system is a web-based application system. This means that this course is the main course that helped me throughout my entire internship. This course taught me how build a web application from scratch. "Sixteen Clothing" web application uses most of the concept from this course.

2.2 Related works

Ecommerce is a web application. It's the online buying and selling of goods and services using computers, tablets or smartphone. Now a Days most retail/service companies develop ecommerce websites to have an online presence and reach wide audience. To develop web application different types of tech stack and frameworks are used. But mostly for the frontend part HTML, CSS, JavaScript, Bootstrap, React JS are used and the backend part are developed using frameworks such as Laravel, Django, Spring depending on the language. We used Html, CSS, JS Bootstrap and PHP with Laravel framework. Here are some web applications that used similar technologies to our projects:

- Contentoo: Contentoo enables users to choose contractors for any particular product. This site provides secure communication between the contractors and their employers. Subsequently, the security feature of the Laravel framework comes into play. Making rigorous use of the Laravel framework, contentoo lets you create a highly-supportive tool for outsourcing the services to your favorite creator. In addition to the regular updates in the components, it lets you integrate 3rd party applications.

- Bagisto: Built on Laravel, Bagisto is an e-commerce platform where you buy and sell without third-party intervention. You can create an online marketplace for your store without having any technical expertise. Bagisto offers a unique feature of live demo. This may remind you of the Laravel feature of code and view at the same time. Laravel lets you manage the huge database of store inventory at your fingertips. It gives you admin access to certain parts of the website and lets you remain a simple user at the same time. The modularity offered by Bagisto is a great feature of the Laravel framework. The payment gateways on this e-commerce platform allow multi-currency transactions by using 3rd party application integration features of Laravel. The high-quality graphics of Bagisto elevate the aesthetic view of the site.

- InvoiceNinja: It is an open-source invoicing solution for businesses and freelancers. In other words, it lets them generate invoices, process payments, track their expenses. Using the SaaS model gives users the freedom of using the public cloud or their own infrastructure. The Laravel framework of the website gives the option of adding additional users to one profile and setting their permission levels.

Chapter 3

Project Management & Financing

3.1 Work Breakdown Structure

A sequential structure that shows the division of the project into smaller parts is called a Work Breakdown Structure (WBS). In this project, we have produced WBS so that our work is integrated. WBS covers views of all scopes, risks, points communication, obligations, costs and guarantees that do not exceed value delivery. By combining mindfulness and collaboration, it is the right tool for the team. In this case, the WBS was used the way to the top.

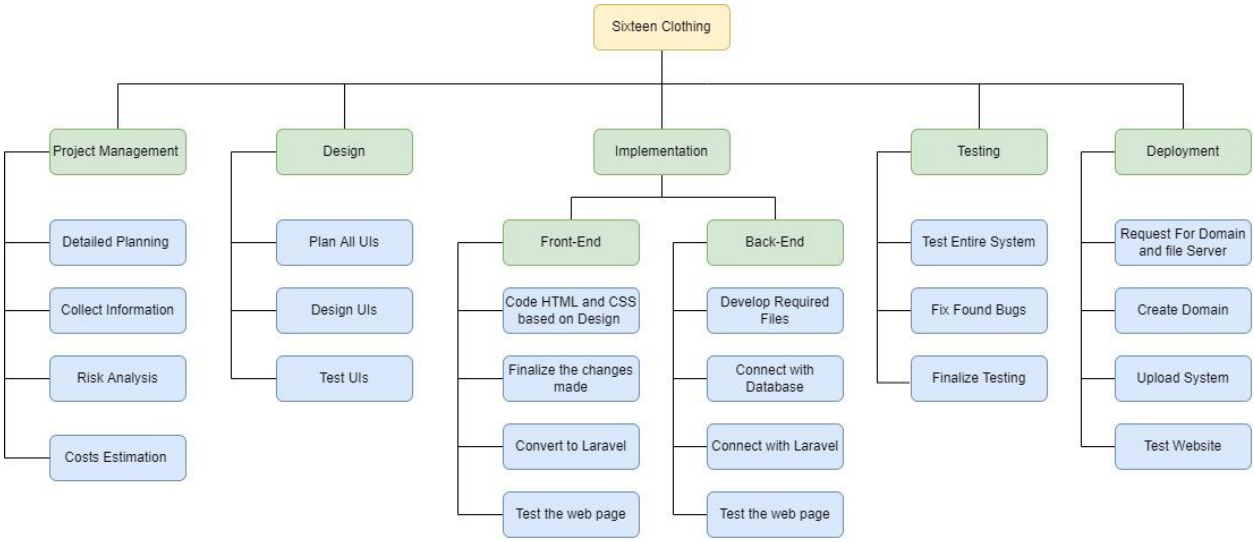


Fig 3.1: Work Breakdown Structure

3.2 Process/Activity wise Time Distribution

In order to complete a project within the estimated time needs a process/activity wise time distribution. This distribution will help to organize all tasks as it will be divided into sections to make it work more efficiently. Besides, a person can work with more flexibility and easily when the entire project is divided into sub groups. The most important challenge in designing the right way application time management. Therefore, the content should be fixed, and progress must be based on this context. A better time management can lead to take less time to complete a task related to project. The critical path method for “Sixteen Clothing” is given bellow:

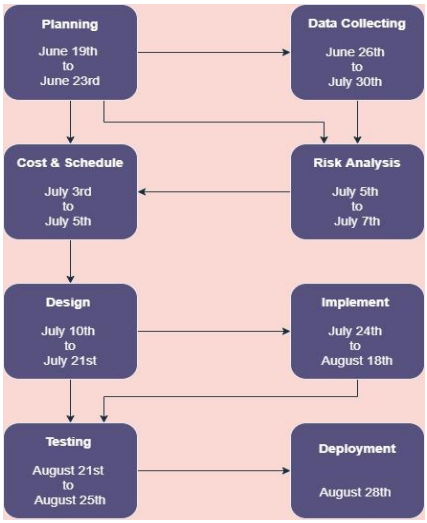


Fig 3.2: Critical Path Method for ’Sixteen Clothing’

Here we can see that 5 days are required for planning the entire project, what languages and framework(s) (if any) is/are needed to build it and how. Cost schedule has been collected by the supervisor within a week. Designing the front end took 12 days. The most extensive work is implementing as all the design and back-ends will be implemented in a framework, in this case Laravel. Finally, after implementing, testing will start and 5 days are needed for testing the whole application and finalizing it for public release. The following project will be deployed by 28th August 2022.

3.3 Gantt Chart

The Gantt chart is a project management tool that assists planning and organizing projects of all sizes, though especially useful in making complex projects. Project management times and tasks are converted to a horizontal bar chart, showing the start and end dates, as well as dependencies, planning and end dates, including most of the work is completed in each category and who owns the work. This helps keep activities on track where there is a large group and more participants where the scope changes.

Gantt charts are used for the following purposes:

- It helps the entire project to be broken down into small tasks.
- A person can know when a project will start and end.
- Monitor and report progress.
- Display milestones and show key events.
- How long a task is supposed to continue.

The Gantt chart for ‘Sixteen clothing’ is as follows:

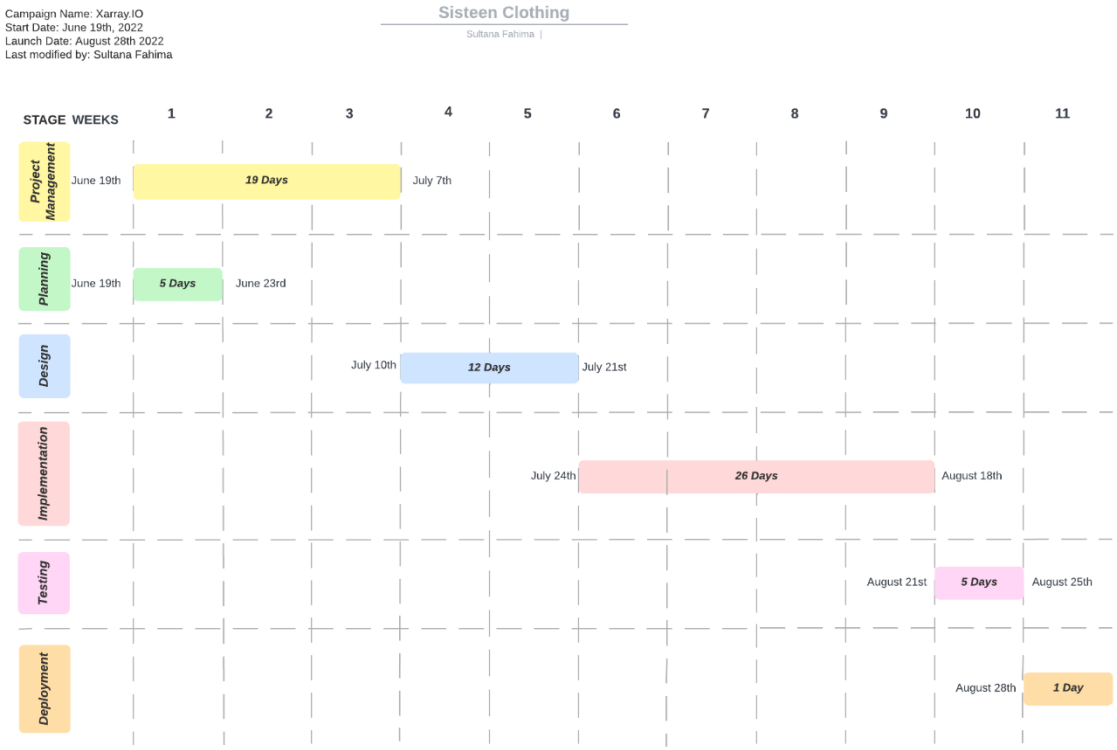


Fig 3.4: Gantt Chart of ‘Sixteen Clothing’ project.

On the section 3.2, we have seen the time distribution of project. On the following Gantt chart above, it is clearly visible that implementation and design took most of the time of the entire project. Abstractly it is clear that most of the time, in building the entire project, was taken by the design and implement section.

3.4 Process/Activity wise Resource Allocation

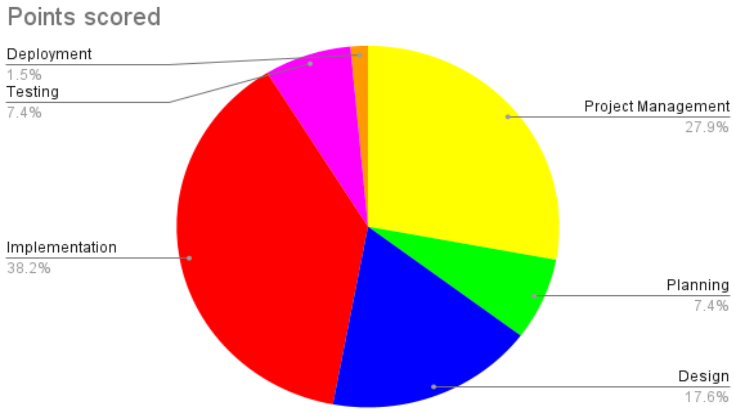


Fig 3.5: Process wise Resource Allocation

Distributing assets in a particular way that supports the own team goals is known as resource sharing. For this project, CS/CSE engineers is the main individuals followed by office computers and servers for airing the application. All company work is considered a resource, which is why everyone has it assigned a specific task with specific deadlines. With respect to the Gantt chart of section 3.4, total of 78 days needed for building the entire system. Details of every step of the project are as follows:

- Project Management: The first stage or task is project management. This is where the main idea of the project and what it is made for, everything in details is explained. For this project, it took 15 working days or 3 weeks to manage all the attributes so that the project could get start build as soon as possible. The tasks of every person for the project management are divided. During the first couple of days, the senior developers and CEO were discussing about how the project should be created i.e., what language(s) will be used from top to bottom. Then the project is divided into sub tasks so that time distribution can be planned. Thus, setting goals and other deadlines making the project easier for the employees to arrange and complete their tasks. This following part consumed almost 35% of the total work.
- Design: This is the second stage where the user interface of the following web application is created. This following part is one of the most consuming parts and consumed almost 17% of the total work.

- Implementation: In this stage, all the planning and designing is done. Now the entire application is implemented into framework and test hundreds of times step by step to verify each and every change that are made to the application. Both the front-end and the back-end are developed and tested as the changes are made. At first the front-end is build using a template and then is connected with the Laravel 8(PHP framework) which is going to handle the back-end task of the application. Then the Laravel routing and the authentication is made on 'web.php' file and middleware section. Finally, all the logic of every front-end page are written down in PHP using Laravel and tested on every changes. This implementation is a long process and it consumed almost 40% work of the entire project. Also, it took 26 days to complete this task.
- Testing: Although many testing was made by the developer as per the implementation; however, a finial testing of the project must be done by the head of the project. This testing will be done on all conditions that are necessary for the testing. If problems are found during this test, the project will be sent back to the developers along with the errors found for correcting it and further implementing if necessary. Testing consumed almost 8% work and time of the entire project.
- Deployment: The deployment is where the project will be put down for practical use by the client. There are different types of deployment depending on the type of project. For this project, since it is a web-based application, the deployment will be a website that can be accessed internationally from anywhere in the world. In order to do this, the following project is need to be uploaded on a server that has public IP. Then a domain is need to be bought with a similar name: 'sixteen clothing.com'. Then database is also needed since the application has login features for different types of users. For this project, database is provided by the company's server. If all above are done, the application should be able to start giving service from that moment. Deployment takes only couple of days to finish.

3.5 Estimated Costing

Costing is calculated by the requirements and features that is going to be offered by the following project ordered by the client(s). The requirements and features of the project depends on the size, functionalities and design of the website including prototype(s) of the project, designing necessaries (themes, logo designs, custom pictures, etc.), total number of pages, SEO (search engine optimization), database, authentication, etc. Also, the cost of developer and resources used have been taken into account. For the entire project, the final estimated cost was 90, 000, ninety-five thousand, BDT.

Features	***Costs in BDT***
Internet Bills	4500
Domain Bills	3500
Hosting Bills	1500
Project Manager	30,000
Designer	25,000
Front-End and Back-end Developers	30,500
Total Costs	95,000

Table 3.1: Estimated Costs for ‘Sixteen Clothing’

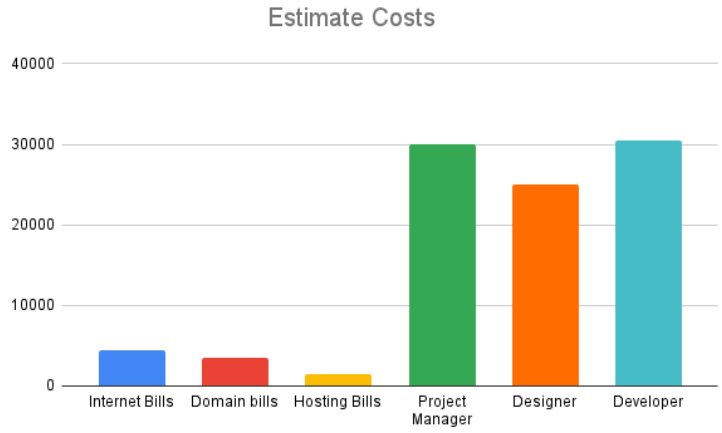


Fig 3.6: Estimated Costs

Chapter 4

Methodology

Methodology is an in depth little by little method that identifies, technique and examine diversity of facts approximately particular subjects. It involves analyzing the manner of how the proposed machine works and switch it to in a platform with more simplified efficient of that gadget. The web utility that I have been operating on, on my internship, used the concept of methodology to feature numerous features and functions to the internet site to make it extra bendy for the customers. the usage of the idea of methodology, I've first understood how the farming control works. Then I divided the device into many components on the way to understand them deeply in order that I can use the device wherever I'm able to. Thus, converting it into extra simplified device that is simple to run. additionally, the simplified system is easy to understand and put into effect as an internet software. As I need to make recognize how my utility goes to make my client's work easy, methodology helped me to make it clean to convert it into virtual utility.

Chapter 5

Body of the Project

The theme of the project in the report is a detailed discussion of the work of those students who want to know about the depth and completeness of something done. The body of the project shows what is being done, how it is done, what the results are, and what conclusions and recommendations can be made.

5.1 Work Description

Sixteen Clothing is a Web based E-commerce platform that allows the users to buy products from the site when thy have a valid account. This is a digital system. This means that users will be able to complete the purchasing procedure automatically through the system.

The admin user will be able to keep the website information updated.

The consists of four modules. These are:

- Registration: A person can register to ‘Sixteen Clothing’ to by using a username, email, and password, address, mobile number. As soon as the person enters the following credentials, the person becomes a permanent registered user of the web application called ‘Sixteen Clothing’.
- Log In: In order to log in to ‘Sixteen Clothing’, the person must need to enter the email id and password. If one of them gets failed to be completed, successfully log in cannot be performed. The user will therefore lose his/her account permanently.
- Change Username: A user of ‘Sixteen Clothing’ can change his/her username to any name the following user wants to.
- Change Password: A user of ‘Sixteen Clothing’ can change his/her password to any characters as long as it follows some conditions for creating password, for example, the password must be at least 8 characters long, must contain at least a symbol, etc.

5.2 System Analysis

System analysis is a problem-solving process that involves looking at a broad approach, segmentation, and finding out how they work to achieve a goal. It is used in information technology, where computer-based systems need to be configured once design analysis.

5.2.1 Six Element Analysis

Process	Human	Non-Computing hardware	Computing Hardware	Software	Database	Network and Communication
1. Login	**User:** In order to purchase product A person must need to login to the system. Using the valid email and password.	Monitor, Mouse Keyboard etc.	Desktop, Laptop or Smart Phones.	Internet Browsers like: Firefox, Chrome and also Operating System	MySQL	Internet Connection
2. Registrar	**User:** To login into the user account registration must be done giving the correct information.	Monitor, Mouse Keyboard etc.	Desktop, Laptop or Smart Phones.	Internet Browsers like: Firefox, Chrome and also Operating System	MySQL	Internet Connection
3. Add to Cart	**User:** User need to add products to the cart to order. User also can choose the Quantity of the product.	Monitor, Mouse Keyboard etc.	Desktop, Laptop or Smart Phones.	Internet Browsers like: Firefox, Chrome and also Operating System	MySQL	Internet Connection

Process	Human	Non-Computing hardware	Computing Hardware	Software	Database	Network and Communication
4. View Cart	**User:** By clicking the cart button user will be able to view the cart page	Monitor, Mouse Keyboard etc.	Desktop, Laptop or Smart Phones.	Internet Browsers like: Firefox, Chrome and also Operating System	MySQL	Internet Connection
5. Place Order/ Delete Item	**User:** From the cart user can place order or delete any item from the item list	Monitor, Mouse Keyboard etc.	Desktop, Laptop or Smart Phones.	Internet Browsers like: Firefox, Chrome and also Operating System	MySQL	Internet Connection
6. Update, Add or Delete Product	**Admin:** In order to Update, Add or Delete any products Admin must login to the system and navigate to these sites.	Monitor, Mouse Keyboard etc.	Desktop, Laptop or Smart Phones.	Internet Browsers like: Firefox, Chrome and also Operating System	MySQL	Internet Connection
7. View Added Products	**Admin:** In order to view the added products admin must click the view products button.	Monitor, Mouse Keyboard etc.	Desktop, Laptop or Smart Phones.	Internet Browsers like: Firefox, Chrome and also Operating System	MySQL	Internet Connection

Table 5.2.1: Six elements analysis of "Sixteen Clothing"

5.2.2 Feasibility Analysis

Possible studies show the functioning of the system vision, it will help: to explain the goals and objectives of building a system in the most efficient, developmental way the best plan and practice. Observation is used to determine which one mental functioning, which includes ensuring that the work is legal and professional possible in addition to economic forgiveness.

We will be able to see whether or not what is being done is really worth the support — in a few cases, the business may not work. The new work system needs to hear whether it is possible to think about it for a specific end purpose to produce a productive effect. This is advised on all issues that can be, in particular, performance or financial matters and how to resolve them by introducing new technologies, operations and financial skills in their project. The most important research feature is the possibility find out if the project has a good chance of success. Split spending compare client needs and more. There are many types of research possible such as operational, technical and economic aspects.

Some of the terms of feasibility analysis are as follows:

- **Technical Feasibility:** Technical Feasibility looks at small components of how to transfer the object or organization (i.e., equipment, work, delivery, the business will find out what areas, development needed, etc.). Think of a technical feasibility study such as strategic planning or strategy how your business will create, store, transfer, and track its products or services. Technical competency research is an incredible and long-term research tool harvest planning. With a few features, it completes as a framework for your product resources grow and you go about your business for your physical gain your market. Also, do not say that the performance of the technology is about how you will deliver product or service.
- **Operational Feasibility:** Potential Performance is part of the problem-solving problem with the support of another proposed program. It helps to use open doors and satisfies the condition as dividing the time between project development. It is important to know that management and clients support the work. There they are the six pieces of structure that can cause the division of performance issues to be resolved. They are performance, knowledge, economy, control, efficiency and resources with a clinical management plan the project must focus on something complete the goal of success.
- **Schedule Feasibility:** Schedule Performance is indicated as a project opportunity completed during the allotted time. In case the project is of a high standard Chances of lust ending after a fixed date, at that time the possibility of a schedule it is thought to be high. The possibility of a schedule ensures that the project can be completed before a project or technology expires or has no purpose.
- **Economic Feasibility:** The id function of the economic feasibility study is shown the total benefit of the proposed project to tolerate or distribute electrical goods / benefits, to combine benefits and costs with the agency, in another case. offices, and the general public.

5.2.3 Problem Solution Analysis

Problem solving involves thinking and understanding. Although it may seem easy, identifying a problem can be a challenging process. One of the main problems is dealing with them top with a variety of changes in technology day by day. Troubleshooting is an act of to explain the problem; to find the cause of the problem; identification, prioritization, and choosing alternative solutions; and apply the solution. And so is the congress gaining additional needs is important

Solutions of a problem can be found by using the following methods:

- **Define the problem:** Check the situation to focus on the problem, not just its symptoms. Practical ways to solve problems include using flowcharts identify the expected process steps and cause-effect diagrams to be defined and analyze the causes. The sections below help explain how to solve important issues steps. These measures support the involvement of interested parties, the application of facts knowledge, expected comparisons and realities, and a focus on the causes of a problem
- **Evaluate and select an alternative:** Skilled problem solvers use a series of considerations when choosing the best option.
- **Implement and follow up on the solution**: Leaders can be called guide others to use the solution, "sell" the solution, or facilitate implementation with the help of others. Involving others in use is an effective way to gain acquisition and support and reduce resistance to subsequent changes.

5.2.4 Effect and Constraints Analysis

Effect: E-Commerce system is one of the best ways of ensuring business growth and monitoring the business also understanding customer's wants and needs. During the pandemic it was quite clear to all that online shopping and business was a complete live saver. Without the e-commerce systems the whole retail business could have been in a complete loss. The customers can shop and also check their order info and previous orders with the help of an e-commerce site.

Constraints Analysis: Limitations can be used to determine the desired structure of web document, and embedded behavior of applets.

Introducing the program formats in which both the author and the viewer can set the parameters of the page layout, some are required and some are optional. This is the last look of a web page the result of a dialogue between the author and the viewer, in which this dialogue takes place without resolving a set of required and preferred barriers for both parties. We identify two sound system structures, based on different classification methods the task of resolving issues between a web server and a web client. Finally, we define implementation of a prototype based constraining web authoring system and viewer, viz and provides limited embedded applets.

5.3 System Design

Process or technique for defining hardware and software architecture, components, modules, interactions, and computer system data to meet specific needs. One can see it as the application of system theory to a computer. Some are scattered with system analysis instruction seems inevitable. Design tools like UML now fix some of the problems of computer systems and connectivity.

5.3.1 Rich Picture

The rich picture is a graphical tool that produces cartoon like representations of problem situations within organizations. Knowledge is gained from multiple stakeholders and differing viewpoints usually within a workshop context. A rich picture is used as one of the 3 primary tools in his soft system method maintaining that it must not be structured. The rich picture tool is popular amongst many analysts but has been increasingly criticized over the years for its lack of syntax, structure and rules.

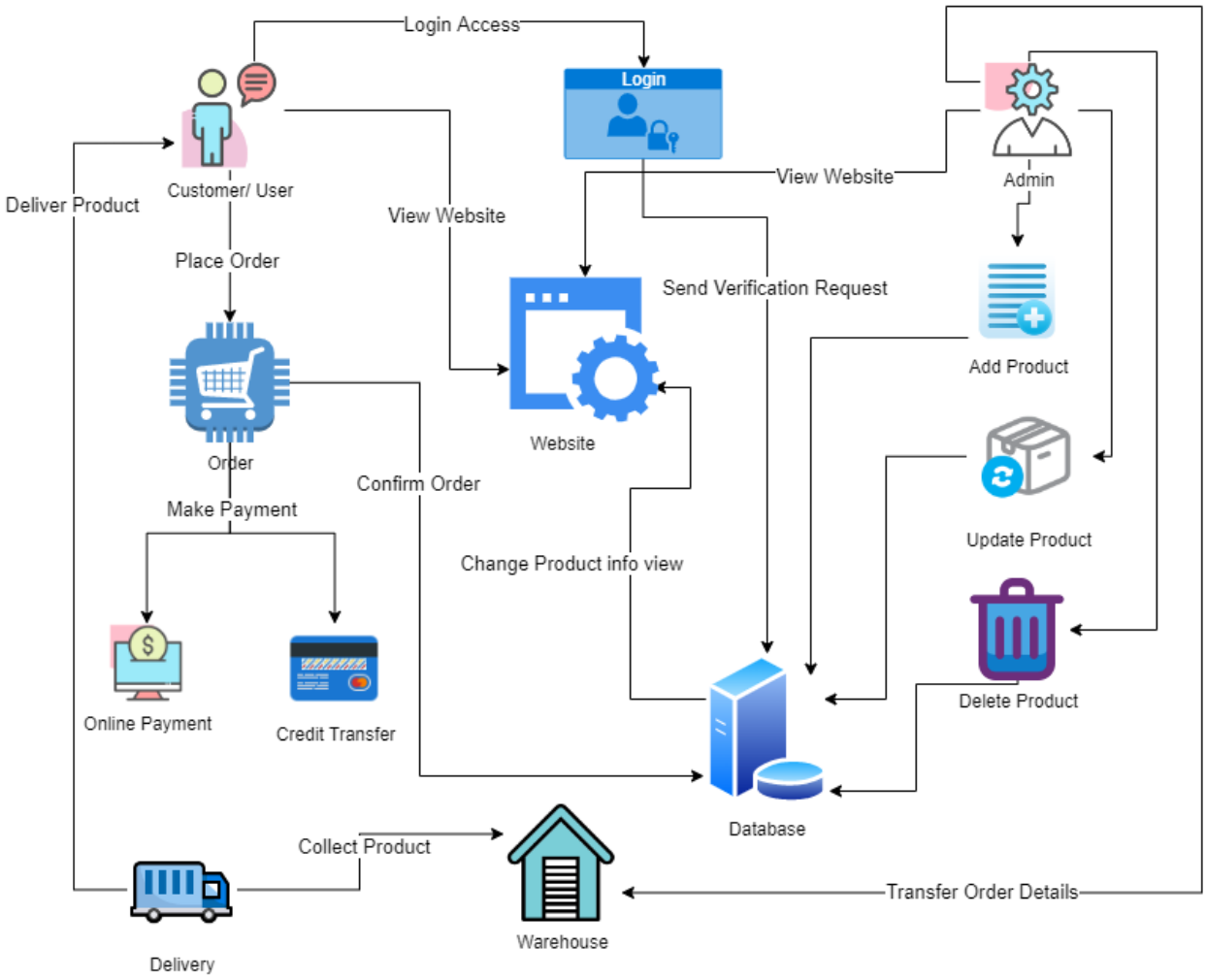


Fig 5.3.1: Rich Picture

5.3.2 UML Diagrams

Integrated Modeling Language (UML) is a common, evolving target language, which exemplifies the field of software engineering aimed at providing quality. how to detect system configuration. Any complex system is better understood to make some kind of drawings or pictures. These drawings have a better effect on us understanding. If we look around, we will see that paintings are not a new concept but it is widely used in different ways in different industries.

Use Case Diagram: A usage case diagram describes how to use it charges were made. For example, let's explain the charge for using a Withdrawal. This the process is done in many steps, such as Enter card, Enter PIN, select value, take withdraw money and issue a card. Of course, all these services come from customers opinion - but this sequence should not be included in the use case diagram. Other drawings are recommended for that, like a work sketch. A working case diagram should describe the desired function of the system and associate it with the use of cases and characters. Thus, it can represent the existing ideas of the system and how it is interpreted in a different way - only then can the needs be fully understood.

Use Case diagrams of "sixteen Clothing" are given below:

Module 1: Log in

Actors: User and Admin

Description: The diagram below represents the log in process of "Sixteen Clothing"

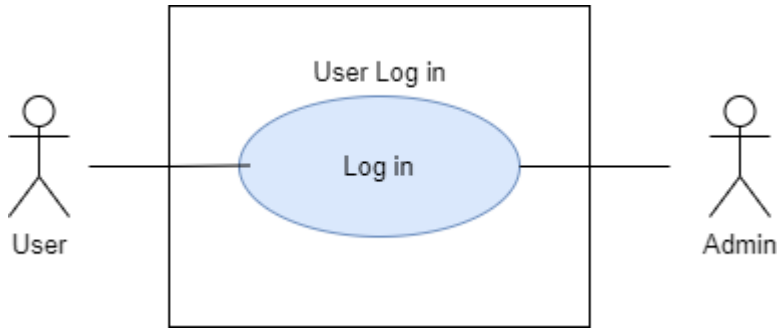


Fig 5.3.1: User Login

Module 2: Place Order

Actors: User

Description: The diagram below represents the order placing process of "Sixteen Clothing"

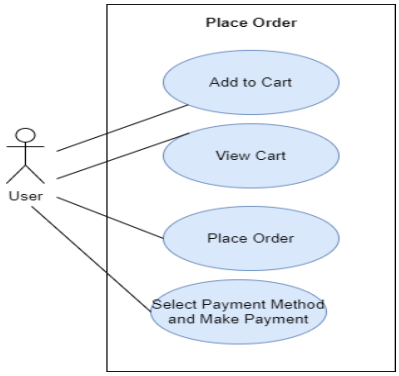


Fig 5.3.2: Place Order

Module 3: Add Product

Actors: Admin

Description: The diagram below represents the adding product process of “Sixteen Clothing”

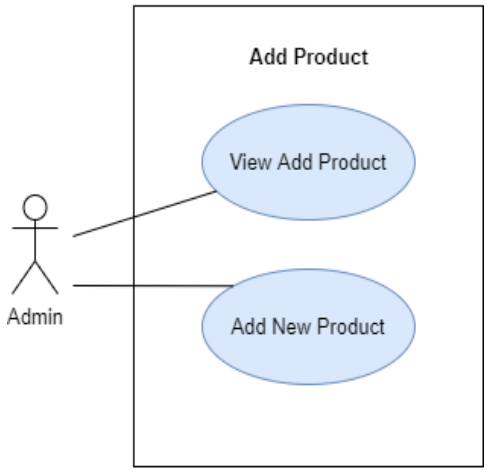


Fig 5.3.3: Add Product

Module 4: Update and Delete Product

Actors: Admin

Description: The diagram below represents the updating and deleting product process of “Sixteen Clothing”

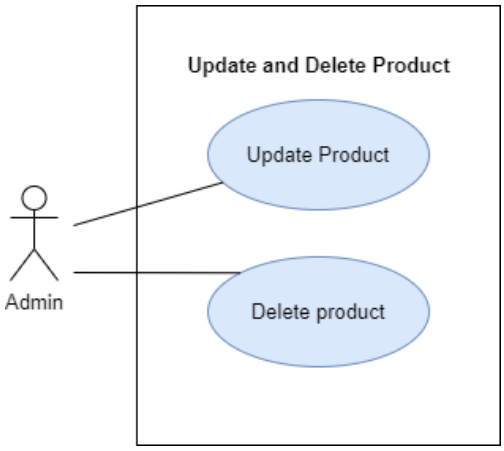


Fig 5.3.4: Update and Delete Product

Module 2: Receive Order

Actors: Admin

Description: The diagram below represents the receiving order process of “Sixteen Clothing”

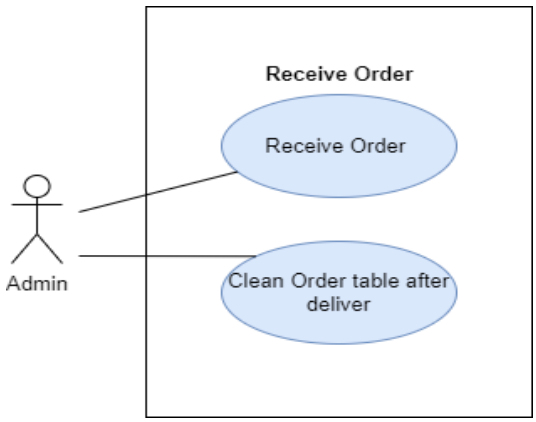


Fig 5.3.5: Receive Order

Activity Diagram:

In UML, an activity diagram provides a view of the behavior of a system by describing the sequence of actions in a process. Activity diagrams are similar to flowcharts because they show the flow between the actions in an activity; however, activity diagrams can also show parallel or concurrent flows and alternate flows. In activity diagrams, you use activity nodes and activity edges to model the flow of control and data between actions.

Activity diagrams are helpful in the following phases of a project:

- Before starting a project, you can create activity diagrams to model the most important workflows.
- During the requirements phase, you can create activity diagrams to illustrate the flow of events that the use cases describe.
- During the analysis and design phases, you can use activity diagrams to help define the behavior of operations.

The following topics describe model elements in activity diagrams:

- **Activities**: In UML, activities are container elements that describe the highest level of behavior in an activity diagram. Activities contain several activity nodes and activity edges that represent the sequence of tasks in a workflow that result in a behavior.
- **Actions:** In UML, an action represents a discrete unit of functionality in an activity. Actions have incoming and outgoing activity edges that specify the flow of control and data to and from other activity nodes. The actions in an activity start when all of the input conditions are met. Input pins and output pins can be added to specify values that are passed to and from the action when it starts.
- **Control nodes:** In activity diagrams, a control node is an abstract activity node that coordinates the flow of control in an activity.
- **Object nodes:** In activity diagrams, an object node is an abstract activity node that helps to define the object flow in an activity. An object node indicates that an instance of a classifier might be available at a particular point in the activity.
- **Activity edges:** In activity diagrams, an activity edge is a directed connection between two activity nodes. When a specific action in an activity is complete, the activity edge continues the flow to the next action in the sequence.

The activity diagrams of "Sixteen Clothing" are given below:

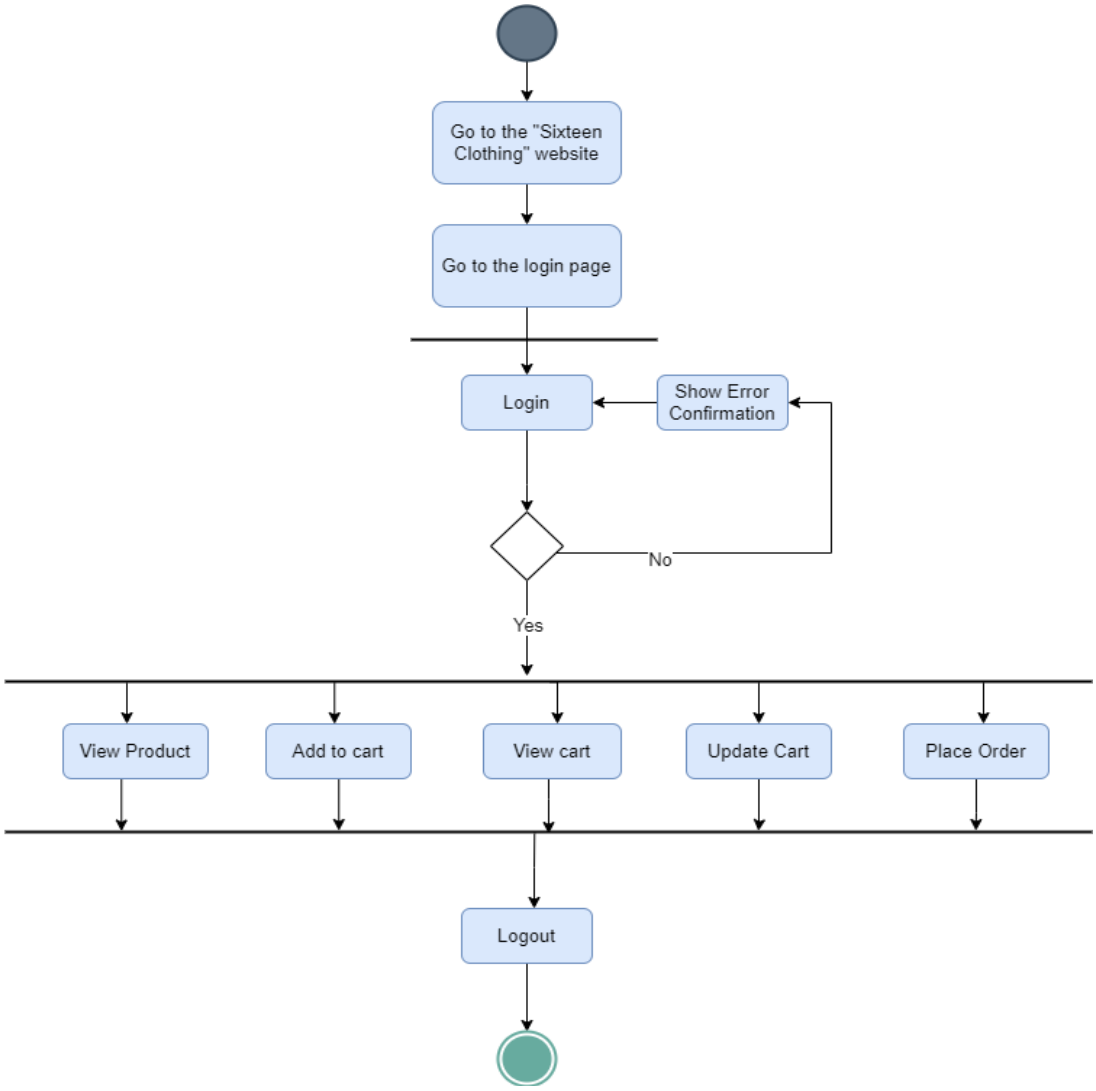


Fig 5.3.6: User Activity Diagram

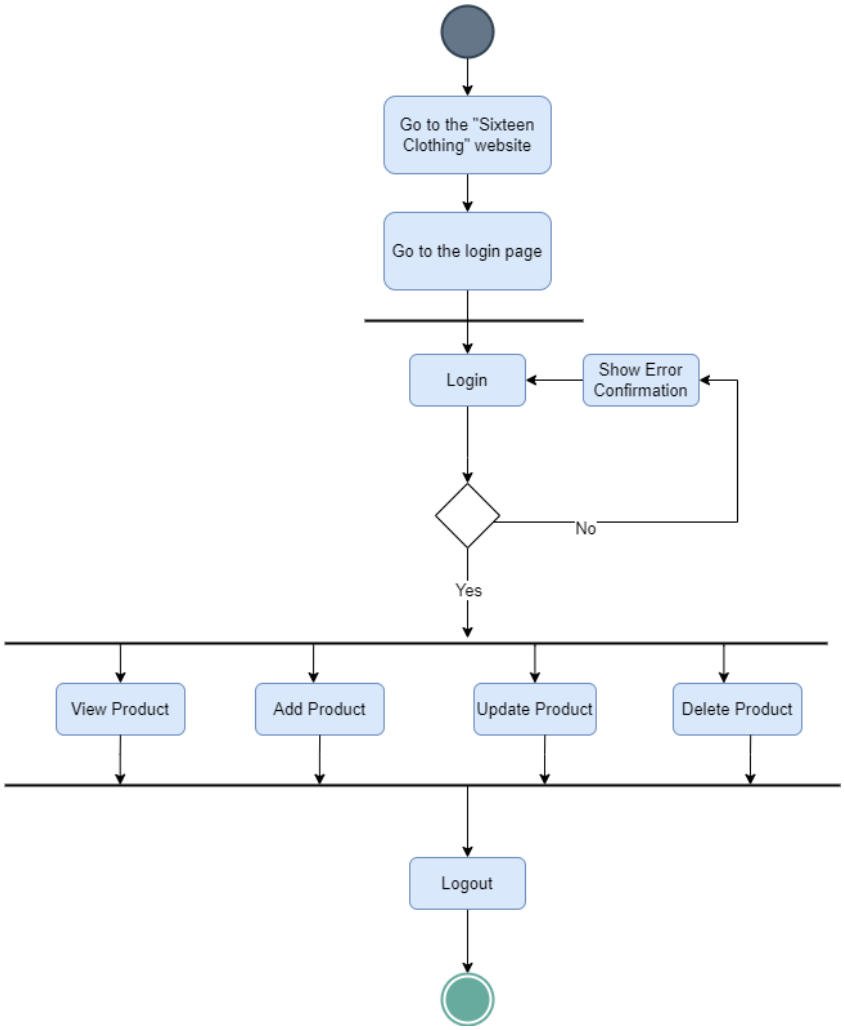


Fig 5.3.7: Admin Activity Diagram

Entity Relationship Diagram:

An entity relationship diagram describes how entities relate to each other. In simple terms, it's a picture or a framework of your business or a certain business process. Entities are the things we need to store data about. It's an aspect of your business that needs to store data, such as a department – or sales, revenues, maybe clients. It also gives a snapshot of how these entities relate to each other. We can call it the blueprint that underpins your business architecture, offering a visual representation of the relationships between different sets of data (entities).

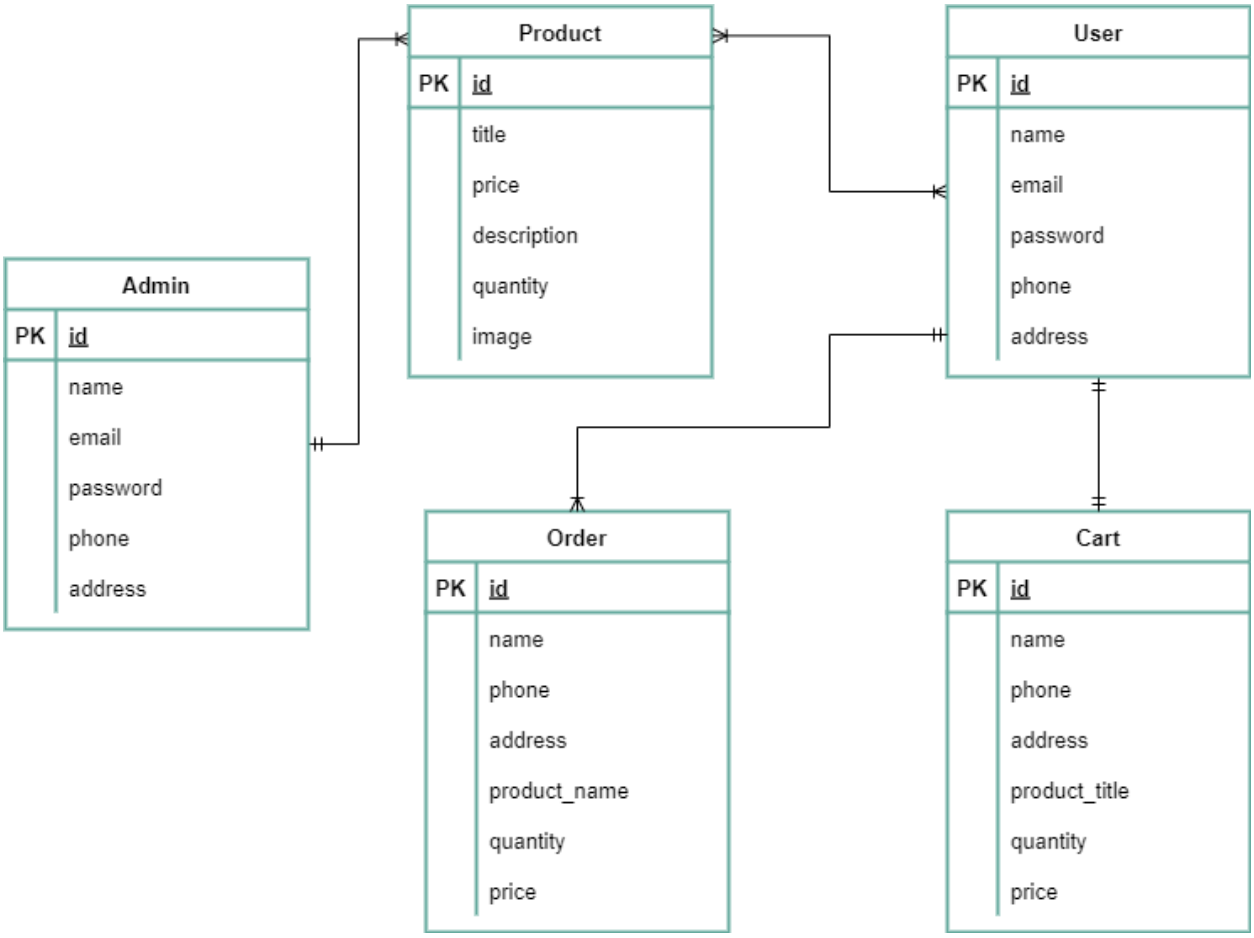


Fig 5.3.8: Entity relationship diagram of "Sixteen Clothing"

5.3.3 Functional and Non-Functional Requirements

Functional Requirements: Need a written description of a feature or strength that a new or improved product design should incorporate. It usually has a lot of details, and it explains what should be given, not how it will be provided. In other words, it does not include usage details. The requirements, as well as the documents from which it is made, are legally binding and therefore the language used in them is very clear.

Function: Log In		
Input: User email, password	**Process:** Check the login credentials with the user database.	**Output:** Show as per the user main if successfully logged in.
Precondition: Must have internet access with internet browser.		
Postcondition: User gets error message and gets redirected to log in page.		

Table 5.3.1: Functional requirement- Log in

Function: Place Order		
Input: Add to cart, quantity, address, number, email, product title	**Process:** Check if all the info is given properly. Click on the place order button.	**Output:** Show 'Order place is successful' in the page.
Precondition: Must have internet access with internet browser.		
Postcondition: User gets message if it's successful or not.		

Table 5.3.2: Functional requirement- place order.

Function: Add Product		
Input: Admin login with password and email, product id, title, price, description, quantity, image	**Process:** Check if all the info is given properly. Click on the add product button.	**Output:** Show 'product added successfully' in the page.
Precondition: Must have internet access with internet browser.		
Postcondition: User gets message if it's successful or not.		

Table 5.3.3: Functional requirement- add product.

Function: Update or delete Product		
Input: Admin login with password and email, product id, title, price, description, quantity, image	**Process:** Check if all the info is given properly. Click on the add product button.	**Output:** Show 'product updated successfully'/ 'product deleted successfully' in the page.
Precondition: Must have internet access with internet browser.		
Postcondition: User gets message if it's successful or not.		

Table 5.3.3: Functional requirement- update or delete product.

Non - Functional Requirements: Inactive requirements are a set of requirements that determine how well the system will work as opposed to operating requirements that focus on the specific business functionality applied for, he does. How the app will work is nothing but a specified quality parameters such as accessibility, efficiency, reliability, usability, etc. on the basis of that app quality is rated.

Some of the attributes of non - functional requirements are as follows:

- **Usability:** Usability is defined as the measure of the degree to which an application can be easily used and operated. For example, in the case of a new application, the easier the flow of the application is for the user to operate it smoothly, the better will be the usability.
- **Scalability:** Scalability is defined as the ability of the system to cater to the growing usage of the application. It is of two types horizontal and vertical scaling. This horizontal scaling can be achieved more by adding more machines. Vertical scaling is provided by adding more CPU and RAM to the available machines.
- **Security:** Security is one of the most important attributes of non - functional requirements. It is the measure of the resilience of the application under any type of malicious attack.
- **Accessibility:** Accessibility is the ability of an application to cater to the needs of the user with special needs or disabilities using some assistive technology like screen readers.
- **Data integrity:** Data integrity deals with the integrity, consistency, and correct ness of the data in the application.
- **Durability:** Durability is the measure of the ability of the application to cater to the requirements for a long period of time.
- Maintainability: Maintainability is defined as the ease with which an application can be restored to working conditions after a failure.
- **Performance:** Performance is a non-functional requirement that deals with the measure of the response time of the application under different load conditions.
- **Reliability:** Reliability of a software system makes use of the Mean Time Between Failure (MTBF) parameter that is the time elapsed between 2 failures. The longer the MTBF the more reliable is the application.
- **Robustness:** The robustness of a software application is the measure of the ability of a software application to deal with invalid or erroneous input effectively.

5.4 Product Features

A product is an object or service designed to meet the specific needs of people or firms. The product feature includes features and attributes that provide value customers and separate the product from the retail center. Manufacturing companies and selling a product or service should ensure that there are certain features like any other product on the market. This ensures that the business has a competitive advantage in the marketing world. In other words, the product feature says skills are usually provided by a software program that allows the user to do something accordingly.

5.4.1 Input

Inputs of "Sixteen Clothing"	
Process	**Field Type**
Log In	Email – String Password- String
Add to Cart	Product title- String Quantity- Integer Price- Float
Confirm Order	Product title- String Quantity- Integer Price- Float Name – String Phone- String Address- String
Add Products	Product title- String Quantity- Integer Price- Float Description- String Image- File
Update Products	Product title- String Quantity- Integer Price- Float Description- String Image- File
Delete Products	ProductId- integer

Table 5.4.1: Inputs of "Sixteen Clothing"

5.4.2 Output

Outputs of "Sixteen Clothing"	
Process	**Field Type**
Log In	On Success- Redirect to the home page On failure- show "Please enter correct password/ email".
Add to Cart	On Success- Show "Product Added Successfully". On failure- "Product is not Added Successfully".
Confirm Order	On Success- Show "Order is confirmed Successfully". On failure- "Order is not Confirmed Successfully".
Add Products	On Success- Show "Product Added Successfully". On failure- "Product is not Added Successfully".
Update Products	On Success- Show "Product Updated Successfully". On failure- "Product is not Updated Successfully".
Delete Products	On Success- Show "Product Deleted Successfully". On failure- "Product is not Deleted Successfully".

Table 5.4.2: Outputs of "Sixteen Clothing"

5.4.3 Architecture

A web application is a program that uses an Internet browser to do something jobs. Comes with middleware and UI that connects both client, server, and details (domains). While backend scripting saves data, frontend transfers that data to consumers who support data exchange. In simple terms, the design of a web application is a way The system works during your daily browsing - enter the web address, view site, and communication - while the browser is transferring data to the server.

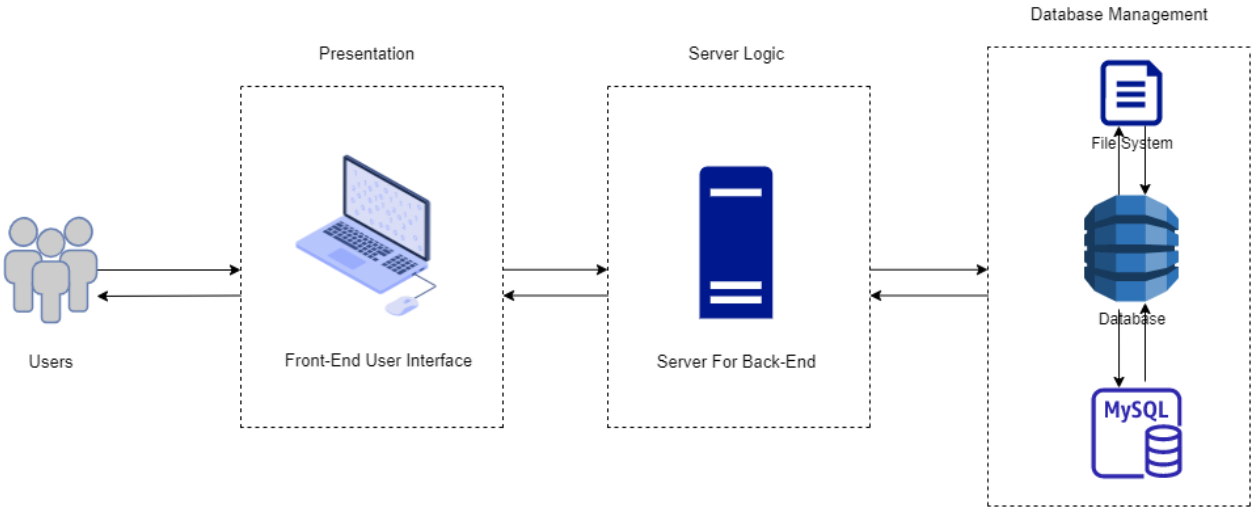


Fig 5.4.1: Architecture

Since the user submission interacts with the front-end, the front-end receives input requests and transfers it to a web server that handles that request using the required intelligence using the website and/or file system where required. And finally, he can get feedback returns at the end where the user can see it as an output.

Chapter 6

Results & Analysis

On one web application page: “Sixteen Clothing”, all features once activities are analyzed and evaluated as well as progress that is passed step by step. Debugging the app has made a significant and significant change in both ends and application back-end enhancement. There were various cases to prove that they were done exactly as planned from the beginning. The project did not move further progressively developed until each test returns the expected output. Through this method, the application is made gradually and lively.

6.1 Software Testing

Software testing can be defined as a software verification process or the application has no interruptions, meets the technical requirements as directed structure and development, and meets the needs of consumers effectively and efficiently with help to manage all unusual situations and limitations.

The statistics below show the test and effect of all web application methods. The following tasks are provided if certain conditions are met successfully.

Test ID	Test Case	Description	Steps to be Executed	Expected Result	Actual Result	Pass/ Fail
T1	Log in	User Must need to successfully sign in for online shopping	1. Go to the page. 2. Go to Login option 3. Give correct Email and Password 4. Click Log in Button	The Information of the Login will be authenticated with the database.	The email and password will be matched, and the result will be shown to the front-end	Pass
T2	Add To Cart	User have to click the "Add to cart" button on the product they wish to order	1. Go to the Page. 2. Click Add to cart Button	It will show a message saying the product added to the cart is successful.	It shows "Product Added Successfully"	Pass
T3	Confirm Order	Inside the Cart page user will confirm the order.	1. Go to the Cart 2. Click "Confirm Order" button.	It will show a message saying the Order Confirmation successful.	It shows "Order Confirmed Successfully"	Pass
T4	Add Product	Admin user will add new products to the page	1. Login to the admin account 2. Go to the add product page 3. Provide product data 4. Click add product button	It will show a message saying the product added successfully.	It shows "Product Added Successfully"	Pass
T5	Update Product	Admin can update any product info when needed	1. Go to the show product page 2. Provide new product data 3. Click "update" button	It will show a message saying the product updated successfully.	It shows "Product Updated Successfully"	Pass

Test ID	Test Case	Description	Steps to be Executed	Expected Result	Actual Result	Pass/ Fail
T6	Delete Product	If any product is no longer in sell admin can delete that product	1. Go to the show product page 2. Click "Delete" button beside the specific product.	It will show a message saying the product Deleted successfully.	It shows "Product Deleted Successfully"	Pass
T7	Receive Order	When user confirms an order admin will be able to view those order and click delivered button when delivered.	1. Go to the Order page. 2. Click "Delivered" when the order is delivered to the customer.	It will change the product status.	It changes the product status from not Delivered to Delivered.	Pass

Table 6.1: Test mode of Sixteen Clothing's User and Admin Panel

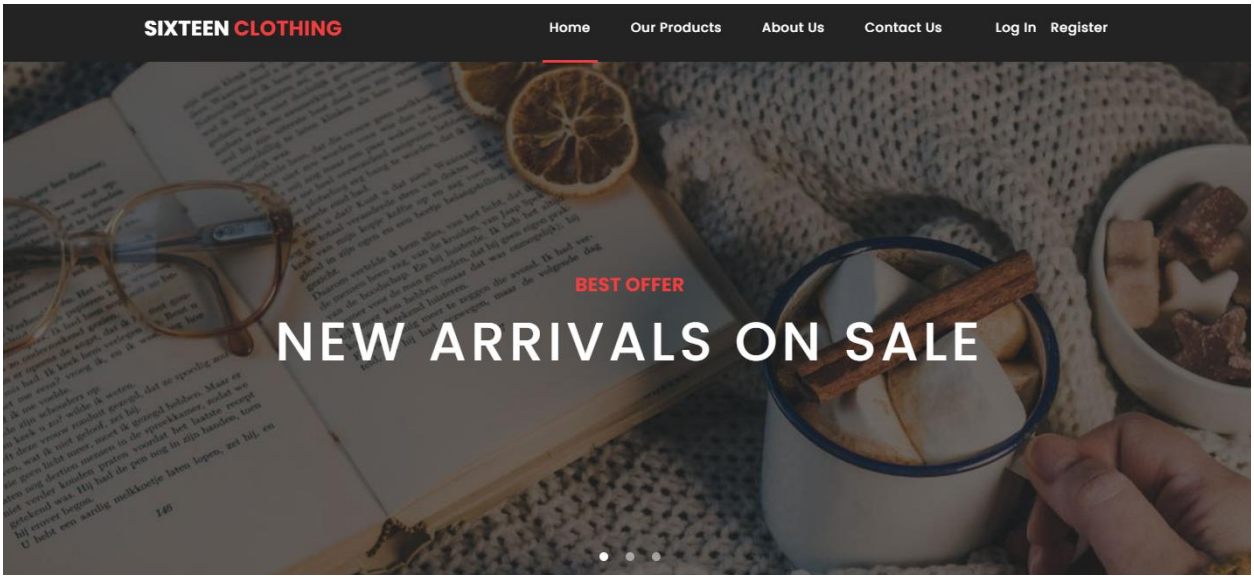


Fig 6.1.1: Sixteen Clothing home page

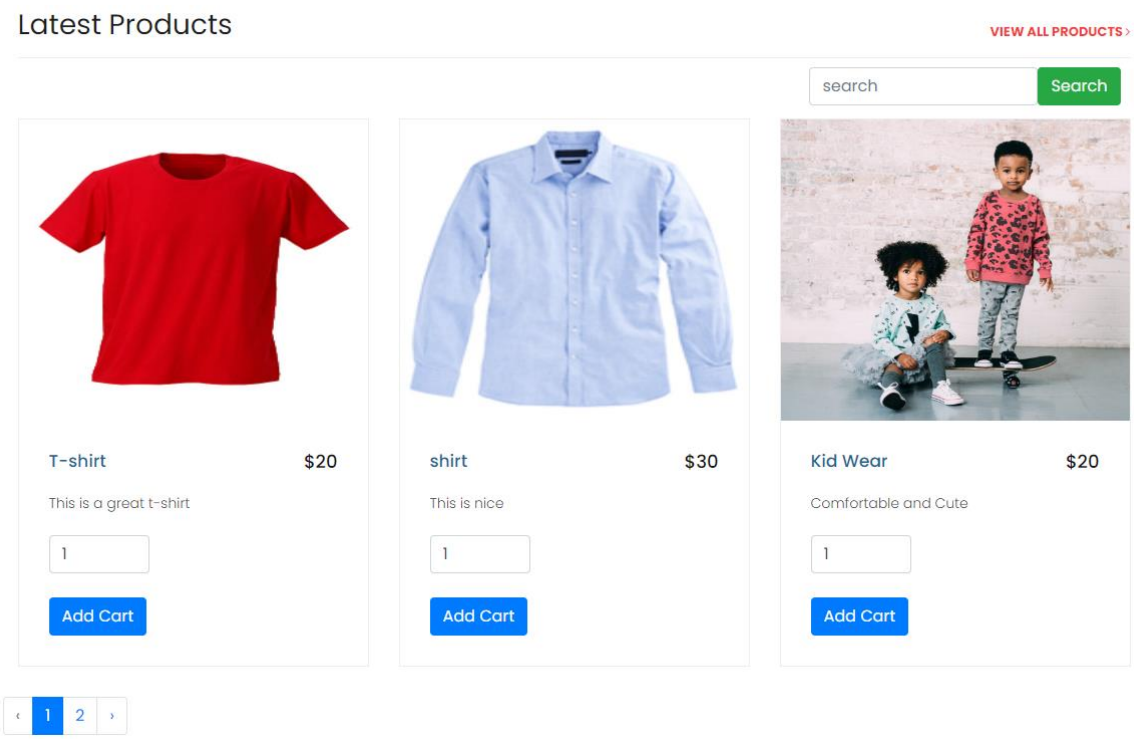


Fig 6.1.2: Sixteen Clothing Product Section

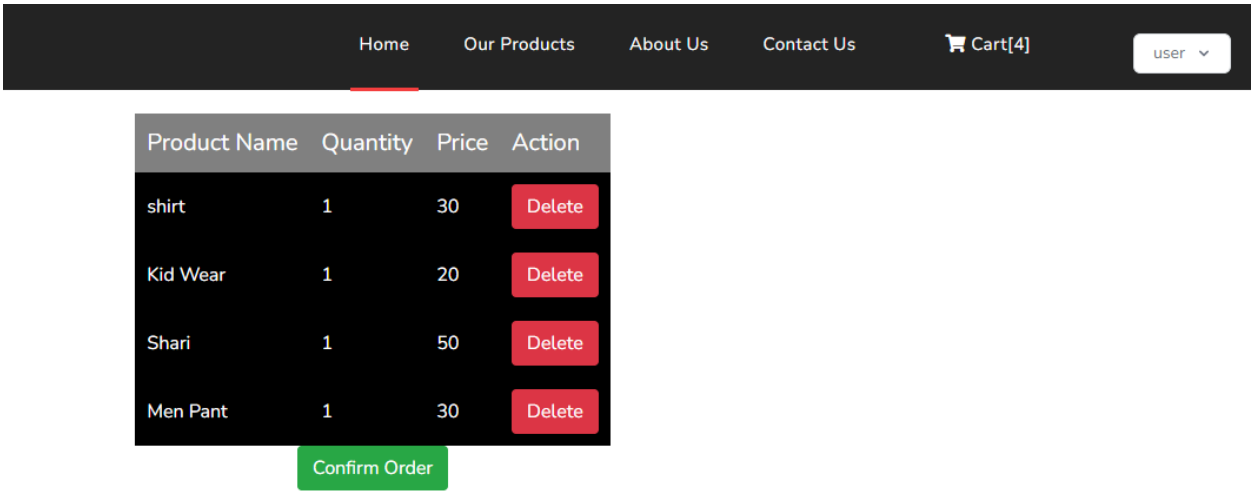


Fig 6.1.3: Sixteen Clothing User Cart page

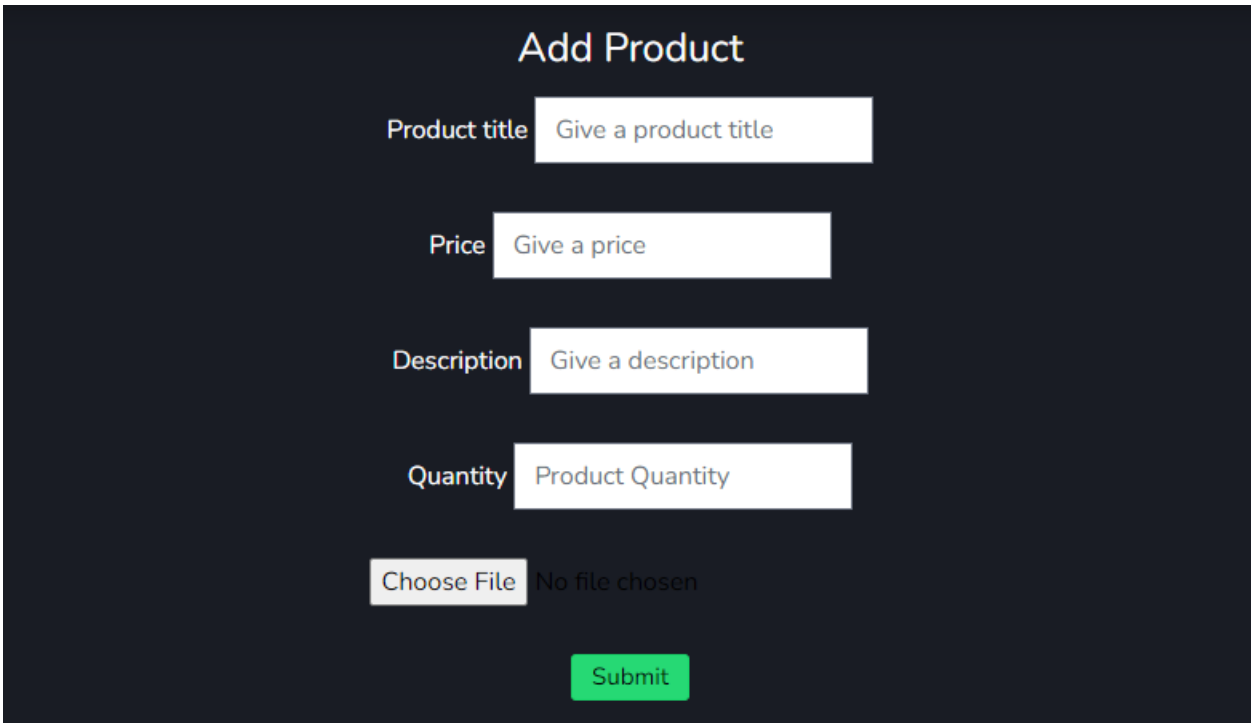


Fig 6.1.4: Sixteen Clothing Admin Add product page

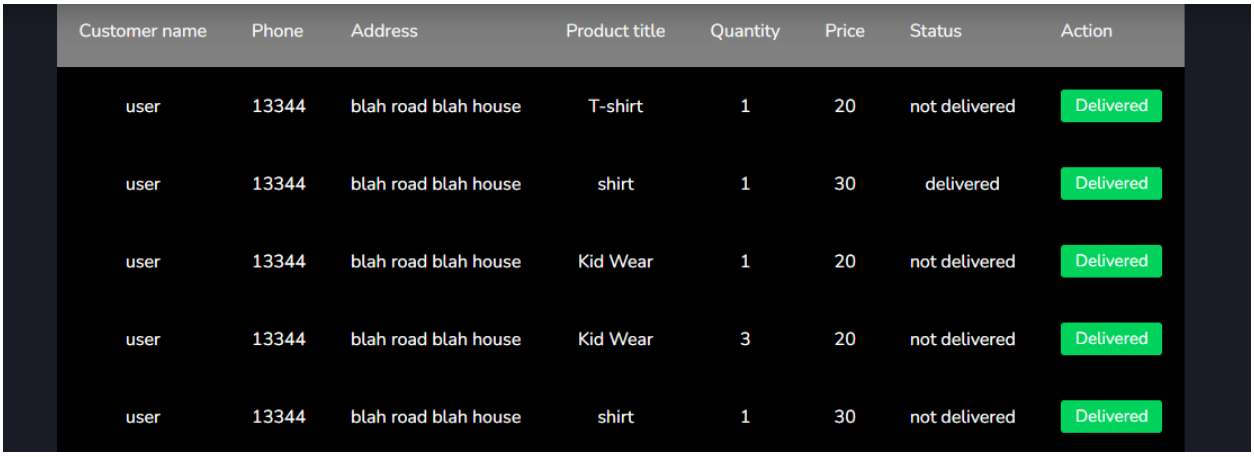


Fig 6.1.5: Sixteen Clothing Admin Order page

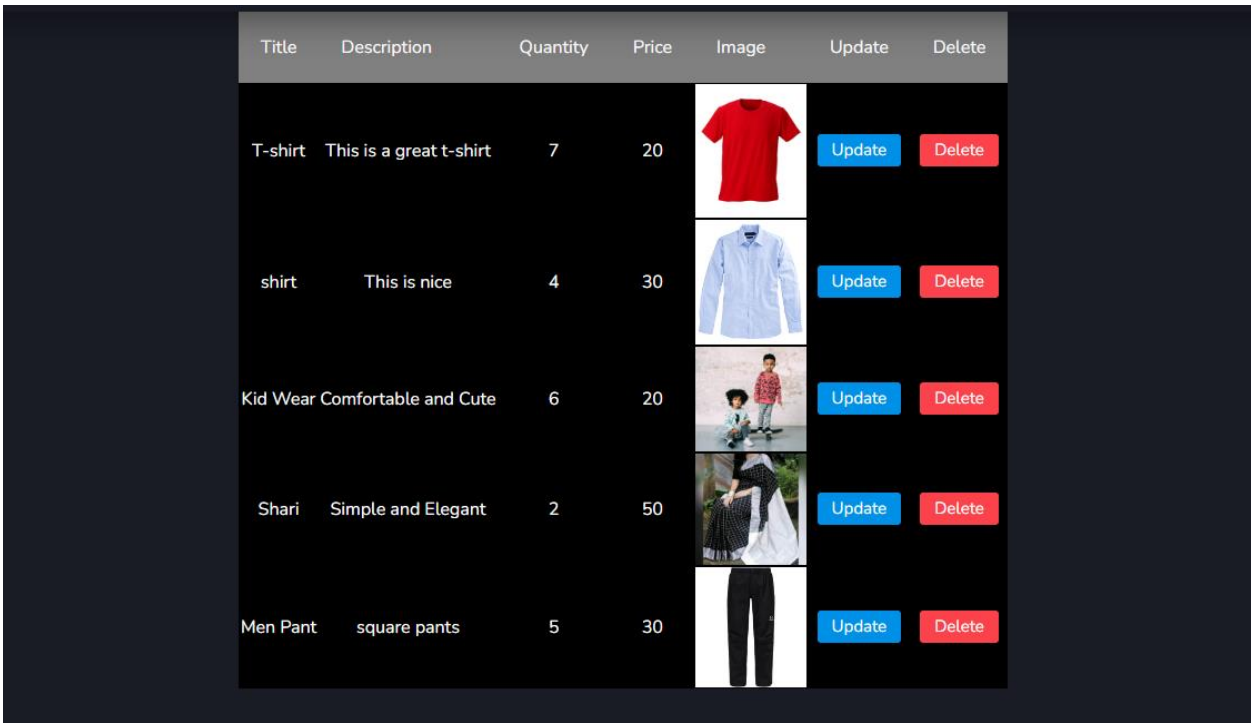


Fig 6.1.6: Sixteen Clothing Admin Show product page

Chapter 7

Project as Engineering Problem Analysis

The problem can be solved by carefully analyzing and producing but solutions to the problem and then deciding which one would be the most appropriate solution. Building a problem tree, identifying a major problem with cause and effect, and creating multiple functional solutions is known as engineering problem analysis.

Project sustainability is a business approach that balances the environmental, social, financial aspects of goal-oriented activities primarily to achieve the participants' best interests without compromising or burdening future generations.

This is a web application designed to work on a desktop or laptop computer. However, if necessary, it can be upgraded as a mobile app as most people in Bangladesh today have smartphones more than ever and will feel more flexible than using a computer application.

The following project can be sustainable in one of the main three categories:

7.1 Sustainability of the Project/Work

- **Social sustainability:** Social sustainability is an effective way to manage and identify business impacts on employees, employees in value chains, customers, and local groups. Businesses that promote the importance of social sustainability understand the importance of their relationships with individuals, groups and com munities. Social responsibility becomes part of their core business approach and they see how their activities affect people.
- **Financial sustainability:** Financial stability is understood as the ability of government officials to continue with current and future policies without causing an increase in debt. This means how the application costs will be managed after the application is issued. The operating costs of this application include: server, website and database.

- Organizational Sustainability: The leadership, talent, global awareness and transformational strategies needed to maximize the unique challenges facing organizations today are known as Organization Sustainability. An E-commerce has many features that are scheduled to be used in the future after release. As it has many programs, the application will be updated with minor changes with the following programs. We can therefore say that the following web application is invited by the organization.

7.2 Social and Environmental Effects and Analysis

- Environmental and social impact assessment involves an integrated approach, which includes assessing the economic components of a project based on cost and benefit estimates - and the environmental impact of project implementation.
- **Social effect:** E-commerce greatly reduces the start-up costs associated with having your own business. With an online store, all you need is a functioning website or social media as opposed to constructing or renting a physical store location. This makes the process of starting your own business much less daunting for new entrepreneurs. Through e-commerce, small businesses are able to connect with a greater reach of customers than with a physical store. E-commerce can even allow for you to sell to people outside of your country, or even outside of the Caribbean region.
- **Environmental effect:** E-commerce business models allow for organizations to conduct business without physically commuting. Transportation is responsible for a large number of harmful emissions/pollutions, and by reducing your organization's reliance on it, you can reduce your carbon footprint. Additionally, if e-commerce organizations allow employees to work from home, they can decrease their footprint even further. The digital transfer of information paired with digital manufacturing could eliminate warehouses and create on-demand production. It is not exactly common knowledge among consumers at large, but warehouses can be an environmental issue. Warehouses consume large tracts of land and freight trucks traveling to and from them can create air pollutants, pavement/road damage, noise pollutants, and potential traffic safety issues.

7.3 Addressing Ethics and Ethical Issues

The moral code in everyday life acts as a moral code, incorporating a moral code that describes behavior as right or wrong. The Web offers a great store of information as well as great communication power, and unscrupulous users can use these skills to gain personal and financial benefits by paying others. The Internet Code of Conduct provides an online guide to proper behavior, adjusting the general ethical standards to provide a framework for online navigation.

Moral issues are situations in which ethical conflicts arise and should be resolved. In other words, it is a time when moral standards are not being questioned.

Fraud and Identity Theft: Enabling third-party software is not included in these websites which can be very harmful to both the application and the application site. The order option prompts the customer to identify a contact number to place an order when needed. Therefore, no payment gateway is used in the system.

Data Security: All users are protected by guaranteed login. This means that without verifying the correct login, no user can access their desired information or perform any activity related to the site beyond their limit.

Chapter 8

Lesson Learned

Internship is something new to me. Although I have faced some challenges and problems; However, I have to find solutions to those problems. I learned a lot of new ways to solve problems in my training and enjoyed it.

8.1 Problems Faced During this Period

The problems that I have faced on my internship are as follows

E-Commerce working structure: There was not enough knowledge I had about e-commerce applications and how it works.

Front-end Design: Did not know how to visualize the front end, i.e., how it will look like, formats, standard layouts, etc.

Laravel: There was minimum knowledge about Laravel, what it is and how it is used and where.

Synchronization with template and Laravel back-end responses: Was unable to synchronize how to send and receive data from database using Laravel and template.

Identifying and Fixing Bugs: There were a lot of bugs that I encountered while using the end. For example, to provide an empty and value-added list, to detect the error of “Internal Server Error, Code: 500” which is an unexpected error encountered during retrieval of data to the end.

8.2 Solution of those Problems

Solutions of the above problems are given below:

E-Commerce working structure: Contacted with someone who have wide knowledge and experience on e-commerce application. Understood how it works and how it can be improved and be more flexible to manage with a web application.

Front-end Design: Supervisor taught me the basic layout format of specific user's homepage, front page, user settings and what to use and when.

Laravel: Learned about Laravel library and its fundamentals from tutorials and some past projects are given to me so that I can learn the structure and components of react and how to use them.

Synchronization with bootstrap and Laravel back-end responses: There is a JavaScript package of bootstrap that handles all kind of animation-based styling.

Identifying and Fixing Bugs: Each of the bugs are fixed by partially commenting out the codes that are believed to be working properly and keeping the codes that supposed to be the problematic.

Chapter 9

Future Work & Conclusion

The future of work describes changes in the way work will be done over the next ten years, have contributed to technological change, generation and society.

9.1 Future Works

Sixteen Clothing is created with the minimum concept of E-Commerce application management system. However, there are many features that can be added to it:

- **Adding Wishlist:** A wish list allows shoppers to create personalized collections of products they want to buy and save them in their user account for future reference
- **Add Payment gateway:** A payment gateway is a technology used by merchants to accept debit or credit card purchases from customers. The term includes not only the physical card-reading devices found in brick-and-mortar retail stores but also the payment processing portals found in online stores.
- **Improve UI:** Make the User interface for user friendly.
- **Add Order History:** Order history is a convenient way for a buyer to keep track of all current and past orders and their status in the order process. It allows the buyer to get up-to-date information on each order placed online, including shipping updates, delivery, and payment details.

9.2 Conclusion

My internship experience was one of my best work experiences. The supervisor and all the other elders helped me whenever I needed help from them, especially in studying Laravel. At first, I had very little idea about bootstrap and its libraries, but they taught me the basics and gave me their few projects to learn the structure of the reaction code. As a professional trainee, I was supposed to work on using the Laravel framework but because of my application, they gave me the opportunity to work as a full stack web developer.

Working as a web developer for full stacks for the first time for me. I have gained a lot of experiences working in this field and working with such a wonderful team and coaches is a privilege for me. The concept of this web application seems simple, but when I started developing it, a lot of ideas started to emerge and when I shared it with my coaches, they were happy and wanted me to use it if I could despite not being on the topic.

In conclusion, I would like to thank both my internal and external supervisors whose guidance and inspiration have motivated me to strive for success in this career and fight for success.

Bibliography

[1] Tuerk V., “Assessing the resource intensity of the Internet structure” Master’s Thesis, International Institute of Industrial Environmental Economics, Lund University, Lund,2001

[2] Fichter, K.,” Environmental effects of e-business and Internet economy”, Working Paper for the German Federal Environment Ministry (BMU), Borderstep Institute for Innovation and Sustainability, Berlin,2001.

[3] Daniel Z. Sui, David W. Rejeski, “Environmental Impacts of the Emerging Digital Economy: The E-for-Environment Ecommerce?”, Springer-Verlag New York Inc Environmental Management Vol. 29, No. 2, pp. 155–163, 2002.

[4] Digital Europe – EC Project, “Virtual Dematerialization: E-business and Factor X”, project funded by the European Community and the Information Society Technology Programme,2002

[5] Lifang Peng, Qi Li2, Xianfeng Zhang “Optimism or Pessimism: Environmental Impacts of the E-Commerce.” Environmental Informatics Archives, Scholl of Management, Xiamen University, Xiamen 361005, China 2School of Economics and Finance, Volume 3, pp 263 – 269, 2005.

[6] Keshnee Padayachee, “Utilizing E-Commerce and M-Commerce Applications to Address the Effect of Global Warming”, E-Leader Karakow, School of Computing University of South Africa Unisa, South Africa, 2008

[7] Hanne Siikavirta, Mikko Punakivi, Mikko Ka¨rkka¨inen and Lassi Linnanen “Effects of E-Commerce on Greenhouse Gas Emissions.”, A Case Study of Grocery Home Delivery in Finland, Journal of Industrial Ecology Volume 6, Number 2, pp 83-97, 2008

[8] "Internet users in BRICI countries set to double by 2015". International Business Times, IBTIMES.com,2010-09-01, http://www.ibtimes.com/art/services/print.php?articleid=48062, Retrieved on 09/12/2010

[9] Internet usage statistics, “The Internet Big Picture World Internet Users and Population Stats”, http://www.Internetworldstats.com/stats.htm retrieved on 09/12/2010.

An Undergraduate Internship/Project on

E-Commerce Website(Sixteen Clothing)

By

Sultana Fahima

Student ID: **1731661**

Summer, 2022

Consent Form

The student modified the internship final report as per the recommendations made by his/her academic supervisor and/or panel members during final viva, and the department can use this version for archiving.

On recommendation of the board

(Signature of the Supervisor)

September 25, 2022

Name of the Supervisor: Bijoy Rahman Arif

Department of Computer Science & Engineering

Independent University, Bangladesh