Development of Digital Service Portal for Ztrios Tech and Marketing.

Md Mahamud Hasan

ID # 19203022

A practicum report submitted in partial fulfillment of the requirements for the award of Bachelor of Computer Science and Engineering

Department of Computer Science and Engineering

College of Engineering and Technology

IUBAT– International University of Business Agriculture and Technology

Spring 2023

Development of
Digital Service Portal for
Ztrios Tech and Marketing.

Md Mahamud Hasan

A practicum report submitted in partial fulfillment of the requirements for the degree of Bachelor of Computer Science and Engineering (BCSE)

The practicum has been examined and approved by,

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Letter of Transmittal

15 April 2023

The Chairman

Practicum and Placement Board

College of Engineering and Technology - CEAT

IUBAT- International University of Business Agriculture and Technology 4

Embankment Drive Road, Sector- 10, Uttara Model Town

Dhaka-1230, Bangladesh

Subject: Letter of Transmittal

Dear Sir,

With due respect, I want to acquaint you that, it is a great experience as well as immense pleasure for me to submit this report titled "Development of Digital Service Portal for Ztrios Tech and Marketing." for the fulfillment of my Practicum course.

It was a splendid opportunity for me to work on this project to actualize my theoretical knowledge and has an enormous exposure with the corporate culture of a renowned company. Now I am looking forward for your kind appraisal regarding this practicum report.

I shall remain deeply grateful to you if you kindly go through this report and evaluate my performance.

Your Sincerely,

Md Mahamud Hasan
ID# 19203022

Letter of Authorization

15 April 2023

IUBAT – International University of Business Agriculture and Technology

4 Embankment Drive Road, Sector -10

Uttara Model Town, Dhaka-1230

Subject: Letter of Authorization

Dear Md Mahamud Hasan,

You will be happy to know that project on “Development of Digital Service Portal for Ztrios Tech and Marketing.” has been accepted by the department. We hope you will successfully complete the project on time. After successful completion of the project, you are requested to write a report based on the project.

For any kind of needs, don’t hesitate to contact with us.

Co Supervisor	Supervisor
Dr. Hasibur Rashid Chayon	Krishna Das
Coordinator and Associate Professor	Assistant Professor
Department of Computer Science and Engineering	Department of Computer Science and Engineering

Student's Declaration

I am Md Mahamud Hasan, a student of BCSE-Bachelor of Computer Science and Engineering program, under the College of Engineering and Technology (CEAT) of International University of Business Agriculture and Technology (IUBAT) declaring that, this report on the topic of 'Development of Digital Service Portal for Ztrios Tech and Marketing.' has been prepared for the fulfillment of the internship course CSC 490, which is the partial requirement of Bachelor of Computer Science and Engineering degree.

The report and the project on "Development of Digital Service Portal for Ztrios Tech and Marketing." are originally prepared by me. All module and procedure of this project made after proper inspection and internet information.

It has not been prepared for any other purposes, rewards or presentations.

Md Mahamud Hasan

ID #19203022

Program: BCSE

Acknowledgements

In the name of Allah, most merciful, most gracious and most benevolent.

I am very much grateful to thank a few people who have, assisted, encouraged, directed and supported me throughout my practicum program.

I want to thank my parents, who have endowed their immeasurable-innumerable support and encouragement to attain this exquisite event of my life.

My outmost and sincere gratitude goes to Dr. Hasibur Rashid Chayon, Coordinator of Department of Computer Science and Engineering, who is most sincere and responsible person for the design of our course curriculum, for which we experience the professional environment and working experience on real life projects.

I would like to pay my gratitude to my faculty advisor Mr. Krishna Das, Assistant Professor of Computer Science & Engineering Department, who has guided me all through my project and report, for not only in this semester but also throughout my university life by giving his valuable suggestions and advices at any time, any situation. I was able to develop this project and report effectively and properly only for his perfect guidance.

Last but not least, I sincerely would like to thank Ridwanul Islam Rifat (Co-Founder & Chief Executive Officer, Ztrios Tech and Marketing) for giving me the opportunity to complete my internship and project at Ztrios Tech and Marketing.

Their continuous encouragement and contribution gave me the courage and determination needed to complete the internship and project properly.

Supervisor's Certification

This is to certify that Practicum report on "Development of Digital Service Portal for Ztrios Tech and Marketing." has been carried out by Md Mahamud Hasan, bearing ID# 19203022, of IUBAT– International University of Business Agriculture and Technology, as a partial fulfillment of the requirement of practicum defense course. The report has been prepared under my guidance and is a record of the accomplished work, carried out successfully. To the best of my knowledge and as per his declaration, no parts of this report has been submitted anywhere for any degree, diploma or certification.

Now he is permitted to submit the report. I wish him success in all his future endeavors.

Practicum Supervisor

_____

Krishna Das

Assistant Professor

Department of Computer Science and Engineering

IUBAT- International University of Business Agriculture and Technology

Department's Certification

On behalf of the Department of Computer Science and Engineering of IUBAT- International University of Business Agriculture and Technology, we, the undersigned, certify that this practicum report 'Development of Digital Service Portal for Ztrios Tech and Marketing.' for the award of Bachelor of Computer Science and Engineering (BCSE) degree was duly presented by Md Mahamud Hasan (ID No.19203022) and accepted by the department.

Krishna Das

Supervisor

Assistant Professor, Department of Computer Science and Engineering

IUBAT- International University of Business Agriculture and Technology

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Dr. Hasibur Rashid Chayon

Coordinator and Associate Professor,

Department of Computer Science and Engineering

IUBAT- International University of Business Agriculture and Technology

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Prof. Dr. Utpal Kanti Das

Chair & Professor

Department of Computer Science and Engineering

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Abstract

The Digital Service Portal offers a wide range of digital services, including web design, SEO, Facebook ad boosting, IT services, currency conversion, cloud computing, hosting, and more. The user-friendly platform enables businesses to order services quickly and easily, making it an essential tool for modern-day businesses. The purpose to create this the hassle of manually managing orders.

One of the key features of the Digital Service Portal is its ability to track orders in real-time. This functionality ensures timely delivery of services to clients, resulting in enhanced customer satisfaction. Moreover, customers can manage their orders and communicate with the admin team through the personalized dashboard feature, which further enhances the customer experience.

As the developer, I also contributed to the platform's reporting and analytics module, which provides valuable insights into the performance of different services and the overall platform. The admin team can use these insights to optimize the platform's performance and improve its overall efficiency.

In addition to offering a user-friendly interface and real-time tracking, the Digital Service Portal is also designed to comply with all applicable laws and regulations related to data privacy and security. The platform uses advanced encryption techniques to secure customer information and transactions, making it a safe and reliable platform for ordering digital services.

Looking to the future, my plan is to continue improving the Digital Service Portal by advanced features and real-time tracking, the platform ensures timely delivery of top-notch services while enabling the admin team to efficiently manage operations and enhance customer satisfaction.

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Chapter 1

Organization Overview

1.1 Organizational Overview

Ztrios Tech and Marketing is a Software Development, Marketing Solution Integration and Consultancy Company, engaged in complex functionality in the area of Web and Mobile based applications. Established in 2018, Their primary focus is on creating complex web and mobile-based applications that are customized to meet the unique needs of their clients. They have a global workforce comprising experts from diverse backgrounds who collaborate to ensure client satisfaction and technology innovation.

Figure-1.1: Ztrios Tech and Marketing logo

Ztrios Tech and Marketing has built a strong reputation for delivering high-quality solutions within budget and on time, resulting in long-term customer relationships. They collaborate with clients to guide them in selecting the best products from their showcase and implementing the right applications to help organizations move forward quickly. The company is committed to providing exceptional service across all areas of the organization, with unparalleled and reliable consultancy, implementation, and support.

Aim of Ztrios Tech and Marketing Limited:

The aim is to help businesses leverage the latest technologies to achieve their goals. By collaborating with clients and providing exceptional service, Ztrios Tech and Marketing aims to build long-term relationships that drive business success. Their ultimate goal is to be a reliable partner for businesses looking to stay ahead of the competition and succeed in today's fast-paced market

LANGUAGE: Python**,** Java, PHP, JavaScript, Objective-C, C/C++

1.2 Organization Services

- Web Development
- Mobile App Development
- Business Solution
- Software Development
- Digital Marketing
- Video and Photography
- Hosting

1.3 Location

Address: 5th Floor, House # 16, Rd #09, Sector #01, Uttara, Dhaka 1230

Hours: Opens 9.30AM Saturday - Thursday

Phone: 01713-004250

1.4 The Vision

Seek competitive advantages for our clients through innovative use of modern technologies; and help the clients achieve long-term success and prosperity through integrated business application

1.5 The Mission

They started operation in 2019 with the aim to make any complex business idea as simple as possible and boost the business with our Software Solution to achieve the highest growth rate. Unlike others, they work smartly and systematically rather than work day and night relentlessly.

1.6 My Position in this Company

I joined in this company as an intern. I was assigned under a supervisor who is a Senior Software Engineer and also Co-Founder in the company. Under his supervision I have completed my project. For his position he is a very busy person but still he gave me time for my work. I have learned many things within this period of time. I also got myself introduced with the official environment. I really enjoyed working there and gathered a great experience for my future professional life.

1.7 Organizational Structure

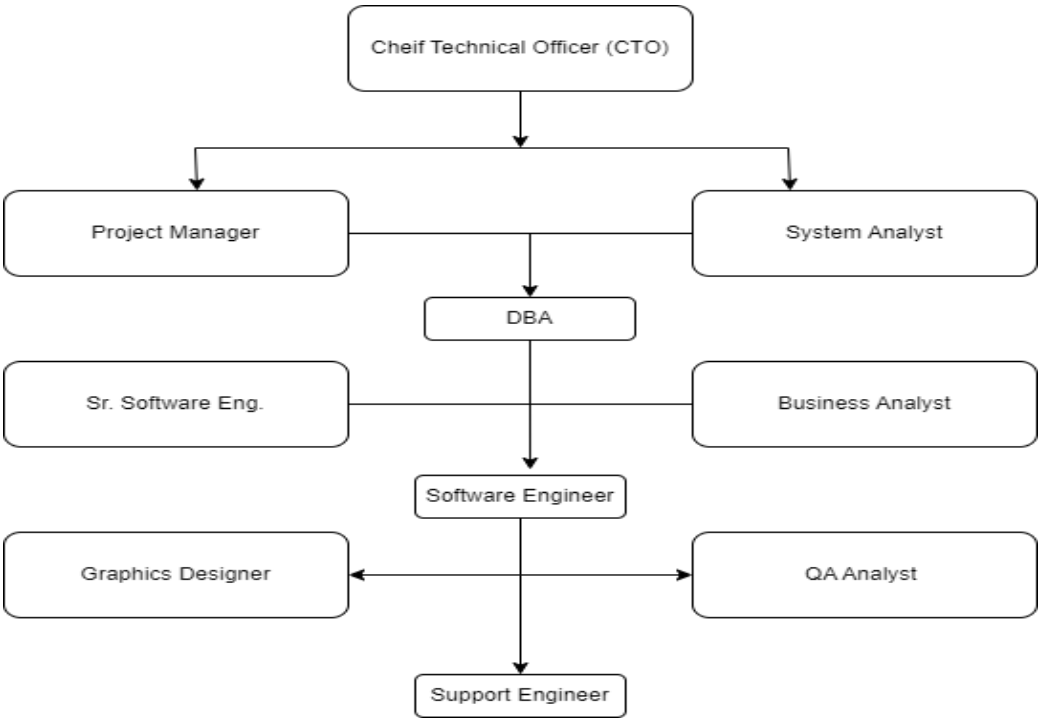

Figure 1.2: Organizational structure

Chapter 02

Project Introduction

2.1 Introduction

In today's digital age, customers demand fast, convenient, and accessible services. The Digital Service Portal is a response to this demand, offering customers an easy-to-use platform to access a range of services, including Facebook ad boosting, web site SEO, cloud computing, marketing, and currency exchange. The platform provides an efficient and user-friendly way for customers to access these services, without the need for manual intervention.

The aim of this project report is to provide a comprehensive overview of the Digital Service Portal, including its purpose, scope, features, and development process. This report will be useful for anyone interested in understanding the benefits of using a digital service portal to streamline their business operations and enhance customer experience.

The report will start with an overview of the Digital Service Portal, including its main features and functionalities. It will then describe the development process of the platform, including the tools and technologies used, any challenges faced during development, and how they were overcome.

Next, the report will discuss the benefits of the Digital Service Portal, including how it can help businesses to improve their customer service, reduce manual intervention, and increase efficiency. It will also describe the potential impact of the Digital Service Portal on the market, including how it can help businesses to compete more effectively and attract new customers.

The report will conclude with a summary of the key findings and recommendations for future development. It will also highlight any limitations or potential areas for improvement of the Digital Service Portal, and suggest possible solutions.

In summary, the Digital Service Portal is a powerful management tool that can help businesses to streamline their operations and provide better service to their customers. By offering a range of services through an easy-to-use digital platform, businesses can reduce manual intervention, increase efficiency, and enhance customer experience. This project report provides a comprehensive overview of the Digital Service Portal, and its potential to transform the way businesses operate in the digital age.

2.2 Background of Study

The rise of digital technologies has transformed the way businesses operate in recent years. With the widespread use of smartphones, tablets, and other digital devices, customers now expect fast and convenient access to services from anywhere, at any time. This has created a demand for digital service

portals, which can offer customers an easy-to-use platform to access a range of services.

One of the key drivers of the Digital Service Portal is the rise of e-commerce. As more and more businesses move their operations online, the need for efficient and reliable online services has become critical. Customers now expect to be able to order products and services online, and receive them quickly and securely. Digital service portals provide a way for businesses to meet this demand, by offering a range of services through an easy-to-use platform.

Another driver of the Digital Service Portal is the need for businesses to reduce manual intervention and increase efficiency. In the past, customers would have to contact businesses manually to place orders, make payments, or resolve any issues. This could be a time-consuming and inefficient process, particularly for businesses that receive a high volume of orders. Digital service portals provide a way to automate many of these processes, reducing manual intervention and increasing efficiency.

The Digital Service Portal also reflects the growing trend towards cloud computing. Cloud computing has revolutionized the way businesses store and access data, by providing a flexible and scalable way to store and process data. Digital service portals can take advantage of this technology, by offering cloud-based services that can be accessed from anywhere, at any time.

2.3 Objectives

The overall objective of the Digital Service Portal is to provide businesses with a platform to offer a range of services to their customers, while reducing manual intervention, increasing efficiency, and improving customer experience. Specific objectives include offering a range of services through an easy-to-use platform, automating processes, enhancing customer experience, taking advantage of cloud-based technologies, and helping businesses compete more effectively in the digital market.

2.3.1 Broad Objective

The ultimate aim of this project was to automate the routine function of businesses an efficient and user-friendly platform to provide a range of services to their customers.

2.3.2 Specific Objective

The aim and objectives were to handle the followings:

1. To automate the process of taking customer orders and payments, reducing the need for manual intervention.
2. To provide a user-friendly interface for customers to easily access a range of services.
3. To offer cloud-based services that can be accessed from anywhere, at any time, making the platform highly accessible and scalable.
4. To provide real-time updates to customers on the status of their orders and services, enhancing the overall customer experience.
5. To offer a range of digital marketing services, such as Facebook ad boosting and website SEO, to help businesses promote their products and services online.
6. To provide a secure and reliable platform for businesses to offer currency exchange services to their customers.

2.4 Proposed System

The proposed system, the Digital Service Portal, is a web-based platform that is designed to help businesses automate their service offerings to customers. It offers a range of features that include a user-friendly interface for managing orders, automated payment processing, digital marketing services, and secure flexible payment options. The platform also provides cloud-based services that are scalable and flexible, making it easy to access and use from anywhere. Overall, the Digital Service Portal aims to simplify the process of offering services to customers, while improving efficiency and enhancing customer experience.

In addition to the functions highlighted above, the system performs the basic functions of storage, retrieval and manipulation of digital services data and information.

The benefits of the proposed system are as follows:

1. Improved efficiency: By automating many of the processes involved in offering services, the Digital Service Portal reduces manual intervention, streamlines operations, and improves overall efficiency.
2. Enhanced customer experience: The platform offers a range of features, such as real-time order tracking and a user-friendly interface, that help to enhance the overall customer experience.

3. Scalability: The cloud-based nature of the platform means that it can be scaled up or down as needed, making it flexible and able to meet the needs of businesses of all sizes.

4. Increased accessibility: The ability to access the platform from anywhere, at any time, means that businesses can offer their services to a wider audience, and customers can access these services easily.

5. Improved accuracy: With automated payment processing and real-time order tracking, the Digital Service Portal reduces the potential for errors and helps to ensure accuracy throughout the service offering process.

6. Competitive advantage: By offering a range of services through a user-friendly and efficient platform, businesses can gain a competitive advantage in the digital market, and offer services that meet the evolving needs of their customers and etc.

2.5 Methodology

This is the method, ruled or ways of collecting data of research. The project was to be carried out by simulating a manual system with automated system. Electing all necessary information was done by searching through internet and talking in person and from my own judgement. The Digital Service Portal was developed using the agile software development methodology, which allowed for iterative development and continuous feedback from stakeholders. This helped to ensure that the final product met the needs of the business and its customers.

2.6 Data Sources

2.6.1 Primary Data Source

Observing the day-to-day activities done in their marketing department, and talking in person to the officials.

2.6.2 Secondary Data Source

Data collected from several journals, articles, blogs etc.

2.7 Process Model

This project follows the **"Agile Process Model".** Agile process model refers to an iterative software

development approach. Agile methods divide tasks into smaller iterations or pieces and do not involve long-term planning directly. The steps of agile process model are:

1. **Planning & Requirements**
2. **Analysis & Design:**
3. **Implementation:**
4. **Testing**
5. **Evaluation.**

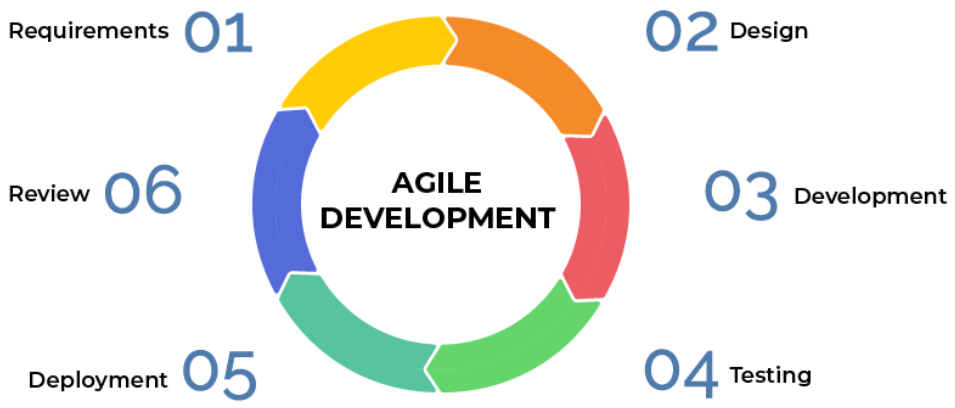

Figure 2.1: Agile process Model.

2.7.1 Features and Advantages of Iterative software model:

I have used agile process model in my project, because I developed this system in smaller increments and through repeated cycles (iteration). This software's requirements were clearly defined and understandable. There were some high-risk features and goals, which I thought might be changed in the future.

Advantages of Iterative Process-Model

- Customer satisfaction by rapid, continuous delivery of useful software.
- People and interactions are emphasized rather than process and tools. Customers, developers and testers constantly interact with each other.

- Working software is delivered frequently (weeks rather than months).
- Face-to-face conversation is the best form of communication.
- Testing and debugging during smaller iteration are easy.
- Close, daily cooperation between business people and developers.
- Continuous attention to technical excellence and good design.

2.8 Feasibility Study

A feasibility study assesses the operational, technical and economic merits of the proposed project. The feasibility study is intended to be a preliminary review of the facts to see if it is worthy of proceeding to the analysis phase. From the systems analyst perspective, the feasibility analysis is the primary tool for recommending whether to proceed to the next phase or to discontinue the project.

The feasibility study is a management-oriented activity. The objective of a feasibility study is to find out if an information system project can be done and to suggest possible alternative solutions.

2.8.1 Technical feasibility

The technical feasibility assessment is focused on gaining an understanding of the present technical resources of the organization and their applicability to the expected needs of the proposed system. It is an evaluation of the hardware and software and how it meets the need of the proposed system. The project entitles " **Development of Digital Service Portal for Ztrios Tech and Marketing.**" is technically feasible because of the below mentioned hardware and software, which are easily available, efficient, cheap and serve the purpose well enough.

Table I: Software and Hardware Requirements

SN	Hardware Requirements	Software Requirements
1.	Computer (Laptop, Desktop), Server	OS (Windows) [cross platform], Browser (Chrome)
2.	Fulltime electricity support	JavaScript, HTML, CSS, react and npm libraries
3.	8GB system memory with 512GB SSD	MySQL Database (Supabase)

2.8.2 Economic feasibility

In economic feasibility, my analysis time was maintained in the proper way and timely. The cost for the system is flexible for the company. The cost for employees' time will reduce if the system is perfectly maintained by the organization. The estimated cost of the hardware was approximately 1- lac

takas, and the estimated cost of the software tools is almost free. The software can be easily customizable and upgradeable anytime based on organization's need. So, I believe the proposed system will be economically beneficial.

2.8.3 Operational feasibility

I kept the interface of this project quite simple and understandable keeping the user's perspective in mind. In this project, the management will know the details of project during installation and the data will be maintained as decentralized.

The software would be very beneficial for the organization because it fulfills all the aspects in a police agency. All behaviorally angles are considered deliberately and reason that the task is behaviorally possible. So, I ensure this software is operationally feasible.

Chapter 3

Requirement Engineering

3.1 Requirement Analysis

Requirement analysis provides the software designer with a representation of information, function and behavior that can be translated to data, architectural, interface and component level designs. In the following task phases the requirement analysis for this project was done.

3.2. Requirements Engineering

Requirements engineering is, as its name suggests, the engineering discipline of establishing user requirements and specifying software systems. There are many definitions of requirements engineering; however, they all share the idea that requirements involve finding out what people want from a computer system, and understanding what their needs mean in terms of design. Requirements engineering is closely related to software engineering, which focuses more on the process of designing the system that users want. Requirement engineering includes following types:

- User requirements
- System requirements
- Functional requirements
- Non-Functional requirements

3.2.1 User Requirements

Following are the user requirements considered for building Digital Service Portal.

1. Only general users can make registration and login to the system.
2. Users can see announcements, offers according to their interests.
3. Users can check services that’re offering.
4. Users can see some statistics and reports.
5. User can view their purchase order.
6. Robust security measures to protect customer data and prevent fraud.

7. Admin can manage orders.
8. Admin can will list the services under main category.
9. Admin can check services that’re running.
10. User-friendly interface for managing orders and services.
11. User can partial payment for their order.
12. Admin can also create order for users.
13. Admin can generate reports based on orders.
14. Admin can check all types of order.
15. Admin can add, edit, delete, view user details.
16. Integrated popular payment gateways.
17. Mobile Friendly design.
18. Dashboard to manage services and track performance and can make decisions.
19. Automated billing and invoice and ability to download
20. Integrated social media platform
21. Offer physical and digital products for services
22. API integration to expand business with the platform

3.2.2 System Requirements

1. Only general users can make registration and login to the system

- Users will provide required info for registration toDSP
- System will check their credential’s validity.
- After successful registration, users can login to system with valid credentials.

2. **Users can see announcements, offers according to their interests**

- Users will be notified with the offers and announcements
- System shall use this information to display relevant announcements and offers to users

3. **Users can check services that're offering.**

- System shall provide a clear and concise description of each service
- System shall allow users to filter and search services based on their preferences.

4. **Users can see statistics and reports**

- This system shall generate and display reports related to services and orders.
- The system shall provide an east-to-understand graphical representation of the data

5. **System allows users to view their purchase orders**

- System shall provide a detailed view of the order, including the date, time, amount and status of the order
- The system shall allow users to track the status of their order.

6. **This system shall Implement robust security measures to protect customer data and prevent fraud.**

- Use SSL encryption to protect customer data during transmission
- Use Multi Factor authentication to prevent unauthorized access to user account
- System will change the access permission followed by the designation accordingly

7. **Allow Administrator to manage orders.**

- This system shall allow administration to view, edit and cancel orders as needed
- System shall provide real-time updates on the status of orders.

8. **Allow Administrators to list the services under main categories**

- The system shall provide a clear and concise description of each category
- Allow administrator to add, edit and delete categories as needed

9. **Allow Admin to view the services that are currently running.**

- The Interface shall provide real-time updates on the status of the services.
- Provide clear instructions and guidance for users to place an order or manage their services.

10. **User-friendly interface for managing orders and services**

- Users can view their purchase orders
- Users can make partial payments for their orders
- Admin can manage order and check all types of orders.

11. **System shall allow users to amake partial payments for their orders**

- The system shall allow uses to pay a portion of the total amount due at the time of order placement.
- The system shall provide real-time updates on the status of the payment.

12. **Allow Administrator to create order for users.**

- System shall allow administrators to specify the details of the order.
- System shall provide real-time updates on the status of the order.

13. **The system shall allow administrator to generate reports based on orders.**

- System shall provide reports on various metrics such as the number of orders, revenue generated etc.
- The system shall provide an easy-to-understand graphical representation of the data

14. **The system shall allow administrator to check all types of order**

- The system shall provide a detailed view of each order, including the date, time, amount and status of the order.
- The system shall allow administrators to search and filter orders based on various criteria.

15. **The system shall allow administrators to add, edit delete and view users details.**

- System shall provide a secure and easy-to-use interface for managing user accounts
- The system shall allow admin to modify user details such as name, email address etc.

16. **Integration with popular payment gateways to provide customers with a range of payment options.**

- The system should integrate with popular payment gateways such as PayPal, Stripe, and Braintree.
- Customers should be able to choose their preferred payment method at checkout.
- The system should ensure secure and reliable payment processing.

17. **Mobile-friendly design to ensure that customers can easily access the platform from their smartphones and tablets.**

- The system should have a responsive design that is optimized for mobile devices.
- Customers should be able to access all features and functionalities of the system from their mobile devices.
- The system should be compatible with both iOS and Android operating systems.

18. **Easy-to-use dashboard for businesses to manage their services, track performance, and make data-driven decisions.**

- The system should have a user-friendly dashboard for businesses to manage their services.
- Businesses should be able to track the performance of their services and make data-driven decisions based on analytics and insights.
- The dashboard should provide real-time updates and notifications.

19. **Automated invoicing and billing features to reduce manual work and improve accuracy**

- The system should have automated invoicing and billing features to reduce manual work.
- Invoices should be generated automatically and download it

20. **Integration with social media platforms to help businesses reach a wider audience and promote their services.**

- The system should integrate with popular social media platforms such as Facebook, Twitter and

Instagram.

- Businesses should be able to share their services and promotions on social media to reach a wider audience with meta data.

21. Ability to offer both physical and digital products and services.

- The system should support both physical and digital products and services.
- Businesses should be able to manage their physical inventory and delivery logistics.
- Customers should be able to download digital products and access them through their accounts.

22. API integration to allow businesses to integrate the platform with their own systems and tools

- The system should support API integration to allow businesses to integrate the platform with their own systems and tools. They will deal with a case based on priority
- The system should provide clear documentation and support for API integration

3.2.3 Functional Requirements

- ❖ The system should allow users to register with portal by providing their personal details and creating a unique login ID and password
- ❖ The system should enable admins to list various services provided by businesses under the main category
- ❖ The system should allow business to manage their services, including adding, updating and deleting them
- ❖ The system should enable customers to place orders for services they require, and allow business to accept or reject those orders
- ❖ The system should provide customers with a range of payment options and process payments securely and efficiently
- ❖ The system should generate reports for admins and businesses on orders, services and customer feedback.

3.2.4 Non-Functional Requirements

- ❖ The system should have a user-friendly interface that is easy to navigate and understand
- ❖ System should have robust security measures in place to protect customer data and prevent fraud.
- ❖ The system should be fast and reliable with minimal downtime or errors.

- The system should be designed to handle a growing number of users and businesses without compromising performance or security.
- The system should be compatible with different devices and operation systems including desktops laptops, smartphones and tablet

3.3 Specification of Each Requirement

3.3.1 Admin Specification

- **Function:** Log in, add information, edit information and delete information.
- **Description:** Role based access to the system.
- **Input:** Admin input his information in his criteria.
- **Output:** Information submits successfully.
- **Side effects:** None

3.3.2 User's Specification

- **Function:** Log in, add information, edit information.
- **Description:** Easily use the system for his useful purpose.
- **Input:** User input his information in his criteria
- **Output:** Information submits successfully.
- **Side effects:** None

3.4 Use Case Diagram

The Use Case Diagram drawn below represents how different types of users interact with '**Development of Digital Service Portal for Ztrios Tech and Marketing.**' and how the system interacts with its environment.

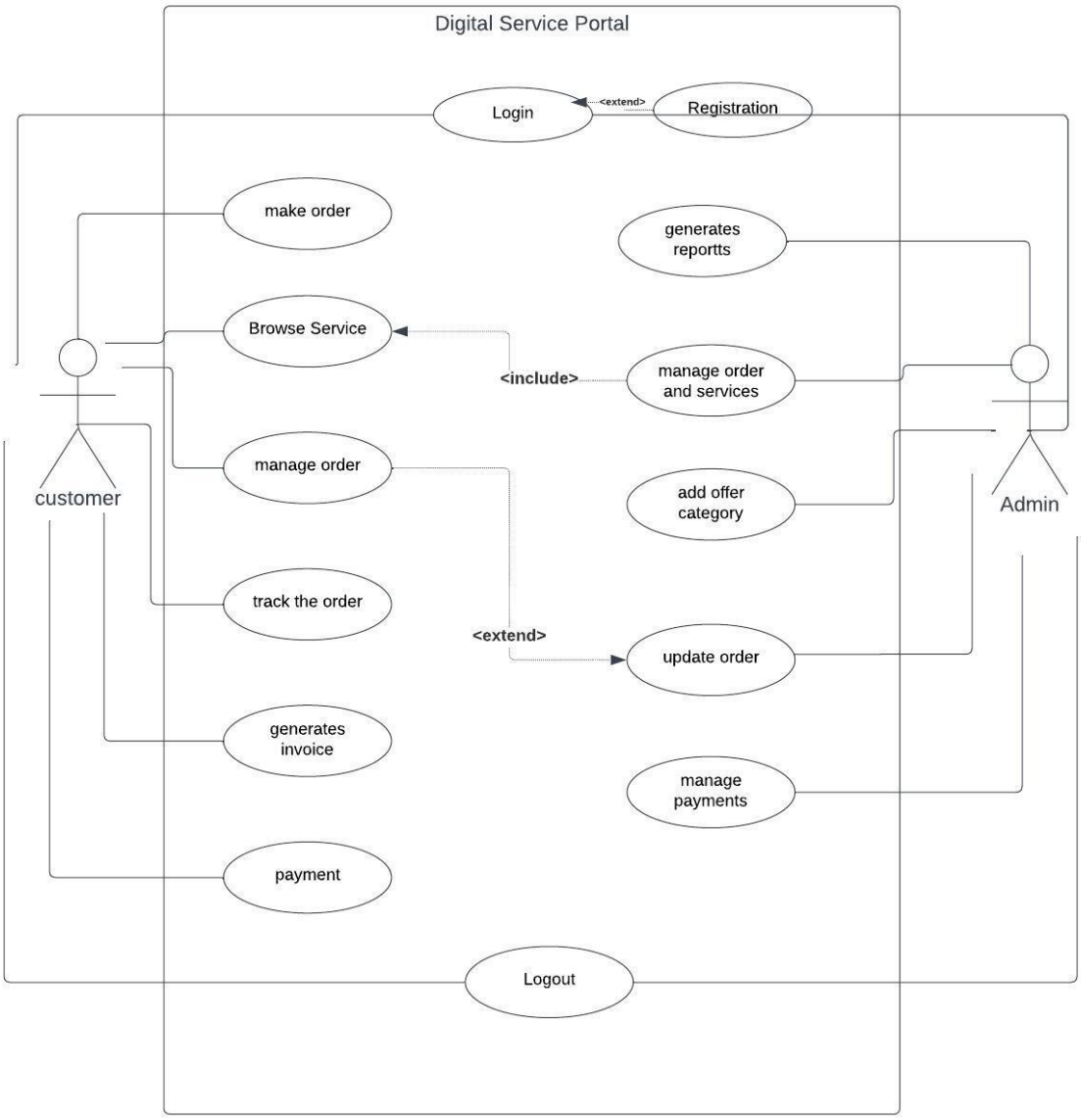

Fig 3.1 Use Case Diagram for DSP

3.4.1. Use Case Details

Use Case: Registration

Actor: Customer as General user

Description:

To access the system as an end user, one needs to make registration first to access some specific module. If any user is already registered, system will notify it to the user, otherwise registration will be done. After registration users will get an email to confirm his/her registration to the system. Without confirming the email no one can login the system.

Use Case: Login

Actor: General User

Description:

After successful registration, users can login to the system with valid credentials to access the services offered by the portal. The system will authenticate the user's credentials and grant access to the user.

Use Case: View Services

Actor: General User

Description: Users can view the services offered by the portal, including their descriptions and pricing. Users can browse and filter services according to their interests.

Use Case: Order Service

Actor: General User

Description: Users can order services by adding them to the cart and proceeding to the checkout. The system will prompt users to provide necessary information such as billing address and payment details.

Use Case: Make Payment

Actor: General user

Description: Users can make payments for the services they have ordered using the payment options provided by the portal. The system will integrate with popular payment gateways to provide users with a range of payment options.

Use Case: View Order Status

Actor: General User

Description: Users can view the status of their orders, including the order history, order details, and delivery status. The system will keep users informed about the progress of their order.

Use Case: View Announcements

Actor: General User

Description: Users can view announcements made by the portal, including new services, special offers, and updates. The system will notify users about new announcements that match their interests.

Use Case: Partial Payment

Actor: General User

Description: Users can make partial payments for their orders using the payment options provided by the portal. The system will keep track of the remaining balance and prompt users to make full payments when necessary.

Use Case: Create Order

Actor: Admin, General User

Description: They can create orders on behalf of users by adding services to the cart and proceeding to the checkout. The system will prompt admins to provide necessary information such as user details, billing address, and payment details.

Use Case: Manage Orders

Actor: Admin

Description: Admin can manage orders, including viewing order history, order details, and delivery status. Admins can cancel or modify orders as necessary.

Use Case: Generate Reports

Actor: Admin

Description: Admin can generate reports based on orders, including order history, sales reports, and customer analytics. The system will provide admins with insights to make data-driven decisions.

Use Case: Manage Services

Actor: Admin

Description: Admin can manage services offered by the portal, including adding new services, modifying existing services, and deleting services that are no longer available.

Use Case: Manage User Accounts

Actor: Admin

Description: Admin can manage user accounts, including adding new users, modifying existing user details, and deleting user accounts that are no longer needed.

Use Case: View Statistics

Actor: General User

Description: Users can view statistics and reports on the portal, including sales reports, customer analytics, and other insights that can help them make informed decisions.

Use Case: Robust Security Measures

Actor: System

Description: The system will implement robust security measures to protect customer data and prevent fraud, including encryption, secure data storage, and multi-factor authentication.

Use Case: Mobile-Friendly Design

Actor: System

Description: The system will have a mobile-friendly design to ensure that customers can easily access the platform from their smartphones and tablets.

Use Case: Automated Invoicing and Billing

Actor: User /Admin

Description: The system should generate automated invoices and bills for the services that the customers have purchased. The business owner or administrator should be able to view the generated invoices, edit them if necessary, and send them to the customers. The system should also be able to handle different billing cycles (e.g., monthly and partial) and generate automated bills accordingly.

Use Case: Social Media Integration

Actor: Business Owner/Administrator

Description: The system should allow business owners or administrators to integrate their social media accounts (e.g. Facebook, Twitter, Instagram) with the platform. This will allow them to promote their services, post announcements and offers, and engage with customers on social media platforms.

Use Case: Personalization

Actor: General User

Description: The system should provide personalized experiences to individual customers based on their preferences and previous interactions. The system should be able to recommend services and offers that match the customer's interests and purchase history. Customers should also be able to customize their profiles and preferences to get more relevant recommendations.

Use Case: Digital Products and Services

Actor: General User

Description: The system should allow businesses to offer digital products and services to their customers. Customers should be able to browse and purchase products as service.

Use Case: API Integration

Actor: Admin

Description: The system should provide API integration capabilities for businesses to integrate the platform with their own systems and tools. This will allow businesses to streamline their operations, automate processes, and improve efficiency.

Use Case: Data Backup and Disaster Recovery

Actor: Admin

Description: The system should have robust data backup and disaster recovery features to ensure that customer data is safe and secure. The system administrator should be able to perform regular backups, test the backup and recovery process, and restore data in case of any disaster or system failure.

Use Case: Service Management

Actor: Admin

Description: The system should allow businesses to manage their services effectively. This includes creating new services, updating existing services, and deleting services that are no longer offered. Business owners or administrators should be able to view the details of each service, including its description, price, and availability.

Use Case: Order Management

Actor: Admin

Description: The system should allow businesses to manage their orders efficiently. Business owners or administrators should be able to view and track the status of each order, update the order details, and communicate with customers regarding their orders. The system should also allow businesses to generate reports based on order data.

Use Case: User Management

Actor: Admin

Description: The system should allow business owners or administrators to manage the users of the platform. This includes creating new user accounts, updating user details, and deleting user accounts when necessary. The system should also provide business owners or administrators with the ability to view the details of each user, including their purchase history and feedback.

Use Case: Payment Gateway Integration

Actor: General User

Description: The system should integrate with popular payment gateways to provide customers with a range of payment options. Customers should be able to pay

Chapter 4

System Planning

4.1 Functions of Proposed System

Table II Functions of Proposed System

Registration	F1
Login	F2
User Dashboard	F3
View Announcements	F4
View Offers	F5
View categories	F6
Purchase Services	F7
Partial payment	F8
View purchased order	F9
Admin Dashboard	F10
Manage orders	F11
List Services	F12
Check Running services	F13
Create orders for users	F14
Generate Reports	F15
Check all Types of Oder	F16
User Management	F17
Add new Services	F18
Edit services	F19
Delete services	F20
View User Details	F21
Payment Gateway Integration	F22
Mobile Friendly Design	F23
Automated Invoicing and Billing	F24
Invoice Download	F25
Manage Order and payment	F26
Generate reports	F27

4.1.1 Function Description

Function description descriptive the function in details. It concerns on three factors: what is the possible input, possible output for a particular function and which table of the database uses by that function.

- **Registration**
  Input: users email and password
  Output: If registration info is valid, an email will be sent to the general user's email to confirm registration, otherwise show message that the user is already registered or not in the database.
  Use table of the database: users table

- **Login**
  Input: Username and Password
  Output: If valid information is given user will be redirected to page according to their role. Otherwise, an error message will be shown to user.
  Use table of the database: users table

- **User Dashboard**
  Input: user's credentials, role
  Output: A personalized dashboard will be displayed for the user with their profile information and options to view their orders, view offers, and manage their account.
  Use table of the database: user table

- **View Announcements**
  Input: user's credential
  Output: A list of announcements will be displayed to the user that may include updates, news, or other important information related to the platform. Use table of the database: announcements table.
  Use table of the database: announcements table

- **View Offers**
  Input: user's credentials
  Output: A list of offers will be displayed to the user that may include discounts or promotional deals for the platform's services. Use table of the database: offers table.
  Use table of the database: offers table

- **View Categories**

  Input: user's credentials

  Output: A list of service categories will be displayed to the user for easy navigation and browsing.

  Use table of the database: categories table

- **View Purchase Services**
- **Input:** user's credential, service details

  Output: Allow the user to purchase a service by providing their payment information and service details.

  Use table of the database: orders table

- **Partial Payment**

  Input: user's credential, orders details and payment details

  Output: Allow the user to make partial payment for an order by providing necessary details like payment amount, payment method, etc.

  Use table of the database: payment table

- **View Purchased Orders**

  Input: user's credentials, ordered and invoice id

  Output: Display all the purchased orders made by the user with their respective order details.

  Use table of the database: orders table

- **Admin Dashboard**

  Input: admin's credentials

  Output: A personalized dashboard will be displayed to the admin with options to manage orders, manage services, and view user details. Use table of the database: admin table

  Use table of the database: users table and role table

- **Manage Orders**

  Input: admin's credentials, order details

  Output: Allow the admin to manage orders by changing the status or canceling an order

  Use table of the database: orders table

- **List Services**

  Input: service title, service id, category id

  Output: A list of available services will be displayed to the user based on their selected category.

  Use table of the database: user info table

- **Check Running Services**

  Input: auth credentials, service id, service status

  Output: A list of running services will be displayed to the admin with details like service name, provider name, and start/end time.

  Use table of the database: users table, service table

- **Create Orders for users**

  Input: users' details, service details

  Output: Allow the admin to create orders for users by providing their details and service detail.

  Use table of the database: user table, service table, order table

- **Generate Reports**

  Input: report type

  Output: Allow the admin to generate different reports like top orders, service usage, revenue, or user statistics.

  Use table of the database: orders table, user table

- **User Management**

  Input: admin credentials, users' details

  Output: Allow the admin to manage users by creating, updating, or deleting their accounts. Also, enable the admin to view a list of all registered users.

  Use table of the database: users table

- **Payment Gateway Integration**

  Input: user payment information, payment amount

  Output: Allow the user to make payments for services using various payment methods such as credit cards, mobile banking, debit card, cash, bank etc.

  Use table of the database: payment table

- **Mobile Friendly Design**

  Input: Platform information

  Output: Ensure that the platform is mobile-friendly and can be accessed from any device, providing a seamless user experience.

  Use table of the database: none

- **Automated Invoicing and Billing**

  Input: User payment information, service details

  Output: Generate automated invoices and bills for services purchased by the user, which can be viewed and downloaded from their account dashboard.

  Use table of the database: order table

- **Invoice Download**

  Input: users order

  Output: Allow the user to download the invoice for the services they have purchased.

  Use table of the database: order table

- **Manage Order and Payment**

  Input: users order and payment details

  Output: Allow the user to manage their orders and payments, including partial payments, payment reminders, and payment history

  Use table of the database: order and payment table

- **Generates Reports**

  Input: users account details, payment and order history

  Output: Allow the user to generate customized reports of their account activity, including payment and order history.

  Use table of the database: user, order, payment table

- **Check All Types of Order**

  Input: admin credentials, order details

Output: Allow the admin to view a list of all types of orders and their status, including completed, in-progress, and pending orders.

Use table of the database: orders table

4.2 System Project Planning

To ensure successful project completion, it is crucial to conduct a thorough analysis of the work required, necessary resources, and estimated timeline. This allows for feasibility assessment and helps identify potential challenges that may need to be addressed. Such planning lays a strong foundation for achieving project goals and objectives.

The following activities of software project planning that I have followed in this project are:

- System Project Estimation
- Function Oriented Metrics
- Process Based Estimation
- Task Scheduling
- Project Schedule Chart
- Cost Estimation

4.2.1 System Project Estimation

The accuracy of a software project estimate predicated based on a number of things:

- Properly estimated the size of the product to build.
- The ability to translate the size estimation into human effort, calendar time and money.
- The degree to which the project plan reflects the abilities of the software team or engineer.

- ❖ The stability of the product requirements and the environment that supports the software engineering effort.

Software size estimation is the most important matter that I had to consider during the software project. If the software size was not calculated properly, then this would cause various problems such as scheduling problems, budget problem etc.

4.2.2 Function Oriented Metrics

Function point-based estimation focuses on information domain values rather that software values. Function points are computed by comparing five information domain characteristics. The information domain values are as follows:

Number of external inputs (EI) – Each user input that provides distinct application-oriented data to the software is counted inputs should be distinguished from inquires.

Number of external outputs (EO) – Each user output that provides application-oriented information to the user is counted.

Number of external inquires (EQ) – An inquiry defined as an on-line input those results in the generation of some immediate software response in the form of an on-line output. Each distinct inquiry counted.

Number of Internal logical files (ILF) – Each logical master file counted. Database table wherefrom input goes for modified by application.

Numbers of external interfaces files (EIF) – All machine-readable interfaces that used to transmit information to another system counted.

The weights of the domains are fixes, which are provided in appropriate table location. Weights can be divided into three categories according to the functionality of the system. They are simple, average and complex. The total system is a complex system but the part of the total system. Once these data have collected, a complexity value is associated with each count. To find out the FP count the following formula is used,

Function Point Count = Count-Total * [0.65+0.01 * ΣFi]

Count-total= Total UFP of Transition Function + Total UFP of Data Function

Adjusted Function Point Count (AFP) = UFP * VAF Effort for python = AFP * Productivity

Functional Complexity: The first adjustment factor considers the Functional Complexity for each unique function. Functional Complexity is determined based on the combination of data groupings and data elements of a particular function. The number of data elements and unique groupings are counted and compared to a complexity matrix that will rate the function as low, average or high complexity. Each of the five functional components (ILF, EIF, EI, EO and EQ) has its own unique complexity matrix. The complexity matrixes are listed below:

Complexity Matrix

Table III Complexity Matrix for EI

EI	**1 - 4 DETs**	**5 - 15 DETs**	**16 or more DETs**
FTR < 2	Low	Low	Average
FTRs = 2	Low	Average	High
FTRs = > 3	Average	High	High

Table IV Complexity Matrix for EO/EQ

EO/EQ	**1 - 5 DETs**	**6 - 19 DETs**	**20 or more DETs**
FTR<= 1	Low	Low	Average
2<= FTRs <= 3	Low	Average	High
FTRs > 3	Average	High	High

Table V Complexity Matrix for ILF/ ELF

ILF/ ELF	**1 - 19 DETs**	**20 - 50 DETs**	**51 or more DETs**
RETs <= 1	Low	Low	Average
2<= RETs <= 5	Low	Average	High
RETs > 5	Average	High	High

Table VI Complexity Matrix for UFP

Complexity	Transaction Function Type		Data Function Type	
	EI/EQ	**EO**	**ILF**	**EIF**
L (Low)	3	4	7	5
A (Average)	4	5	10	7
H (High)	6	7	15	10

Identifying complexity

Identifying complexity of transition function

Table VII Identifying Complexity of Transition Function Point Count

Transaction Function	Field/File involved	FTRs	DETs
Add new user (EI)	**Field** – user_id, first_name, last_name, email, phone, password, repeat password, address, **File –** user, address, role	3	8
Update User (EI)	**Field** – first_name, last_name, email, phone **File -** user	1	4
New Category (EI)	**Field** – id, name, description, **File –** category	1	3
Update Category (EI)	**Fields -** name, description, updateAt **File –** category	1	2
Add service (EI)	**Fields** – id, title, status, description, price, categoryId **File** – service, category	2	6
Update services (EI)	**Fields –** id, title, status, description, price, **File** – service	1	5

Delete Services (EI)	**Fields** – service id **File** – services	1	1
Create a new order (EI)	**Fields-** service id, service name **File –** service	1	2
Create a new order admin (EI)	**Fields** – user id, service title, id, price, order status, order amount **File –** service, user, order	3	6
Add partial payment (EI)	**Fields –** amount, payment method type, name account holder name, account name, account type, transaction id, order **File**-payment, order,	1	2
Add new announcement (EI)	**Field–** name, type, id **File –** announcement info	1	3
Change Order Status (EI)	**Field–** order id, order status, **File –** order	1	2
Change payment status (EI)	**Fields-** order id, payment id, payment method, **File-** payment	1	3
Update Order (EI)	**Field** – services, payment, order Id **File –** order, payment	2	3
View user details (EO)	**Fields-** first name, last name, email, address, phone number **File –**user	1	8
View order details (EO)	**Fields-** service id, service title, service price, user id, user first name, last name, email, phone, order price, custom service price, order number, status, date **File–** order, user	2	14
View Invoice (EO)	**Fields -** customer name, address, phone no, invoice no, date period, service id, service name, item price, total amount, payment id, method name, amount, total payment amount, total due amount **File–** user, order, service, order status, payment status, payment	6	14

View Order Filter wise (EO)	**Fields** – order status, first name, last name, order date, order total, order id **File** – order	1	6
View category (EO)	**Fields –** category id, category name, category description **File** – category	1	3
View services (EO)	**Fields–** service id, name, price, status **File –** service	1	3
View users' information (EO)	**Fields–** first name, last name, address, phone, email, total order **File** – user, order	2	6
View user list (EO)	**Fields** – first name, last name, account creation, running order, money invested, **File** – user, order, payment	3	5
View announcements (EO)	**Fields-** name, type, id **File –** announcement info	1	3
Generating monthly order report (EO)	**Fields –** from date, to date, button, close button, print, download. **File –** order, user	2	6
Generating service wise report (EO)	**Fields –**close button, print, download. **File –** order, user	2	3
Generating most orders by users (EO)	**Fields –** user email, user phone number **File** – user, order	2	2
Search user (EQ)	**Fields** – user_id **File -** user	1	1
Search service (EQ)	**Fields** – service name **File** – service	1	1
Search orders (EQ)	**Fields** – order id, invoice id **File** – order	1	2

Search invoices (EQ)	**Fields** – invoice id **File** – order	1	1
Search category (EQ)	**Fields** – category name **File** – category	1	1
Search payment (EQ)	**Fields** – payment id **File** – payment	1	1
Search recent orders (EQ)	**Fields** – type **File** – orders	1	1

Identifying complexity of data function

Table VIII Identifying complexity of data function

Data Function	Fields / Files	RETs	DETs
General user (ILF)	**Fields-** user_id, first name, last name, email, phone, password, repeat password, address **File –** user	1	8
Order (ILF)	**Fields-** service id, service title, service price, user id, user first name, last name, email, phone, order price, custom service price, order number, status, date **File –** order, status	2	14
User (ILF)	**Fields** – first name, last name, email, address, phone number, account creation, running order, money invested **File –** user, order, payment	1	8
Invoice (ILF)	**Fields -** customer name, address, phone no, invoice no, date period, service id, service name, item price, total amount, payment id, method name, amount, total payment amount, total due amount **File–** user, order, service, order status, payment status, payment	4	14

Unadjusted function point contribution

Table IX Unadjusted function point contribution of Transaction Function

Transition Function	**FTRs**	**DETs**	**Complexity**	**UFP**
Add new user (EI)	3	8	Low	3
Update User (EI)	1	4	Low	3
New Category (EI)	1	3	Low	3
Update Category (EI)	1	2	Low	3
Add service (EI)	2	6	High	6
Update services (EI)	1	5	Low	3
Delete Services (EI)	1	1	Low	3
Create a new order (EI)	1	2	Low	3
Create a new order admin (EI)	3	6	High	6
Add partial payment (EI)	1	2	Low	3
Add new announcement (EI)	1	3	Low	3
Change Order Status (EI)	1	2	Low	3
Change payment status (EI)	1	3	Low	3
Update Order (EI)	2	3	High	6
View user details (EO)	1	8	Low	4
View order details (EO)	2	14	Average	5
View Invoice (EO)	6	14	High	7

View Order Filter wise (EO)	1	6	Low	4
View category (EO)	1	3	Low	4
View services (EO)	1	3	Low	4
View users' information (EO)	2	6	Average	5
View user list (EO)	3	5	Average	5
View announcements (EO)	1	3	Low	4
Generating monthly order report (EO)	2	6	Average	5
Generating service wise report (EO)	2	3	Low	4
Generating most orders by users (EO)	2	2	Low	4
Search user (EQ)	1	1	Low	3
Search service (EQ)	1	1	Low	3
Search orders (EQ)	1	2	Low	3
Search invoices (EQ)	1	1	Low	3
Search category (EQ)	1	1	Low	3
Search payment (EQ)	1	1	Low	3
Search officer (EQ)	1	1	Low	3
Search recent orders (EQ)	1	1	Low	3
			Total =	**100**

Table X Unadjusted function point contribution of Data Function

Data Function	**RETs**	**DETs**	**Complexity**	**UFP**
General user (ILF)	1	8	Low	**7**
Order (ILF)	2	14	Low	**7**
User (ILF)	1	8	Low	**7**
Invoice (ELF)	4	14	Low	**5**
			Total =	**26**

Performance and Environmental impact

Table XI Performance and Environmental impact

GSC (General System Characteristics)	**DI**
Data Communication	4
Distributed Data Processing	0
Performance	4
Heavily Used Configuration	1
Transaction Rate	2
Online Data Entry	3
End-user Efficiency	4
Online Update	0
Complex Processing	3
Reusability	4
Installation Ease	4
Operational Ease	4
Multiple Sites	0
Facilitate Change	3
Total Degree of Influence (TDI), ΣFi =	34

Counting Adjusted Function point

Function Point Count =Count – Total * [0.65 + 0.01 * ΣFi]

Here,
Count-Total = Total UFP of Transition Function + Total UFP of Data Function
= 100 + 26 = 126
ΣFi = Total Degree of Influence (TDI) = 34
So,
Function Point Count = Count-Total * [0.65 + 0.01 * ΣFi]
= 126 * [0.65 + 0.01 * 34]
= 124.68

Effort for JavaScript = AFP * productivity

= 124.68 * 15.5

= 1934.04 persons hours / 8 hours

= 241.76 person days / 3 persons [3 person in a group]

= 80.59 days approximately

= 3 persons need 2 months and 10 days to complete the project

4.3 Process Based Estimation

Process-based estimation involves breaking down a software development process into smaller, manageable tasks and estimating the effort required for each task. This approach starts with identifying software functions from the project scope and then determining the specific activities that must be completed for each function. By decomposing the process in this way, project managers can more accurately estimate the resources needed to complete the project and ensure that all necessary tasks are accounted for. Ultimately, process-based estimation is a critical aspect of effective project planning and management in software development.

Table XII Process based estimation

Activity	CC	Planning	Engineering		Construction		Imp.	Total
Function			Analysis	Design	Code	Test		
F1	0.011	0.053	0.115	0.104	0.133	0.021	0.032	
F2	0.010	0.051	0.165	0.129	0.164	0.052	0.024	
F3	0.016	0.030	0.102	0.175	0.139	0.031	0.016	
F4	0.013	0.023	0.049	0.192	0.238	0.057	0.025	
F5	0.015	0.016	0.102	0.147	0.297	0.018	0.012	
F6	0.016	0.021	0.151	0.113	0.234	0.063	0.026	
F7	0.010	0.039	0.123	0.121	0.232	0.039	0.027	
F8	0.012	0.032	0.112	0.295	0.136	0.016	0.022	
F9	0.014	0.061	0.125	0.192	0.215	0.032	0.029	
F10	0.013	0.064	0.185	0.282	0.233	0.061	0.047	
F11	0.010	0.025	0.117	0.105	0.135	0.014	0.014	
F12	0.011	0.022	0.128	0.125	0.142	0.025	0.021	
F13	0.012	0.052	0.144	0.172	0.176	0.020	0.018	
F14	0.010	0.035	0.122	0.185	0.240	0.032	0.021	**13.32**
F15	0.013	0.016	0.106	0.112	0.134	0.044	0.019	
F16	0.015	0.024	0.101	0.285	0.158	0.018	0.031	
F17	0.014	0.033	0.118	0.108	0.155	0.055	0.042	
F18	0.012	0.063	0.152	0.123	0.132	0.034	0.028	
F19	0.011	0.062	0.150	0.209	0.134	0.041	0.024	
F20	0.013	0.036	0.164	0.119	0.138	0.047	0.032	
F21	0.016	0.027	0.089	0.174	0.188	0.038	0.015	
F22	0.010	0.029	0.075	0.148	0.147	0.023	0.048	
F23	0.012	0.017	0.086	0.101	0.246	0.058	0.026	
F24	0.011	0.035	0.128	0.112	0.134	0.044	0.019	
F25	0.027	0.079	0.043	0.284	0.158	0.065	0.031	
F26	0.013	0.086	0.122	0.108	0.155	0.055	0.042	
F27	0.022	0.033	0.106	0.242	0.270	0.034	0.028	
Total	**0.24**	**0.90**	**2.28**	**3.70**	**4.90**	**0.69**	**0.61**	**13.32**
Effort	**2%**	**9%**	**15%**	**25%**	**40%**	**6%**	**3%**	**100%**

4.4 Task Scheduling

Project scheduling is an activity of distributing the estimated efforts within the planned project duration. There are some basic rules for project scheduling. They are as follows –

Compartmentalization – The project must compartmentalize into a number of manageable activities and tasks.

Interdependency – The interdependency of each compartmentalized activity or task must be determined. Some tasks must occur in sequence while others can occur in parallel.

Time allocation – Each task to be scheduled must allocated some number of work units.

Effort validation – Every project has a defined number of staff members. It should ensure that no more than the allocated number of people has scheduled at any given time.

Defined responsibilities – Every task that is scheduled should assign to a specific team member.

Defined outcomes – Every task that is scheduled should have a defined outcome. The outcome is normally a work product or a part of a work product.

4.5 Project Schedule Chart

Total system development is a combination of set of tasks. These set of tasks should be done sequentially and timely. Project schedule works as the guideline of the system developer. The following is the schedule chart of this project:

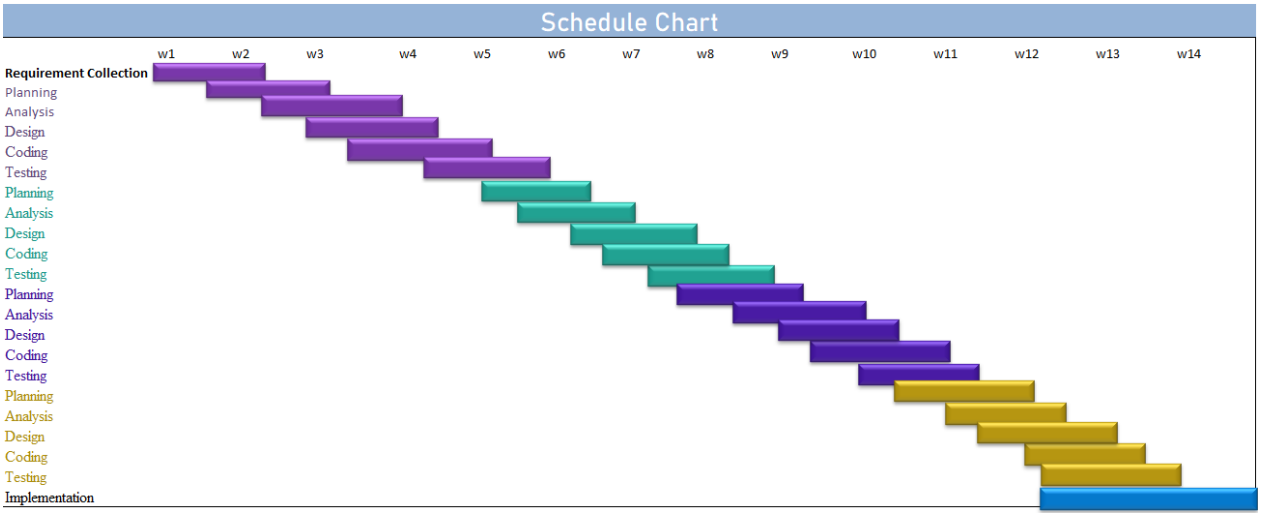

Figure 4.1 Project Gantt Chart

4.6 Cost Estimation

The approximation of the cost of a program is cost estimation. In this project, there are five factors to analyze and calculate the cost which are given in the next page-

- Personnel cost
- Software cost
- Hardware cost
- Other cost

4.6.1 Personnel cost

- Number of days for this project = 81
- Number of holidays during the project = 21
- Total number of working days to develop the project =81-21 =60 days
- Total number of working days per months to develop the project =60/3 =20 days
- Organization working hours per day = 8 hours
- Organization working hours per month=20*8= 160 hours

Table XIII Personnel Cost

Type	Number of members	Duration	Honorarium
System Analyst and Designer	1	2 Month	50,000 BDT
Developer and Tester	1	2 months	40000 BDT
		Total	**60,000 BDT**

Table XIV Hardware Cost

Name	Cost
PC	35,000 BDT
Total	35,000 BDT

Table XV Software Cost

Name	Cost
JavaScript, react, next	Free
Git, Prisma, node, vs code	Free
Typescript, Framer motion	Free

Table XVI Other Cost

Name	Cost
Pen, paper and others	1,000 taka
Foods	3,000 taka
Electricity and Net Bill	2,000 taka
Total	**6,000**

Table XVII Accounts Table

Particulars	Amount (BDT)
Salary- • System Analyst and Designer • Developer and Tester	 50,000.00 40,000.00
	90,000.00 /=
Hardware Cost – • PC	 35,000.00
	1255,000.00/=
Other Costs- • Pen and paper • Foods • Electricity and Net Bill	 1,000.00 3000.00 2,000.00
	6,000.00 /=
Total cost	**1,31,000.00 /=**

Chapter 5

Risk Management

5.1 Risk Analysis

Risk analysis and management am a series of works that help a system development team to understand and manage uncertainty. Many problems can arise while developing a system. A risk is a potential problem – it may happen may not. There are several steps to analyze and manage risks. The first step is risk identification. Next each risk is analyzed to determine the likelihood that it will occur and the damage that it will do if it does occur. Once this information is established risks am remarked. Finally, a plan is developed to manage those risks with high probability and impact.[4]

There are different categories of risks that should be considered in any software project. The following categories of risks have been considered in this software project.

1. Project risks: These risks threaten the project plan. If these risks become real, it is likely that the project schedule will slip and that costs will increase. Project risks identify potential budgetary, schedule, personnel, resource, customer and requirement problems and their impact on the software project. [5]

2. Technical risks: These risks threaten the quality and timeliness of the software to be produced. If a technical risk becomes a reality, implementation may become difficult or impossible. Technical risks identify potential design, implementation, interface, verification and maintenance problems. Moreover, specification ambiguity, technical uncertainty, technical obsolescence's are also risk factors.[5]

3. Business risks: These risks threaten the viability of the software to be built. The business risks can be market risks, building a system that no one really wants. Strategic risks, building a system that no longer fits into the overall business strategy for the company. Management risks, losing the support of senior management due to a change in focus or a change in people. Budget risks, losing budgetary or personnel commitment. [5]

Table XVIII Project Risk (P01)

Project Risk (P01)	
Name	Changes of requirements
Probability	Low (25%)
Impact	Marginal (2)
Description	Client may change their requirements
Mitigation & Monitoring	Requirements are redefined by the client due to time or business needs. Meeting will be held with the client regularly. This ensures that the product I am producing is up to the mark.
Management	Emergency meeting with client to identify new project requirements and goals.
Status	Not occur

Table XIX Project Risk (P02)

Project Risk (P02)	
Name	Poor Quality Documentation
Probability	Low (25%)
Impact	Catastrophic (1)
Description	Poor documentation of work by the developer
Mitigation & Monitoring	Proper direction for writing documentation and monitoring.
Management	The addition of new topics or removal of unnecessary topics into the documentation will assigned to responsible person.
Status	Handled successfully

Technical Risks: threaten product quality and the timeliness of the schedule. As this is my practicum project, therefore these types of risks need to be taken care of properly.

Table XX Technical Risk (TR01)

Technical Risk (TR01)	
Name	Computer Crash
Probability	Moderate (25-40%)
Impact	Catastrophic (1)
Description	Computer may crash due to several reasons.
Mitigation & Monitoring	Need proper follow up of computers and also need regular data backup every day, IPS can be used to stop unexpected shutdown.
Management	If computer has been crashed then we will restore backup.
Status	I did not encounter such issue.

Table XXI Technical Risk (TR02)

Technical Risk (TR02)	
Name	Technology Doesn't Meet Specifications.
Probability	Low (25%)
Impact	Catastrophic (1)
Description	Client doesn't have the technology to his desired specification.
Mitigation & Monitoring	That ensures that the product I am producing and the specifications of the client are equivalent.
Management	The client should be immediately notified and whatever steps necessary to rectify this problem should be done.
Status	I have not encountered such issue yet

Business Risk: Threaten the viability of the software to be built (market risks, strategic risks, management risks, budget risks). As I am developing it as my practicum project by myself, classic business risks won't be encountered here. The Probability of all type of Business Risks is therefore, determined as Low.

Table XXII Business Risk (B01)

Business Risk (B01)	
Name	Not pay the installment of Software Cost.
Probability	Very Low (5%)
Impact	Catastrophic (2)
Description	Customer doesn't pay for the installment of Software Cost.
Mitigation & Monitoring	A good communication with clients.
Management	The only course of action available would be find out the reason and come in a solution.
Status	Not encountered

Chapter 6

Analysis and Modeling

Analysis modeling uses a combination of text and diagrammatic forms to depict requirements for data, function, and behavior in a way that is relatively easy to understand, and more important, straightforward to review for correctness, completeness and consistency. This section presents resources for conventional and object-oriented analysis (OOA) methods as well as other resources.

6.1 Analysis Modeling

Objectives of analysis model are:

- Domain Analysis
- Describe what the client requires
- Establish a basis for the creation of a software design
- Define a set of requirements that can be validated once the software is built.

6.2 Activity Diagram

We use Activity Diagrams to illustrate the flow of control in a system and refer to the steps involved in the execution of a use case. We model sequential and concurrent activities using activity diagrams. So, we basically depict workflows visually using an activity diagram. An activity diagram focuses on condition of flow and the sequence in which it happens. We describe or depict what causes a particular event using an activity diagram. [3]

An activity diagram portrays the control flow from a start point to a finish point showing the various decision paths that exist while the activity is being executed. We can depict both sequential processing and concurrent processing of activities using an activity diagram. They are used in business and process modelling where their primary use is to depict the dynamic aspects of a system.

Activity diagram based on different roles in DSP is shown below:

6.2.1 Activity Diagram for Customer

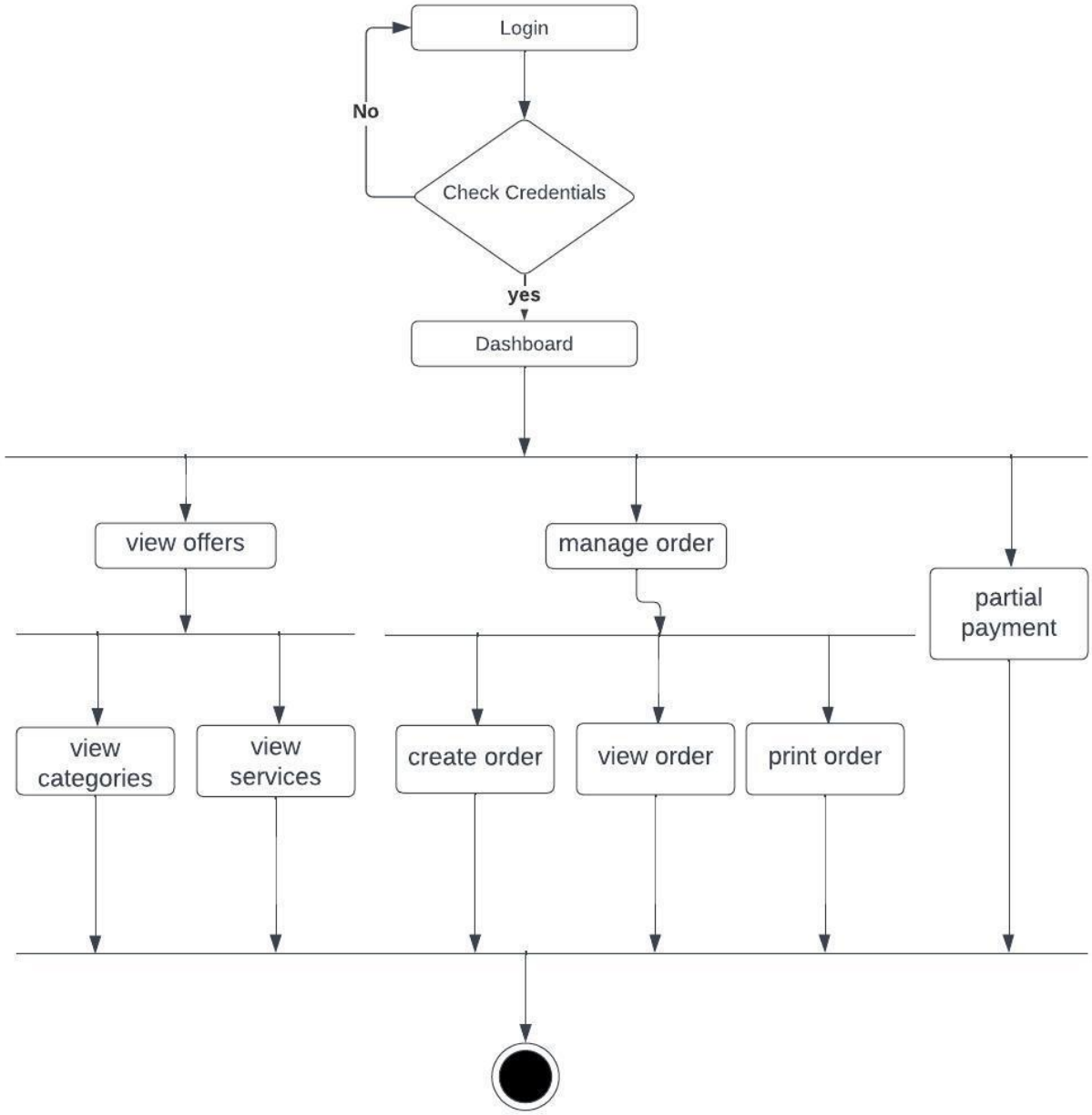

Fig 6.1 Activity Diagram for customer

6.2.2 Activity Diagram for Admin

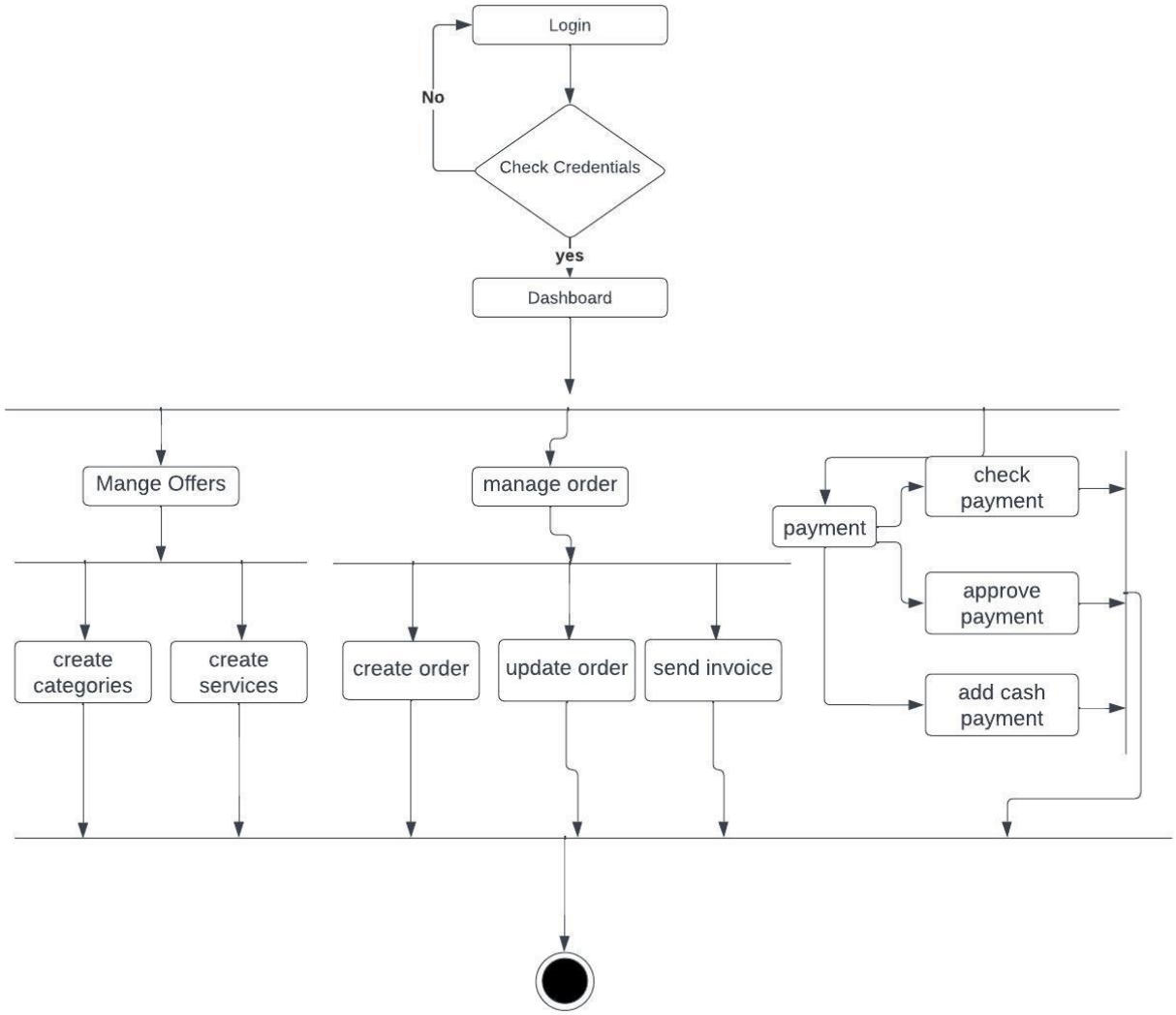

Fig 6.2 Activity Diagram for Admin

6.3 ER Diagram

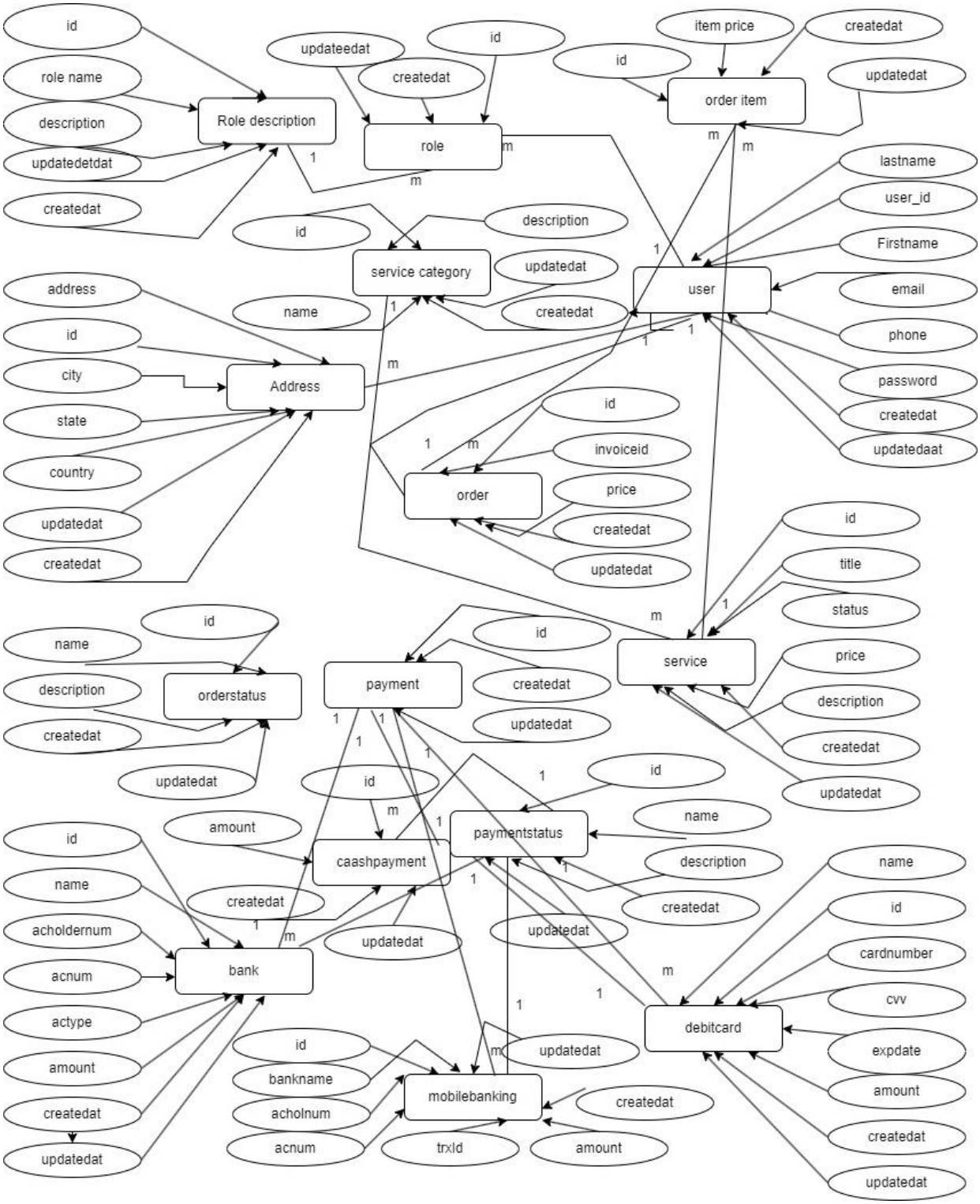

Fig 6.5 DSP Entity Relation Diagram

6.4 Data Flow Diagram

A data flow diagram (DFD) is a graphical representation of the flow of data through an information system, modeling its process aspects. A DFD is often used as a preliminary step to create an overview of the system, which can later be elaborated DFDs can also, be used for the visualization of data processing.

A DFD shows what kind of information will be input to and output from the system, where the data will come from and go to, and where the data will be stored. It does not show information about the timing of process or information about whether processes will operate in sequence or in parallel.

6.4.1 Context Level DFD

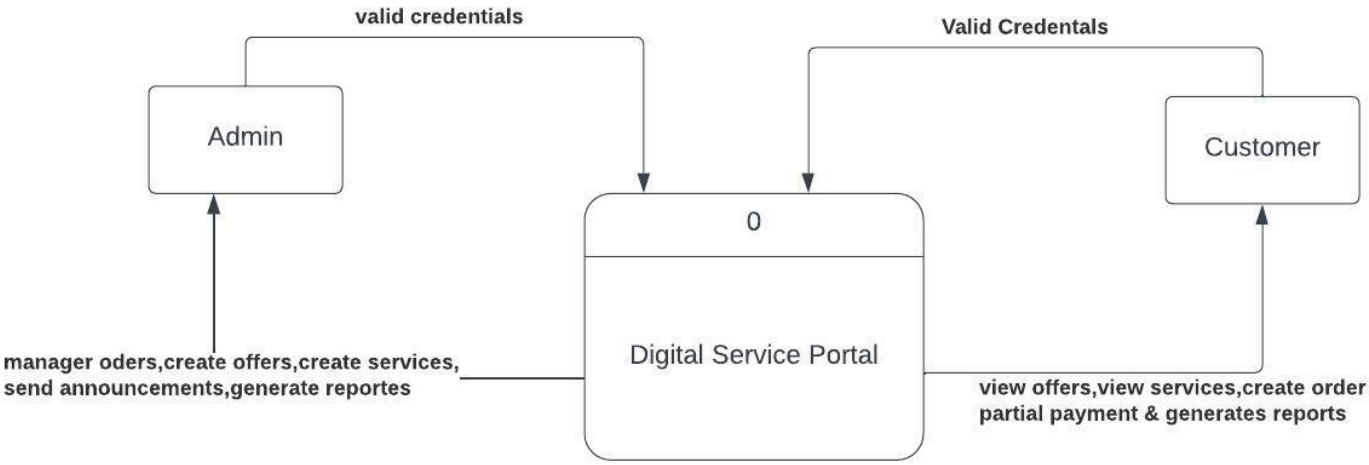

Fig: 6.6 DSP Context level DFD

6.4.2 Level 1 DFD

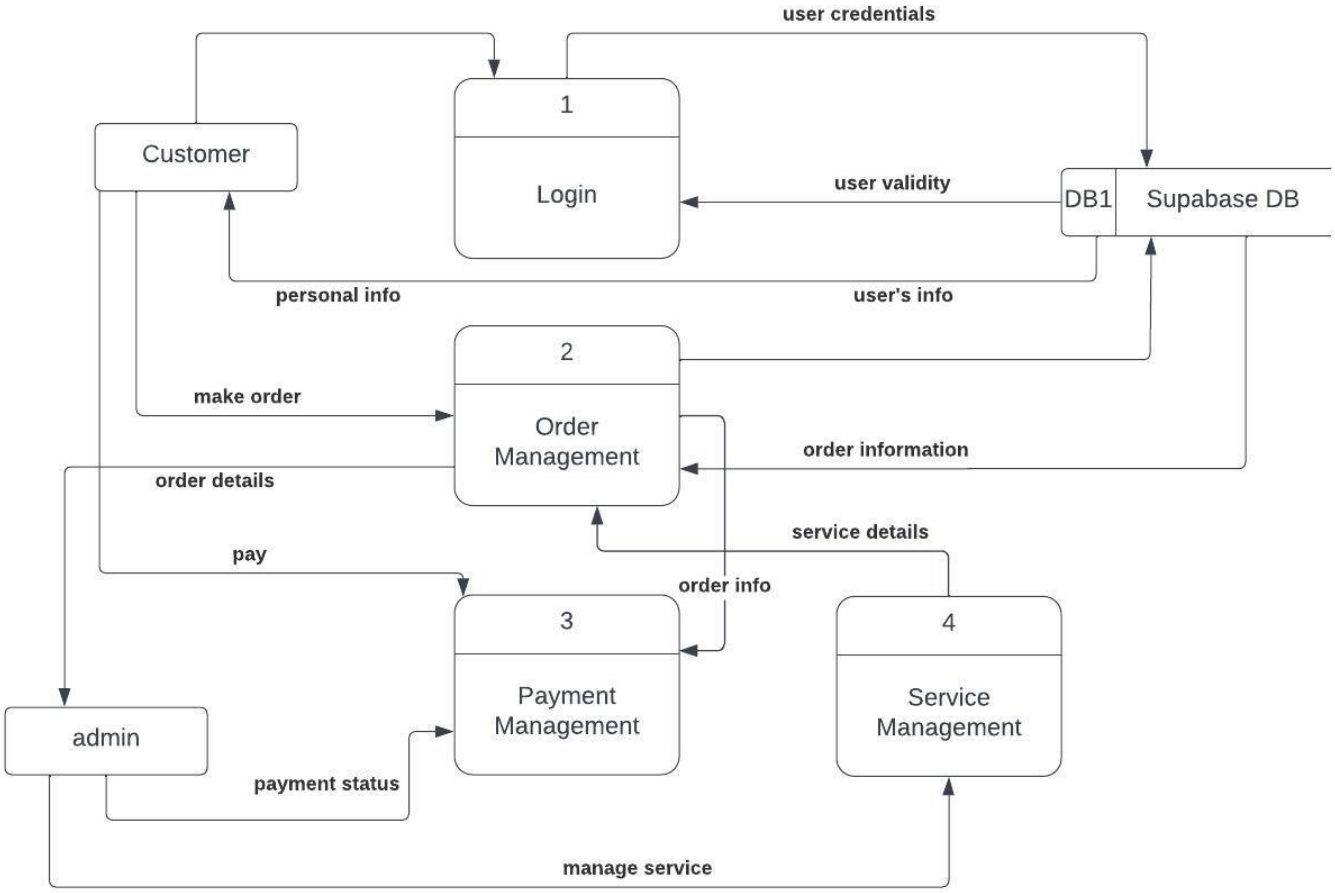

Fig 6.7 DSP level 1 DFD

6.4.3 Level 2 DFD (Process 1)

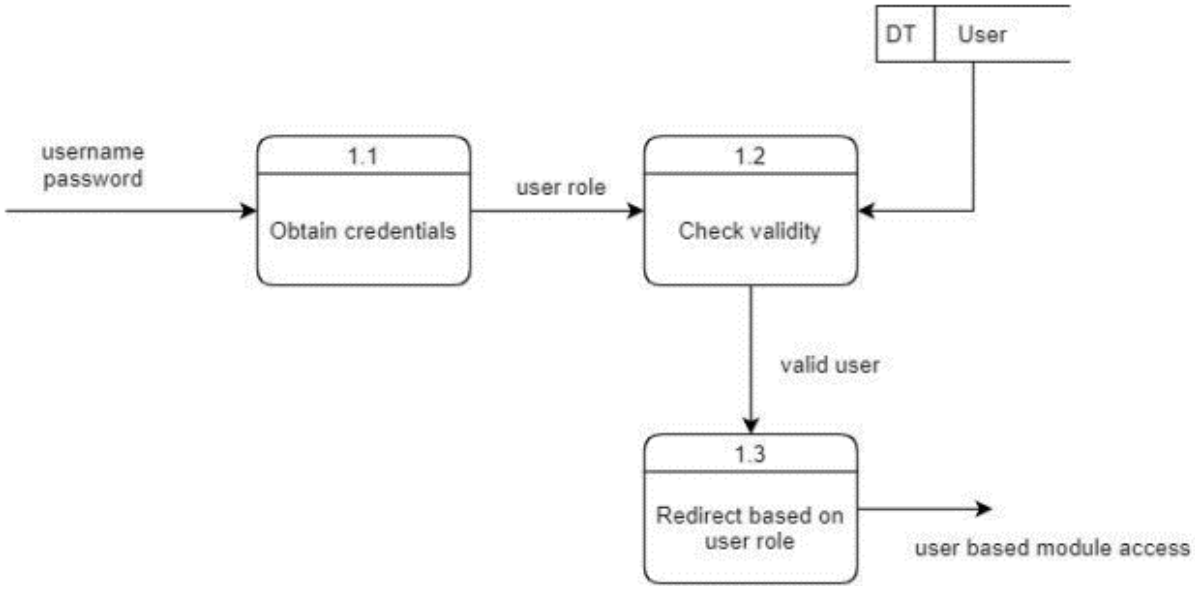

Fig 6.8 Level 2 DFD (Login Process)

6.4.4 Level 2 DFD (Process 2)

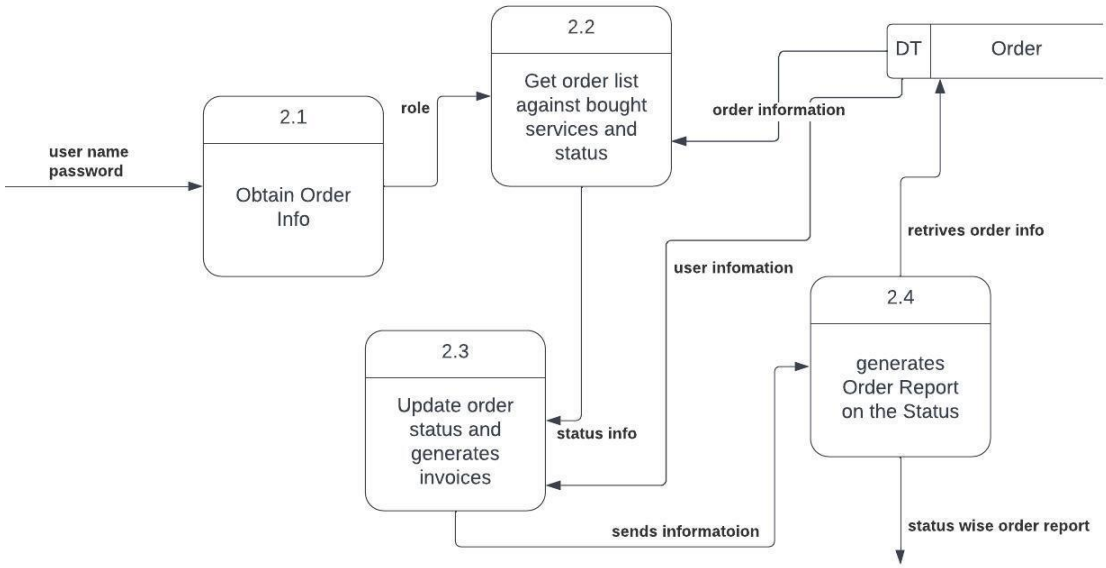

Fig 6.9 Level 2 DFD (Order Management Process)

6.4.5 Level 2 DFD (Process 3)

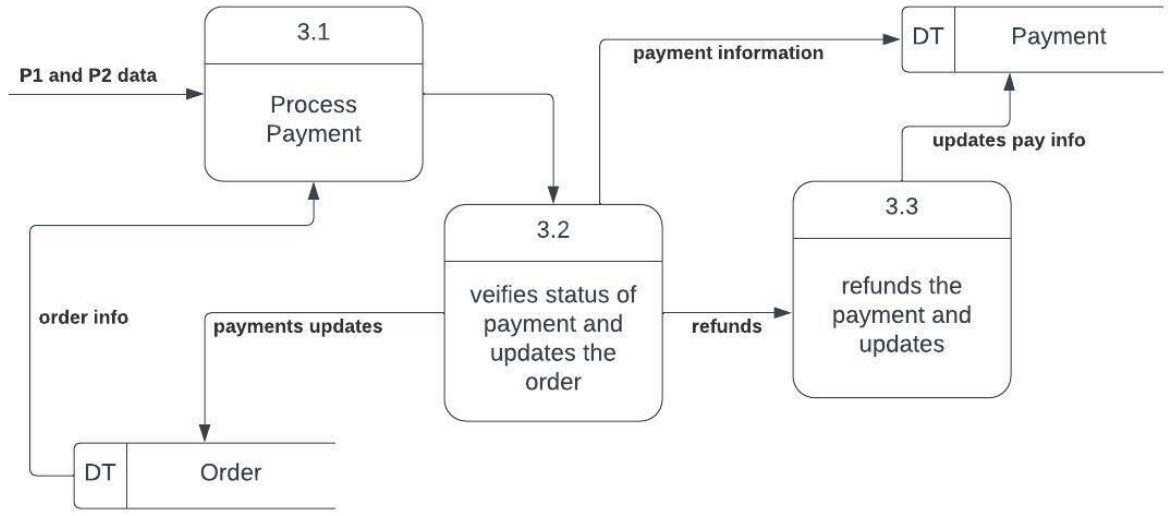

Fig 6.10 Level 2 DFD (Payment Management Process)

6.4.6 Level 2 DFD (Process 4)

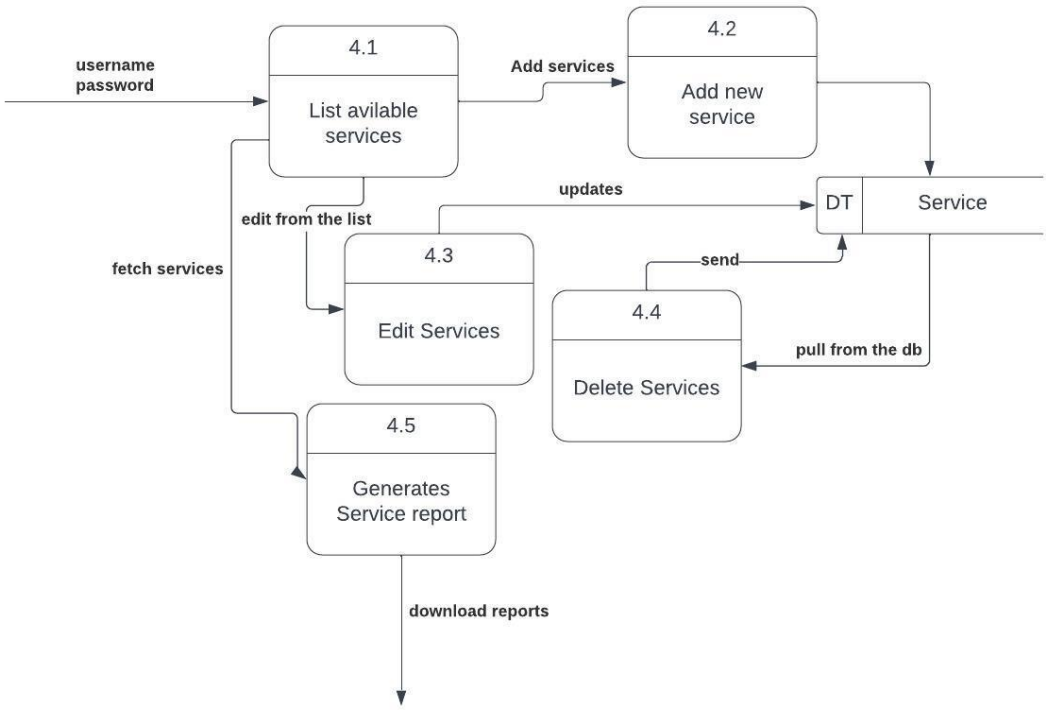

Fig 6.11 Level 2 DFD (Service Management)

Chapter 7

Interface Designing

7.1 Database Field Design

User

user_id	firstName	lastName	phone	email	password	createdAt	updatedAt	address	role	order
dcab8e60-8927…	Maruf	Ahmed	0182827722	marufah76@…	$2b$10$.Mf…	2023-03-31T…	2023-03-31…	0 Address	1 Role	1 Order
7e89a20c-b97c…	Shraboni	Puja	019734800…	puja@gmail…	$2b$10$4BT…	2023-04-12T…	2023-04-12…	0 Address	1 Role	1 Order
48039b9f-e18f…	User	User	0123456789	user@gmail…	$2b$10$ioX…	2023-03-23T…	2023-03-23…	0 Address	1 Role	2 Order
40af2dcf-91db…	reyad	hasan	017840611…	rockreyad@…	$2b$10$Omq…	2023-03-30T…	2023-03-30…	0 Address	1 Role	2 Order
18af6e3c-0aed…	Admin	Admin	0123456789	admin@gmai…	$2b$10$ioX…	2023-03-23T…	2023-03-23…	0 Address	1 Role	0 Order

Fig 7.1 User Table

Category

id	name	description	createdAt	updatedAt
1	Digital Marketing	Boost online visibility…	2023-03-23T18:48:31.218Z	2023-03-23T18:48:31.218Z
2	Web design and developm…	Create stunning website…	2023-03-23T18:48:31.218Z	2023-03-23T18:48:31.218Z
3	social media marketing	social media marketing …	2023-04-12T17:22:50.083Z	2023-04-12T17:22:50.083Z
4	search engine optimizat…	orienting your website …	2023-04-12T17:24:22.308Z	2023-04-12T17:24:22.308Z
5	content marketing.	a marketing strategy us…	2023-04-12T17:24:42.439Z	2023-04-12T17:24:42.439Z
6	influencer marketing.	enables businesses to c…	2023-04-12T17:25:19.673Z	2023-04-12T17:25:19.673Z
7	affiliate marketing	a process where publish…	2023-04-12T17:25:42.515Z	2023-04-12T17:25:42.515Z
8	email marketing	form of marketing that …	2023-04-12T17:26:32.228Z	2023-04-12T17:26:32.228Z
9	paid advertising	a digital marketing mod…	2023-04-12T17:27:11.653Z	2023-04-12T17:27:11.653Z

Fig 7.2 Category Table

Service

id	title	status	price	description	categoryId	createdAt	updatedAt
1	Search Engine Optimizat…	false	450.81	improving the quality a…	1	2023-03-23T1…	2023-03-23T18:4…
2	Custom website design a…	false	100.27	Create a professional c…	2	2023-03-23T1…	2023-03-23T18:4…
3	Facebook Ads Management	true	2100	Facebook Ads CPM (Cost …	3	2023-04-12T1…	2023-04-12T17:3…

Fig 7.3 Service Table

Order

id	invoiceId	userId	orderItems []	price	payment []	statusId	createdAt	updatedAt
1	INV202303241	48039b9f-e18…	2 OrderIt…	5020.67	6 Payment	1	2023-03-2…	2023-03-2…
2	INV202303242	48039b9f-e18…	2 OrderIt…	711.07…	2 Payment	1	2023-03-2…	2023-03-2…
3	INV202303303	40af2dcf-91d…	2 OrderIt…	551.08	1 Payment	3	2023-03-3…	2023-04-1…
4	INV202303304	40af2dcf-91d…	2 OrderIt…	5350	1 Payment	5	2023-03-3…	2023-04-1…
5	INV202303315	dcab8e60-892…	2 OrderIt…	5561.08	3 Payment	1	2023-03-3…	2023-03-3…
6	INV202304126	7e89a20c-b97…	1 OrderIt…	2100	0 Payment	1	2023-04-1…	2023-04-1…

Fig 7.4 Order Table

Order Status

#	name	description	order []	createdAt	updatedAt
1	pending	order is pending	4 Order	2023-03…	2023-03-2…
2	delivered	order is delivered	0 Order	2023-03…	2023-03-2…
3	complete	order is complete	1 Order	2023-03…	2023-03-2…
4	fraud	order is fraud	0 Order	2023-03…	2023-03-2…
5	processing	order is Processing	1 Order	2023-03…	2023-03-2…

Fig 7.5 Order Status Table

Order Item

id	orderId	order	serviceId	itemPrice	service	createdAt	updatedAt
1	1	Order	1	120	Service	2023-03-23T…	2023-03-23T1…
2	1	Order	2	390	Service	2023-03-23T…	2023-03-23T1…
3	2	Order	1	410.81	Service	2023-03-23T…	2023-03-23T1…
4	2	Order	2	300.27	Service	2023-03-23T…	2023-03-23T1…
5	3	Order	2	100.27	Service	2023-03-30T…	2023-03-30T0…
6	3	Order	1	450.81	Service	2023-03-30T…	2023-03-30T0…
7	4	Order	1	4150	Service	2023-03-30T…	2023-03-30T1…
8	4	Order	2	1200	Service	2023-03-30T…	2023-03-30T1…
9	5	Order	2	100.27	Service	2023-03-31T…	2023-03-31T0…
10	5	Order	1	450.81	Service	2023-03-31T…	2023-03-31T0…
11	6	Order	3	2100	Service	2023-04-12T…	2023-04-12T1…

Fig 7.6 Order Item Table

Payment

id	orderId	order	cashPayment	bank	debitCard	mobileBanking	createdAt	updatedAt
1	1	Order	CashPayment	Bank	DebitCard	MobileBanking	2023-03-23T…	2023-03-23T…
2	1	Order	CashPayment	Bank	DebitCard	MobileBanking	2023-03-24T…	2023-03-24T…
3	1	Order	CashPayment	Bank	DebitCard	MobileBanking	2023-03-25T…	2023-03-25T…
4	2	Order	CashPayment	Bank	DebitCard	MobileBanking	2023-03-25T…	2023-03-25T…
6	1	Order	CashPayment	Bank	DebitCard	MobileBanking	2023-03-26T…	2023-03-26T…
7	1	Order	CashPayment	Bank	DebitCard	MobileBanking	2023-03-26T…	2023-03-26T…
13	2	Order	CashPayment	Bank	DebitCard	MobileBanking	2023-03-26T…	2023-03-26T…
14	1	Order	CashPayment	Bank	DebitCard	MobileBanking	2023-03-30T…	2023-03-30T…
15	3	Order	CashPayment	Bank	DebitCard	MobileBanking	2023-03-30T…	2023-03-30T…
16	5	Order	CashPayment	Bank	DebitCard	MobileBanking	2023-03-31T…	2023-03-31T…
17	5	Order	CashPayment	Bank	DebitCard	MobileBanking	2023-03-31T…	2023-03-31T…
18	5	Order	CashPayment	Bank	DebitCard	MobileBanking	2023-03-31T…	2023-03-31T…
19	4	Order	CashPayment	Bank	DebitCard	MobileBanking	2023-04-10T…	2023-04-10T…

Fig 7.7 Payment Table

Payment Status

id #	name A	description A?	mobileBanking []	cashPayment []	bank []	debitCard []	createdAt	updatedAt
1	pending	This is a pa…	2 MobileBanking	3 CashPayment	0 Bank	4 DebitCard	2023-03-23T…	2023-03-23T…
2	failed	This is a pa…	0 MobileBanking	0 CashPayment	0 Bank	0 DebitCard	2023-03-23T…	2023-03-30T…
3	comple…	This is a pa…	2 MobileBanking	2 CashPayment	0 Bank	0 DebitCard	2023-03-23T…	2023-03-23T…
4	refund…	This is a pa…	0 MobileBanking	0 CashPayment	0 Bank	0 DebitCard	2023-03-23T…	2023-03-23T…

Fig 7.8 Payment Status Table

7.2 Interface Design

Home/ Portal

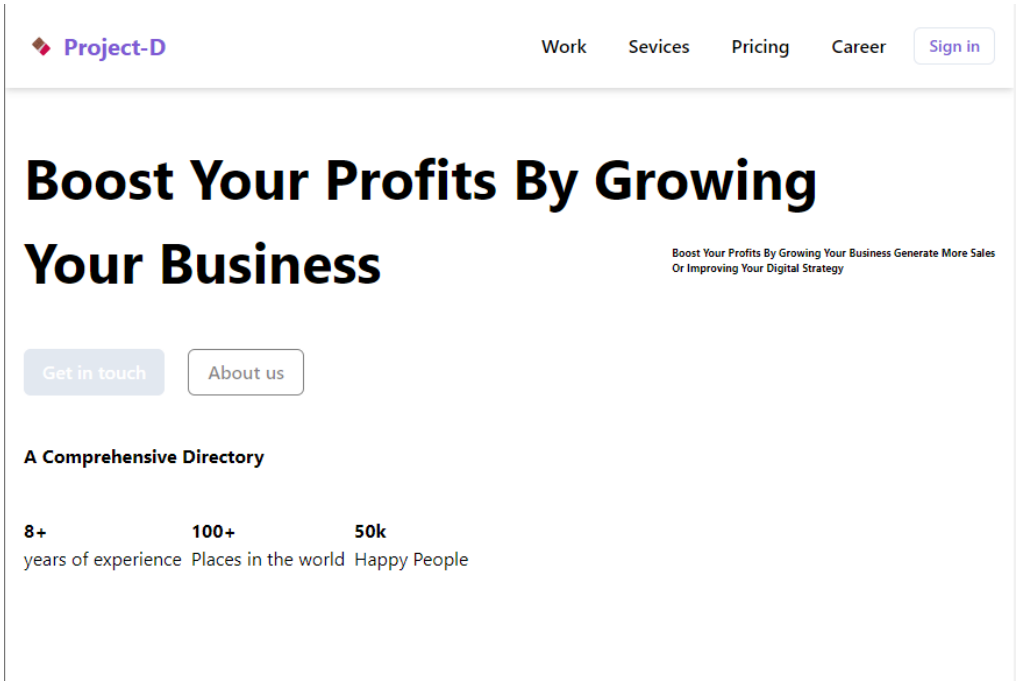

Fig 7.9 Landing Page

General User Registration

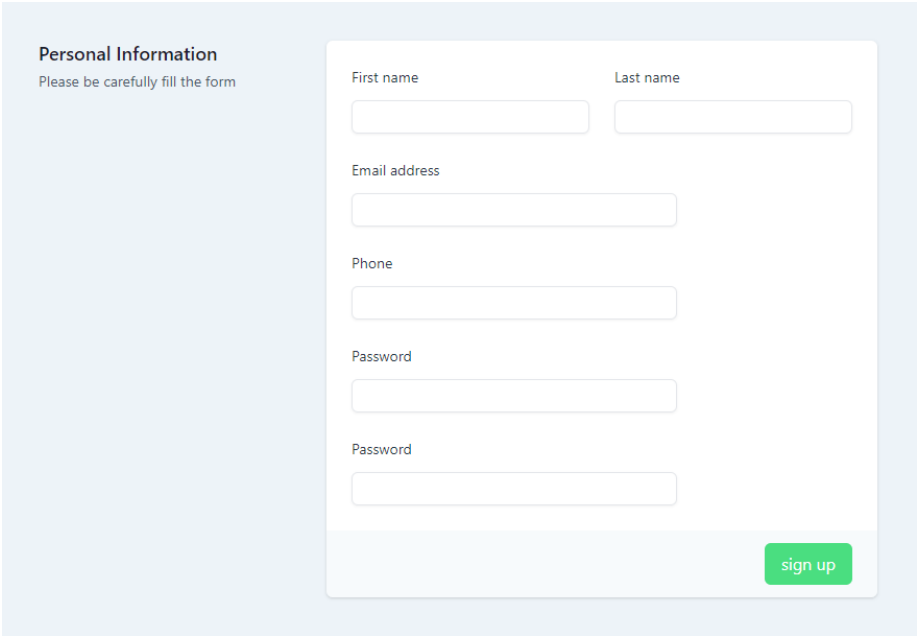

Fig 7.10 Registration interface

User Login

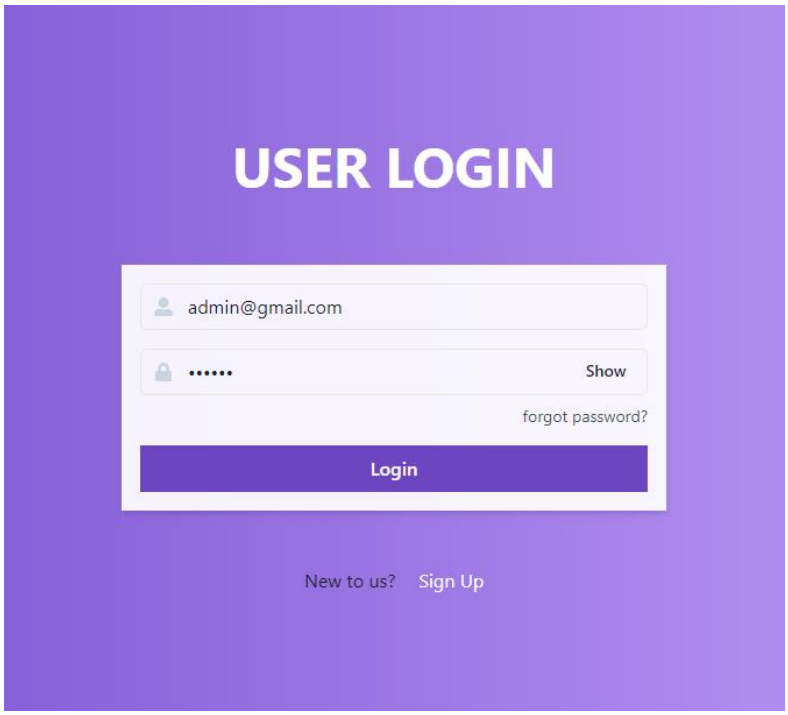

Fig 7.11 User Login

Admin Dashboard

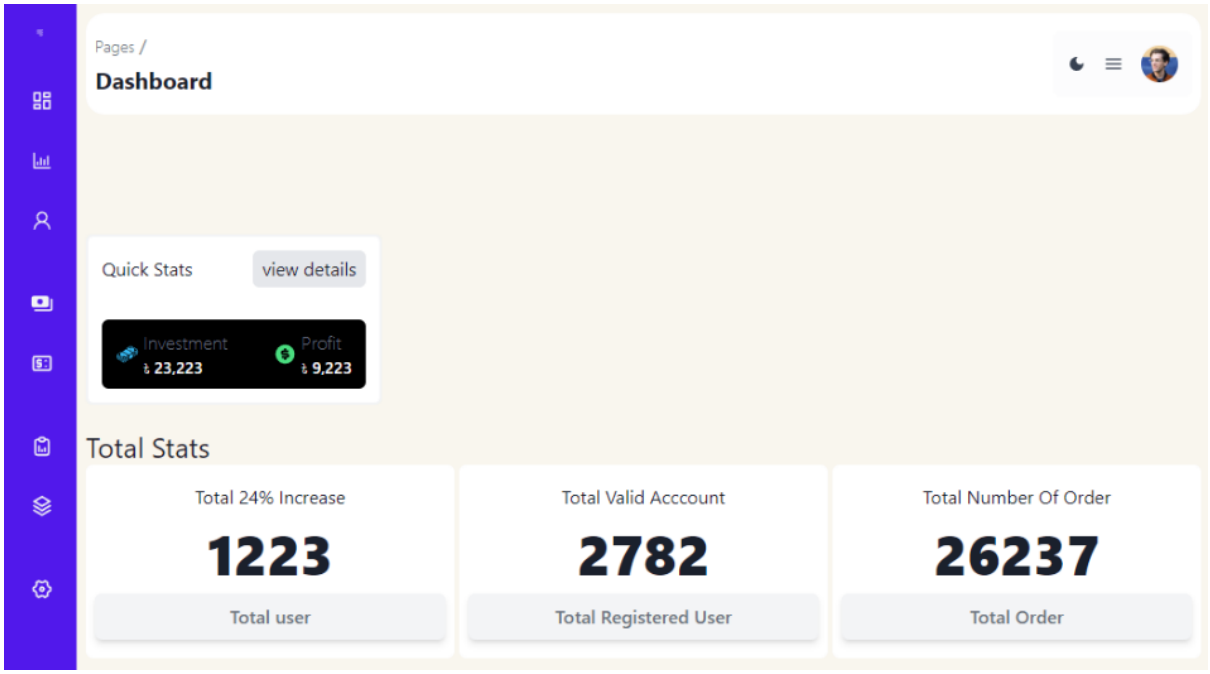

Fig 7.12 Admin Dashboard

Order page

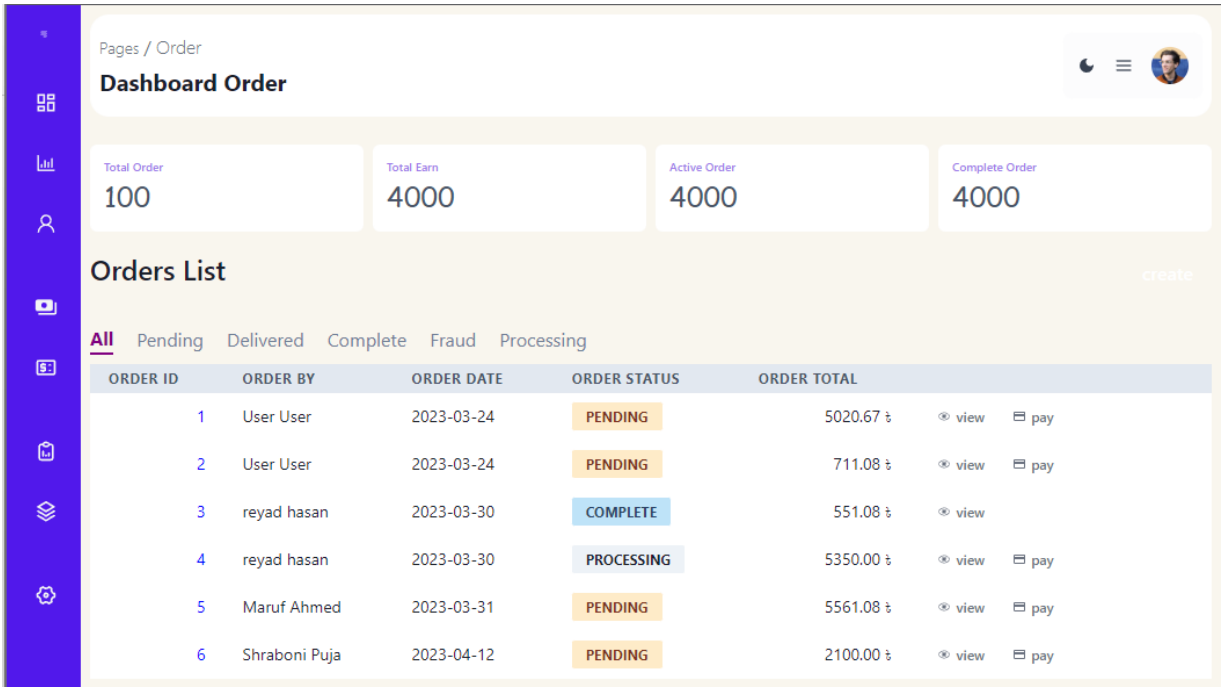

Fig 7.13 Order Page

New order

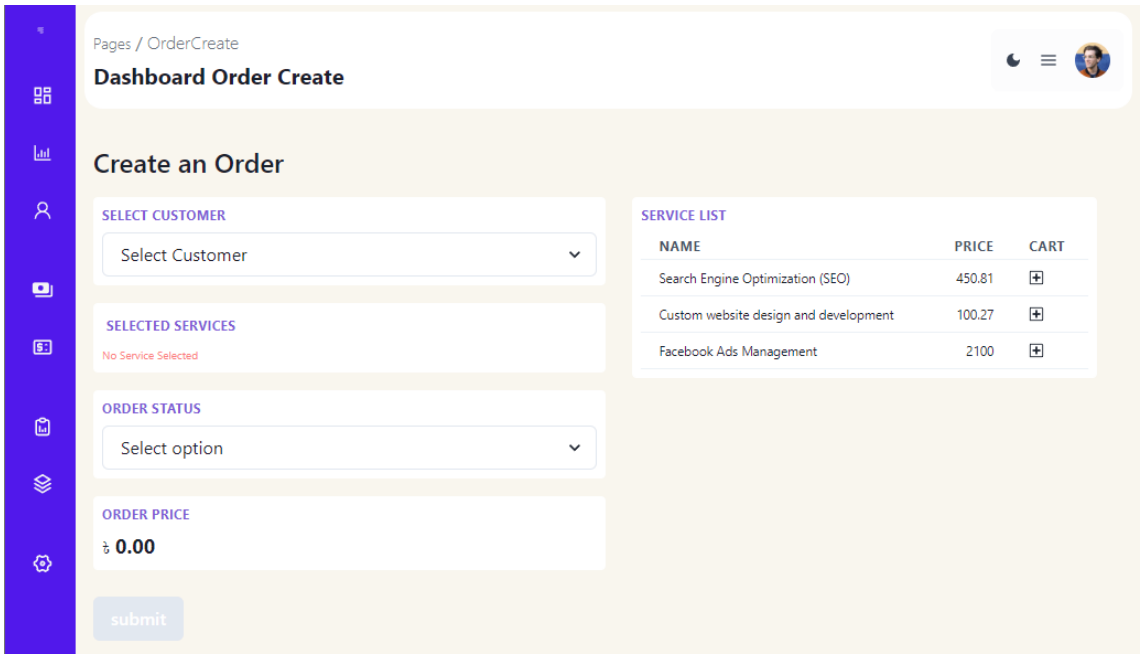

Fig 7.14 New Order

Service category

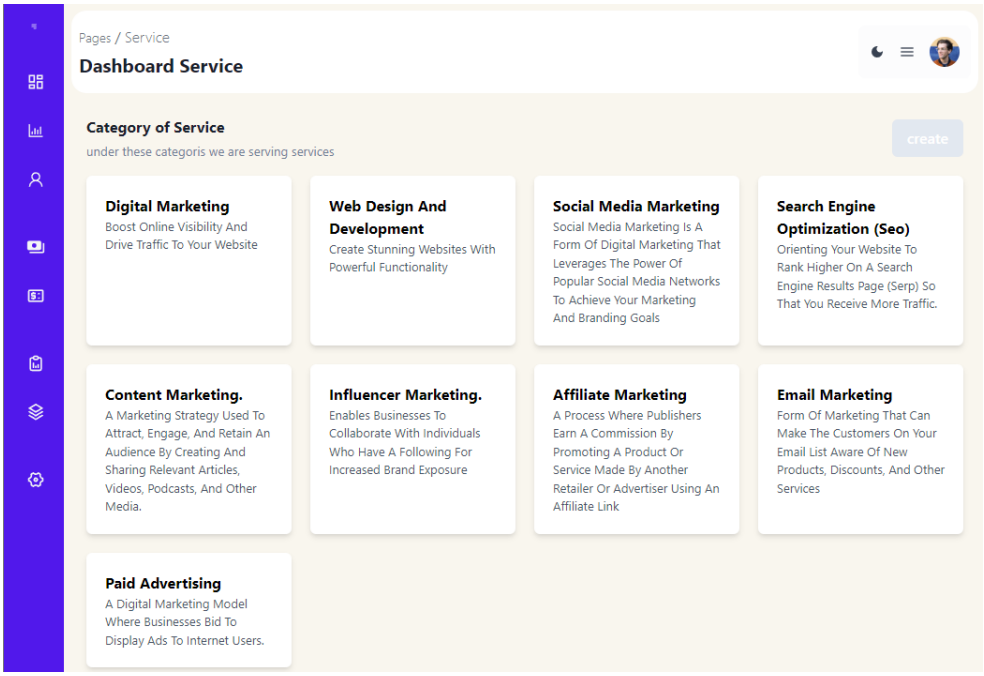

Fig 7.15 Service Category

View order page

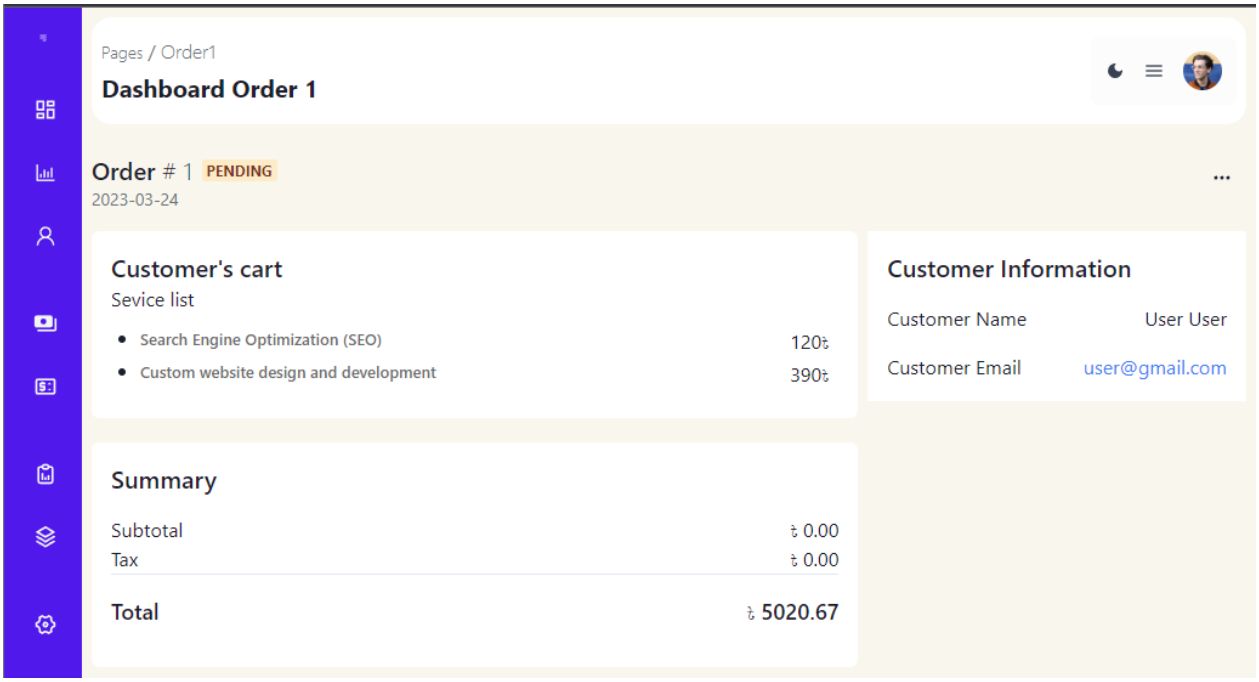

Fig 7.16 View Order Page

Invoice download Page

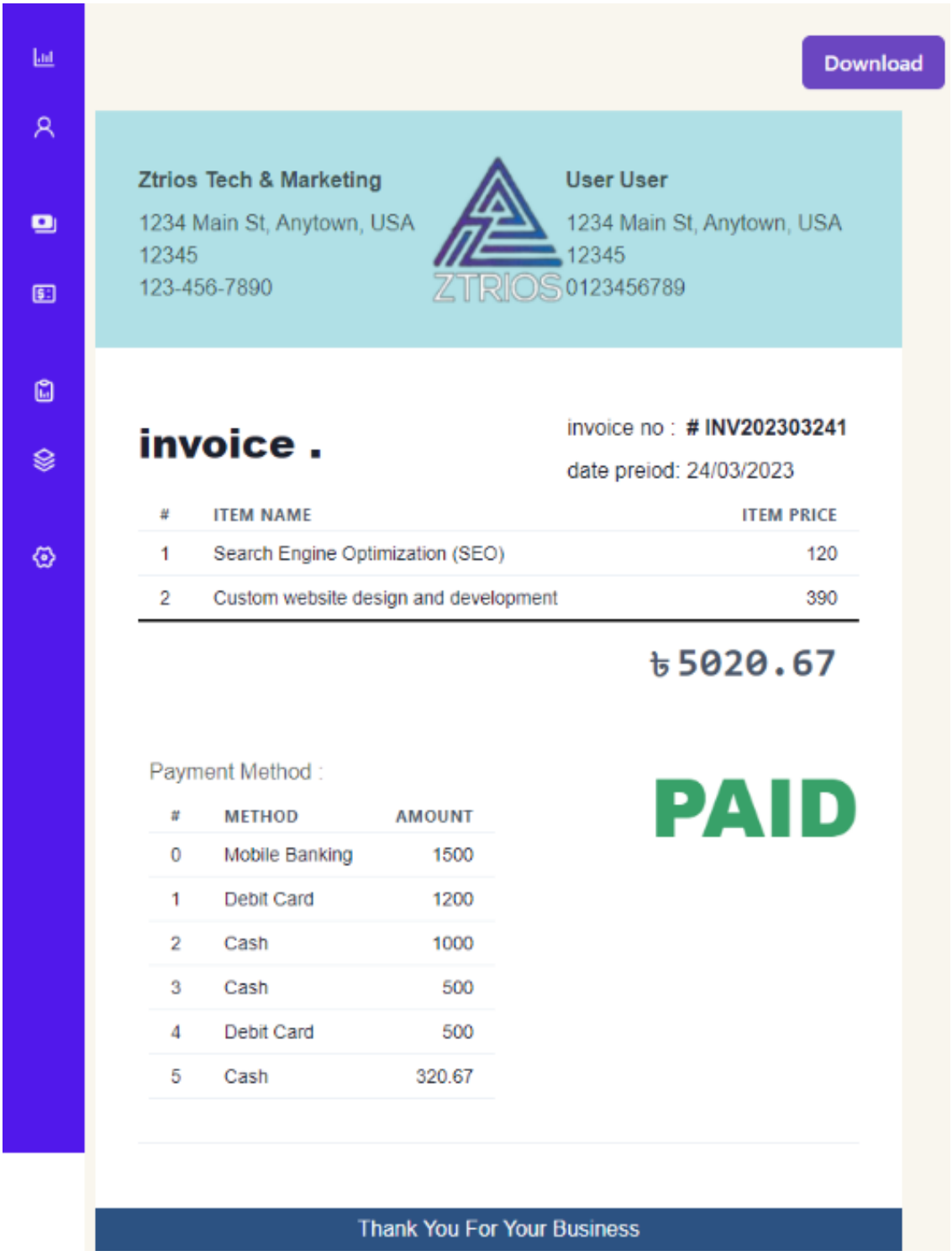

Fig 7.17 Invoice Download page

Partial payment page

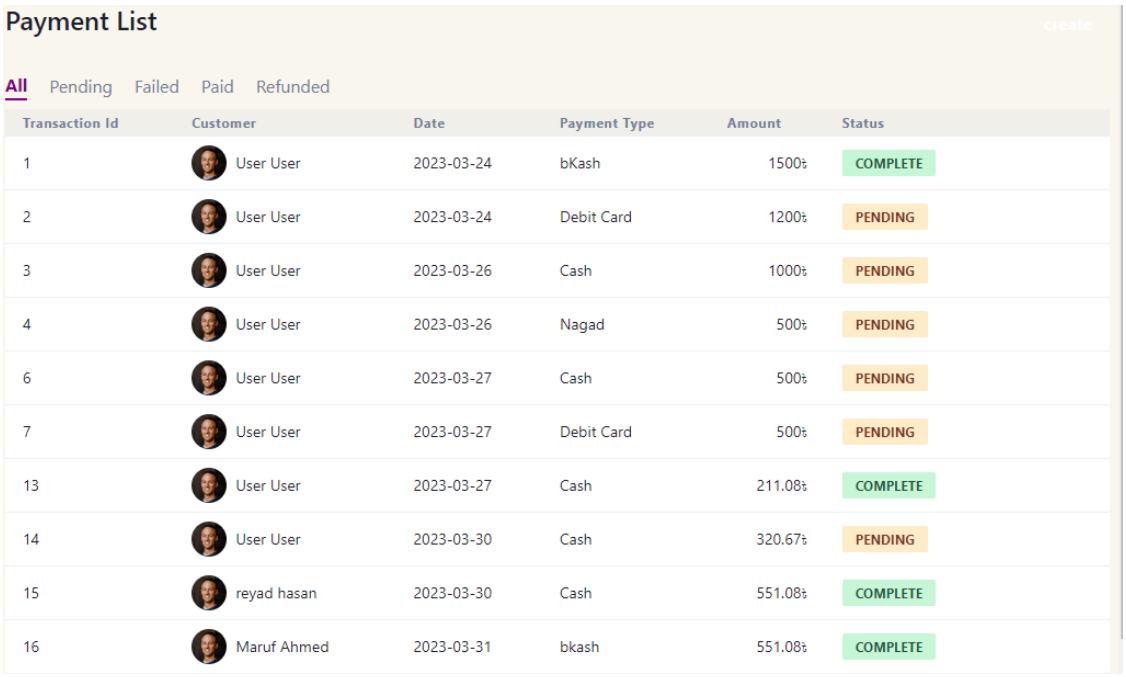

Fig 7.18 Partial payment page

Chapter 8

Testing

8.1 System testing

Software testing is the process of evaluation a software item to detect differences between given input and expected output. Also, to assess the feature of A software item. Testing assesses the quality of the product. Software testing is a process that should be done during the development process. In other words, software testing is a verification and validation process. [6]

Verification: Verification is the process to make sure the product satisfies the conditions imposed at the start of the development phase. In other words, to make sure the product behaves the way we want it to.

Validation: Validation is the process to make sure the product satisfies the specified requirements at the end of the development phase. In other words, to make sure the product is built as per customer requirements.

The objectives of software testing are:

- Testing is a process of executing a program with the intent of finding an error.
- A good test case is one that has a high probability of finding an as-yet-undiscovered error.
- A successful test is one that uncovers an as-yet-undiscovered error.

The design of tests for software can be challenging as the initial design of the product itself. Software can be tested in one of two ways:

- Knowing the specified function that the software has been designed to perform, tests can be conducted that demonstrate each function fully while at the same time searching for errors in each function. This approach is known as black-box testing.

- Knowing the internal workings of software, tests can be conducted to ensure that internal operations are performed according to specifications and all internal components have been adequately exercised. This approach is known as white-box testing.

8.2 Testing Design

In my project I have used the following test scenarios and applied black-box testing method to ensure the validity and conformity of the requirements of the project.

Table XXIIII Testing Scenario No 1

Scenario	Admin, User Login testing
Input's	Email, Password
Desired Output's	When valid email, password will be entered then user and admin will get access to their corresponding modules otherwise not
Actual Output's	For valid email and password, user & admin, get access to their corresponding modules.
Verdict	Desired Output and Actual Output indicate that the system login works properly.

Table XXIV Testing Scenario No 2

Scenario	User Registration
Input's	Email, Password
Desired Output's	When valid email, user will get email notification for confirming their registration in digital service portal platform.
Actual Output's	For valid email and users, get notification and can confirm their registration.
Verdict	Desired Output and Actual Output indicate that the system login works properly.

Table XXV Testing Scenario No 3

Scenario	Adding new services
Input's	Admin credentials, service details
Desired Output's	The new service should be added to the platform with the provided details.
Actual Output's	After providing valid admin credentials and service details, the service should be successfully added to the platform.
Verdict	Desired and actual outputs match, indicating that the function of adding new services works properly.

Table XXVI Testing Scenario No 4

Scenario	Purchase Services
Input's	User credentials, service details, payment information
Desired Output's	After completing the payment process, the user should be able to access the purchased service.
Actual Output's	Upon providing valid user credentials, service details, and payment information, the user should be able to access the purchased service.
Verdict	Desired and actual outputs match, indicating that the function of purchasing services works properly.

Table XXVII Testing Scenario No 5

Scenario	Edit Services
Input's	Admin credentials, service details
Desired Output's	After editing a service, the updated service details should be reflected on the platform.
Actual Output's	Upon providing valid admin credentials and service details to be edited, the updated service details should be successfully reflected on the platform.
Verdict	Desired and actual outputs match, indicating that the function of editing services works properly.

Table XXVIII Testing Scenario No 6

Scenario	View Purchased Order
Input's	User credentials
Desired Output's	The user should be able to view their previously purchased orders.
Actual Output's	Upon providing valid user credentials, the user should be able to view their previously purchased orders.
Verdict	Desired and actual outputs match, indicating that the function of viewing purchased orders works properly.

Table XXIX Testing Scenario No 7

Scenario	Generate Reports
Input's	Admin credentials, date range
Desired Output's	The system should generate a report of services sold within the specified date range.
Actual Output's	Upon providing valid admin credentials and a date range, the system should generate a report of services sold within that range.
Verdict	Desired and actual outputs match, indicating that the function of generating reports works properly.

Table XXX Testing Scenario No 8

Scenario	Check Running Services
Input's	User credentials
Desired Output's	The user should be able to view their currently running services.
Actual Output's	Upon providing valid user credentials, the user should be able to view their currently running services.
Verdict	Desired and actual outputs match, indicating that the function of checking running services works properly.

Table XXXI Testing Scenario No 9

Scenario	Payment Gateway Integration
Input's	Payment information
Desired Output's	Upon providing valid payment information, the user should be able to complete the payment process securely.
Actual Output's	Upon providing valid payment information, the user is able to complete the payment process securely.
Verdict	Desired and actual outputs match, indicating that the function of payment gateway integration works properly.

Table XXXII Testing Scenario No 10

Scenario	Mobile-Friendly Design
Input's	Device with internet access
Desired Output's	The digital service portal platform should be optimized for mobile devices, with a user-friendly design and easy navigation.
Actual Output's	The digital service portal platform is optimized for mobile devices, with a user-friendly design and easy navigation.
Verdict	Desired and actual outputs match, indicating that the function of mobile-friendly design works properly.

Table XXXIII Testing Scenario No 11

Scenario	Invoice Download
Input's	User credentials, order details
Desired Output's	Upon providing valid user credentials and order details, the user should be able to download their invoice.
Actual Output's	Upon providing valid user credentials and order details, the user is able to download their invoice.
Verdict	Desired and actual outputs match, indicating that the function of invoice download works properly.

Table XXXV Testing Scenario No 12

Scenario	Manage Order and Payment
Input's	Admin credentials, order details, payment information
Desired Output's	upon providing valid admin credentials, the admin should be able to manage order and payment details, including updating payment status and issuing refunds.
Actual Output's	Upon providing valid admin credentials, the admin is able to manage order and payment details, including updating payment status and issuing refunds.
Verdict	Desired and actual outputs match, indicating that the function of managing orders and payments works properly.

8.3 Other Aspects

Besides these testing scenarios where I have put only valid inputs, I also checked my system providing invalid inputs and verified whether my system can identify and restrict invalid input or not. I have built the following test cases for different functions of my system and checked thoroughly.

Login Function:

- Username and password fields are present with proper placeholder
- Empty submitting of any of these fields raise validation error.
- Providing invalid input gives a human readable meaningful message.

Status: System passed successfully

Registration Function

- Username and password fields are present with placeholder
- Check whether the user is already registered to the system or not.
- If not already registered, then user with the email can access to the system after successful registration.
- Register the users only and redirect to Dashboard with auto login.

Status: System passed successfully

All Add Page

- All fields are present
- Required fields show star mark and outline will change if null
- Invalid input shows validation error from client side
- Submit/ Submit another button works properly as their name suggests
- Dropdown, checkbox, date fields etc. works properly as expected.

Status: System passed successfully

PDF Report Generator

- Valid input (Ex: From Date, To Date etc.)
- Bootstrap modal popup for providing input for report generating.
- Close Button on modal popup works as expected.
- Preview button in modal popup generates a downloadable PDF document
- The design of the pdf reports is consistent and readable

Status: System passed successfully

Chapter 9

Conclusion

9.1 Preface

In this modern age of science and information, online communication plays a crucial role in the development of effective operational and management processes. To ensure uninterrupted services for employees at Ztrios Tech and Marketing, a group of software specialists work tirelessly together. I consider myself fortunate to have the opportunity to work with these efficient, hard-working, and friendly engineers. From the bottom of my heart, I extend my sincere thanks, gratitude, and salutations to these wonderful individuals. Together, we strive to provide the best possible service to our colleagues at Ztrios, utilizing the latest technological advancements.

9.1.1 Practicum and Its Value

As I progress in my career, I understand that the effort I put in has a direct correlation with the rewards I gather. For me, the practicum program served as a bridge between my college education and the real-world workplace, providing hands-on experience in engineering practices.

During my four years of undergraduate engineering studies, I gained both theoretical and practical knowledge. However, participating in the practicum program provided me with an opportunity to apply this knowledge and observe live operational systems, enhancing my practical working skills. It gives me immense satisfaction to say that my practicum was a successful event.

Practical work experience is invaluable and should not be overlooked. Nowadays, recruiters no longer just consider high grades, good communication skills, and part-time work experiences. Work experience in one's major field of study is now considered a crucial factor when hiring applicants. Students with better work experiences tend to secure better job opportunities.

I had the privilege of working at Ztrios Tech and Marketing during my internship, where I worked tirelessly to develop an efficient system. I applied the lessons, methods, tools, and techniques that I had learned during my study period at the College of Engineering and Technology (CEAT) in IUBAT. Successful software development requires a blend of standard practices, proper theoretical knowledge, and the developer's creativity.

As a student of CEAT at IUBAT, I participated in the practicum program, which carries a weight of six credit hours and lasts for a semester after completing our coursework. Upon completion, we submit a

report followed by a presentation showcasing our project work. Overall, the value of practicum programs cannot be overstated as they provide students with real-world experiences and prepare them for the job market.

9.2 Limitations

- **Scalability:** As the project grows, it may become more difficult to manage and maintain, especially as the number of users and data increases. No real time tracking for criminal and officer location
- **Security:** Depending on the type of data being handled by the system, security could be a major concern. Sensitive information, such as passwords or financial data, should be protected to prevent unauthorized access.
- **Compatibility:** The system may face compatibility issues with different platforms, devices, or web browsers. Compatibility testing is important to ensure that the system works seamlessly across various environments.
- **User Adoption:** A new system can face resistance from users, who may find it difficult to adapt to new technology or workflows. Proper training and user feedback mechanisms should be put in place to help users become comfortable with the new system.
- **Integration:** Integration with existing systems and third-party applications can be a challenge, especially if the system is expected to interact with a large number of external entities.
- **Maintenance:** Maintenance and support of the system may require dedicated resources, including personnel, infrastructure, and funding. Adequate planning and budgeting for ongoing maintenance are essential to ensure the system remains functional and up-to-date.

9.3 Future Plan

- Real time tracking system for criminals and officers for efficient monitoring of the system
- Online payment-based (BKash, Rocket, PayPal) special services for the end users
- More report for better management of the system
- User documentation for using the system

Conclusion

In conclusion, this project is an exciting venture that aims to develop a functional system to cater to the needs of the target users. The project's success is anchored on the development team's dedication, skills, and resources required for its successful implementation. The use of Prisma Schema and Complexity Matrix tables has provided a roadmap towards achieving the desired functionality and ensuring the project's success. However, the project has some limitations, such as its inability to handle large volumes of data, limited compatibility with some operating systems, and the need for regular updates to ensure continued efficiency.

The future plans for this project include implementing additional features to enhance its functionality, such as real-time analytics, additional security protocols, and incorporating machine learning and artificial intelligence to improve user experience. Additionally, efforts should be directed towards improving the system's scalability and compatibility with different operating systems to cater to a broader user base. In conclusion, this project is a continuous process, and the team needs to remain innovative and adaptable to changing technological trends to ensure its continued success

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