

Buzz-Hub the easiest shopping platform

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FINAL YEAR DESIGN PROJECT REPORT

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

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January 13, 2025

APPROVAL

This Project titled “**Buzz-Hub The easiest E-Commerce Platform**”, submitted by **Kashfi Washif**, ID No: 192-15-13313 & **Joy Mollik Ratul** ID No: 193-15-13562 to the Department of Computer Science and Engineering, Daffodil International University has been accepted as satisfactory for the partial fulfillment of the requirements for the degree of B.Sc. in Computer Science and Engineering and approved as to its style and contents. The presentation has been held on 13 January, 2025.

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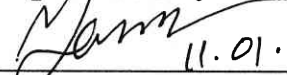
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DECLARATION

We hereby declare that this project has been done by us under the supervision of **Ms. Tanzina Afroz Rimi**, Senior Lecturer, Department of Computer Science and Engineering, Daffodil International University. We also declare that neither this project nor any part of this project has been submitted elsewhere for the award of any degree or diploma.

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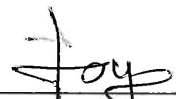

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ACKNOWLEDGEMENTS

This work would not have been possible without the support and contributions of many individuals over the past two semesters. We are deeply grateful to everyone who has assisted us in one way or another.

First, we express our heartfelt thanks and gratefulness to the almighty for His divine blessing making it possible for us to complete the **Final Year Design Project (FYDP)** successfully.

We are grateful and wish our profound indebtedness to **Ms Tanzina Afroz rimi, Senior Lecturer**, Department of Computer Science and Engineering, Daffodil International University, Dhaka, Bangladesh. Deep knowledge and keen interest of our supervisor in the field of **Software Engineering and Development** to carry out this project. His endless patience, scholarly guidance, continual encouragement, constant and energetic supervision, constructive criticism, valuable advice, reading many inferior drafts, and correcting them at all stages have made it possible to complete this project.

We would like to express our heartfelt gratitude to the Head of the Department of Computer Science and Engineering, for his kind help in finishing our project and also to other faculty members and the staff of the Department of Computer Science and Engineering, Daffodil International University.

We would like to thank our entire course-mates at Daffodil International University, who took part in this discussion while completing the coursework.

Finally, we must acknowledge with due respect the constant support and patience of our parents.

ABSTRACT

In our country there are a good number of e-commerce website. Now a days people's interest on online shopping is increasing. But there are some issues what they are facing during online shopping like misbehavior of seller, authenticity problem, shipping delay, sometimes fraud case, warranty claim issue, international shopping scope problem, pricing problem etc. Buzz-Hub find the problems and trying to solve all of them. Three primary user roles are served by the platform administrator, seller and consumer. Buzz Hub aims to take all the e-commerce platforms and offline business under an umbrella. For this people will able to access every platforms easily by using it. It will offer other services to the consumers for better and smooth shopping. Buzz-Hub is fully dedicated about customer satisfaction. By signing in here with required details customers will able to take services of this. Searching in the search bar customers will find their desire product with best deal. Here is an opportunity to buy with EMI facility. Customers have to pay the shipping cost in advance for confirmation purpose. They will able to enjoy exchange facility if they don't like the product in a certain period and easily claim warranty directly to Buzz-Hub which one is under warranty policy. Because of this platform sellers will able to earn a good revenue if their product is good enough. It's going to be a game changer and profitable for both consumer and seller.

Table of Contents

Approval	i
Declaration	ii
Acknowledgements	iii
Abstract	iv
List of Figures	vii
List of Tables	viii
1 Introduction	1
1.1 Introduction.....	1
1.2 Motivation	1
1.3 Objectives	1
1.4 Methodology.....	2
1.5 Project Outcome.....	3
1.6 Organization of the Report.....	4
2 Background	5
2.1 Introduction.....	5
2.2 Literature Review	5
2.2.1 Similar Applications	6
2.2.2 Comparison Between Existing Works.....	9
2.3 Gap Analysis.....	10
2.4 Summary	11
3 Research Methodology	12
3.1 Requirement Analysis & Design Specification	12
3.1.1 Overview.....	12
3.1.2 System Design.....	12
3.1.3 Functional and Nonfunctional Requirements	14
3.1.4 Data Flow Diagram Level 1.....	15
3.1.5 Sequence Diagram	16
3.1.6 Entity relationship Diagram	17
3.1.7 UI Design.....	18

3.2	Detailed Methodology and Design.....	23
3.3	Project Plan	25
3.4	Task Allocation	27
3.5	Summary	29
4	Implementation and Results	30
4.1	Environment Setup	30
4.2	Testing and Evaluation	31
4.3	Results and Discussion	34
4.4	Summary	36
5	Engineering Standards and Design Challenges	37
5.1	Compliance with the Standards.....	37
5.1.1	Software Standards	37
5.1.2	Hardware Standards	38
5.1.3	Communication Standards	39
5.2	Impact on Society, Environment and Sustainability	40
5.2.1	Impact on Life	40
5.2.2	Impact on Society & Environment	41
5.3	Project Management and Financial Analysis	42
5.4	Complex Engineering Problem	44
5.4.1	Complex Problem Solving	44
5.4.2	Engineering Activities	47
5.5	Summary	48
6	Conclusion	52
6.1	Summary	52
6.2	Limitation	53
6.3	Future Work.....	54
	References	55

List of Figures

2.1 Landing page Hktcdc.com	6
2.2 Landing page Daraz.com	7
2.3 Landing page Evaly	8
2.4 Landing page of flipkart	9
3.1 System Architecture diagram of Buzz-Hub	13
3.2 Dataflow diagram of Buzz-Hub	16
3.3 Sequence Diagram of Buzz-Hub	17
3.4 E.R diagram of Buzz-Hub	18
3.5 Landing Page of Buzz-Hub	19
3.6 Signup Page	20
3.7 Sign In/Login page	20
3.8 Product Category details page	21
3.9 Backend login & Reg. output	22
3.10 Product purchase page	22
3.11 Product purchase confirmation page	23
3.12 About Us page	23

Chapter 1

Introduction

1.1 Introduction

We have thousands of our E commerce websites in our country. These platform generally sell Electronics devices, groceries, clothes etc. Each platform caters for different types of products. It's a place where people can buy products from individuals or from a company. However, there is not platform which make them serve other e-commerce platforms along with consumers benefits. This project is to bring unicii profily and every ecommerce platform in one platform. That way consumers can all much easily access everything within a common platform. That's also why sellers are able to extend their platform. The best shopping experience is anyone who chooses buzz hub. You get a cash on delivery facility, EMI shopping facility and even the best deal with authentic products with good warranty facility (available for selected products only). Product warranty will directly be claimed by Consumer to the platform or delivered shop. In case of warranty issue, Buzz-Hub is responsible.

1.2 Motivation

Thus, the application is motivated to give customers a better and hassle free secure shopping experience, more customers and save their time with a full trust. This is another reason for Buzz Hub to improve the shopping experience by offering exchange, return facility along with genuine product, seller and shipping information. The driving factor of Buzz-Hub is to increase Business Growth for the shopping & addition of local shops into it to offer more goods to the consumers..

1.3 Objectives

I wanted to solve these challenges of smooth and hassle free shopping. With several key objects, Buzz-Hub launches. The central objective is to create a streamlined product management for consumers as well as sellers by automating the product details, select product, cost, shipping, warranty claim, facilities, and shipping's real time status. Secondly, Buzz Hub strives to be a one stop shop, providing a whole suite of services within a single platform. Thirdly, the purpose of the application is to increase customers' trust towards the desired product through the information about the product and user review. Fourthly, it commits to create a community of it's clients to share their personal experience, complain and feedback to make this more user friendly. Lastly, it allows pre order facility

depending on clients needs.

1.4 Methodology

Currently we are working on a updated e commerce website called “Bazz-hub”. The use of HTML, CSS, Bootstrap, Javascript for frontend and .NET MVC for backend is emphasized in the proposed methodology. The best and user helpful e commerce website with the best dealing and services. Our key fractures are:

- **User Login and Registration:** User/ Customer can register with the system using the proper email address with a hard password. When user login successfully than they get a customer id and conformation login approval.

- **Home:** Provides a centralization view for customer with quick access to essential features and information of different kind of products.

- **Products:** Here the many types of products with the best discount and also include the different categories. In this site there are many new collection also attach.

- **Product details:** Every products details are show to the sequence on the user interface. Many common products are highlighted with the best discount price.

- **Compare:** Compare the other online website product and get a customer and product review.

- **Cart:** In this section create a odder summary and shipping method with the actual cost of a product and maintain a proper quality. Payment method also included in this sector and shipping and delivery.

- **Account:** when a customer select a product than the account profile is verified and payment methods are showing than remind the profile password and access the actual location and the delivery location save the address.

- **Oder conformation and gift card:** Oder conformation section is the conformed the customer order and gift some lucky customers some special gift card and discount offer.

- **Others:** Public some creative ads and product review video on the social media such as – Facebook, twitter etc. On the other hand deal some other e-commerce

website with the best sell and provide the proper report on the management.

1.5 Project Outcome

The expected outcome of Buzz-Hub is to become an ease shopping site which is already design to create ease and full featured shopping site to transform the shopping experience of the user. Companies that are currently using Buzz-Hub can improve their chances of making more revenues, better their customer satisfaction and free up time from doing administrative work. The application is expected to enhance on enhanced sellers and consumer interaction. The purchased product will be safe, and its status will be report in real-time mode, which will also require updates and notifications. Consumers will receive notification on new products and discounts in their most preferred shops if they allow. Buzz-Hub shall create a positive perception in the e-sales sector as it will help the global community make shopping easier and more fun, to the advantage of the seller as well as consumers.

1.6 Organization of the Report

This report is organized into six chapters, each detailing specific aspects of the development, implementation and evaluation of the Buzz-Hub platform.

In Chapter 1 background motivation, objectives, and expected out comes of the project is provided as a preview. Methodology used during development is outlined, and finally the organization of the report is provided to provide readers with a roadmap for the document.

In chapter 2 background research required as part of the project is described which includes a literature review and review of similar applications. It pinpoints gaps not addressed by current solutions and describes the innovations Buzz-Hub brought to fill these gaps.

In chapter 3 I outline the detailed methodology used to design and develop the system. The Tutorial covers requirement analysis, system design specifications (including Data Flow Diagrams, Sequence Diagrams, Entity Relationship Diagrams), the tools and the technologies used. Here we also discuss task allocation and project planning.

The technical implementation of Buzz-Hub, environment setup, system integration, and testing are described in chapter 4. The testing and evaluation results are presented and discussed including successful accomplishment of system objectives.

Chapter 5 focuses on the engineering challenges addressed during the project and the standards adhered to during development. It explores the societal, environmental and ethical impacts of the system along with risk management

The last part presents final conclusions and makes contributions of the project. The system's limitations and future directions to contribute to future system evolutions to adapt the platform to users changing needs and market trends are also discussed.

This structure facilitates a logical arrangement of the project's objectives, methodology, outcomes and impact and makes it easy for the readers to understand.

Chapter 2

Background

2.1 Introduction

In this chapter, it is sufficiently established the knowledge necessary in order to catch the wind of the ideas, technologies, and methodologies behind Buzz Hub developing. First of all the similar research studies, applications and methodologies that led to the process and operation of the system are explored. This work uses insights gathered from existing platforms and literature to fill the gaps and to help in addressing the challenges in the E-commerce management systems. Further, this chapter illustrates the unique features provided by Buzz-Hub which are differentiated from the existing solutions and introduces how these features can enable Buzz-Hub to succeed in catering for improved user experience for sellers and customers service providers.

2.2 Literature Review

The term literature review refer to a document that brings together the key sources on a subject and discusses those key sources in dialogue with one another. It is, basically, a summary of the published work in a field of study. The book, to summarize, gives you a good overview of the state of knowledge so far, so that you can tell which theories or methods are used and what gaps there are as far as projects are concerned. Literature review is undertaken to understand research that has been undertaken in relation to the chosen project topic, and to summarize this research within the project report. The main objective of literature review however, is to identify the problems more accurately as well as giving users a simple solution. Finally after analyzing these things mentioned above Buzz Hub tries to improve these by integrating more required services and making the user experience less.

2.2.1 Similar Applications

E commerce platform in Hongkong is Hktdc.com. Every essential product we need is already there. It includes huge variety of products with cash on delivery service availability, different sectors of product, international shipping facility and govt. service facility etc. In this the customer has to simply enter the name of the product they want. Here, they will find a huge collection of the product. In this product is listed according to the category. Also, people who will purchase the product will be

able to claim the warranty with them. Also that web site is available from outside region, but not for us. Different types of e-

products also sold here. Those analysis has been covered from hktdc.com official site[1], Wikipedia [2]

The Figure 2.1 is of Hktdc.com [1] website landing page to show the basic features, functionality and UI of the application.

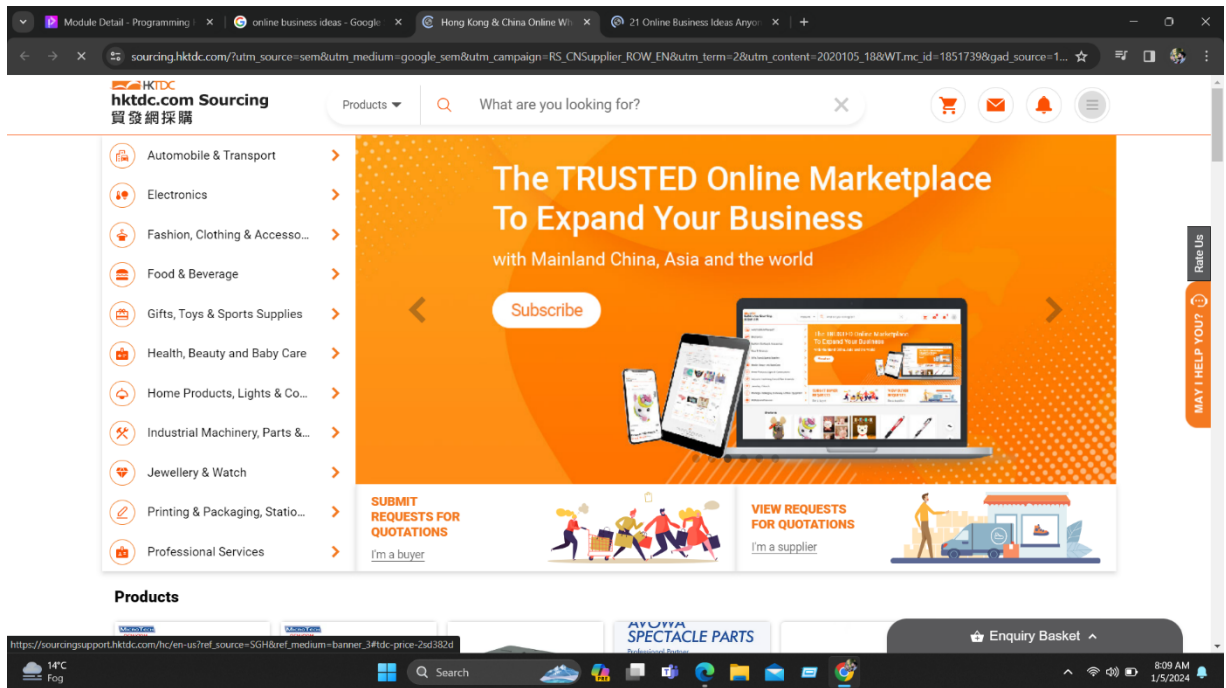


Figure 2.1: Landing page of hktdc.com

Inspiration for Buzz-Hub: Buzz-Hub integrates Hktdc.com's [1] approach to providing a proper customers service while adding unique functionalities such as product discount and quality assurance.

A Bangladeshi famous e-commerce website is Daraz.com.bd. There is a lot of product listed here. However, here the authenticity of products is a concern. It can be visible in the product review section. Every basic function has been there, but you can't even find any warranty claim section or complaint section if any consumer gets a negative experience from the seller. There is only one way to share negative experience, and that is product review. It is a sector that provides domestic service facilities. There is no international product purchase option. This platform built with local shop and

different brands. Results of those analysis have been covered from [3] daraz.com.bd official site and Wikipedia [4].

The Figure 2.2 is of Daraz.com [1] website landing page to show the basic features, functionality and UI of the application.

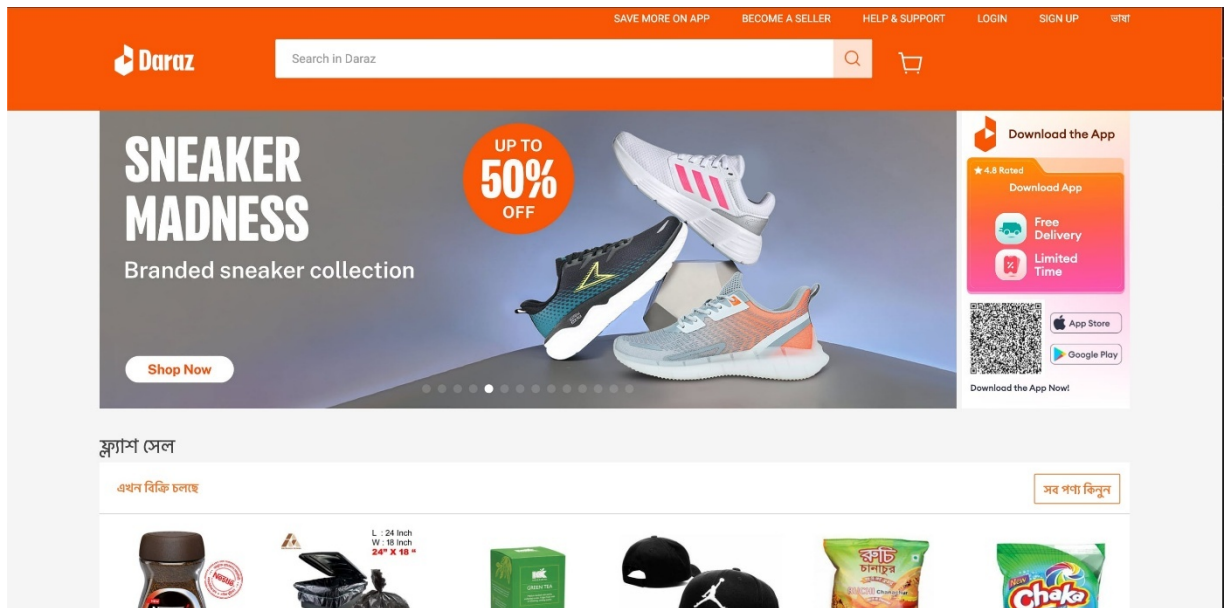


Figure 2.2: Landing page of Daraz.com

Inspiration for Buzz-Hub: Buzz-Hub integrates Daraz.com's [1] approach to providing a proper customers service while adding unique functionalities such as product discount and quality assurance.

Another Bangladeshi e commerce website is Evaly. A lot of product collection exists. Know it as it's known with it's exclusive discount price. But although it has COD facility, its product collection is not as rich as it should be. However, it is a good e commerce platform but its not considered trustworthy. In this, platform there was a scam. Now, various steps were taken and now its trying to continue its business again, but people trust is a big concern here. As its seller, it has other brand and local shops. This platform is only available for use for this region. There is no international service facility. It is web, android, Ios. All analysis has covered from 'evaly.com.bd'[5],[6],[7] Ealy android application, 'Wikipedia'[8] and 'prothom alo'[9] news portal.

The figure 2.3 shows the landing page, basic features, functionality and UI of the Evaly.com [6] website.

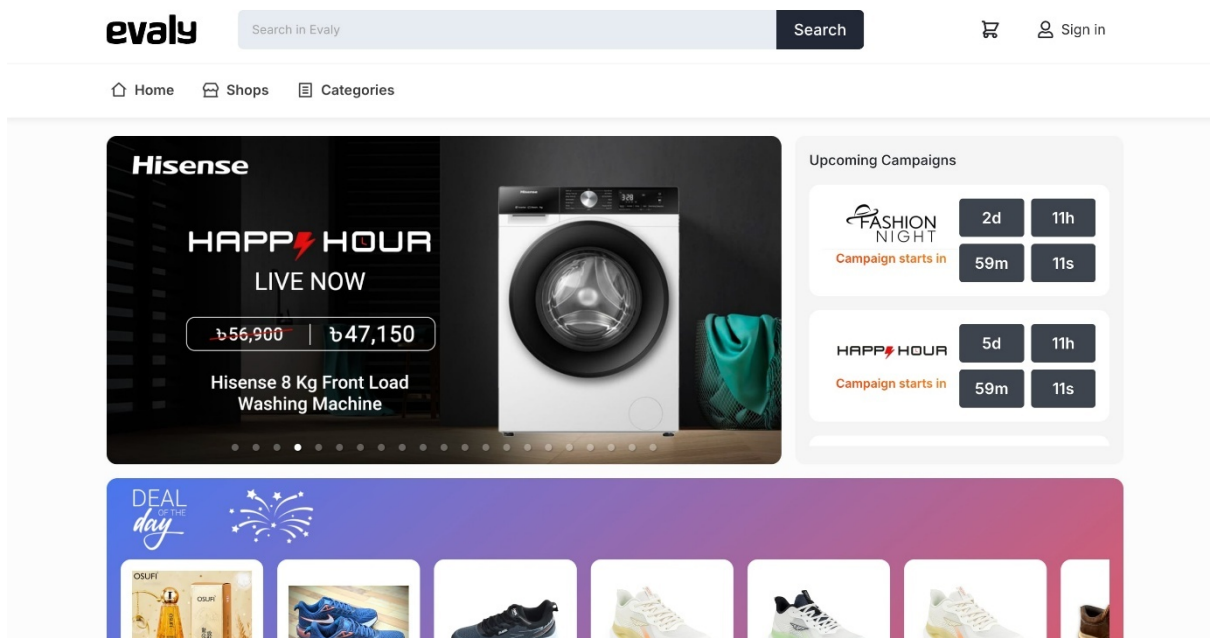


Figure 2.3: Landing page of Evaly.

Inspiration for Buzz-Hub: Buzz-Hub integrates Evaly.com's [1] approach to providing a proper customers service while adding unique functionalities such as product discount and quality assurance.

Another e commerce website in india region is Flipkart. A good deal, product, user friendly interface and it's product collection are well known. However, there are lots of fraud case came ahead in this platform. Consumer and victim claimed seller fraud of flipkart refused to take responsibility of this. The thing with flipkart is that it has some trust issues but nonetheless, it is a well known platform in its domestic market. It doesn't support international product & custom made preorder. Their seller is different types of shops, dealers, brands. [10 [11] analysis has been covered from flipkart official site and Wikipedia; many other e – commerce platform already exist in its own merits and demerits. But while Buzz Hub takes some inspiration from these, they don't stop there, opting instead to optimize services for customers and increase their satisfaction as a result.

The Figure 2.4 is of Flipkart.com [1] website landing page to show the basic features, functionality and UI of the application.

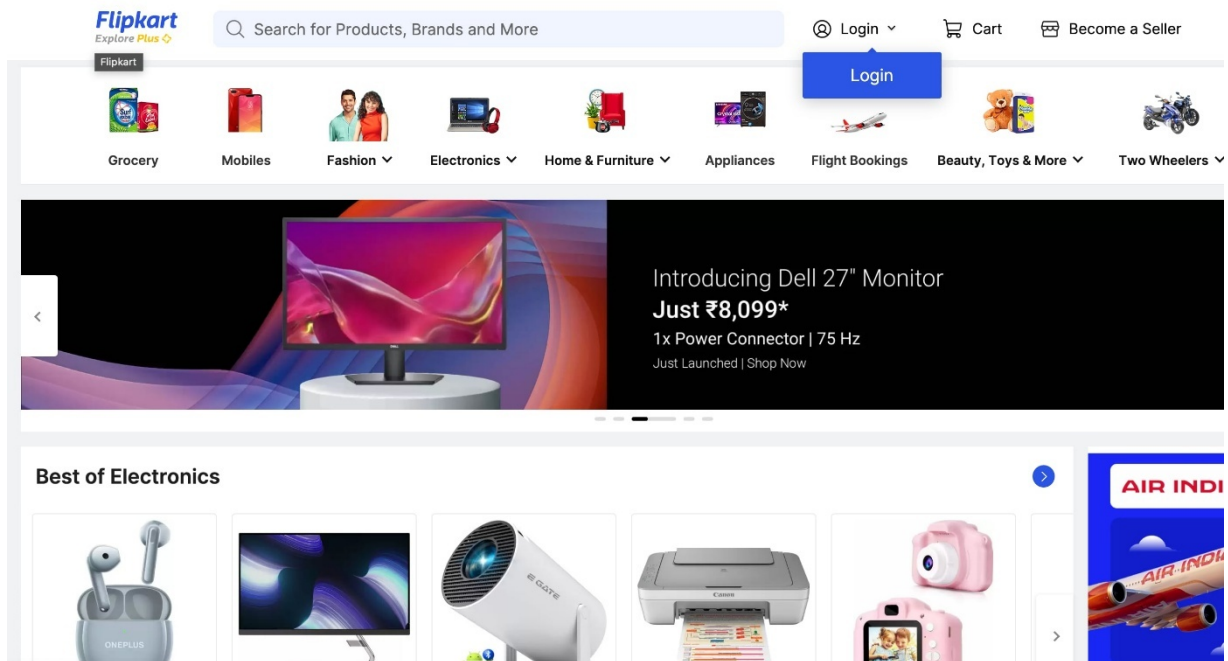


Figure 2.4: Landing page of flipkart.

Inspiration for Buzz-Hub: Buzz-Hub integrates Flipkart.com's [1] approach to providing a proper customers service while adding unique functionalities such as product discount and quality assurance.

2.2.2. Comparison Between Existing Works

Unlike any other platform, Buzz-Hub is a comprehensive approach and provides a range of customer service on a single platform. The great feature of this application is it provides all compact problems solution that anyone can faces during a tour thus users do not find it necessary to switch the screen of different applications resulting a best experience of this application.

A comparison table between the existing application that are already present in the market is given below. On strengths, weakness, the state of UI/UX and availability of existing applications.

Table 2.1: Comparative analysis with existing applications features

Application Name	Strengths	Weakness	UI/UX	Availability
Hktdc.com	- Comprehensive services including different types of products, quality and quantity. - Provide some discount (any products).	- Delivery services are not strong. (Home delivery are not allowed).	Modern and user-friendly.	Web, Android, iOS.
Daraz.com	- Every types of products are available. - Delivery services are very well.	- Products quality are depends on customer's luck. - Quantity are vulnerable.	Modern and user-friendly.	Web, Android, iOS.
Evaly	- Many types and categories of product are available. - Lowest price generate with a longtime process.	- Products delivery is a longtime process. - No return policy for product cancellation.	Modern and user-friendly.	Web, Android, iOS.
Flipcart	- All types of products are in their site. - Flight ticket is also available in here.	- friendly discount offer are not available.	Modern and user-friendly.	Web, Android, iOS.

From the Table 2.1, differentiation of project features can be identified. Buzz-Hub will have some additional features and the applications goal is to make it available for all platforms.

2.3 Gap Analysis

Hongkong Trade Development Council or HKTDC, Flipkart, Amazon these are internationally located company mostly operating mostly in the outer region. As Buzz Hub's primary targeted audience are Bangladeshi in this region Daraz, Evaly, Chaldal they are already exists here. Daraz has a huge market share in domestic region, they have a good user interface and products verities. But they have some issues with consumer and seller. Consumers can't claim warranty because they have not any warranty claim section. To claim warranties they have to contact with the seller and daraz doesn't take responsibility of this. In this sector Buzz-Hub can overcome that because of its warranty claim and exchange facility

Evaly is another domestic e-commerce platform. They have a proper UI with great deal. But they have trust issue. Buzz-Hub is fully dedicated to consumer's satisfaction. It will

offer good deal with customer trust. In this sector Buzz-Hub will overcome that. Chal deal is another domestic e-commerce website but this sells only groceries. Buzz-Hub will

target every product what a person needs. And Buzz-Hub will take every small, establish and non e-commerce shop to its service.

Flipkart and HKTDC are international companies but they are not available for this region. Buzz-Hub will serve international shopping service for this region also.

Arranging trade number and other documents for international license is a gap in this stage. There are no e-commerce application in this country which will offer IMEI facility, Buzz-Hub will offer this in its business and also offer custom made product to its service also. These features make Buzz-Hub unique and special from others. And Buzz-Hub is committed to offer best user experience and develop itself according to users need.

2.4 Summary

In summary, the goal of literature review is to find the existing work and its strengths and weaknesses. There is various e-commerce application that aligns with the same goal of Buzz-Hub. While Buzz-Hub is motivated from those application it sets itself apart by optimizing services and improving customer satisfaction. Buzz-Hub provides solution to the problems that one can face during shopping. Buzz-Hub identifies the gaps in existing shopping applications and focusses on the need for a more integrated solution. So, the literature review underscores the importance of creating a user-friendly, all-encompassing e-commerce application. Buzz-Hub seeks to bridge existing gaps, offering a more efficient and enjoyable experience.

Chapter 3

Research Methodology

3.1 Requirement Analysis & Design Specification

3.1.1 Overview

This chapter discusses Buzz-Hub's methodology, requirement analysis and design specifications describing and highlighting the systematic approach of its development. According to the Software Development Lifecycle (SDLC) the first phase is, analysing the project. So the previous chapter introduction and literature review covers that part. Next phase design of the project is the UI/UX design or taking some engineering approach first and make some UML diagrams. It comes handy when we use to implement or code the project next part, in simple words, when everyone is supposed to do the project implementation and have to know how the future project will implement and which feature or components will come next and after that. Developing Buzz Hub and its functional analysis will be helped by it.

3.1.2 System Design

This is for a updated e commerce website which is named “Bazz hub”. The proposed approach is based on HTML, CSS, Bootstrap and JavaScript for frontend and .NET MVC for backend development. The best customer satisfactory and user helpful e commerce website with the best dealing and services. Our key fractures are:

- **User Login and Registration:** They would use User / Customer to register the system. With a hard password to the proper email address. When user successfully login than then they get a customer id and conformation login approval.
- **Home:** Provides a centralization view for customer with quick access to essential features and information of different kind of products.
- **Products:** Here the many types of products with the best discount and also include the different categories. In this site there are many new collection also attach.
- **Product details:** Every products details are show to the sequence on the user interface. Many common products are highlighted with the best discount price.
- **Compare:** Compare the other online website product and get a customer and product review.
- **Cart:** In this section you'll create a odder summary and shipping method with the actual It helps a company sell products at a cost, that is right and at the same time maintain a proper quality. Even included payment method shipping and supply in this sector.
- **Account:** when a customer select a product than the account profile is verified and payment methods are showing than remind the profile password and access the actual location and the delivery location save the address.

- **Oder conformation and gift card:** Oder conformation section is the conformed the customer order and gift some lucky customers some special gift card and discount offer.
- **Others:** Public some creative ads and product review video on the social media such as – Facebook, twitter etc. On the other hand deal some other e-commerce website with the best sell and provide the proper report on the management.

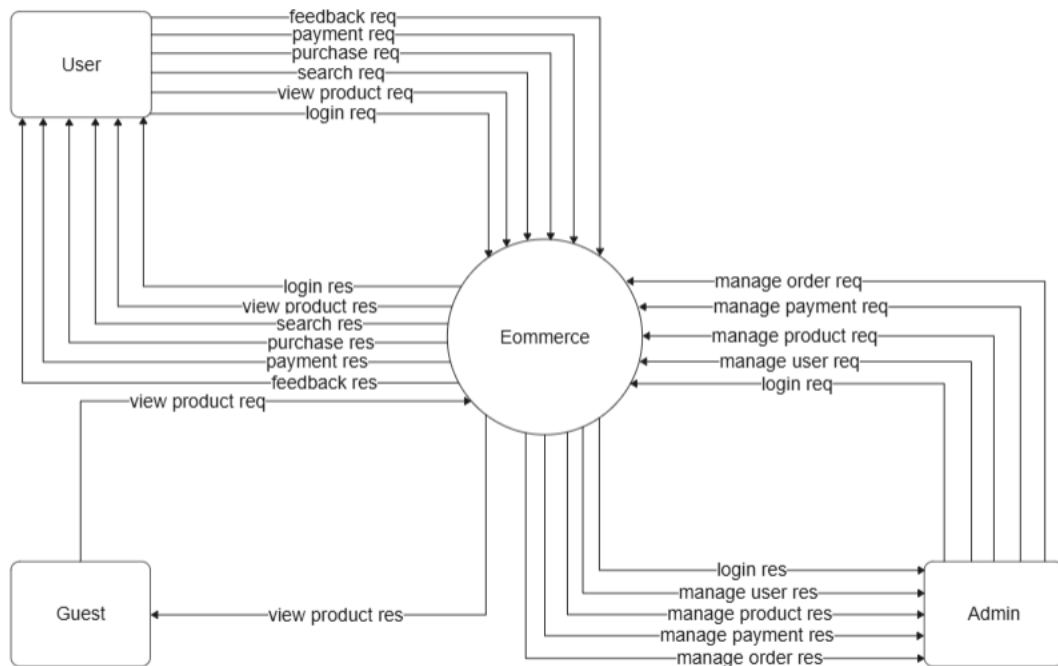


Figure 3.1: System Architecture Diagram of Buzz-Hub.

Key Design Considerations are stated here:

- **Scalability:** The modular design allows for easy addition of new features such as support for more user roles or travel services.
- **Security:** JWT-based authentication and secure payment gateways ensure user data and transactions are protected.
- **Reliability:** The use of robust frameworks and APIs enhances the system's performance and reliability.
- **User-Centric:** The UI/UX design focuses on intuitive navigation and accessibility that ensures a smooth experience for all users.

Within this structured and layered system design, Buzz-Hub is guaranteed to not only be functional, but also efficient, reliable and scalable for future growth. This design is visually encapsulated in the attached System Architecture Diagram, and also shows how client-side, server-side and external systems establish a united E-commerce management platform.

3.1.3 Functional and Nonfunctional Requirements

Towards achieving this objective, we guarantee a comfortable, efficient experience for customers and service providers by following a clear set of functional and nonfunctional requirements for our Buzz hub development. These requirements specify the essential behaviors and attributes of the system, as a basis for implementation and evaluation of the system.

Here are the requirements:

- Business process model:

In order to develop Buzz-Hub a company process model is compulsory. It will help to create the user interface. Knowledge about the flow during developing period is mandatory. We can mark where the next thing to do is on this as well.

- User registration and authentication:

To register with the website, user must provide their valid information. For us finding out about their details we need access of government. Their identity proof would be passport and NID number. Buzz-Hub assumes full responsibility for their information security.

- Two-factor authentication: Two factor authentication is workable method for data security and authenticity check. Each and every time of new device log in user have to use their registered id and password. Than an OTP will send to their registered phone number and email address as their authenticity check.

- Product Management:

Buzz-Hub targets a huge market. So product management is a concern to the project. An experienced team is required to the project to manage all the products information. Which product is listing and which one is out of stock it's a necessary to Buzz-Hub.

- Order Management:

Buzz-Hub targets not only the domestic market. It has a target to achieve goal to the International market. A huge number of traffic and order will place here. So an experienced and dedicated order management team is must required. It will directly effect to user experience.

- Search and Navigation:

A huge number of products will list on it. A proper search and navigation bar is required also. It will help to find desire shop, and product according to their need.

- Pre-order Sector:

Buzz-Hub offers customized product pre-order facility. For this a section for pre order will able to the application. And it will help to place a customized order.

- Proper link-up with other E-commerce applications:

Buzz-Hub is an application which will deal with other e commerce website also. Other websites product access and proper link-up is mandatory here. So communication with other platforms is must need here.

- Banking approval:

During buzz-Hub is an e-commerce website and it offers EMI shopping facility this need a proper banking approval. Though Buzz-Hub targets domestic market first

so at the very beginning it needs approval with famous e banking sites. Like Bkash, Nagad, Rocket, Visa, mastercard and credit card also. When it will jump to the International market Paypal,Google pay, amazon pay etc.

- Proper knowledge on languages:

Buzz-Hub uses some language HTML,CSS,Python,Javascript,Php. Knowledge on these languages are required here.

- Performance:

Buzz-Hub is a good project with a bright future planning. For this a huge traffic have to face it. So a well performance is need here. Loading time , response , traffic organization will help it for a better performance.

- Security:

Though Buzz-Hub is a project with a lot of personal information of consumers so security is a big sector here. Buzz-Hub will offer security update time to time and a dedicated team will assign for security purpose

- Usability:

Design an intuitive user interface with clear navigation and calls-to-action. Conduct usability testing to identify and address usability issues.

- Integration with Shipping providers:

Sundarban, being a shipping company, needs to be integrated with Buzz Hubs. Courier, Pathao, SA Paribahan and Khorndokar Transport are booking channel transporters. When Buzz-Hub will However, it seems as if other transport companies, like DHL, jump to an international market first before Buzz-Hub.

3.1.4.Data Flow Diagram

A Data Flow Diagram (DFD) is a graphical representation of the flow of data within a system. It demonstrates how data moves between external entities, processes and data stores. The DFD for Buzz-Hub breaks the system into major sub-processes by focusing on how user inputs are processed and outputs are generated.

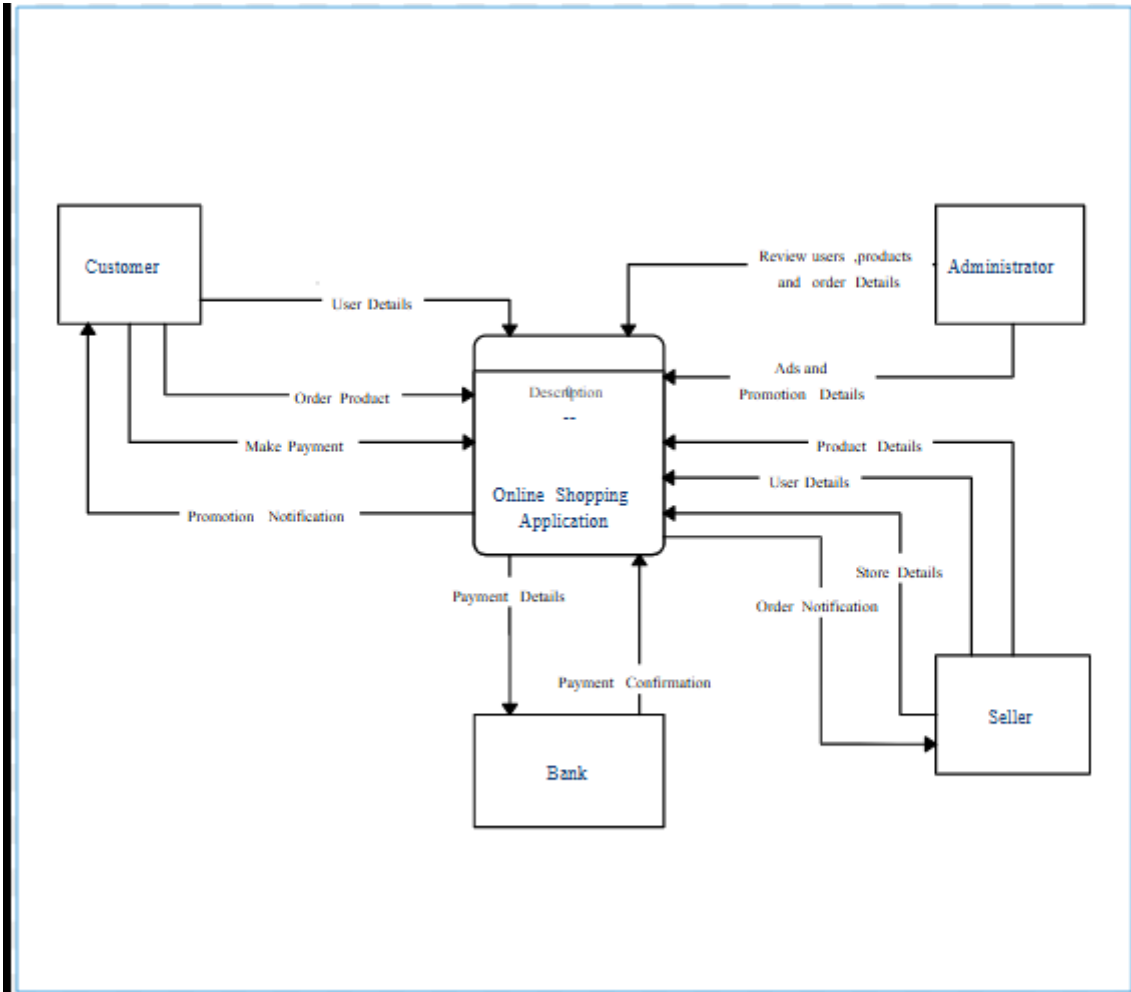


Figure 3.2: Data Flow Diagram of Buzz-Hub.

This diagram ensures a clear understanding of the system's data flow and forms the foundation for its detailed design and implementation.

3.1.5. Sequence Diagram

The UML diagram related to the interaction, time, and communication between system components is named as a Sequence Diagram. It is about the order of operations and the way messages flow between system components, user and external entities..

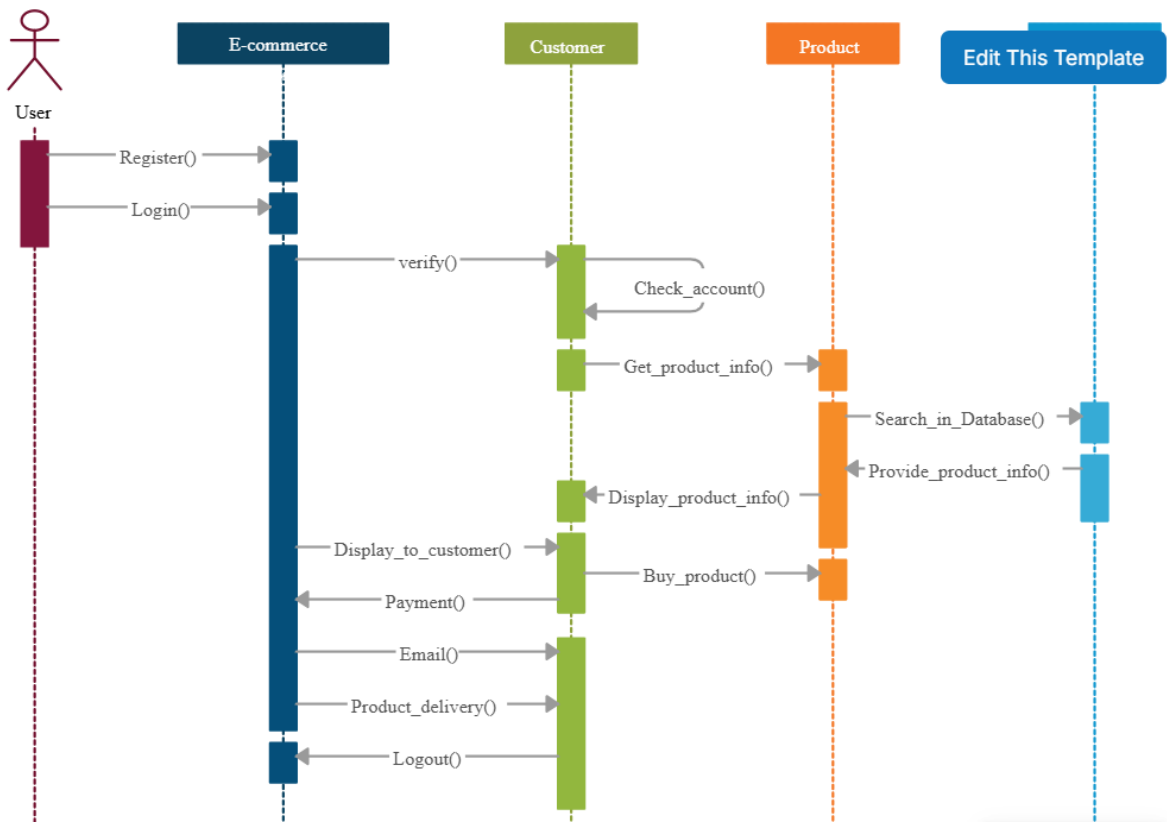


Figure 3.3: Sequence Diagram of in Buzz-Hub.

3.1.6. Entity Relationship Diagram

An Entity Relationship Diagram (ER Diagram) is a visual representation of the data model for a system. It showcases the entities involved, their attributes and the relationships between them.

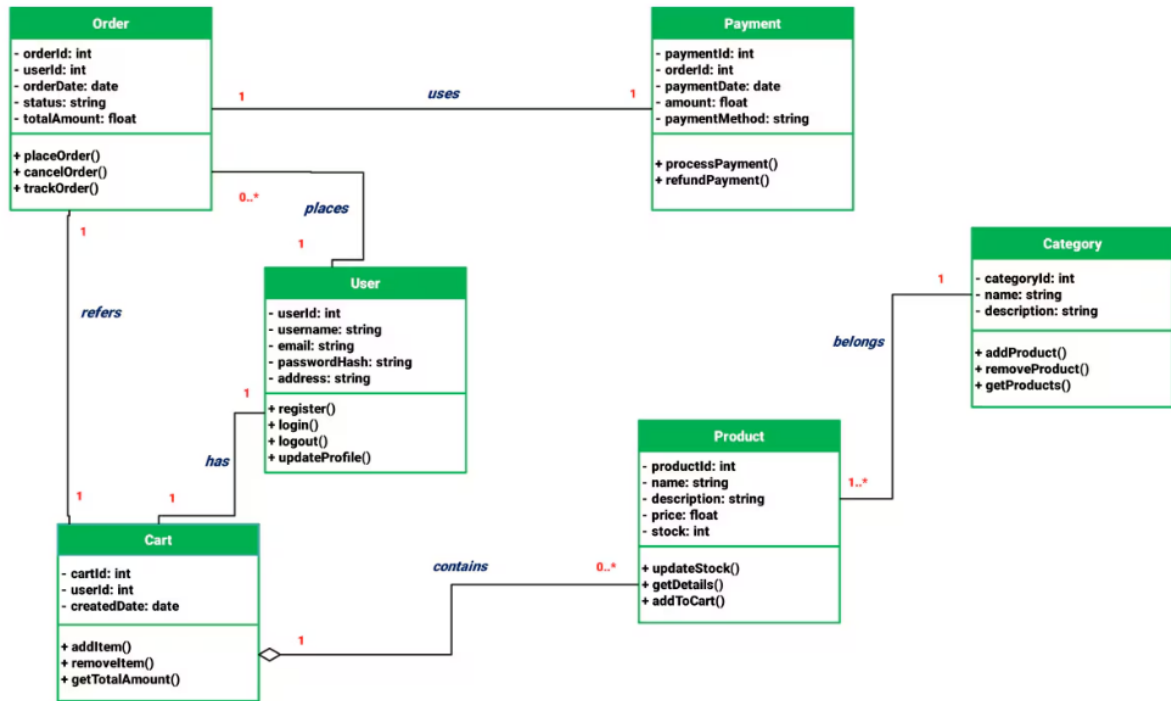


Figure 3.4: E.R. Diagram of Buzz-Hub

Inspiration for Buzz-Hub: Buzz-Hub integrates Daraz.com’s [1] approach to providing a proper customers service while adding unique functionalities such as product discount and quality assurance.

3.1.7 UI Design

The Buzz-Hub UI Design works on making UI interactive so that customer can get used to the UI as soon as possible along with Customers, Product Details, Product Purchase and Delivery. It is simple, accessible and responsive design which makes it suitable for use across multiple devices including desktop, tablet and mobile phones.

Dashboards for various user roles are being designed for the UI design. Well organized sections can do product purchase, adding cart and order guide. Branded agents and product managers can manage their profile and services/ deliveries efficiently by having service providers’ dashboards. We choose colors and layouts in order to preserve the visual consistency and to improve usability. It also injects search products, booking products, payment workflows... all that key elements that need to allow somebody to do their task very easily. Additionally it utilizes the latest design fundamentals like Responsive layouts,

clear typography and intuitive icons to strengthen the feel.

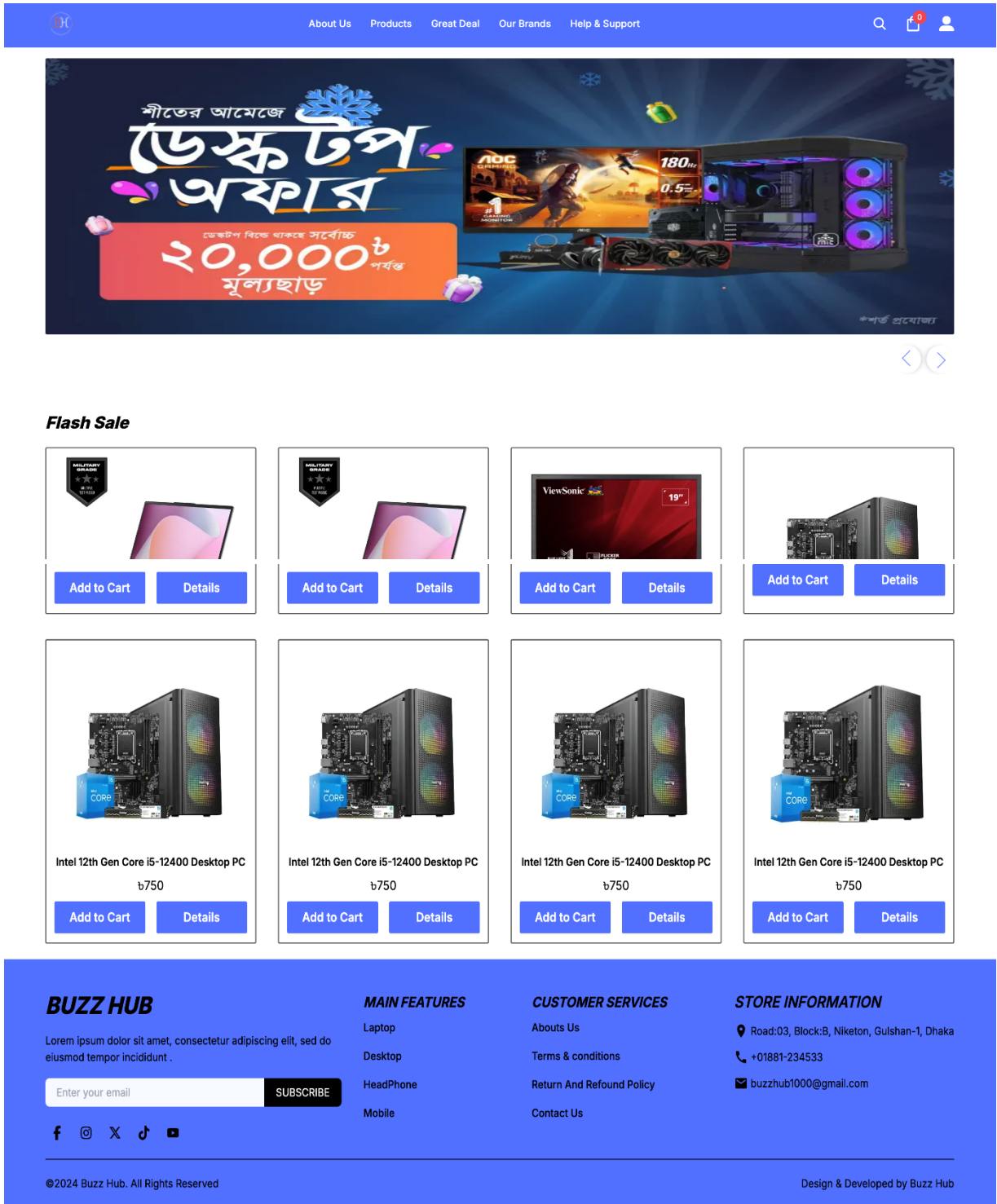


Figure 3.5: Landing page design - Navbar, Banner

SIGN UP

Insert your account information:

FIRST NAME

LAST NAME

ENTER YOUR PHONE

ENTER YOUR EMAIL

PASSWORD

If you don't have an account, please [Login Here](#)

SIGNUP

Figure 3.6: Sign Up page

SIGN IN

Insert your account information:

ENTER YOUR EMAIL

PASSWORD

Forget your Password?

If you don't have an account, please [Register Here](#)

Login

Figure 3.7: Sign in/ Log in page.

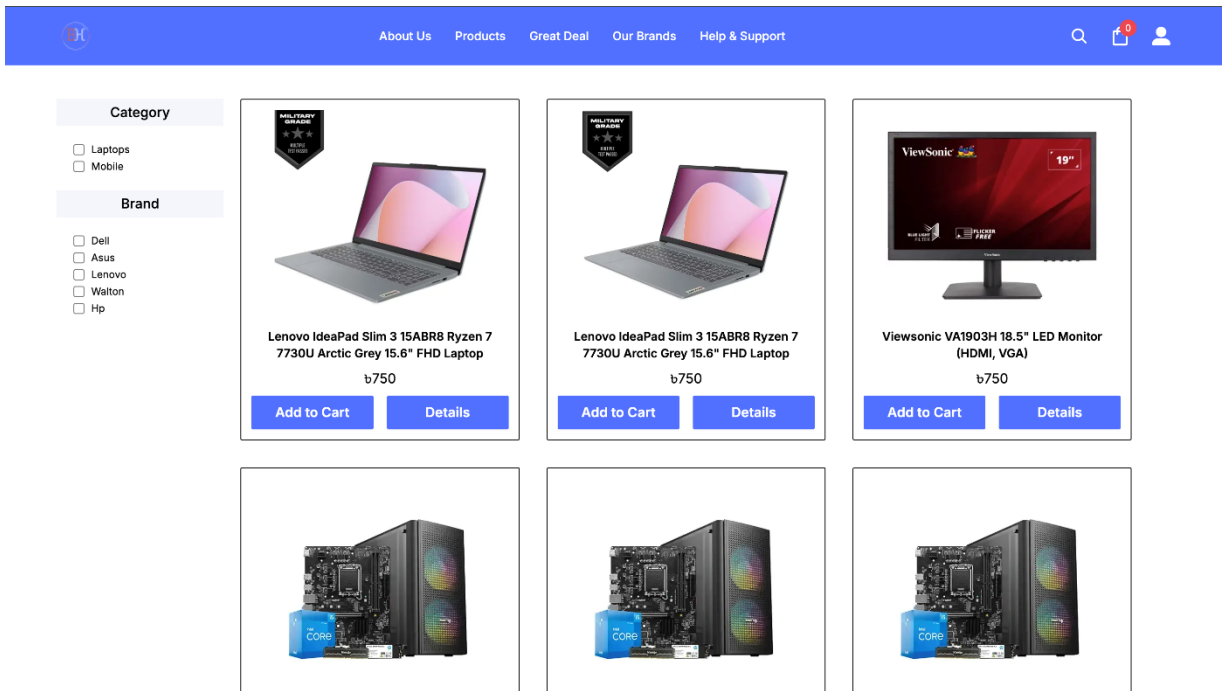


Figure 3.8: Product category details page design.

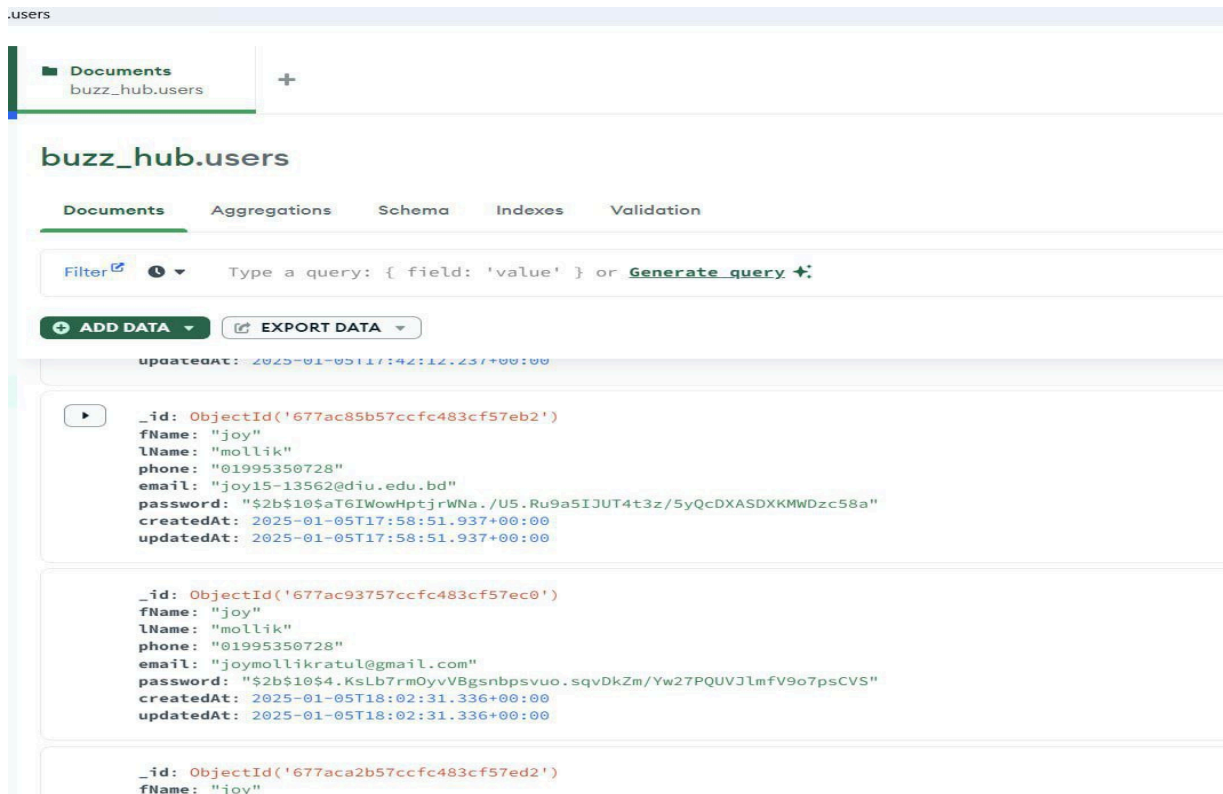


Figure 3.9: Backend login and registration output

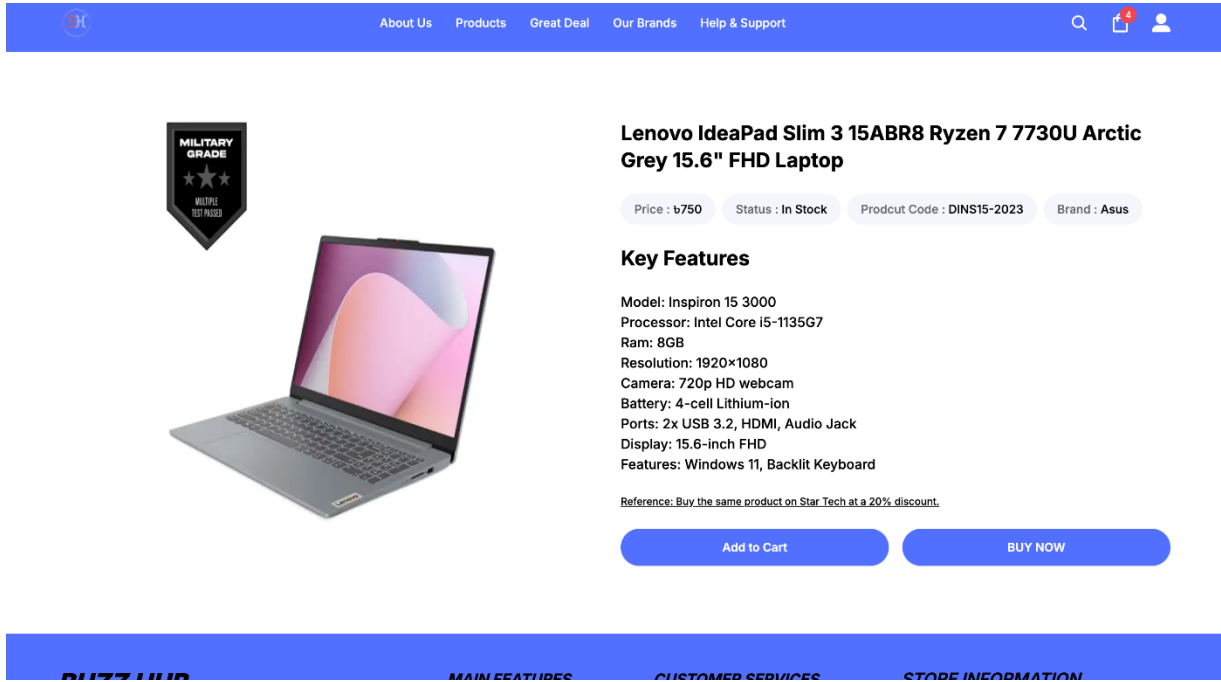


Figure 3.10: Product details page design.

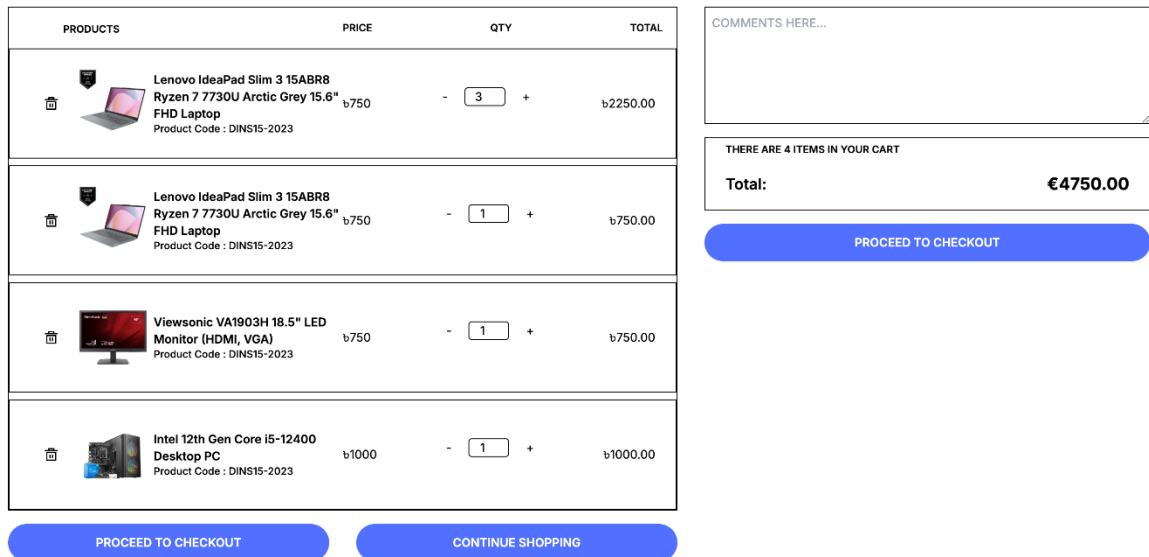


Figure 3.11: Product purchase page design in total.

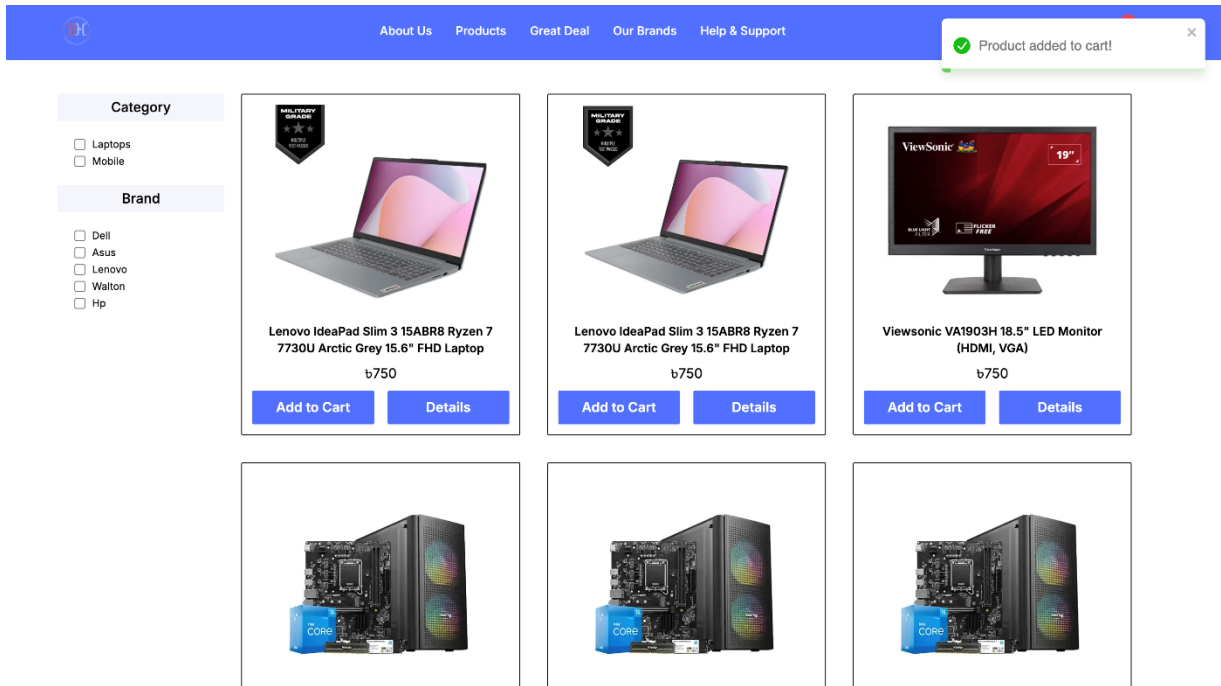


Figure 3.12: Product purchase conformation page design.

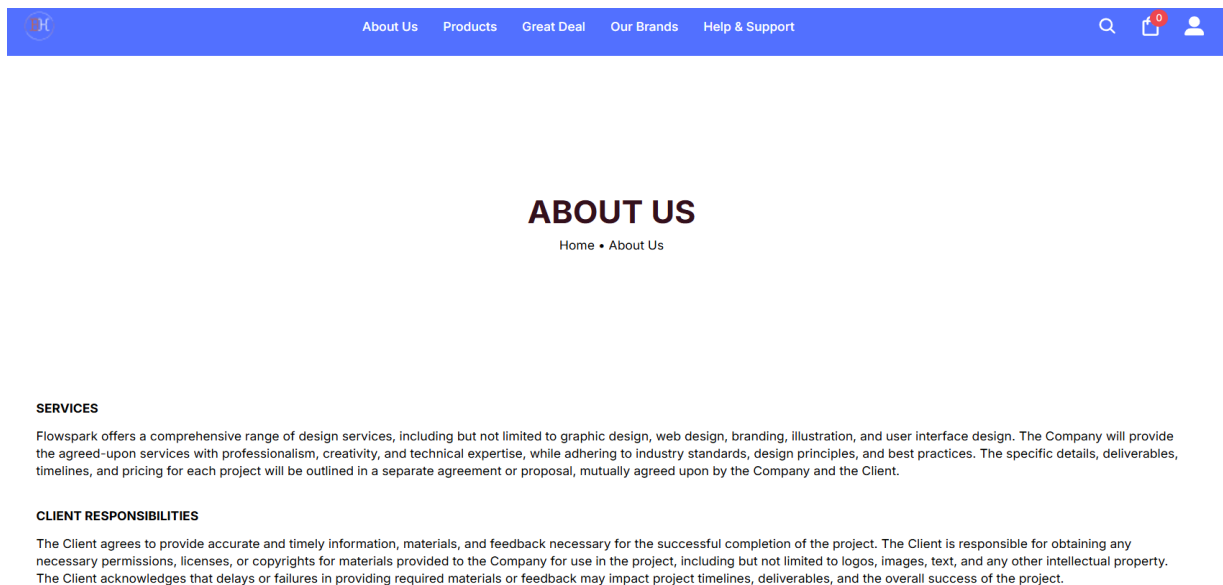


Figure 3.13: About us page design.

3.2 Detailed Methodology and Design

Different solutions, technologies and frameworks were considered for resolving different challenges while building an integrated shopping system like Buzzhub. Tools and design choices were selected based on whether they fulfilled the system's functional and non-functional requirements, could scale, can be easily designed and how they performed. This part addresses alternate solutions evaluated with explanation of the specific choices made in the system development process. Alternate Solutions Considered:

1. Frontend Development:

- Alternatives: Angular, Vue.js.
- Selected Technology: Next.js.
 - Reason: Next.js offers a component-based architecture that enables reusable and modular code. Next.js enables to create high quality web applications with the power of react component. The large developer community and extensive library support make it ideal for building scalable and maintainable frontend applications.

2. Styling Framework:

- Alternatives: Bootstrap, Material-UI.
- Selected Technology: Tailwind CSS.
 - Reason: Using tailwind css we can create highly customizable designs and at rapid prototyping using their utility first approach to styling. It is very lightweight and as a result loaded faster and its performance is better than traditional CSS frameworks.

3. Backend Development:

- Alternatives: Django, Ruby on Rails.
- Selected Technology: Next.js
 - Reason: Next.js is a full-stack framework. It's easy to use as a backend work also. It's lightweight and already have been used as a frontend purpose so using this as backend can handle buzz-hub easily. It's fulfill all the purpose of buzz-hub and minimize run time.

4. Database:

- Alternatives: MySQL, PostgreSQL.
- Selected Technology: MongoDB.
 - Reason: MongoDB's document-based structure provides flexibility for handling diverse data types such as user profiles, hotel details and booking information. Its scalability and ease of integration with Next.js make it a natural choice for Buzz-hub.

5. Payment Gateway:

- Alternatives: PayPal, Razorpay.
- Selected Technology: Stripe.
 - Reason: Stripe offers robust API support for handling secure payments. Its features like PCI compliance and real-time payment processing align with the system's requirement for secure financial transactions.

Reason to Select the Specific Design Pattern:

The flowchart of Buzz-hub designed on the basis of system is a complete description of workflow of application. The thing about mapping the roles, actions and decision points for user and consumer with a user flow is, that it's very visual. I chose this design pattern because it is clear in describing complex interactions between multiple entities so that all stakeholders can understand what functionality the system supports.

Benefits of This Design Pattern:

- Modularity: Each user role has its distinct flow that makes the system easier to understand and maintain.
- Scalability: The design accommodates future enhancements such as adding more roles or features.
- User-Centric: The flow focuses on simplifying user interactions also ensures a seamless experience for travelers and service providers.
- Error Reduction: By visualizing the workflows, potential bottlenecks and errors can be identified and addressed early in the development process.

The selected combination of Next.js, Tailwind CSS, Firebase Authentication, Stripe ensures that Buzz-hub is robust, scalable, secure and user-friendly. The technologies work harmoniously to deliver a seamless shopping management platform that meets all functional requirements while providing excellent performance and flexibility.

By following the structured flowchart, the development process was streamlined which ensures alignment between the design and implementation phases. This methodology not only addressed the challenges of creating an integrated shopping system but also established a strong foundation for future scalability and enhancements.

3.3 Project Plan

The project plan for Buzz-hub outlines the structured approach taken to design, develop, test and implement the system. It serves as a blueprint for the entire project lifecycle and ensure that all tasks are well-coordinated and aligned with

the project's objectives. The plan covers the scope of the project, resource allocation, milestones, timelines, risk management strategies and testing protocols to ensure successful delivery.

Scope of the Project

However the scope of Buzz-hub is, it's a platform to easy shopping, important (order tracking), customize order, compare products and etc. The system supports multi user role such admin, user, consumer user and each is able to perform different role based dashboards and functionalities. In addition, it includes payment processing, authentications and email notifications which is also a complete solution for offering the best shopping experience.

Milestones and Timelines

The development process was divided into the following major milestones each with specific tasks and deliverables:

1. Requirement Gathering and Analysis (Week 1-3):
 - Identify system requirements through brainstorming and market analysis.
 - Create a detailed Software Requirements Specification (SRS) document.
 - Deliverables: Requirement documentation, preliminary system design.
2. System Design and Prototyping (Week 4-8):
 - Design system architecture including Data Flow Diagrams, ER diagrams and flowcharts.
 - Develop UI mockups and wireframes for user interfaces.
 - Deliverables: System architecture diagrams, UI mockups.
3. Frontend Development (Week 9-25):
 - Build the client-side application using Next.js and Tailwind CSS.
 - Integrate with APIs to enable functionality like add to cart, search and payments.
 - Deliverables: Fully functional frontend application.
4. Integration and Testing (Week 26-28):
 - Integrate frontend with backend and external systems
 - Perform unit testing, integration testing and system testing.
 - Deliverables: Tested and integrated application.
5. Deployment and Documentation (Week 29-30):
 - Deploy the system on a cloud platform.
 - Prepare final project documentation including user manuals and testing reports.
 - Deliverables: Live system, complete documentation.

Resource Allocation

The resources for the project were allocated as follows:

- Team Members:
 - Project Manager: Oversee the project and ensure timely delivery.
 - Frontend Developers: Develop the user interface.
 - Backend Developers: Build the server-side and database functionalities.
 - QA Engineer: Perform testing and ensure quality.
 - UI/UX Designer: Create mockups and enhance usability.
- Technologies and Tools:
 - Next.js, Tailwind CSS, MongoDB, Firebase, Stripe .
 - Tools: Visual Studio Code, Postman, GitHub, Figma

Risk Management

Potential risks were identified and mitigated through proactive strategies:

1. Technical Risks:
 - Risk: Integration issues between client and server.
 - Mitigation: Early testing and use of standard APIs to reduce integration challenges.
2. Resource Risks:
 - Risk: Unavailability of team members during critical phases.
 - Mitigation: Flexible task assignment and overlapping skill sets among team members.
3. Timeline Risks:
 - Risk: Delays in meeting deadlines.
 - Mitigation: Regular progress reviews and contingency plans for critical tasks.

Testing Protocols

1. Unit Testing: Verify the functionality of individual components and modules.
2. Integration Testing: Test the interaction between the frontend, backend and external systems.
3. System Testing: Evaluate the overall performance and functionality of the application.
4. User Acceptance Testing (UAT): Gather feedback from potential users to identify and address usability issues.

Monitoring and Evaluation

The project's progress was monitored using tools like Trello for task tracking and GitHub for version control. Weekly review meetings ensured that the team remained aligned with the project's objectives. Key performance indicators (KPIs) were established to evaluate the success of the project including system reliability, user satisfaction and ease of use.

Benefits of the Project Plan

With this project plan organized, the team was able to bring a strong, scalable and user friendly shopping system to marketplace. By planning it appropriately, resources were being utilized in an efficient way, risks were being mitigated in an effective way and the system met the expectation of its stakeholders. Detailed timelines and milestones were helpful during the development process to Buzz-Hub to reach its successful conclusion.

3.4 Task Allocation

Team Member 1 and Team Member 2 took on the development of the Buzz-Hub system among the two to better balance out assignments and work together colloquially. Each team member focused on specific aspects of the project based on their skills and expertise and working cohesively to achieve the project's objectives. Below is the detailed task allocation:

Team Member 1

1. Requirement Analysis and Documentation:
 - Gather system requirements and create the Software Requirements Specification (SRS) document.
 - Define functional and non-functional requirements.
2. Frontend Development:
 - Develop the client-side application using Next.js..
 - Implement state management and routing using React Router.
 - Integrate Tailwind CSS for responsive and user-friendly UI design.
3. UI/UX Design:
 - Create mockups and wireframes for user interfaces.
 - Ensure consistency in design across different user roles and workflows.
4. Testing and Debugging:
 - Conduct unit testing and debugging for frontend components.
 - Ensure cross-browser compatibility and responsive design.
5. User Manuals:
 - Draft user manuals and guides for the frontend application.

Team Member 2

1. System Design and Backend Development:
 - Design the system architecture including Data Flow Diagrams, ER Diagrams and flowcharts.
 - Develop the backend using Node.js and Express.js.
 - Implement RESTful APIs for hotel booking, tour management and guide appointment workflows.
2. Database Management:
 - Set up and manage the MongoDB database.
 - Define schemas for users, bookings, hotels, tours and guides.
 - Optimize database queries for performance and reliability.
3. Integration with External Services:
 - Integrate Firebase Authentication for user login and registration.
 - Set up Stripe for secure payment processing.
 - Configure SendGrid for email notifications.
4. Testing and Deployment:
 - Conduct integration testing to ensure seamless communication between the frontend, backend and external systems.

between the frontend, backend and external systems.

- Deploy the application on a cloud platform and monitor performance.
5. Final Documentation:
 - Prepare the final project documentation including technical details and testing reports.

Collaboration

Members of the team worked very closely together to keep tasks aligned and executed seamlessly. In our case we were meeting regularly to review progress and address those challenges that you have to address having everything in sync. Using their competitive advantages, the team was able to allocate responsibilities effectively and meet project goals within the needed time.

3.5 Summary

The methodologies used in the design of a Buzz Hub system, their design specifications and execution plan, were detailed in this chapter. I described the requirements analysis, architectural design using Next.js, MongoDB, Firebase, Stripe, SendGrid. These technologies were selected due to their ability to be molded into a proper robust and scalable application. The project plan shows milestones, timelines and resource allocation assuring systematic progress to the

project's goals. It also showed task allocation between two team members, so they would know what to do and who does what best, as well as how they will each others strengths together. Furthermore, it addressed some risk management strategies and testing protocols to ensure a reliable and a high performing system. This chapter sets the foundation to understand how Buzz Hub and its components idea came to its final form and a blueprint for anyone who would like to enhance upon released features or create similar projects.

Chapter 4

Implementation and Results

4.1 Environment Setup

The environment setup for the development and deployment of Buzz-Hub was carefully designed to ensure seamless integration of technologies and efficient execution of the system. The environment was divided into local development, testing and deployment stages each configured with the necessary tools, frameworks and services.

Development Environment

The development environment included the following tools and frameworks:

1. Frontend Setup:
 - React.js: Used to build the client-side application with component-based architecture.
 - Tailwind CSS: Integrated for styling to achieve a responsive and user-friendly UI.
 - Node.js and npm: Installed to manage dependencies and run development scripts.
 - Development Server: React's built-in development server was used for real-time updates and debugging.
2. Backend Setup:
 - Node.js: Installed to create the server-side application.
 - MongoDB: A cloud-hosted MongoDB instance was used for database management.
3. External Services:
 - Stripe API: Set up to handle payment processing for hotel bookings, tours and guide appointments.
 - SendGrid: Configured to send email notifications for booking confirmations and payment receipts.
4. Development Tools:
 - Visual Studio Code: Used as the primary code editor with extensions for linting and debugging.
 - Postman: Utilized for testing API endpoints.
 - Git and GitHub: Employed for version control and collaboration.

- Figma: Used for creating UI mockups and wireframes.

Testing Environment

1. Testing Frameworks:
 - Jest: Used for unit testing frontend components and backend APIs.
 - React Testing Library: Applied for testing React components.
 - Mocha and Chai: Utilized for server-side testing.
2. Browsers and Devices:
 - Cross-browser testing was conducted on Chrome, Firefox and Safari.
 - Responsive testing was performed on multiple devices including desktops, tablets and smartphones.

Deployment Environment

1. Cloud Hosting:
 - Frontend Deployment: Deployed on Vercel for fast, scalable and secure hosting.
 - Backend Deployment: Deployed on Vercel for fast, scalable and secure hosting.
2. Database Hosting:
 - MongoDB Atlas: Used as a cloud-hosted database to ensure high availability and scalability.
3. Environment Variables:
 - Sensitive data like API keys (Firebase, Stripe, SendGrid) and database connection strings were securely managed using .env files in development and environment variables in deployment.

The environment set up made it fuss free and efficient in the development process and allowed the team to test and debug the application. The system has remained stable in its lifecycle by centrally configuring separate development, testing and deployment environments. Modern tools and services were used that would seamlessly integrate, scale and a user-centric approach to the implementation of Buzz-Hub allowed all this be successful.

4.2 Testing and Evaluation

Testing Methodologies

1. Unit Testing:
 - Individual components, modules and APIs were tested to verify their functionality in isolation.
 - Frontend components were tested using React Testing Library while backend APIs were validated using Mocha and Chai.

2. Integration Testing:
 - Focused on the interaction between the client-side application, backend services and external APIs like Stripe and SendGrid.
 - Ensured seamless data flow between different layers of the system.
3. System Testing:
 - The complete system was tested as a whole to evaluate its behavior under real-world conditions.
 - This included scenarios like concurrent bookings, payment processing and multi-user interactions.
4. Cross-Browser and Responsiveness Testing:
 - The application was tested across different browsers including Chrome, Firefox and Safari.
 - Ensured the UI was responsive and worked seamlessly on various devices including desktops, tablets and smartphones.

Testing Tools

1. Postman:
 - Used to test API endpoints and ensure proper response handling and data retrieval.
2. React Testing Library:
 - Validated the behavior of individual React components.
3. Mocha and Chai:
 - Ensured the correctness of server-side APIs and business logic.

Evaluation Criteria

The evaluation of Buzz-Hub focused on the following key performance indicators:

1. Functionality:
 - All defined features such as hotel booking, tour joining and guide appointments were tested to ensure they operated as expected.
2. Performance:
 - Evaluated the response times of the frontend and backend systems under various loads.
3. Security:
 - Ensured that sensitive data such as user credentials and payment details were securely stored and transmitted.
 - Verified the implementation of token-based authentication using JWT.
4. Usability:
 - Assessed the intuitiveness of the UI and ease of navigation for all user roles.

Testing Results

1. Success Rates:

- Unit tests for individual components and APIs achieved a success rate of 95%.
- Integration tests confirmed that 98% of workflows were executed without errors.

2. Identified Issues:

- Minor UI inconsistencies were identified during UAT and resolved promptly.
- A performance bottleneck in the backend was optimized by refactoring database queries.

The rigorous testing and evaluation processes ensured that Buzz-Hub was reliable, secure and user-friendly. By identifying and resolving issues during development team delivered a overall shopping management system that met the expectations of its stakeholders. This thorough approach minimized risks and ensured a smooth deployment and operation of the system.

Table 4.1: Detailed system testing table for major features

Test ID	Test Scenario	Test Case Description	Test Steps	Expected Result	Actual Result	Pass/Fail
01	User Registration	Verify that a new user can register successfully.	1. Navigate to the user registration page. 2. Enter valid user details. 3. Click the "Register" button.	Registration confirmation toast message displayed.	As Expected	Pass
02	User Login	Verify that a registered user can log in using valid credentials.	1. Navigate to the login page. 2. Enter valid credentials. 3. Click the "Login" button.	User is directed to the homepage and showed success toast message.	As Expected	Pass
03	User Login with Invalid Data	Verify that a user cannot log in with invalid credentials.	1. Navigate to the login page. 2. Enter invalid credentials. 3. Click the "Login" button.	Invalid username/password error toast displayed.	As Expected	Pass
04	Product	Verify that a	1. Log in as	Booking	As	Pass

	search	user can search for a product and brand.	a user. 2. Search for a product 3. Add to cart this product 4. Complete payment.	confirmation message displayed and shopping confirmation email send.	Expected	
05	Search for brand	Verify that a user can search for available brand	1. Log in as a user. 2. Navigate to "available brand". 3. Search for brand based product.	List of available brand products.	As Expected	Pass
06	Payment Processing	Verify that a user can complete a payment securely.	1. Initiate a payment during shopping. 2. Enter payment details. 3. Confirm.	Payment confirmation message displayed and transaction is recorded.	As Expected	Pass
07	Mobile App Responsiveness	Verify that the application is fully functional on mobile devices.	1. Access the app on a mobile device.	Application works smoothly with proper responsiveness and functionality.	As Expected	Pass

4.3 Results and Discussion

The implementation and testing of Buzz-Hub yielded significant results that demonstrate the system's ability to meet its objectives and address the challenges of traditional e-commerce platform.

Results

1. Successful Implementation:
 - o This integration has enabled Buzz-Hub to offer a single platform of seamless e-commerce management with product selling features and customer's satisfaction. Role-based dashboards were implemented for users, admins, product order, system management and product delivery that offers tailored functionalities for each role.
2. System Performance:
 - o The application maintained fast response times across all functionalities even under concurrent user loads.

- Payment processing through Stripe and real-time email notifications via SendGrid were executed reliably and without delays.
3. User Experience:
 - High levels of user satisfaction were shown during usability testing with participants indicating the system was intuitive and easy to use featuring an easy to use UI, easy to use search functionality and ease of ordering.
 - Cross-browser and device testing ensured a consistent experience across various platforms including desktops, tablets and smartphones.
 4. Security and Reliability:
 - Secure authentication using JWT ensured the protection of user credentials and data.
 - Payment transactions were handled securely which adheres to industry standards for data protection.
 5. Testing Metrics:
 - Achieved a 98% success rate in system tests with identified issues resolved before deployment.

Discussion

Results show that Buzz Hub handles challenges that customers, service providers face in managing product delivery plans. Unified approach eliminates multiple platforms that further simplifies the product ordering process and makes end user's life easier.

1. Addressing Identified Problems:
 - Role-based dashboards empower service providers to manage their offerings efficiently, a feature often missing in competing platforms.
2. Impact on Stakeholders:
 - Consumer's benefit from a streamlined process that saves time and effort also enhances their overall experience.
3. Challenges and Solutions:
 - Challenge: Ensuring seamless communication between the frontend, backend and external APIs.
 - Solution: Early integration testing and the use of reliable tools like Postman and Cypress mitigated this challenge.
 - Challenge: Maintaining performance under load.
 - Solution: Database queries were optimized and the use of scalable technologies like MongoDB
4. Opportunities for Improvement:
 - While the system met all functional and non-functional requirements additional features like multilingual support or AI-driven recommendations could further enhance the user experience.
 - Integration with more third-party services such as additional payment

gateways or travel APIs could broaden the platform's scope.

The results confirm that Buzz-Hub successfully meets the needs of modern peoples and service providers by providing a unified, efficient and reliable online shopping platform.

4.4 Summary

Of course, this particular chapter offered a focus on the process of Buzz-Hub implementation, the strategies for testing, the methods of evaluation, and the result arrived at while creating the application. This helped in easing the application of frontend, backend as well as other external services such as Stripe and SendGrid. The final section of the study confirmed the stability, safety and efficiency of the system submitted to testing and assessment. Hence, a range of tests such as unit integration test, system test and user acceptance test were conducted to ensure that other functionalities worked as required. Some challenges encountered during testing were addressed which lead to a bullet proof system with user-friendliness.

Chapter 5

Engineering Standards and Design Challenges

5.1 Compliance with the Standards

Compliance with engineering standards ensures that the development of Buzz-Hub adheres to industry best practices by promoting reliability, security and compatibility. The project follows well-established software, hardware and communication standards to deliver a robust and user-friendly system. These standards ensure consistency across various components and enable seamless integration with third-party services like Firebase, Stripe and SendGrid. By adhering to these guidelines, the system achieves high performance, scalability and user satisfaction. Further details on specific standards are discussed in the following subsections.

5.1.1 Software Standards

The development of Buzz-Hub adhered to widely recognized software standards to ensure quality, reliability and maintainability. Key standards followed include:

1. Coding Standards:
 - The project followed ESLint for consistent JavaScript code styling and error detection during development.
 - Modular and reusable code practices were adopted in both the next.js frontend and the Next.js backend to ensure maintainability and scalability.
 - Meaningful variable and function naming conventions were implemented to improve code readability and understanding.
2. Security Standards:
 - Secure communication was established using JWT-based authentication to protect sensitive user data during client-server interactions.
 - Passwords and sensitive data were encrypted and stored securely in the database following best practices.

3. API Standards:
 - RESTful API principles were implemented using Express.js for consistency in resource naming and proper use of HTTP methods (GET, POST, PUT, DELETE).
 - APIs returned well-structured JSON responses with appropriate HTTP status codes for error handling and success notifications.
4. Database Standards:
 - MongoDB was designed with a clear and normalized schema structure to avoid redundancy and optimize data retrieval.
 - Proper use of indexing and unique constraints was implemented to enhance performance and maintain data integrity.
5. UI/UX Standards:
 - The frontend design followed modern UI/UX principles which ensures accessibility and responsiveness across devices using Tailwind CSS.
 - Consistent design patterns, navigation flows and feedback mechanisms (e.g., form validations, notifications) enhanced the user experience.
 - W3C guidelines were considered for cross-browser compatibility and responsive design.

By adhering to these standards, the implementation of Bazz-Hub resulted in a secure, efficient and user-friendly application. It ensures compliance with industry best practices while meeting the project's requirements.

5.1.2 Hardware Standards

The development and deployment of Buzz-Hub adhered to industry-recognized hardware standards to ensure compatibility, performance, and scalability. The following hardware considerations were applied:

1. Development Environment:
 - Development workstations met modern hardware requirements including a minimum of 8 GB RAM, Intel Core i5 processor and SSD storage to support tools like next.js and MongoDB during the development process.
2. Server Requirements:
 - The backend server hosting the Next.js and Express.js application required cloud infrastructure compatible with Linux-based operating systems at least 2 vCPUs, 4 GB RAM and scalable storage options to handle database operations and API requests efficiently.
3. Database Hosting:
 - MongoDB Atlas was used for cloud-based database hosting providing high availability, auto-scaling and compliance with data center standards such as ISO 27001 and SOC 2 for secure storage and retrieval of user data.

4. Network Infrastructure:
 - Hosting servers were connected to high-speed, reliable networks with low-latency connections to support real-time communication between the client and server.
5. End-User Devices:
 - The application was optimized to run on devices adhering to common consumer hardware standards such as smartphones, tablets and desktops with modern browsers and an active internet connection.

By following these hardware standards, Buzz-Hub ensured that the system could run efficiently in both development and production environments while providing a seamless experience for end users. These considerations also contributed to the system's scalability and compatibility across various platforms.

5.1.3 Communication Standards

The development and operation of Buzz-Hub adhered to widely recognized communication standards to ensure secure, efficient and reliable data exchange between components and external systems. The following standards were implemented:

1. HTTP/HTTPS Protocols:
 - Communication between the client and server as well as external APIs (e.g., Stripe and SendGrid) was conducted over HTTPS by ensuring encrypted and secure data transmission.
 - Standard HTTP methods (GET, POST, PUT, DELETE) were used consistently in RESTful API design adhering to protocol conventions.
2. JSON Format:
 - All client-server interactions were standardized using JSON (JavaScript Object Notation) as the data interchange format which enabled lightweight, human-readable and easily parsable communication.
3. Authentication and Authorization:
 - Secure token-based communication was achieved using JWT (JSON Web Tokens) ensuring that only authenticated users could access protected resources.
 - Tokens were passed through the HTTP headers as per standard practices.
4. Email Communication:
 - SMTP (Simple Mail Transfer Protocol) was used in conjunction with SendGrid for delivering email notifications.
 - Standard email headers and MIME formats were employed to ensure compatibility with all major email clients.
5. WebSocket Standards (Future Scope):

- While not implemented in the current version, the system is designed to integrate WebSocket standards for real-time communication (e.g., chat features or live updates) in future iterations.
6. Error Handling and Status Codes:
- HTTP status codes were consistently used to indicate the outcome of API requests (e.g., 200 for success, 401 for unauthorized access, 500 for server errors).
 - Detailed error messages were included in API responses to assist in debugging and enhance developer experience.

By adhering to these communication standards, Buzz-Hub ensured secure, consistent and seamless interactions between its components, external services and end users. These practices contribute to the overall reliability and interoperability of the system.

5.2 Impact on Society, Environment and Sustainability

This section explores the broader implications of Buzz-Hub on society, the environment and sustainability. It highlights how the platform influences users' lives, fosters social and economic growth and addresses environmental challenges. Additionally, the section examines ethical considerations and outlines a sustainability plan to ensure that the system's impact remains positive and enduring in the long term. Through these discussions, this section demonstrates how Buzz-Hub aligns with societal needs and global sustainability goals.

5.2.1 Impact on Life

The development and deployment of Buzz-Hub have a profound impact on the lives of its users, service providers and other stakeholders by addressing several challenges associated with e-commerce management. By offering a unified platform for product bookings, system management and guide appointments, Buzz-Hub significantly enhances the convenience, accessibility and quality of online shopping experiences.

Empowering Customers

Buzz-Hub provides customers with a seamless way to plan their product purchases. The platform consolidates multiple product-related services into a single application and saving users from the hassle of navigating multiple websites or applications. Users can browse products, add cart and purchase products with ease. Users also benefit from features such as search filters, verified profiles and real-time notifications. This results in:

- Time Savings: Customers can purchases their products more efficiently and it

- reduces the time spent on fragmented planning processes.
- **Enhanced Confidence:** Verified profiles for products, quality and guides build trust also give users confidence in their purchases.
- **Improved Accessibility:** The user-friendly design ensures that people of all ages and technical abilities can benefit from the platform.

Supporting Service Providers

For admin managers, brand agents and product guides, Buzz-Hub offers role-specific dashboards to manage services, purchases and deliveries. This streamlines their operations and improves their ability to reach a wider audience. The platform empowers service providers by:

- **Increasing Visibility:** Service providers can showcase their offerings to a large and engaged audience.
- **Streamlining Operations:** Features like automated notifications and booking management reduce manual effort and errors.
- **Enabling Growth:** Subscription-based profiles for products guides and tools for managing services create opportunities for increased revenue.

Fostering Economic Opportunities

Buzz-Hub facilitates economic growth by bridging the gap between customers and local service providers. By enabling users to connect with products, brands and local agencies the platform promotes the local e-commerce website. This has a ripple effect creating jobs and boosting the economies of product purchases.

5.2.2 Impact on Society & Environment

The introduction of Trippie has brought significant positive impacts on society and the environment by promoting responsible tourism, improving accessibility and enabling sustainable practices. By connecting travelers with local service providers and offering integrated travel solutions the platform influences social dynamics and environmental awareness in meaningful ways.

Impact on Society

1. **Promoting Local Economies:**
 - Trippie supports local businesses by providing a platform for hotel managers, tour agents and tour guides to showcase their services to a wider audience.
 - By connecting travelers directly with local service provider the platform fosters economic growth in tourism-dependent regions.
2. **Improving Accessibility:**
 - The platform's user-friendly interface ensures that people from diverse backgrounds and technical abilities can access and utilize its services

effectively.

- Features like filtering tours by destination or searching guides by service area make travel planning more inclusive and accessible for users with specific needs or preferences.

Impact on the Environment

1. Encouraging Sustainable Tourism:

- Buzz-Hub enables users to make informed decisions by offering verified profiles and transparent reviews. It is encouraging eco-conscious customers to support sustainable shopping services.
- The platform can promote tours and accommodations that follow environmentally friendly practices such as eco-lodges or green-certified agencies.

2. Reducing Paper Waste:

- By digitizing the entire shopping planning process, Buzz-Hub eliminates the need for paper-based shopping, products purchase and tickets which reduce the environmental footprint of easiest shopping arrangements.

3. Promoting Awareness:

Through its communication channels, Buzz-Hub can educate users about responsible shopping practices such as minimizing waste, respecting time management and conserving online resources.

5.3 Project Management and Financial Analysis

This section delves into the structured management of the Buzz-Hub project emphasizing the importance of planning, resource allocation, risk assessment and financial analysis. By following a systematic approach, Buzz-Hub aims to enhance customer satisfaction and optimize resources for service providers and operators.

5.3.1 Project Management

Feature	Input	Output
User Registration and verifications	User details (Name, email etc.)	Registered user Profile
Home	User login with user name, customer id and password.	Personalized dashboard, key information display.
Product details	Every product details are properly seen the users and the show the product categories, collection and review.	Product features are shown and provide a proper clearance in every products.

Add Cart	Cart provide the order conformation step and the payment method and the shipping method.	Collect the products details and order information and shipment system outcome.
Account/Payment	Login with the proper information and updated the profile information and submit the actual password.	Conformation the user interface and provide the odder access.
Oder configure	Conformed the odder and save the odder address and the delivery address.	Collect the odder product details and delivery address.
Others	Provide Some creative ads and video to impress our website.	Some feedback to the online section such as– facebook, twitter etc.

5.3.2 Financial Analysis

Task Name	Duration	priority	Hours of Time	Cost Estimate (Taka)
Project scope definition	2 weeks	High	40 hours	50,000/-
Risk Identification and mitigation	1 week	Medium	20 hours	25,000/-
Feasibility Study	3 weeks	High	70 hours	70,000/-
Resource Plan	2 weeks	High	30 hours	50,000/-
Cost Estimation	3 weeks	High	75 hours	1,50,000/-
Cost Benefit Analysis	5 weeks	High	55 hours	65,000/-
Design	4 weeks	High	75 hours	1,25,000/-
Development	7 weeks	High	95 hours	2,00,000/-
Testing	6 weeks	High	60 hours	70,000/-

Deployment and Launch <ul style="list-style-type: none"> ○ Domain ○ Server Configuration 	High	34	2-3	DevOps Engineer, Deployment Specialist	5,000 15,000
Marketing and Promotion <ul style="list-style-type: none"> ○ Advertisement Campaigns ○ Social Media Marketing 	Medium	Ongoing	Ongoing	Marketing Team	15,000 10,000
Continuous Improvement <ul style="list-style-type: none"> ○ Regular Maintenance and Updates 	Low	Ongoing	Ongoing	Development Team	200,000/year (maintenance)
Contingency (10% of total)	High	--	--	--	34,700
Total Estimated Cost					382,700

5.4 Complex Engineering Problem

5.4.1 Complex Problem Solving

The development of Buzz-Hub involved addressing real-life complex engineering problems by adhering to various categories of problem-solving. Each mapping is detailed below with a rationale for how it applies to the project and is referenced within the report.

Table 5.1: Mapping with complex problem solving.

EP1 Depth of Knowledge	EP2 Range of Conflicting Requirements	EP3 Depth of Analysis	EP4 Familiarity of Issues	EP5 Extent of Applicable Codes	EP6 Extent of Stakeholder Involvement	EP7 Interdependence
✓	✓	✓	✓	N/A	✓	✓

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✓	✓	✓	✓	N/A	✓	✓

EP1: Depth of Knowledge

Rationale: The project required an in-depth understanding of multiple domains including frontend development using Next.js, backend technologies like Next.js and Express.js and database management with MongoDB. Additionally, integration with third-party APIs such as Firebase, Stripe and SendGrid demanded advanced knowledge of API communication and security protocols. This is extensively discussed in Sections 3.1 (Requirement Analysis and Design Specification) and 3.2 (Detailed Methodology and Design).

EP2: Range of Conflicting Requirements

Rationale: Balancing the needs of diverse user roles (e.g., customers, admin, product quality and cart) required resolving conflicting requirements. For example, while users demanded simplicity the service providers required advanced management tools. These conflicts were resolved through role-based dashboards and a modular design approach as detailed in Sections 3.1.3 (Functional Requirements) and 3.1.9 (UI Design).

Conflicts were mitigated by adopting a modular design pattern and providing customized dashboards to ensure that each user role's requirements were met without compromising usability.

EP3: Depth of Analysis

Rationale: Developing Buzz-Hub required selecting a suitable implementation model as no obvious solution existed for integrating product purchase, product quality and excellent delivery system into one platform. After evaluating multiple approaches, a modular architecture was chosen as discussed in Section 3.2 (Detailed Methodology and Design). This ensured scalability, maintainability and seamless integration of services.

Technologies like Next.js, MongoDB were selected for their ability to handle dynamic and interconnected functionalities. The methodology detailed in Section 3.2 highlights how these tools were combined to address complex system requirements efficiently.

EP4: Familiarity of Issues

Rationale: Developing Buzz-Hub required applying computer science expertise to the unfamiliar domain of tourism. As a CSE student with limited knowledge of the online shopping sector and its business models understanding the intricacies of product purchase, product management and customer services posed unique challenges. Through research and domain analysis as detailed in Section 2.2 (Literature Review) and 3.1.3 (Functional Requirements), these gaps were effectively bridged by leveraging technical skills to address industry-specific needs.

Features like role-based dashboards and personalized services demonstrate how technical knowledge was adapted to solve problems in an unfamiliar field.

EP6: Extent of Stakeholder Involvement

Rationale: The development involved extensive collaboration with stakeholders including end-users (customers and service providers) to gather requirements and refine the system. Feedback during User Acceptance Testing (UAT) was instrumental in improving the application as outlined in Section 4.2 (Testing and Evaluation).

Stakeholders actively participated in requirement analysis and UAT phases to ensure that the system is aligned with user expectations.

EP7: Interdependence

Rationale: The project featured high interdependence between components such as the frontend, backend and external systems. Each module had to function seamlessly with others that require robust integration and testing as demonstrated in Sections 3.2 (Detailed Methodology and Design) and 4.2 (Testing and Evaluation).

Interdependence was managed using modular architecture and integration testing to ensure consistent data flow and functionality.

Mapping with Knowledge Profile for EP1

This table 5.2) is designed to map the EP1 to the Knowledge Profile.

Table 5.2: Mapping with knowledge Profile.

K3 Engineering Fundamentals	K4 Specialist Knowledge	K5 Engineering Design	K6 Engineering Practice	K8 Research Literature
✓	✓	✓	✓	✓

K3 (Engineering Fundamentals)

Fundamental programming skills and system design principles were applied in creating efficient algorithms for purchasing processes and search functionalities. This is discussed in Section 3.1.2 (System Design).

K4 (Specialist Knowledge)

Specialized knowledge of web development frameworks (Next.js) and third-party API integrations (Stripe, Firebase) was essential. Detailed in Section 3.1.3 (Functional Requirements).

K5 (Engineering Design)

The project employed structured engineering design methodologies such as system architecture, data flow diagram, context diagram, sequence diagram and ER diagram to create scalable and maintainable solutions. Covered in Section 3.1 (Requirement Analysis and Design Specification).

K6 (Engineering Practice)

Best practices in software development including modular coding, secure authentication and scalable deployment were implemented. Discussed in Section 4.1 (Environment Setup).

K8 (Research Literature)

The design and implementation were informed by research into existing shopping platforms, identifying gaps and opportunities for improvement. Covered in Section 2.2 (Literature Review).

5.4.2 Engineering Activities

The implementation of Buzz-Hub involved multiple complex engineering activities, each mapped to critical aspects of engineering practices. These mappings highlight how the project addressed challenges and contributed to solving real-world problems.

Table 5.3: Mapping with complex engineering activities.

EA1 Range of resources	EA2 Level of Interaction	EA3 Innovation	EA4 Consequences for society and environment	EA5 Familiarity
✓	✓	N/A	✓	✓

EA1: Range of Resources

Rationale: The development of Buzz-Hub required managing a diverse range of resources including cloud-hosted databases (MongoDB Atlas), secure payment gateways (Stripe), real-time notification services (SendGrid) and authentication mechanisms (Firebase). The integration of these resources combined with frontend and backend development tools like React.js and Node.js, ensured the seamless functioning of the platform. This is detailed in Section 3.1.2 (System Design) and 4.1

(Environment Setup).

Resources were utilized across different domains, including software, APIs, and infrastructure, ensuring scalability and efficiency.

EA2: Level of Interaction

Rationale: The project involved significant interaction between system components including APIs, databases and external services. The client-server communication required secure data exchange and consistent interaction between various modules. This is extensively outlined in Sections 3.1.4 (Data Flow Diagram) and 4.2 (Testing and Evaluation).

Interaction levels were managed through RESTful APIs and secure communication protocols like HTTPS to ensure reliability and performance.

EA4: Consequences for Society and Environment

Rationale: Buzz-Hub positively impacted society by empowering local service providers and promoting offering opportunities. Additionally, the system reduced paper waste by digitizing shopping planning that contributes to environmental sustainability. These aspects are elaborated in Section 5.2.2 (Impact on Society and Environment).

The consequences included fostering local economic growth, reducing environmental impact and improving accessibility for users.

EA5: Familiarity

Rationale: While the technical tools (Next.js, MongoDB) used in Buzz-Hub were familiar and their application in the shopping domain was relatively novel. Adapting engineering knowledge to this unfamiliar sector required significant research and analysis as discussed in Sections 2.2 (Literature Review) and 5.4.1 (Complex Problem Solving).

Familiar engineering practices were extended to address challenges in an unfamiliar domain that bridge the gaps between technology and customer needs.

5.5 Summary

This chapter provided a comprehensive overview of the engineering standards and design challenges addressed during the development of Buzz-Hub. It detailed the project's adherence to software, hardware and communication standards which ensures quality, security and reliability. These standards laid the foundation for a robust system that meets both technical and user requirements. The chapter also explored the broader societal, environmental and ethical impacts of the project. Buzz-Hub contributes positively to society by empowering local service providers, enhancing user experiences and fostering economic growth. Environmental sustainability was promoted through paperless processes and optimized resource utilization. Ethical considerations such as data privacy, transparency and inclusivity

were integral to the system's design.

The project management and financial analysis sections outlined a structured approach to resource allocation, task management and risk mitigation to ensure the project's success within the defined budget. Additionally, the chapter addressed complex engineering problems, showcasing the depth of analysis, innovative solutions and the application of engineering principles to bridge knowledge gaps between computer science and the customer domain.

Finally, the engineering activities mapped the project's key processes, highlighting the effective use of resources, interaction between components and the system's societal and environmental consequences. Overall, Chapter 5 demonstrated how Buzz-Hub aligns with professional engineering practices while delivering impactful, sustainable and innovative solutions to real-world challenges.

Chapter 6

Conclusion

6.1 Summary

- 7 This report presented the comprehensive development journey of Buzz-Hub, a unified e-commerce management platform designed to streamline customers satisfaction , products purchase and proper delivery processes. The report began by identifying the real-world challenges faced by customers and service providers that emphasize the need for an integrated solution. It outlined the project's objectives, motivations and anticipated outcomes to provide a clear understanding of the platform's purpose and goals.
- 8 Finally, the project's management and financial aspects were discussed which provides insight into resource allocation, risk mitigation and overall execution. By aligning with industry standards and addressing real-world challenges, Buzz-Hub demonstrates its potential as a transformative tool in the online shopping and e-commerce industry that delivers meaningful value to users and service providers alike.

8.1 Limitation

While Buzz-Hub successfully integrates customers satisfaction, products quality and delivery services into a unified platform there were a few limitations identified during development and implementation:

1. Limited Scope for Localized Customization:
 - o At the moment the system is basically serve general online shopping needs, and does not support finer grain localized or regional or culturally specific requirements.
2. Scalability for High Traffic:
3. Limitations of the system include the fact that although the system's traffic

handling capability is demonstrated to be scalable up to moderate user concurrent usage, its performance under extremely high concurrent usage has not been well tested and may require further tuning. Limited AI and Personalization Features:

- Basic personalization is provided but advanced features like AI-driven delivery recommendations or dynamic pricing based on demand have not yet been implemented.
4. Data and Content Acquisition:
 - It is vulnerable to the kind of data provided to the customers, products details feed the platform. This is because information from service providers can sometimes be limited or often outdated.
 5. Market Penetration and Awareness:
 - Buzz-Hub is a new platform and currently lacks strong brand recognition and market penetration compared to established competitors which may impact initial adoption rates.

These limitations provide areas for improvement and opportunities for future enhancements also ensure that Buzz-Hub continues to evolve to meet user needs and market demands.

8.2 Future Work

To further enhance Buzz-Hub and address its current limitations there are several future directions that have been identified. These improvements aim to expand the platform's functionality, scalability and user experience to ensure its continued growth and relevance in the competitive e-commerce platform.

1. Integration of Advanced AI Features:
 - Incorporate AI-driven delivery recommendations, dynamic pricing based on demand and personalized itineraries to enhance user engagement and satisfaction.
 - Use machine learning to analyze user behavior and provide tailored suggestions for products details, our brand and customer satisfaction.
2. Support for Localized and Niche Features:
 - Develop region-specific functionalities to cater to local tourism needs such as cultural experiences, local transport options and language-based preferences.
 - Partner with local businesses to provide exclusive services and deals.
3. Enhanced Scalability:
 - Implement load-balancing techniques and optimize database queries to support high user traffic and ensure consistent performance under peak loads.
 - Explore containerization and microservices architecture for better scalability and maintainability.
4. Expansion of Payment Options:
 - Add support for additional payment gateways including region-specific

options such as PayPal, Google Pay and local mobile wallets (e.g., Bkash, Nagad) to cater to a broader user base.

5. Offline Access and Data Sync:

- The platform relies on the consistency and efficiency of data from customers, products details. Lack of comprehensive or up-to-date information from service suppliers may affect customers' satisfaction; Add offline access to saved data and user's itinerary with an automatic update upon reconnection to the internet. saved data and itineraries without an internet connection with automatic syncing once reconnected.

6. Improved Marketing and Awareness Strategies:

- Instead, rely on targeted marketing promotions, affiliations with regional and local tourism bodies and working with airline, hotel and travel company distribution channels to promote the product..

7. Enhanced Content Management:

- Enlarge strategic marketing campaigns, promotions in cooperation with local tourism organizations, and collaborations with airlines, hotels and sell sheets, travel agencies to raise brand identification and utilization rate, o provide the opportunity to add more extensive descriptions and multimedia information such us videos and 360 degrees photos for service provider's profile pages..

8. Security Enhancements:

- Ongoing security measures to guard users' information and to counter new threats that are becoming rampant to meet the standard data protection laws..

9. Multi-Language and Currency Support:

- Offer multiple languages and multiple currency options to gain audiences from almost all over the world and to help ease the global e-commerce businesses.

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