Web Application on E-commerce

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Department of Computer Science & Engineering

Independent University, Bangladesh

Attestation

I understand the nature of plagiarism, and I am aware of the University's policy on this. I certify that this is an original work by me during my internship. However, following internationally accepted academic guideline of using others written work and / or software (in the form of code) in my University project is properly cited if used in any part of this work.

_____   _____
Signature   Date

David Dipto Corraya
_____
Name

Certificate

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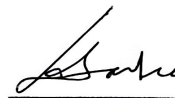**Date of issuance:** 8th November,2020

To whom it may concern

This letter certifies **David Dipto Corraya** as an intern with our company, New Gen Solutions Limited, during the period beginning 6th August,2020 and ending 5th November,2020

During his time with New Gen Solutions Limited, David has remained dedicated and loyal to his work and responsibilities with our company. His responsibility includes Developing website content, Digital Marketing, providing graphics solutions, installing new hardware and software, routinely testing IT systems and technologies to ensure they meet necessary standards, ensuring safe and secure data storage.

David Dipto Corraya has always maintained a professional and courteous attitude and appearance while with our company.

Thanking you

Yours truly,

Damien Sarker
Managing Director

Acknowledgement

Working in NGSL was a big learning experience for me. During these four months of internship, I learnt a lot on web development design, IT management and business communication. I have to thank Md. Motiur Rahman sir for supervising me during this internship period. In addition, I am grateful to the people at NGSL for supporting me throughout the project and welcoming me to their family. I especially want to thank Damien Sarker, managing director of NGSL, for providing me the opportunity and flexibility even during this pandemic.

Letter of Transmittal

November 15, 2020
Md. Motiur Rahman
Lecturer, Department of Computer Science and Engineering,
Independent University, Bangladesh

Subject: Letter of Transmittal of Internship Report, Summer 2020.

Dear Sir,

    This letter is written to kindly inform you that I, David Dipto Corraya, have completed my internship program and its report. The Internship was conducted from 5th July 2020 to 28th November 2020. I completed my Internship with New Gen Solutions Limited as a technical analyst and full stack web developer. The following report is based on my experience and the work I did in the company. I was assigned multiple roles in their IT department throughout my internship period. Although I had no prior experience in back-end web development, I have tried my best to learn and contribute to the project I was assigned in. I hope this report fulfills your level of expectation from me.

Thank you.

Sincerely yours,
David Dipto Corraya
ID: 1531096

Evaluation Committee

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Signature

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Name

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Supervisor

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Signature

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Name

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Internal Examiner

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External Examiner

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Name

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Convener

Abstract

During my internship period with NGSL from August 2020 to December 2020, I have been part of many projects and departments with work ranging from fixing software/hardware equipment, entering data, researching on future software products like Tableau and ESRI AGIS, attending business meetings with Brac, CCULB and other clients, setting up networking and CCTV's for a restaurant to building a website. This report contains a brief overview and analysis of the development process of the website we have developed for an e-commerce platform known as Kapor.com, targeting the fabric industry of Bangladesh. I hope I was able to document my work in a brief, precise and clear manner.

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Chapter 1

Introduction

1.1   Overview/Background of the Work

Ever since the introduction of the Web, traditional trade businesses have been booming to this day through online marketplaces, which we know as E-commerce. The idea of buying anything you can possibly imagine while sitting at your home just with a click of a button was no longer a myth. E-commerce has become so popular that new businesses cannot even think of running without an online marketplace. Due to the shift towards online marketplaces by traditional businesses, we can buy anything from a needle to industrial machineries. Kapor is an e-commerce platform where ready-made fabrics for suits are bought and sold. Due to Covid-19, local fabric shops have seen a huge drop in their sales as customers avoid going to physical stores. Although, there is a huge demand for fabrics in our country especially in the coming winter, buyers do not have any means to communicate with sellers to buy their product.

Kapor has taken the initiative to close this market gap through their e-commerce site. It is enriched with all the necessary features of an e-commerce like order, product and marketing management system, coupons/discounts and many more. As part of this whole project, I was assigned the work of creating the front-end and the admin panel.

New Gen Solutions Limited is an IT and interiors solutions and service provider. Its mission is to achieve the reputation of a quality, high standard and reliable solution and service Provider Company in the ICT industry and its core focus is to provide, through customer engagement, outstanding technology infrastructure, services and solutions that enrich the client user experience, empower staff to provide exceptional services, and effectively manage and protect institutional data. Current clients and collaborators of NGSL are CCULB, BRAC Bank, Media soft and Digicon.

1.2 Objectives

The core objective of Kapor is to fill the market gap between buyers and sellers in the fabric market. It is quite difficult and time consuming for a buyer to go through the streets and alleys of insecure places in Dhaka to find a good fabric store. In addition, most buyers have limited knowledge when it comes to pricing and might get overcharged. On the other hand, most local sellers have plenty of quality fabric that they can provide at a cheaper rate. However, the upper-middle class buyers are paying a premium to third-party sellers just due to lack of information and communication. Kapor aims to solve all these issues in one platform through their e-commerce site. Every seller will be able to advertise their products, irrespective of their store locations. Buyers will not only save time but also money due to transparency of prices.

1.3 Scope

Features that will be available after the development of the website are listed below:

1. Admin Dashboard for managing products which includes adding, removing, and modifying products.
2. Admin Dashboard for managing coupon and delivery charges
3. Dashboard for managing editing, adding, and removing category

1.3.1 Out of Scope

1. Home Page, About Us page, and Contact Us page
2. Shop Page where user can see the products
3. Cart and Checkout Page
4. Order Confirmation Page
5. User Dashboard for showing user purchase history and order tracking
6. Account and registration of individual user
7. Shop Catalog Page for showing products to user
8. Admin Dashboard for analyzing purchase data

Chapter 2

Literature Review

2.1 Relationship with Undergraduate Studies

Web-Application and Internet
This was the most relevant course for this project. Html, CSS, Bootstrap, JavaScript and PHP were the fundamentals while building this web application. In addition, for hosting purposes, we used Xaamp.

Database Management
Kapor uses a MySQL database, a relation-based database, and the relationship needs to be managed and normalized so I had to put my knowledge of Database management into use.

Object-Oriented Programming
Kapor is made with JavaScript. Concepts of Object-oriented programming was necessary in order to write code using JS.

2.2 Related works

- Merakapda.com - is a leading supplier of one stop source for first-quality Men's suiting fabric of at rock-bottom prices in India.

- Tissura.com - Tissura has been selling luxury couture fabrics for 20 years. Supplying fabrics by leading European brands and providing international delivery at Tissura online fabric store.

- Aarong.com: Aarong's specialty is its Bengali ethnic wear and handcrafted products. It has an e-commerce website which gives you the chance of buying all their product online.

- TheFabricStoreOnline.com – is an e-commerce store bringing an incredible range of fabrics to the international market.

Chapter 3

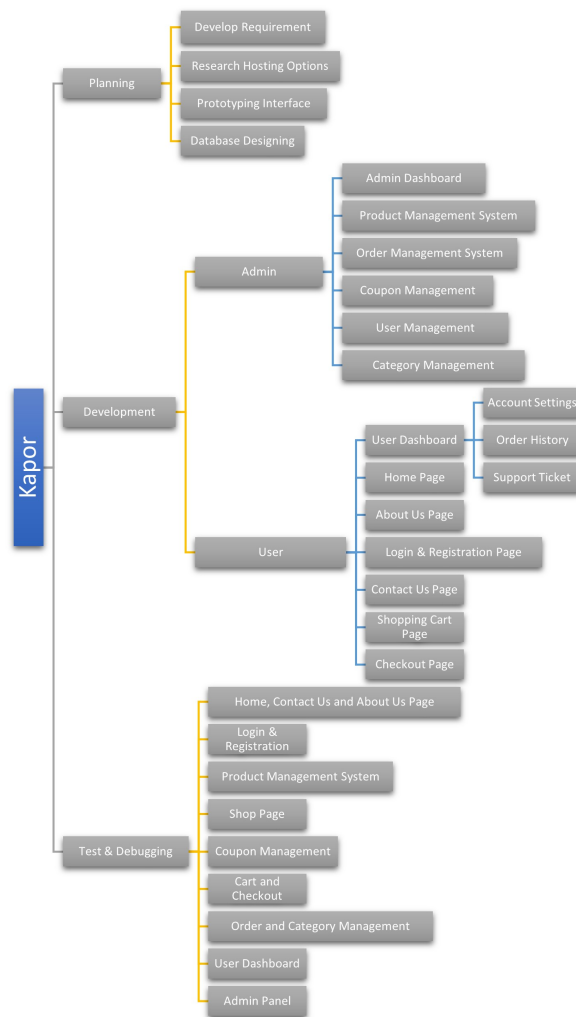# Project Management & Financing

3.1 Work Breakdown Structure

Figure 3.1: Work Breakdown Sturcture

3.2   Process/Activity Wise Time Distribution

Sl.	Process	Start Date	End Date	Duration (days)
1	Develop Requirement	24-Sep	27-Sep	3
2	Research Hosting Options	27-Sep	28-Sep	1
3	Prototyping Interface	28-Sep	4-Oct	6
4	Database Designing	4-Oct	8-Oct	4
5	Home Page	8-Oct	10-Oct	2
6	About Us Page	10-Oct	12-Oct	2
7	Login & Registration Page	12-Oct	14-Oct	2
8	Shop Page	14-Oct	16-Oct	2
9	Contact Us Page	16-Oct	18-Oct	2
10	Cart Page	18-Oct	23-Oct	5
11	Checkout Page	23-Oct	30-Oct	7
12	User Dashboard	30-Oct	4-Nov	5
13	Account Settings	4-Nov	7-Nov	3
14	Order History	7-Nov	10-Nov	3
15	Order Tracking	10-Nov	13-Nov	3
16	Support Ticket	13-Nov	14-Nov	1
17	Product Management System	14-Nov	19-Nov	5
18	Coupon Management System	19-Nov	24-Nov	5
19	Category Management	24-Nov	28-Nov	4
20	Admin Panel	28-Nov	2-Dec	4
21	Testing Home, Contact Us and About Us Pages	2-Dec	3-Dec	1
22	Testing Login and Registration	3-Dec	4-Dec	1
23	Testing Management Pages	4-Dec	5-Dec	1
24	Testing Cart and Checkout Pages	5-Dec	6-Dec	1
25	Testing User Panel	6-Dec	8-Dec	2
26	Testing Admin Panel	8-Dec	10-Dec	2

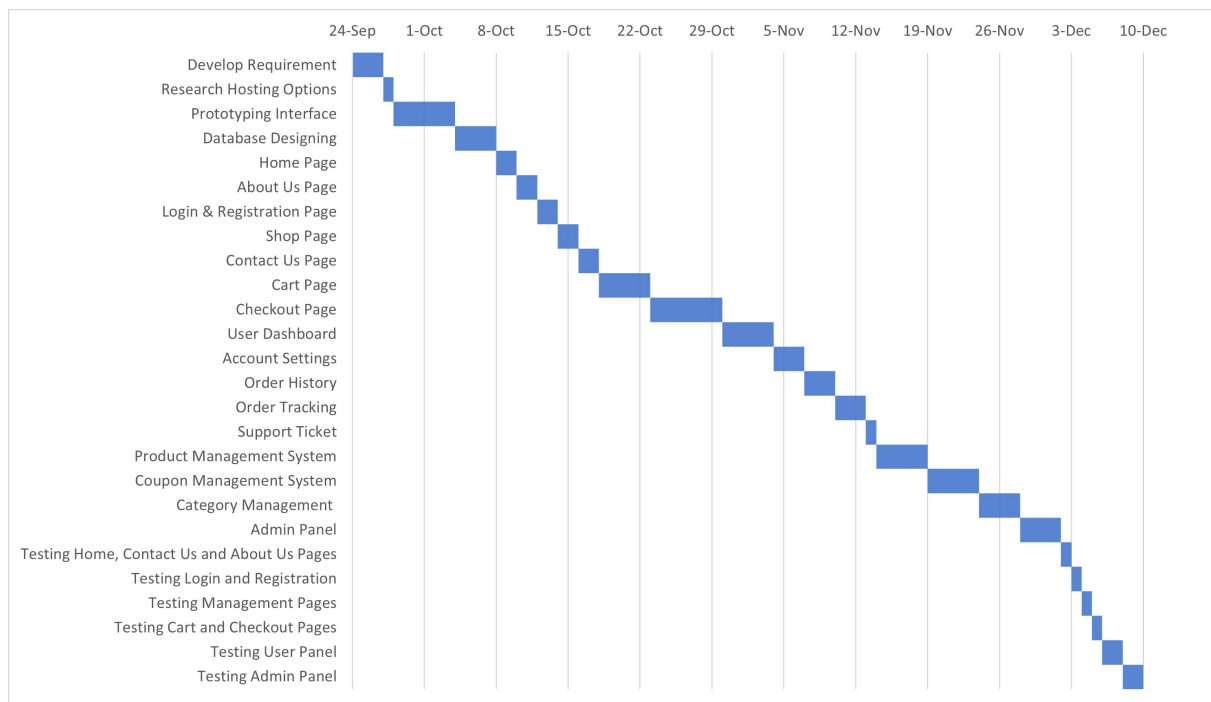Table 3.1: Process-wise Time Distribution Table

3.3 Gantt Chart

Figure 3.2: Gantt Chart

3.4 Process/Activity wise Resource Allocation

Sl.	Process	Start Date	Duration (days)	Cost/day (Taka)
1	Develop Requirement	Project Manager	3	1500
2	Research Hosting Options	Project Manager	1	1500
3	Prototyping Interface	Project Manager	6	1500
4	Database Designing	Project Manager	4	1500
5	Home Page	Developer 1	2	1000
6	About Us Page	Developer 1	2	1000
7	Login & Registration Page	Developer 1	2	1000
8	Shop Page	Developer 1	2	1000
9	Contact Us Page	Developer 1	2	1000
10	Cart Page	Developer 1	5	1000
11	Checkout Page	Developer 1	7	1000
12	User Dashboard	Developer 1	5	1000
13	Account Settings	Developer 1	3	1000
14	Order History	Developer 1	3	1000
15	Order Tracking	Developer 1	3	1000
16	Support Ticket	Developer 1	1	1000
17	Product Management System	Developer 1	5	1000
18	Coupon Management System	Developer 1	5	1000
19	Category Management	Developer 1	4	1000
20	Admin Panel	Developer 2	4	1000
21	Testing Home, Contact Us and About Us Pages	Developer 2	1	1000
22	Testing Login and Registration	Developer 2	1	1000
23	Testing Management Pages	Developer 2	1	1000
24	Testing Cart and Checkout Pages	Developer 2	1	1000
25	Testing User Panel	Developer 2	2	1000
26	Testing Admin Panel	Developer 2	2	1000

Table 3.2: Process-wise Resource Allocation Table

3.5 Estimated Costing

Resources	Cost/day (Taka)	Duration (days)	Total Cost (Taka)
Project Manager	1500	14	21,000
Developer 1	1000	51	51,000
Developer 2	1000	12	12,000
Utilities	500	90	45,000
Total Estimated Cost			1,29,000

Table 3.3: Estimated Costing Table

Chapter 4

Methodology

Kapor is an e-commerce platform that facilitate online transactions of Suit Fabrics over the Internet. The website uses JavaScript, HTML 5 and CSS 3 for its frontend development and PHP for its backend development following the MVC architecture. Initially, we have collected the requirements from our client over a couple of meetings. Most of the primary data were collected from the client, for example, the design, functionalities and costing. Afterwards, we collected secondary data from the web about e-commerce site, for example, templates, back-end source codes, front-end designs etc. We have decided to follow Waterfall methodology since we had a good grasp of the requirement from the beginning. Moreover, due to the project being small consisting of only two developers, both our client and us liked the linear approach to keep everything in order.

4.0.1   Required Tools

PHP
PHP is a general-purpose scripting language especially suited to web development. It was originally created by Danish-Canadian programmer Rasmus Lerdorf in 1994. The PHP reference implementation is now produced by The PHP Group.

JavaScript
JavaScript is a scripting language that empowers you to make powerfully dynamically substance, control multimedia and sound, animate pictures, and a great deal.

Html and CSS
HTML (the Hypertext Markup Language) and CSS (Cascading Style Sheets) are two of the core technologies for building Web pages. HTML provides the structure of the page, CSS the (visual and aural) layout, for a variety of devices. Along with graphics and scripting, HTML and CSS are the basis of building Web pages and Web Applications.

VS Code

Visual Studio Code is a free source-code editor made by Microsoft for Windows, Linux and macOS. Features include support for debugging, syntax highlighting, intelligent code completion, snippets, code refactoring, and embedded Git.

Chapter 5

Body of the Project

5.1 Work Description

Kapor is an e-commerce platform where ready-made fabrics for suits are bought and sold. Due to Covid-19, local fabric shops have seen a huge drop in their sales as customers avoid going to physical stores. Although, there is a huge demand for fabrics in our country especially in the coming winter, buyers do not have any means to communicate with sellers to buy their product.

Kapor has taken the initiative to close this market gap through their e-commerce site. It is enriched with all the necessary features of an e-commerce like order, product and marketing management system, coupons/discounts and many more. As part of this whole project, I was assigned the work of creating the front-end and the admin panel.

5.2 System Analysis

5.2.1 Feasibility Analysis

The feasibility study is the test of the proposed system in the light of its workability, meeting the user's requirements, effective use of resources and of course, cost-effectiveness. These are categorized as technical, operational, economic, schedule and social feasibility. The main goal of the feasibility study is not to solve the problem but to achieve the scope. In the process of feasibility study, the cost and benefits are estimated with greater accuracy to find the Return on Investment (ROI). This also defines the resources needed to complete the detailed investigation. The result is a feasibility report submitted to the management. This may be accepted or accepted with modifications or rejected.

- Economic Feasibility: Our client's budget was more than our estimated cost. We have the required skill set to create this proposed system. Despite the cost, in the long run, the profit margin will drastically increase due to the project's uniqueness

and usefulness. From consumers perspective, it is economically feasible due to the cut down in transport cost and time spent to buy a product in the market.

- Operational Feasibility: Our proposed system solves one of the biggest problems in the current market when buying fabrics, which is time and effort. The amount of time and effort a consumer must provide in order to go through the alleys of new market/elephant road etc. just is not worth it. Our system solves this problem completely. Now consumers can sit at their home and in a click of a button buy their favorite fabric.

- Technical Feasibility: We have enough experience to build the web app. The required tools are quite well known by our company. NGSL is a very reputed and well financed companies in the IT sector.

5.3   System Design
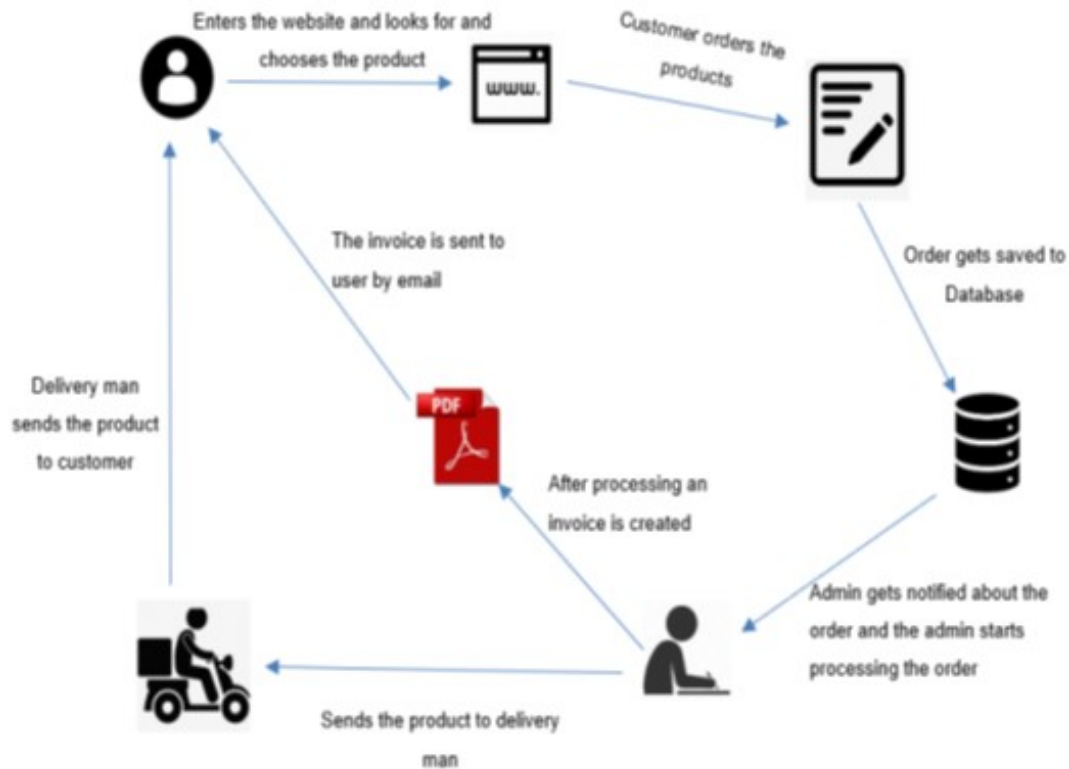
5.3.1   Rich Picture

Figure 5.1: Rich Picture of Kapor.com
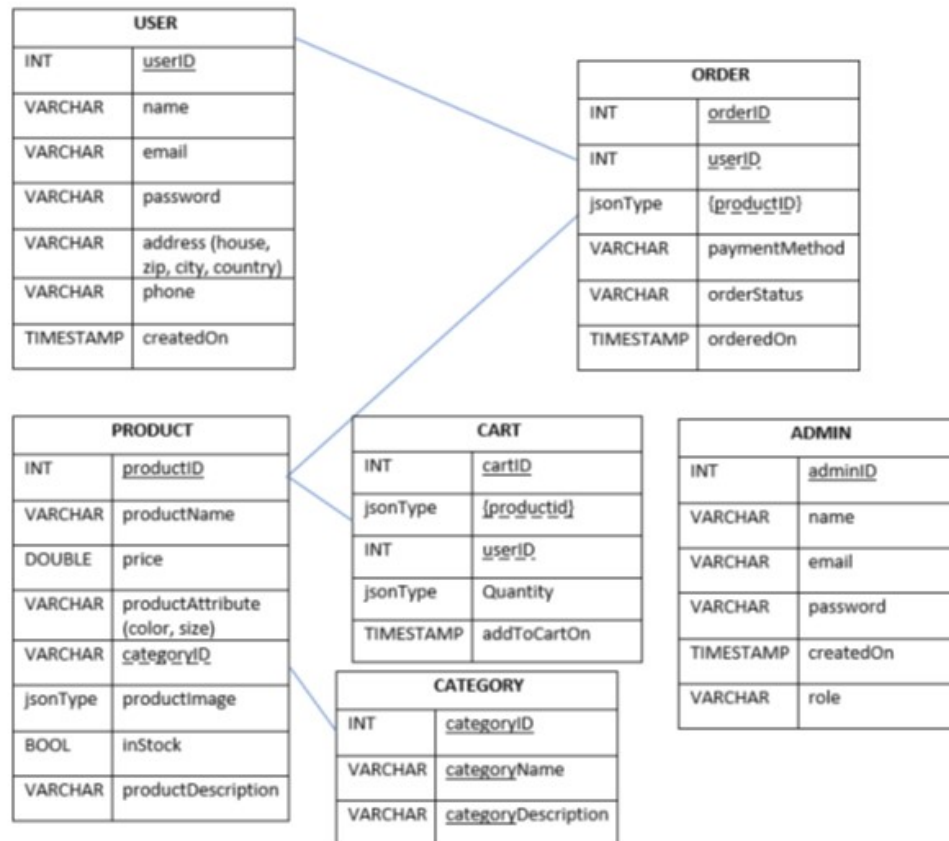
5.3.2   ERD Diagrams

Figure 5.2: ERD

5.3.3   Functional

The functional requirement is that it essentially specifies something a system should do. The Functional Requirements are the operations and activities that a system must be able to perform. In our project. In this section we try to find functional requirements for Admin Agent. The following functional requirements were gathered, and their inputs, behavior and output are discussed below.

Function Name: Consistent across devices (Responsive)		
Input: N/A	Process: Responsive design using flexbox element and bootstrap framework.	Output: Accessible everywhere across devices.
Precondition: User must have a compatible device which can view and modify webpages.		
Postcondition: N/A		
Alternative option: N/A		

Table 5.1: Function Name: Consistent across devices

Function Name: Admin Login		
Input: Email and Password	Process: Collect login credentials and crossmatch against the database.	Output: Access admin interface
Precondition: User must be registered admin with correct login credentials.		
Postcondition: N/A		
Alternative option: Forget Password option provided that user is a registered admin.		

Table 5.2: Function Name: Admin Login

Function Name: Create Account		
Input: Username and Password	Process: Collect login credentials and add entries in the database table.	Output: Account created message.
Precondition: Username and password should be compliant with universal standards.		
Postcondition: N/A		
Alternative option: N/A		

Table 5.3: Function Name: Create Account

Function Name: CRUD Account		
Input: Username	Process: Search information in database	Output: View account information
Precondition: Username should be valid. Accessible only from admin panel.		
Postcondition: N/A		
Alternative option: N/A		

Table 5.4: Function Name: CRUD Account

Function Name: View and approve pending order		
Input: Mark/unmark order	Process: Marked ones will be approved	Output: Approved orders will no longer be pending orders
Precondition: Admin only. Order list is not null.		
Postcondition: Approval information will get updated in customer's account.		
Alternative option: N/A		

Table 5.5: Function Name: View and approve pending order

5.3.4   Non-Functional Requirements

- **Privacy:** meets the basic requirements for GDPR.

- **Scalability and Performance:** Uses a virtual server (AWS Services) which can scale up in times of high traffic.

- **Speed:** Loads under 3 seconds which is the standard loading speed of an optimized website.

- **Quality:** Well written code which enforces all the good practice of universal coding standards.

- **Data Integrity and Retention:** Encrypted database which store the passwords in md5 hash (Still under progress).

- **Compatibility:** Integration with 3rd party systems is simple and easy.

- **Availability:** Currently running on a server in NGSL, which has 24/7 power and data backup in RAID 1 setup.

- **Infrastructure:** Server is scalable and has enough power to handle heavy traffic if needed.

5.3.5   Architecture

We used Client-Server Architecture in our web app. Client server architecture of a computer network in which many clients (remote processors) request and receive service from a centralized server (host computer). Client's PC give an interface to permit a computer client to demand administrations of the server and to show the website consequently.

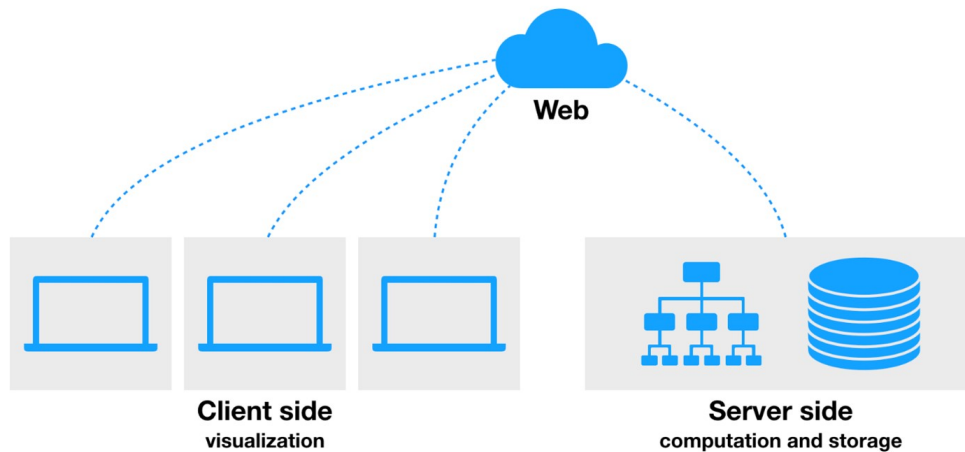Figure 5.3: System Architecture

Figure 5.4: Architecture Diagram

Chapter 6

Results & Analysis

6.1 Testing

We have followed the standard test cases for login, CRUD account and all tests were passed. Minor bugs still do exist which we hope to fix in the near future. We allowed a third person from NGSL to use our site as a customer and then as an admin to check whether each and every process works properly.

Test Task Name	Purpose	Pre condition	Test Steps	Expected Result	Actual Result	StatusRe	marks
Admin Login	Check if the Admin Login Is suc cessfully done.	Admin must have a device like desktop, laptop, smart phone with net connection	i) Validate The Admin input email and pass word etc. ii)Click to Login button.	i)If Admin input correctly website logged into The Admin Panel. ii)Otherwise show error message.	Software will log in Successfully	Pass	No Re marks

Table 6.1: Admin Login Test Table

Test Task Name	Purpose	Pre condition	Test Steps	Expected Result	Actual Result	Status	Re marks
User Regis tration	Check if the User Regis tration is suc cessfully done by Admin	Admin must have A device like desktop, laptop, smart phone with net connection	i) Validate the input email and pass word etc. ii)Click to Register button.	i)If Admin input correctly Software will add user into the Admin Panel. ii)Otherwise show error massage.	Software Will Mail User given address	Pass	No Re marks

Table 6.2: User Registration Test Table

Test Task Name	Purpose	Pre condition	Test Steps	Expected Result	Actual Result	Status	Re marks
User Login	Purpose Check if the User Login is suc cessfully done.	User must have A de- vice Like desktop, laptop, smart phone with net connection	i)Validate the Admin input email and pass word etc. ii)Click to Login button.	i) If User Input Correctly The user redact user panel otherwise see error Message	Software Will Logged in Suc cessfully	Pass	No Re marks

Table 6.3: User Login Test Table

6.2 Deployment

After the successful test cases, Kapor.com was compiled for release. During my internship period, we worked on a local server(XAAMP) and database (PHPMYADMIN). After further modifications, NGSL will hand-over the MVP to our client Maricham by January 2021.

Chapter 7

Project as Engineering Problem Analysis

7.1   Sustainability of the Project/Work

Sustainability depends on multiple factors like time period, trend, technological changes and others. Kapor is an e-commerce platform just like million other websites like Amazon, Daraz, AliExpress to name a few. This platform is sustainable as long as we are in the era of technology. Smaller businesses are moving towards online platforms and creating e-commerce sites now more than ever due to its accessibility, ease of use and low cost/benefit ratio. Competition is an important factor when it comes to sustainability. From my perspective, Kapor is a unique platform which targets only a specific market of Fabrics. It will also be the first in the country, therefore, competition will be low.

7.2   Social and Environmental Effects and Analysis

E-commerce business has a lot of environmental benefits as customers including:

- Online platform making everything paper-free. Invoices and bills will be generated as digital copies.

- Purchases will now happen while sitting at home. This means customers will travel less which will have a direct effect on pollution and natural resource consumption.

- Due to e-commerce platforms like Kapor, customers are travelling less which means less chance of spreading coronavirus.

However, conventional shopping is a part of social life. People tend to socialize when they go out for shopping. Online platforms have affected this social lifestyle drastically over the last decade. It has impacted a major part of our natural desire – the willingness to interact and socialize.

7.3 Addressing Ethics and Ethical Issues

A common problem in e-commerce platforms that sellers face is when a customer provides a fake address or receives a product, damages it and asks for a refund. These issues all come down to trust which cannot be justified without proper evidence. On the other hand, customers have been a victim of receiving fake products, products that do not match with the image and in some cases lost their money due to paying in advance but not receiving the product at all. Since customers have limited knowledge about the product, sellers take advantage of it by overcharging or providing low quality goods.

Chapter 8

Future Work & Conclusion

8.1 Future Works

Fabrics are the fundamental product for formal menswear in the world. Kapor might just become a big platform in this market since it is the first ever in Bangladesh. Although, the infrastructure of the system can handle heavy traffic, it lacks a proper management system for stock and delivery. These things can be automated in the future and security can be increased as well. Implementation of web services like AWS will also make the platform more versatile, cost-effective and secure.

8.2 Conclusion

As technology is moving towards being remote and accessible from anywhere, web technologies are expanding its horizon. I have given a detailed analysis of Kapor in this report and gathered plenty of knowledge while working with my team at NGSL. Initially, I had difficulty understanding the culture of working in a corporate environment since I never had such experience before. NGSL has helped me understand the web development Industry and the IT sector in general. Planning, executing and delivering a product is part of huge process and it was amazing to be a part of this process.