`VALLEY VIEW UNIVERSITY

FACULTY OF SCIENCE

DEPARTMENT OF COMPUTER SCIENCE

A SYSTEM DEVELOPMENT PROJECT SUBMITTED IN PARTIAL FULFILLMENT

OF THE REQUIREMENTS FOR THE BACHELOR OF SCIENCE (BSC.) IN INFORMATION TECHNOLOGY.

TOPIC:

PACKAGE DELIVERY SYSTEM (TRANSPORTEASE)

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DECLARATION

I declare that the project work entitled "PACKAGE DELIVERY SYSTEM" submitted to the Valley View University, is a record of an original work done by me under the guidance of DR. SETH ALORNYO, a lecturer at the Department of Computer Science, Faculty of Applied Science and Technology (FAST). This project work is submitted in partial fulfillment of the requirements for the award of the BSc. Information Technology. The results embodied in this project have not been submitted to any other Technical University or Institution for the award of any degree or diploma.

CERTIFICATION

I hereby confirm that the project work requirements of Valley View University were followed in the conduct of this research.

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ii

ACKNOWLEDGEMENT

I am grateful to God, almighty for the patience, strength, wisdom, and understanding He granted me to complete this project.

I would also like to say a big thank you to our department lecturers, especially my supervisor DR SETH ALORNYO for his immerse help, support and knowledge that enabled me to achieve a successful project.

ABSTRACT

Transportation hubs, serves as a vital transit point for various cargo and passenger services however, the current package delivery processes at various stations often lack organization, leading to delays, loss, and inefficiencies. TransportEase aims to address these challenges by offering a user-friendly, digital solution for managing package deliveries. The key objectives of implementing TransportEase includes efficiency to ensure a streamline package handling and delivery processes to reduce waiting times for customers and optimize resource allocation for service providers, transparency to provide real-time tracking and status updates for packages, enabling customers and service providers to monitor the delivery progress, security to improve enhancing package security by implementing digital tracking, tamper-evident packaging, and user authentication measures and customer experience to improve the overall customer experience by offering user-friendly interfaces, notifications, and a responsive support system.

TABLE OF CONTENT

CONTENT PAGE

DECLARATION.....i

CERTIFICATION.....ii

ACKNOWLEDGEMENT.....iii

ABSTRACT.....iv

TABLE OF CONTENTS.....vi

LIST OF FIGURES.....X

CHAPTER ONE.....1

INTRODUCTION.....1

1.0 INTRODUCTION.....1

1.1 PROBLEM STATEMENT.....3

1.2 OBJECTIVES.....3

1.2.1 MAIN OBJECTIVES.....3

1.2.2 SPECIFIC OBJECTIVES.....4

1.3 BACKGROUND OF STUDY.....4

1.4 SCOPE OF STUDY.....6

1.5 JUSTIFICATION.....6

1.6 METHODOLOGY.....7

1.7 EXPECTED RESULTS....8

1.8 PRESENTATION OF RESEARCH....8

1.9 STUDY OF WORK....9

CHAPTER TWO....10

LITERATURE REVIEW....10

2.1 INTRODUCTION....10

2.2 REVIEW OF EXISTING SYSTEM....10

2.2.1 ZOMATO....11

2.2.2 SYSTEM MODELING OF ZOMATO....12

2.3 PARCEL2GO....15

2.3.1 SYSTEM MODELING OF PARCEL2GO....16

2.4 SHIPHAWK....19

2.4.1 SYSTEM MODELING OF SHIPHAWK....20

2.5 INSTACART....24

2.5.1 SYSTEM MODELING OF INSTACART....25

2.6 EXISTING SYSTEM....28

2.7 PROPOSED SYSTEM....29

CHAPTER THREE....32

CRYSTALLIZATION OF THE PROBLEM.....32

3.1 BACKGROUND/HISTORY.....32

3.2 MANUAL SYSTEM.....34

3.3 SYSTEM DEVELOPMENT LIFE CYCLE.....35

3.4 TYPES OF SDLC MODELS.....36

CHAPTER FOUR.....44

ANALYSIS OF THE PROPOSED SYSTEM.....44

4.0 THE PROPOSED SYSTEM OVERVIEW.....44

4. 1.REQUIREMENT GATHERING AND ANALYSIS.....44

4.1.1 SYSTEM USER REQUIREMENT.....45

4.1.2 FUNCTIONAL REQUIREMENTS.....45

4.1.3 NON-FUNCTIONAL REQUIREMENTS.....46

4.2 FEATURE/COMPONENTS OF PROPOSED SYSTEM.....47

4.3 ADVANTAGES OF PROPOSED SYSTEM.....47

4.4 SYSTEM MODELING OF PROPOSED SYSTEM(TRANSPORTEASE) 48

4.5 **CHAPTER FIVE**.....51

5.0 DETAILED DESIGN OF THE PROPOSED SYSTEM.....51

5.1 THE AGILE METHODOLOGY.....51

5.1.1 JUSTIFICATION FOR CHOOSING AGILE METHODOLOGY.....52

5.2 PROPOSED SYSTEM DEVELOPMENT METHODOLOGY.....54

5.3 DESIGNING OF TRANSPORTEASE.....55

5.3.1 USE CASE DIAGRAM.....55

5.3.2 DATA FLOW DIAGRAM.....56

5.4 DATABASE DESIGN.....57

5.4.1 DESIGN PROCESS.....58

CHAPTER SIX.....59

SYSTEM IMPLIMENTATION AND TESTING.....59

6.0 INTRODUCTION.....59

6.1 SYSTEM METHODOLOGY.....59

6.1.1 JUSTIFICATION FOR CHOOSING PROTOTYPE MODEL.....61

6.2 METHODS USED IN PROJECT CONSTRUCTION.....62

6.2.1 FRONT END DEVELOPMENT TOOLS AND TECHNOLOGIES.....62

6.3 IMPLEMENTATION.....65

6.3.1 IMPLEMENTATION METHOD.....66

6.4 STRATEGIC APPROACH TO SOFTWARE TESTING.....67

6.4.1 USABILITY TESTING.....67

6.4.1.1 BLACKBOX TESTING.....67

6.5 UNIT TESTING.....70

6.5.1 PERFORMANCE TESTING.....71

6.5.2 REQUIREMENT TESTING.....72

6.5.3 VOLUME TESTING.....72

6.5.4 NON-FUNCTIONAL TESTING.....73

6.6 TEST RESULTS.....75

6.7 PERFORMANCE TESTING.....77

6.8 CONCLUSION.....78

CHAPTER SEVEN.....80

SYSTEM DOCUMENTATION.....80

7.0 INTRODUCTION.....80

7.1 SYSTEM OVERVIEW.....80

7.2 SYSTEM REQUIREMENT.....81

7.3 AUTHORIZED USE PERMISSION.....81

7.4 INSTALLING THE SOFTWARE.....82

7.5 SUCCESSFUL LOGIN.....84

7.6 SEND PACKAGE.....84

CHAPTER EIGHT.....89

SUMMARY, CONCLUSION AND RECOMMENDATION.....89

8.0 INTRODUCTION.....89

8.1 CONCLUSION.....89

8.2 RECOMMENDATION.....90

REFERENCES.....90

LIST OF FIGURES

FIGURE 1.0 PROTOTYPING BASED METHODOLOGY.....7

FIGURE 1.1 PROJECT PLANNER.....9

Figure 2.0 CONTEXT MODEL DIAGRAM OF ZOMATO.....13

Figure 2.1 USE CASE DIAGRAM OF ZOMATO.....13

Figure 2.2 BEHAVORIAL MODEL DIAGRAM OF ZOMATO.....14

Figure 2.3 CONTEXT MODEL DIAGRAM OF PARCERL2GO.....17

FIGURE 2.4 USE CASE DIAGRAM INTERFACE MODEL OF PARCEL2GO.....18

FIGURE 2.5 BEHAVORIAL MODEL DIAGRAM OF PARCEL2GO.....18

Figure 2.6 CONTEXT MODEL DIAGRAM OF SHIPHAWK.....21

Figure 2.7 USE CASE DIAGRAM INTERFACE MODEL OF SHIPHAWK.....22

Figure 2.8 BEHAVORIAL MODEL DIAGRAM OF SHIPHAWK.....23

FIGURE 2.9 USE CASE DIAGRAM INTERFACE MODEL OF INSTACART.....26

FIGURE 3.0 BEHAVORIAL MODEL DIAGRAM OF INSTACART.....27

FIGURE 3.1 DIAGRAM OF THE VARIOUS STAGES IN WATERFALL.....36

FIGURE 3.2 SPIRAL MODEL DIAGRAM OF PROPOSED SYSTEM.....38

FIGURE 3.3 ITERATIVE MODEL DIAGRAM OF PROPOSED SYSTEM.....39

FIGURE 3.4 AGILE MODEL DIAGRAM OF PROPOSED SYSTEM.....41

FIGURE 4.0 CONTEXT DIAGRAM OF TRANSPORTEASE.....48

FIGURE 4.1 INTERACTIVE MODEL USE CASE DIAGRAM OF

TRANSPORTEASE.....49

FIGURE 4.2 BEHAVORIAL MODEL DIAGRAM OF TRANSPORTEASE.....50

FIGURE 5.0 DIAGRAM OF THE AGILE METHODLOGY.....52

FIGURE 5.1 TRANSPORTEASE USECASE DIAGRAM.....56

FIGURE 5.2 DATA FLOWCHAT DIAGRAM OF TRANSPORTEASE.....57

FIGURE 6.0 DIAGRAM OF PROTOTYPE DESIGN MODEL.....61

FIGURE 6.1 BLACKBOX TESTING IMAGE.....68

FIGURE 6.2 BLACKBOX TESTING.....69

FIGURE 6.3 SOFTWARE TESTING TABLE.....74

FIGURE 6.4 TESTING RESULT.....77

FIGURE 6.5 TESTING RESULT.....78
FIGURE 6.6 PERFORMANCE TESTING.....79

FIGURE 7.0 LOGING FORM SHOWING THAT EACH FIELD IS REQUIRED.....84

FIGURE 7.1 DASHBOARD AFTER SUCCESSUL LOGIN.....85

FIGURE 7.2 SEND PACKAGE PAGE.....86

FIGURE 7.3 VIEW PACKAGE.....86

FIGURE 7.4 VIEW AND SIGN OUT PACKAGE.....87

FIGURE 7.5 VIEW AND GIVE OUT PACKAGE.....88

FIGURE 7.6 VIEW AND GIVE OUT PACKAGE.....88

FIGURE 7.7 DATABASE STRUCTURE.....89

CHAPTER ONE

INTRODUCTION

1.0 Introduction

In our increasingly digital age, the demand for efficient and convenient package delivery services has grown exponentially. Whether it is e-commerce, courier services, or business-tobusiness logistics, the need for a reliable and user-friendly system to manage package deliveries has never been greater. This is where a Web Package Delivery Application comes into play. The introduction of a Web Package Delivery Application signifies a significant shift in how we approach the delivery and logistics industry. It leverages the power of web-based technologies to streamline and optimize the entire package delivery process, from order creation and tracking to final delivery and confirmation. This innovative solution not only addresses the challenges of traditional package delivery but also introduces a new level of efficiency, transparency, and convenience

With a Web Package Delivery Application, individuals and businesses alike can take advantage of a wide range of features and benefits that redefine the way we send and receive packages. These applications typically offer user-friendly interfaces that make it easy for customers to book deliveries, monitor shipment progress

in real-time, and receive notifications at every critical stage of the journey. Moreover, such applications provide courier companies, drivers, and logistics providers with powerful tools to efficiently manage and track packages, reducing errors and ensuring on-time deliveries. Advanced features like digital signatures, tamper-evident

packaging verification, and automated reporting contribute to enhanced security, accountability, and customer satisfaction.

In addition to operational advantages, a Web Package Delivery Application enhances the overall customer experience. It simplifies the process of sending and receiving packages, eliminates the frustration of lost or delayed shipments, and fosters trust through transparency and clear communication. In an era when speed, accuracy, and reliability are paramount in the delivery and logistics industry, a Web Package Delivery Application emerges as the catalyst for transformation. It empowers businesses to meet the ever-increasing demands of their customers while optimizing internal processes for maximum efficiency and cost-effectiveness. As we delve deeper into the capabilities and impact of this innovative solution, we will explore its features, functionality, implementation, and the benefits it brings to businesses and consumers alike. Whether you're a logistics provider looking to modernize your operations or an individual seeking a hassle-free package delivery

experience, the world of web-based package delivery applications holds promise and potential like never before.

1.1 Problem statement

In today's fast-paced world, the package delivery industry faces many of challenges that hinder its ability to meet the evolving needs and expectations of customers, businesses, and logistics providers. These challenges underscore the critical need for the development and implementation of a comprehensive Web Package Delivery Application. The key problems that this application aims to address includes;

1. Traditional package delivery systems often lack transparency, leaving customers and senders in the dark about the real-time status and location of their shipments.
2. Ensuring the security and integrity of packages during transit remains a significant challenge.
3. Inaccurate Delivery Times.
4. Inefficient resource allocation leads to increased operational costs and longer delivery times.
5. The end-user experience in the package delivery process can be frustrating and cumbersome.
6. Security and Accountability

1.2 Objectives

1.2.1 Main Objectives

To develop, design and deploy a web application that will help the customers at Tema ststion in accra on package delivery challenges.

1.2.2 Specific Objectives

This project will focus on developing a web based application providing the listed functional requirement below:

1. To develop a robust tracking system.

2. To create an intuitive and user-friendly web application interface that caters to both senders and recipients.

3. To simplify the package booking process.

4. To Implement a secure and reliable authentication system for users.

1.3 Background to the Study

In the modern world, transportation hubs play a vital role in facilitating the movement of people and goods. These hubs, such as airports, bus terminals, and train stations, serve as critical points of convergence where travelers, commuters, and cargo intersect. Among the myriad services offered within these hubs,

package delivery is an indispensable aspect, bridging the gap between senders and recipients across distances. Traditionally, package delivery services in transport hubs have relied on conventional methods, involving paper-based tracking systems, manual handling, and a high degree of human intervention. While these methods have served their purpose for decades, they are now facing formidable challenges due to the evolving demands of an increasingly digital and interconnected world.

The rise of e-commerce, the proliferation of online marketplaces, and the rapid growth of the gig economy have led to a surge in the volume of packages passing through transport hubs. As a result, there is a pressing need for a more efficient, reliable, and technologically advanced solution to manage and streamline the package delivery process within these hubs. This is where TransportEase, a revolutionary Web Package Delivery Application, comes into play. The genesis of this application arises from the recognition of the inefficiencies and limitations of existing package delivery systems within transport hubs. TransportEase envisions a future where the entire package delivery ecosystem in these hubs is digitized, interconnected, and optimized to meet the demands of the modern era.

1.4 Scope of study

This research project revolves around the development of an online web package delivery application, by establishing this

comprehensive scope of study, the research project aims to provide a clear roadmap for the development of the online web package delivery application for Tema Station, with a focus on enhancing the efficiency, transparency, and user experience within this critical transport hub. The study will address the unique challenges and opportunities presented by Tema Station and contribute to the advancement of package delivery services in Ghana.

1.5 Justification

There were many manual systems and conventional ways of doing things before the advent of computers, but as computer technology and computer systems have advanced over time to meet market standards, this has led to advancements in businesses and a new standard for what is acceptable when it comes to systems. In this regard, the manual technique is still adaptable but slows down how quickly the cargo is delivered and moved. Historically, it has been challenging for students to access past questions.

1.6 Methodology

The prototyping based methodology of approach will be used to design the system. The prototyping model is a process for developing systems in which an early approximation of the system is constructed, tested, and then revised or modified as necessary until a final, acceptable prototype is attained from which the whole system will then be developed. Simply put, the desire system

needs to interact with the end user frequently, which is why it will be designed using the prototype technique.

The system will be developed using the following Web Technologies

- JAVA
- PHP MYSQL
- HTML / JAVASCRIPT
-

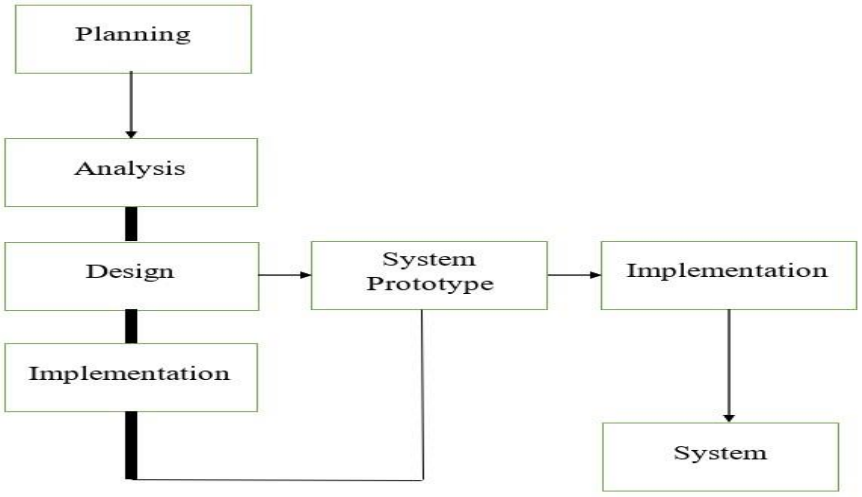


FIGURE 1.1

Prototyping based methodology

1.7 Expected Results of the Study

At the end of this project a fully functional H-desk system will be delivered. Other possible deliverables include

1. Final report
2. Source code
3. Instruction booklet or a user manual

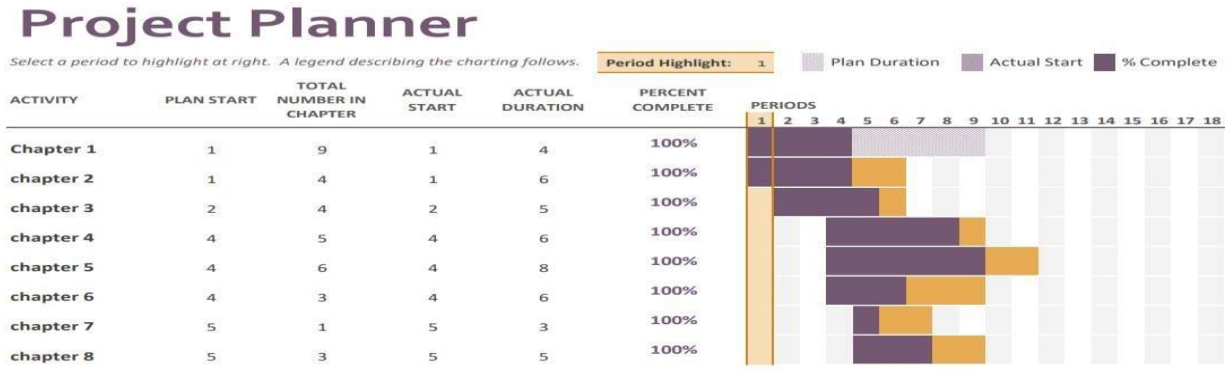
1.8 Presentation of Thesis

The study is divided into eight chapters which are as follows bellow:

1. Chapter one introduces the research study, the subject and field of study, the study objectives, providing the background to the study, the scope of the study, justification and significance of the study, Methodology, Expected results of study, presentation of thesis study work plan.
2. Chapter two presents a review of literature on the topic.
3. Chapter three presents the crystallization of the project.
4. Chapter four Analysis of the proposed System.
5. A detailed design of the proposed system is presented in Chapter five.
6. Chapter six constitutes Implementation of system design and testing.

7. Chapter seven comprises of system Documentation.
8. Finally, chapter eight presents the summary, conclusion, general recommendations of the study and further work.

1.9 Study work plan (Timeliness) Project schedule and work timeline plan



CHAPTER TWO
LITERATURE REVIEW

2.1 Introduction

Considering other environmental issues and package delivery systems and to better understand how the package processes and procedures are carried out properly using modern technologies such as web communications and other supporting frameworks irrespective of their communication method being it wired or wireless, a variety of related environmental issues and package delivery systems which are relevant work of other authors has been reviewed.

Majorly we studied some unique parameters of the viewed systems which will help us to define the strong objectives about our propos ed systems.

2.2 Review of Existing Systems

Considering other package delivery services and package delivery systems and to understand in detail the domain areas of package delivery processes and procedures using modern technologies such as web communications such as web communications and other android supporting frame works irrespective of their communication method being it wired or wireless.A variety of related package delivery systems which are relevant work of other authors have been reviewed.

Majorly we studied some unique features of the reviewed systems which will enable us to define strong objectives about the proposed system. Below are some of the reviewed systems that give us a close and fair idea about the review research we conducted.

They include:

1. **Zomato**
2. **Parcel2Go**
3. **ShipHawk**
4. **Instacart**

2.2.1 ZOMATO

Zomato is a well-known online food delivery and restaurant discovery platform. While it primarily focuses on food delivery services, it also provides information about restaurants,

including menus, reviews, and ratings. Zomato operates in many countries and is available through its website and mobile applications. Users can browse and order food from local restaurants and have it delivered to their location. Additionally, Zomato offers various features like online reservations, table booking, and more to enhance the dining experience. Keep in mind that Zomato's services and availability may vary by region. Some features of zomato includes;

1. Restaurant Discovery: Zomato provides users with an extensive database of restaurants, cafes, and eateries. Users can search for restaurants by cuisine, location, and more.
2. Menus and Reviews: Users can view restaurant menus, prices, and user reviews and ratings to make informed dining choices.
3. Food Delivery

2.2.2 System Modeling Of Zomato;

1. **Context Models;** Context models are used to illustrate the operational context of a system, ie they show what lies outside the system boundaries. The figure below shows the context model design of zomato

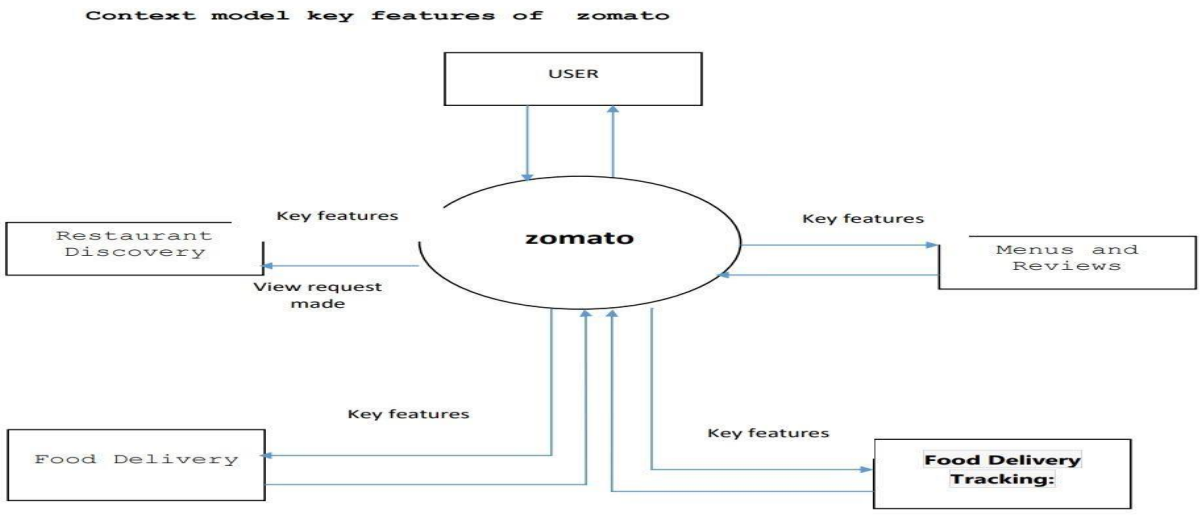


Figure 2.0 Context model diagram of zomato

2. **Interaction Models;** Interaction model helps to identify user requirements of a system and also how users will interact with the system. The figure below shows the use case diagram of the interaction model of zomato

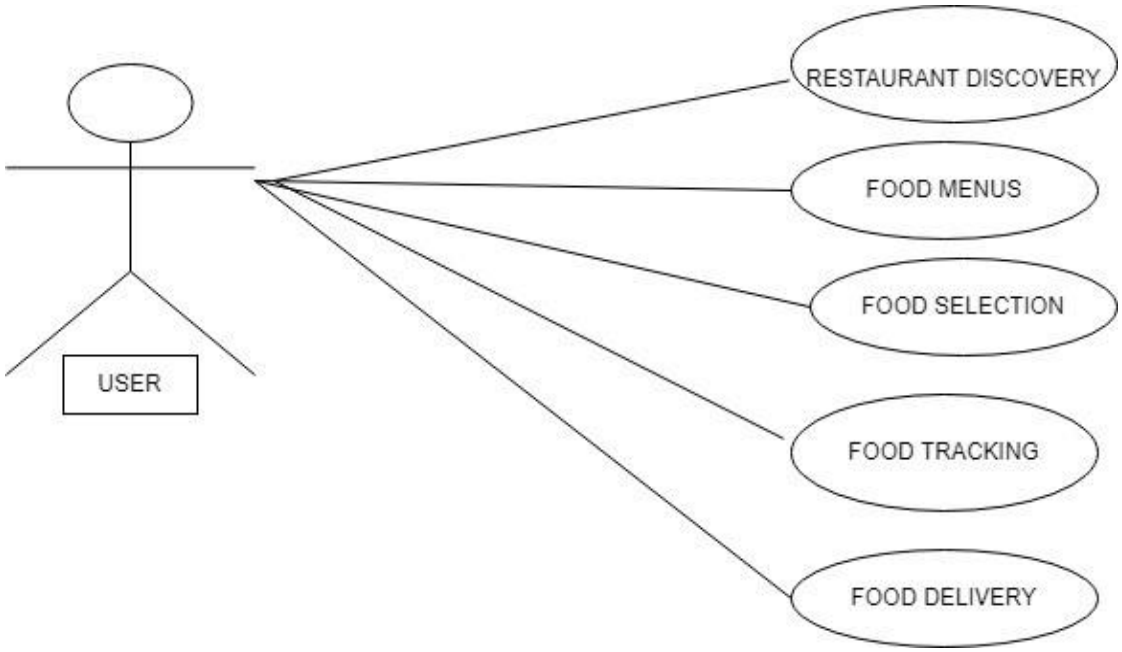


Figure 2.1 Use case diagram of

interaction model of Zomato

3. **Behavorial Model;** These are models of the dynamic behavior of a system as it is executing ie they show what is happening or what is suppose to happen in a system.

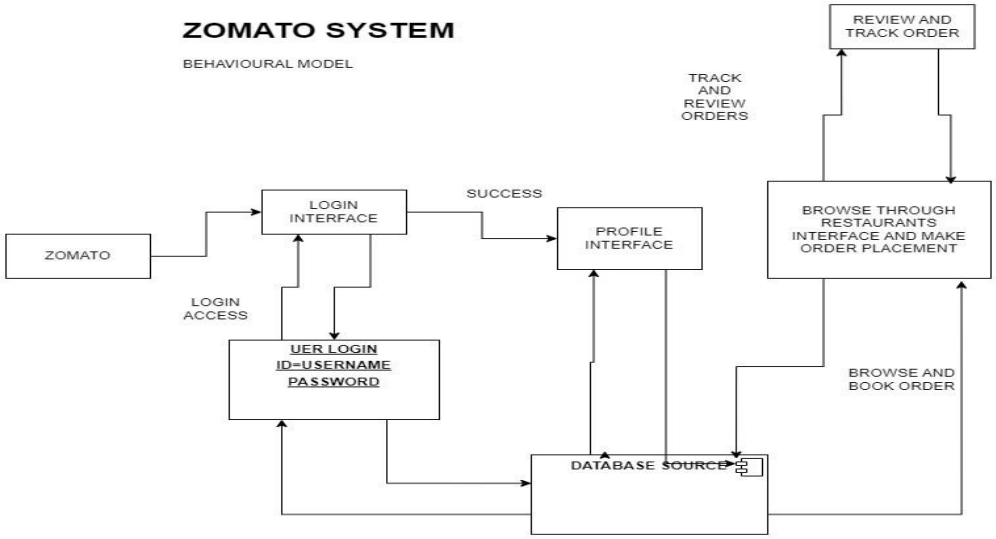


Figure 2.2 Behavorial model diagram of zomato

Strengths And Wakeness Of Zomato

1. Wide Network: Zomato has a vast network of restaurants and food delivery partners, providing users with an extensive range of food options to choose from.

2. User-Friendly Interface: The platform offers a userfriendly interface and a mobile app that makes it easy for customers to search for restaurants, read reviews, and place orders.
3. Restaurant Information: Zomato provides detailed information about restaurants, including menus, reviews, and ratings, helping users make informed dining and delivery choices.
4. Delivery Time Variability: The delivery time for orders can vary significantly, depending on factors like restaurant location, traffic, and order volume, which may result in delays.
5. Quality Control: Ensuring the quality of food during delivery can be a challenge, as it depends on the restaurant's packaging and the delivery partner's handling.

2.3 Parcel2Go

Parcel2Go is a well-known online parcel delivery and courier comparison platform that facilitates the efficient and costeffective shipping of parcels for both individuals and businesses. Established in 2000, Parcel2Go has grown to become one of the largest and most trusted parcel delivery intermediaries in the United Kingdom. The platform connects customers with a wide network of courier service providers, enabling them to send parcels domestically and internationally. Parcel2Go has gained popularity due to its user-friendly platform, competitive pricing, and extensive courier network. It caters to a wide range of customers,

from individuals sending occasional parcels to e-commerce businesses with ongoing shipping needs. The platform's commitment to providing reliable and efficient parcel delivery services has made it a trusted choice for sending parcels in the UK and beyond. Some features of parcel2Go includes;

1. Parcel Comparison: Parcel2Go allows users to compare quotes and services from various courier companies, enabling them to choose the most suitable option based on their needs and budget.
2. Wide Range of Couriers: Parcel2Go partners with a variety of reputable courier companies, including DHL, UPS, FedEx, Hermes, and many more, offering a wide range of delivery options.
3. Online Booking: Users can easily book parcel delivery services online through the Parcel2Go website or mobile app.

2.3.1 System Modeling Of Parcel2Go;

1. **Context Models;** Context models are used to illustrate the operational context of a system, ie they show what lies outside the system boundaries. The figure below shows the context model design of Parcel2GO

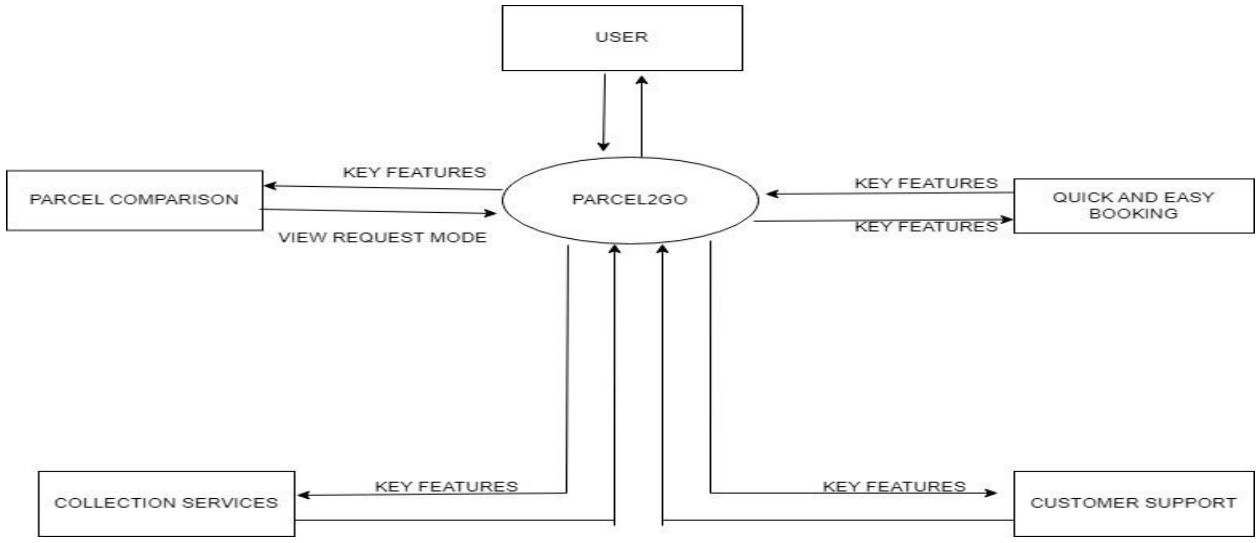


Figure 2.3 Context model Diagram of Parcel2Go

2. **Interaction Models;** Interaction model helps to identify user requirements of a system

and also how users will interact with the system. The figure below shows the use case diagram of the interaction model of parcel2go.

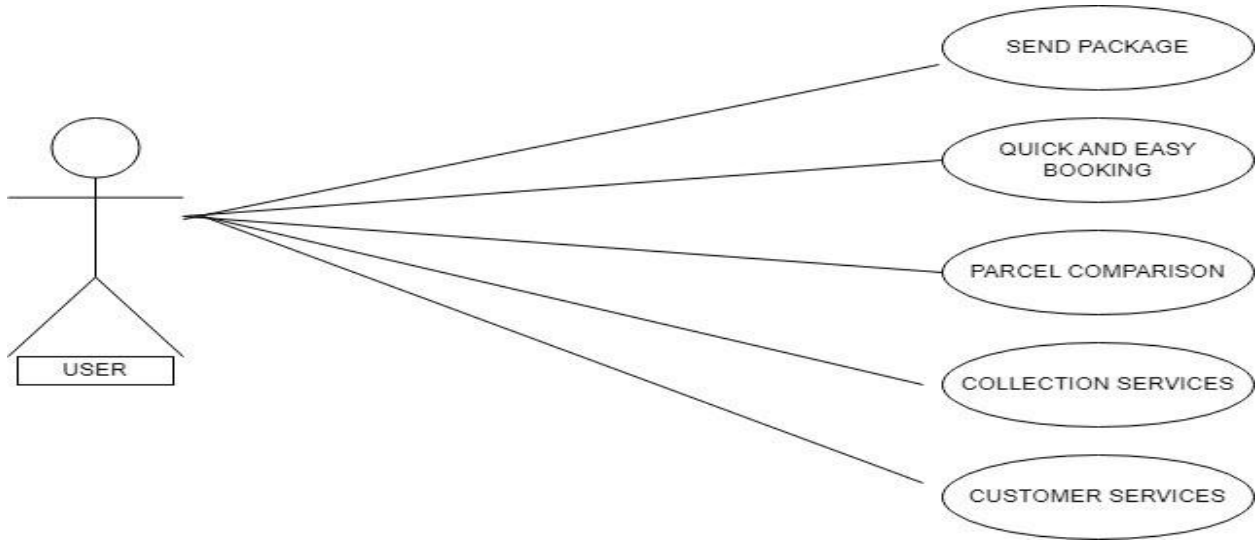


Figure 2.4 Figure 2.1 Use case diagram of interaction model of Parcel2Go

3. **Behavorial Model;** These are models of the dynamic behavior of a system as it is executing ie they show what is happening or what is suppose to happen in a system.

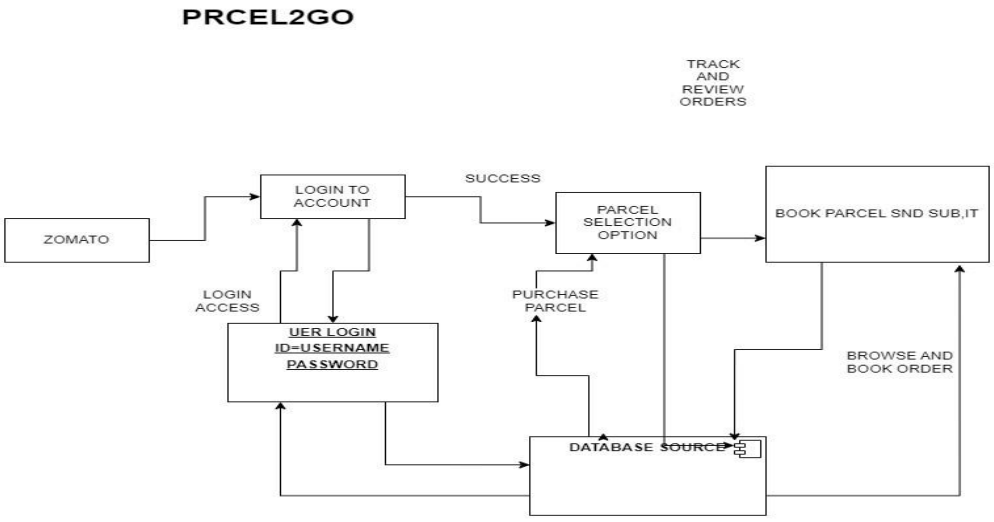


Figure 2.5 Behavioral model Diagram of Parcel2GO

Strengths And Weakness Of Parcel2GO

1. Variety of Couriers: Parcel2Go collaborates with a wide range of courier services, including well-known carriers like DHL, Hermes, and UPS.
2. User-Friendly Platform: The Parcel2Go website is userfriendly, making it easy for customers to compare quotes, book shipments, and track parcels.

3. Competitive Pricing: Parcel2Go often offers competitive pricing for parcel deliveries.
4. Convenience: Parcel2Go allows customers to book parcel deliveries online, which is convenient for individuals and businesses looking for efficient and hassle-free courier services.
5. Customer Service: Some customers have reported issues with Parcel2Go's customer service, particularly when it comes to addressing delivery problems or obtaining refunds.
6. Delivery Issues: There have been instances of delivery issues, such as lost or damaged parcels. While Parcel2Go acts as an intermediary.

2.4 **ShipHawk.**

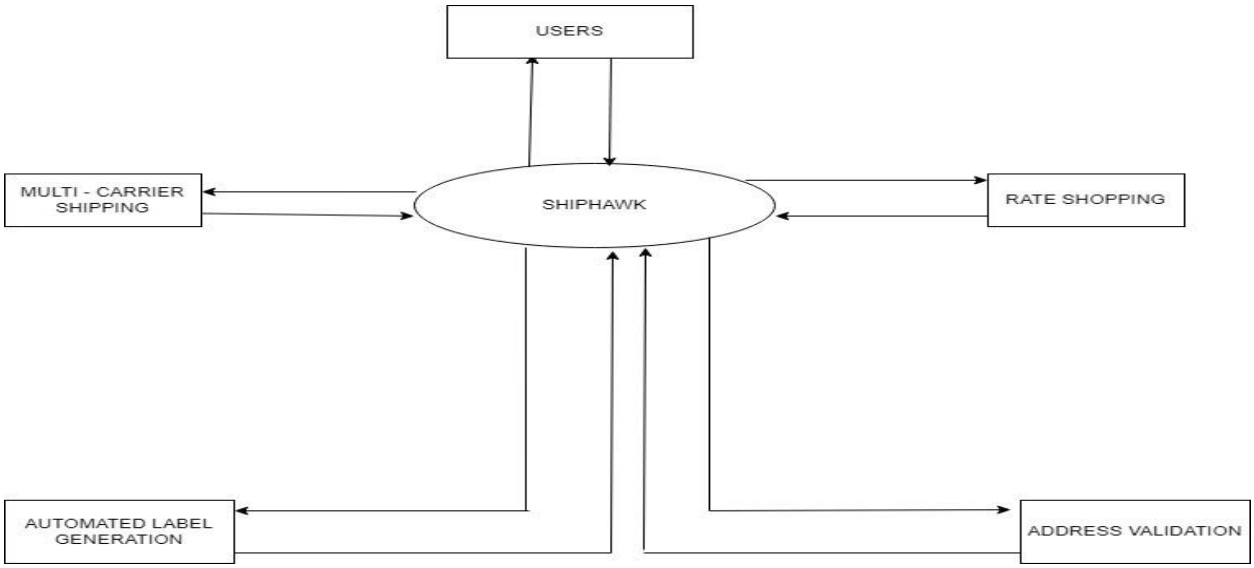
ShipHawk is a comprehensive and innovative shipping and logistics platform designed to simplify and optimize the shipping process for businesses of all sizes. Whether you're a small e-commerce startup or a large enterprise, ShipHawk offers a range of features and services to streamline your shipping operations. Here's an overview of ShipHawk. ShipHawk is a versatile and scalable shipping solution that can benefit businesses across various industries. By streamlining shipping processes, optimizing carrier selection, and providing visibility into shipping operations, ShipHawk helps businesses reduce costs, improve efficiency, and enhance the overall customer experience.Multi-Carrier Shipping: ShipHawk

integrates with various shipping carriers, including UPS, FedEx, USPS, DHL, and regional carriers. . Some key features of Shiphawk includes;

1. Rate Shopping: The platform provides real-time rate shopping, which automatically selects the best shipping carrier and service based on factors like cost, delivery time, and location.
2. Automated Label Generation: ShipHawk automates the process of generating shipping labels, reducing manual data entry errors.

2.4.1 System Modeling Of ShipHawk;

1. **Context Models;** Context models are used to illustrate the operational context of a system, ie they show what lies outside the system boundaries. The figure below shows the context model design of ShipHawk



2.

Figure 2.6 Context Model diagram of ShipHawk

Interaction Models; Interaction model helps to identify user requirements of a system and also how users will interact with the system. The figure below shows the use case diagram of the interaction model of ShipHawk.

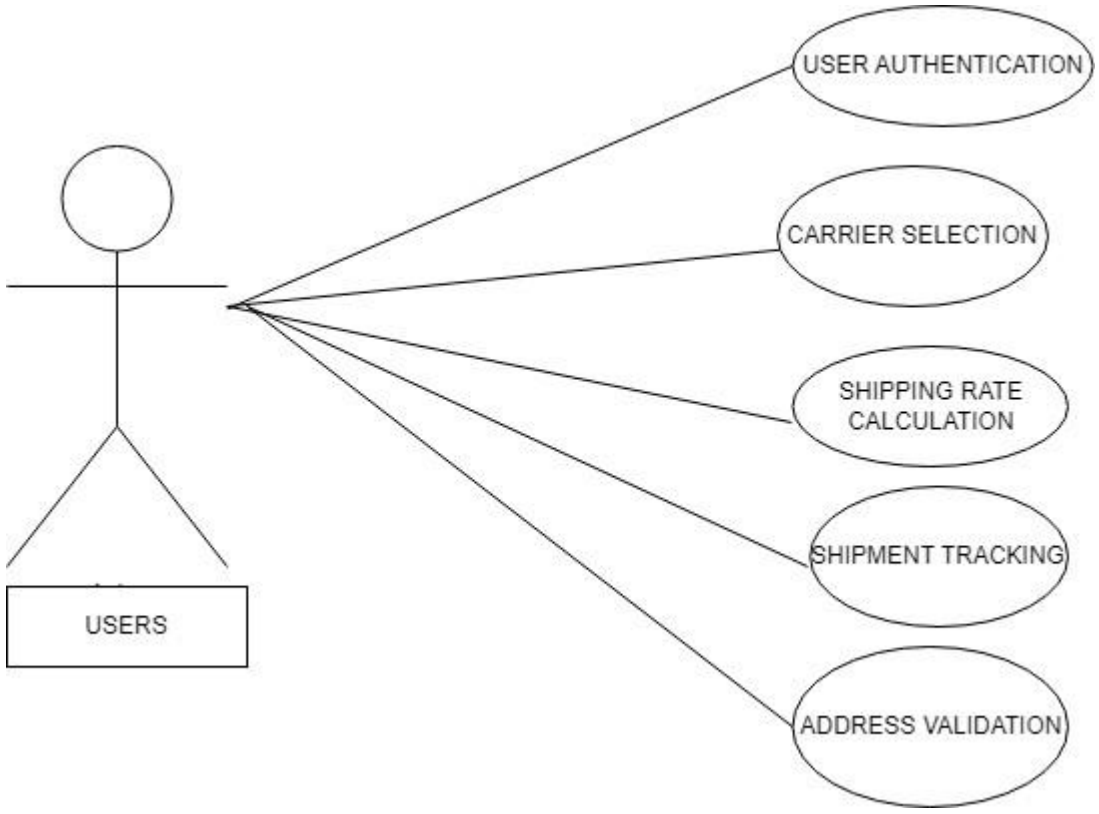
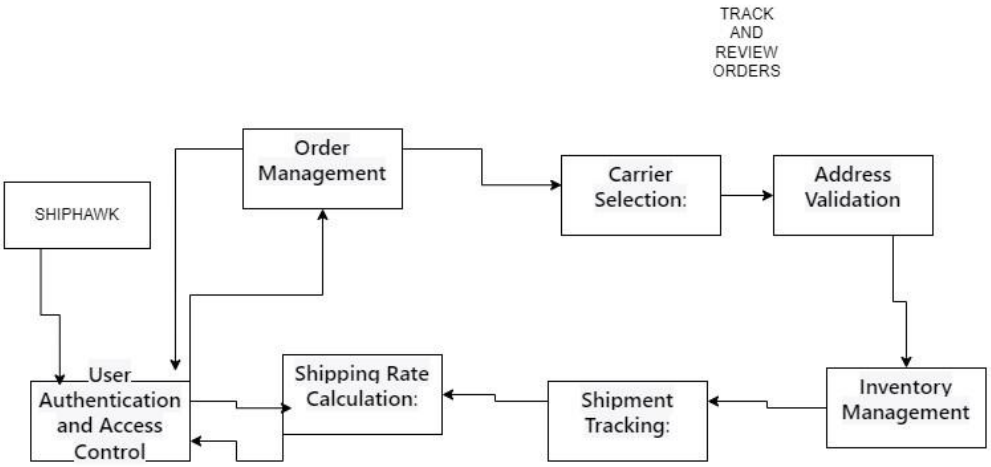


Figure 2.7 Use Case Diagram of Interaction Model of ShipHawk

3.

Behavorial Model; These are models of the dynamic behavior of a system as it is executing ie they show what is



happening or what is suppose to happen in a system.

Figure 2.8 Behavioral Model Diagram of ShipHawk

Strengths And Weakness of ShipHawk:

1. Multi-Carrier Integration: ShipHawk provides integration with multiple shipping carriers, making

4. it easier for businesses to choose the best shipping options based on

their specific needs.

2. Automation and Optimization: The platform offers automation features that help streamline shipping processes, reduce errors, and improve efficiency.
3. Real-Time Tracking: ShipHawk provides real-time tracking and visibility into shipments.
4. Customizable Shipping Rules: ShipHawk allows users to create and implement customizable shipping rules and policies.
5. Complexity: ShipHawk's extensive features and customization options can be complex for some users, especially small businesses. It may require a learning curve and time investment to make the most of the platform.
6. Cost: The comprehensive features of ShipHawk come at a price. Small businesses with limited shipping needs may find the platform costly, especially when compared to more basic shipping solutions.

2.5 Instacart

Instacart is a rapidly growing on-demand grocery delivery and pick-up service that has revolutionized the way people shop for groceries. It was founded in 2012 by Apoorva Mehta, Brandon Leonardo, and Max Mullen with the vision of making grocery shopping more convenient and accessible. Today, Instacart has become a household name in the United States and Canada, providing a

platform for users to order groceries and other household essentials from local stores and have them delivered to their doorstep within hours. Instacart has undeniably transformed the grocery shopping experience, making it more convenient and accessible. Its strengths lie in its unmatched convenience, extensive store network, quick delivery, and personal shopper service. However, it also faces challenges related to pricing, availability, product availability, and maintaining quality control. As Instacart continues to grow and evolve, addressing these issues will be essential to maintaining its position as a leader in the online grocery delivery industry. Some features of Instacart includes

1. Grocery Delivery and Pickup: Instacart offers on-demand grocery delivery services, allowing users to shop for a wide range of groceries and household items online. convenience.
2. Personal Shoppers: Instacart connects users with personal shoppers who pick and pack their grocery orders.
3. Variety of Retailers: Instacart partners with various grocery store chains and retailers, giving customers access to a broad selection of products.

2.5.1 System Modeling Of Instacart;

1. **Interaction Models;** Interaction model helps to identify user requirements of a system

and also how users will interact with the system. The figure below shows the use case diagram of the interaction model of Instacart.

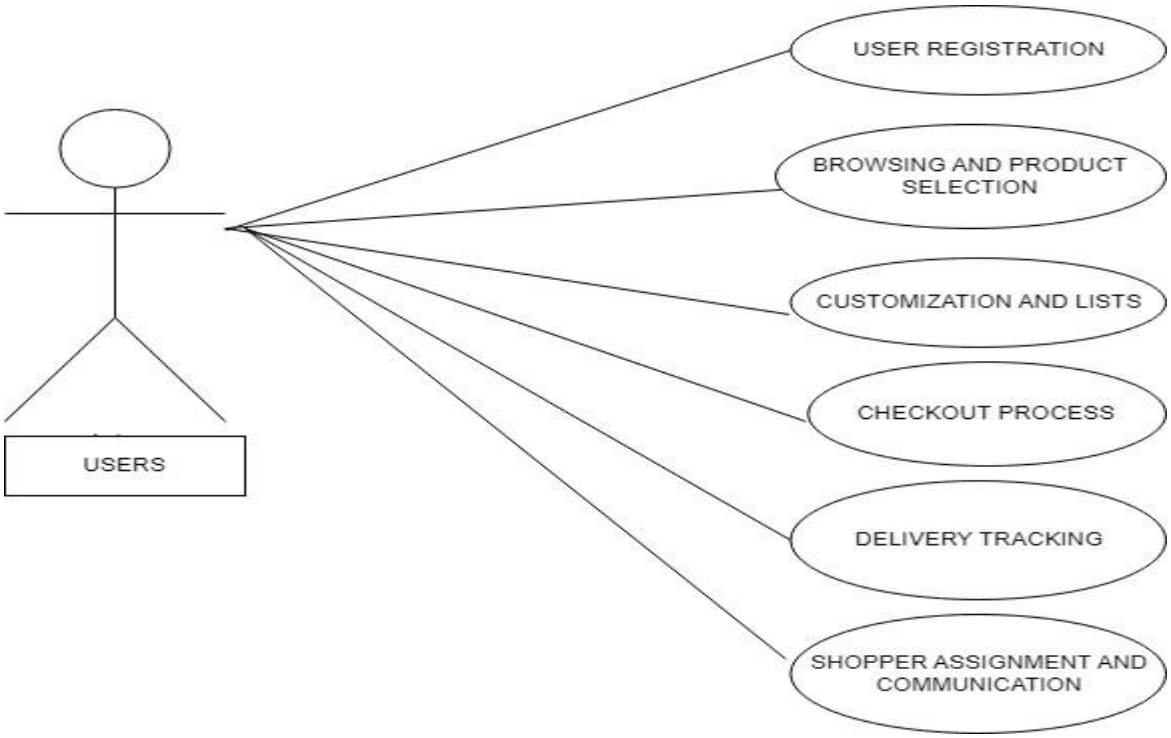


Figure 2.9 Use Case Diagram of Interaction model of instacart

2. **Behavorial Model;** These are models of the dynamic behavior of a system as it is executing ie they show what is happening or what is suppose to happen in a system.

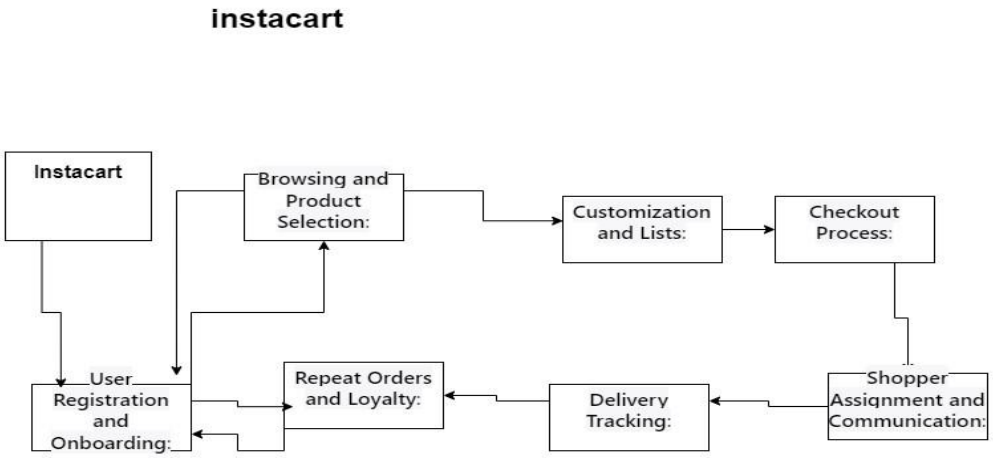


Figure 3.0 Behavioral Model Diagram of Instacart

Strengths And Weakness of Instacart:

3. Wide Retailer Network: Instacart has partnered with a broad range of grocery store chains, making it accessible to a large customer base.
4. Convenience: Instacart offers a convenient and time-saving solution for grocery shopping.
5. Same-Day Delivery: Instacart's same-day delivery service is a significant advantage.
6. Personal Shoppers: Instacart employs personal shoppers who pick and pack the items for customers.

7. High Service Fees: Instacart may charge high service fees, including delivery fees and a markup on product prices compared to in-store prices.

2.6 Existing System

The current system for accessing and delivering packages involves a combination of physical and administrative processes. This system is the traditional method through which individuals or businesses obtain the packages they order online or through other means.

The advantages of the existing system:

1. Familiarity: The current system is likely well-established and familiar to the staff and users. This can make it easier to manage and adapt to changing needs.
2. Personal Interaction: Many traditional systems rely on personal interactions, which can be valuable in a tightknit community. Couriers and staff may know the senders and receivers personally.
3. Simple and Cost-Effective: Older systems may not require complex technology, making them cost-effective to maintain. This can be especially beneficial for smaller transportation hubs.

4. Reliability: If the existing system has been in place for a while, it might have earned a reputation for reliability and trustworthiness. Users may have confidence in the system's ability to deliver packages.

2.7 Proposed System

The proposed web package delivery system for Tema Station, Accra, represents a significant step forward in modernizing this vital transportation hub. By addressing the growing demand for streamlined package delivery, the system aims to provide a more efficient and secure package handling experience, ultimately contributing to the continued growth and development of Tema Station as a key player in Accra's transportation network. The system will be designed to meet the needs of various stakeholders, ensuring that it becomes an integral part of daily operations at the station.

Strengths of Proposed system :

1. Efficiency: A web-based package delivery system can significantly improve the efficiency of package handling at Tema Station. It enables automated tracking, reduces manual paperwork, and streamlines the entire process. This efficiency leads to quicker deliveries and enhanced customer satisfaction.

2. Transparency: One of the key strengths of a web package delivery system is the transparency it offers. Customers and businesses can track their packages in real-time, providing them with visibility into the status and location of their shipments. This transparency builds trust and reliability.
3. Reduced Errors: Automation and digital record-keeping help minimize errors and inaccuracies in package handling. It reduces the chances of misplacing or mishandling packages, leading to a smoother operation and fewer customer complaints.
4. Scalability: A web-based system can easily adapt to the growing demands of Tema Station. As the station continues to serve a larger population and accommodate increasing package volumes, the system can scale up to meet these needs without significant additional infrastructure requirements.

Weaknesses of Proposed System:

1. Initial Setup Costs: Implementing a web package delivery system, including the necessary software and hardware, can involve significant initial setup costs. This financial investment might pose a challenge for the station's management.

2. Digital Literacy: Both staff and users need to be comfortable with digital tools and technologies to effectively utilize a web-based system. Ensuring that everyone can adapt to the new system might require training and resources.
3. Technical Issues: Like any technology-driven solution, a web package delivery system may encounter technical issues such as software bugs, server outages, or connectivity problems. These issues can disrupt
   operations and require prompt technical support.
4. Security Concerns: Handling sensitive information, such as package contents and customer data, within a web system introduces security concerns. Protecting this data from potential cyber threats and ensuring compliance with data privacy regulations are essential but challenging tasks.

CHAPTER THREE

CRYSTALIZATION OF THE PROBLEM.

3.1Background/history

The Tema Station in Accra, Ghana, has a rich history of serving as a bustling transportation hub. It emerged as a key transit point connecting travelers, goods, and services within the region. Over the years, it has evolved and developed, becoming a critical node in the transportation network of the city. However, despite its growth and importance, it has faced challenges in providing efficient and reliable package delivery services. The history of Tema Station dates back several decades. It was established as a central location for various modes of transportation, including buses, taxis, and other forms of public transit. Its strategic location made it a natural choice for commuters and traders.

As Accra experienced rapid urbanization and population growth, the significance of Tema Station increased. It became a vital transportation gateway, facilitating the movement of people and goods within the city and to other parts of Ghana. This development brought new opportunities and challenges. Tema
Station became a focal point for trade and commerce. The movement of goods and commodities was a fundamental aspect of the station's

operations. Local businesses, traders, and vendors relied on the station for the distribution of their products.

Over the years, the infrastructure of tema station saw various improvements. Modern bus terminals, taxi ranks, and passenger waiting areas were constructed to enhance the traveler experience. These upgrades aimed to meet the growing demands of the local population.

Despite its growth and improvements in infrastructure, Tema Station lacked an efficient and reliable package delivery application. This gap in services became evident as e-commerce and the need for convenient package delivery grew. Customers, businesses, and travelers increasingly sought a modern solution for sending and receiving packages within and beyond the station's vicinity. Recognizing the need for a package delivery application, stakeholders at Tema Station are exploring opportunities to implement a modern and technology-driven solution. This development would complement the station's existing services and further enhance its status as a key transportation hub. The aim is to provide a seamless and reliable package delivery experience for all station users and contribute to the continued growth and development of this vital transportation center.

3.2 Manual system

The manual package delivery system that has been in operation at Tema Station in Accra has a rich history deeply intertwined with the evolution of the transportation and logistics landscape in the region. This system represents the traditional way of handling, distributing, and delivering packages within the bustling transport hub of Tema Station, which serves as a central node for both passengers and cargo transport. The roots of this manual system can be traced back several decades when Tema Station was initially established as a vital transportation hub. It emerged in response to the growing demand for efficient goods transportation and passenger services within and beyond the city of Accra. At that time, manual handling was the only available method of managing packages and cargo. In the absence of advanced technologies, the system heavily relied on human labor and expertise. This involved a network of porters, clerks, and couriers who worked tirelessly to ensure packages reached their intended destinations. The process was labor-intensive and required a deep understanding of the station's layout, routes, and various transport operators. While this manual system had served its purpose faithfully, it also faced several challenges and limitations. The risk of misplacement, delays, and errors in package handling was a constant concern. The lack of real-time tracking and accountability mechanisms made it challenging to

provide accurate delivery times and maintain high levels of customer satisfaction. As Tema Station continues to expand its role as a critical transportation and logistics hub in Accra, the transition to a modernized package delivery system is inevitable. The history of the manual system serves as a testament to the dedication of the labor force that upheld it for decades. However, the future holds the promise of enhanced efficiency, accuracy, and customer satisfaction as technology reshapes the way packages are handled and delivered in this bustling transportation center.

3.3 System Development Life Cycle.

Software Development life cycle (SDLC) is a spiritual model used in project management that defines the stages include in an information system development project, from an initial feasibility study to the maintenance of the completed application.

There are different software development life cycles models specify and design, which are followed during the software development phase. In SDLC, each process model follows a series of phase unique to its type to ensure success in the step of software development. In this research we will explain the various types of SDLC, but specifically focus of Agile Model and give a justification for choosing this model.

3.4 Types Of SDLC Models

1. **Waterfall Model;** The waterfall model is a continuous software development model in which development is seen as flowing steadily downwards (like a waterfall) through the steps of requirements analysis, design, implementation, testing (validation), integration, and maintenance.

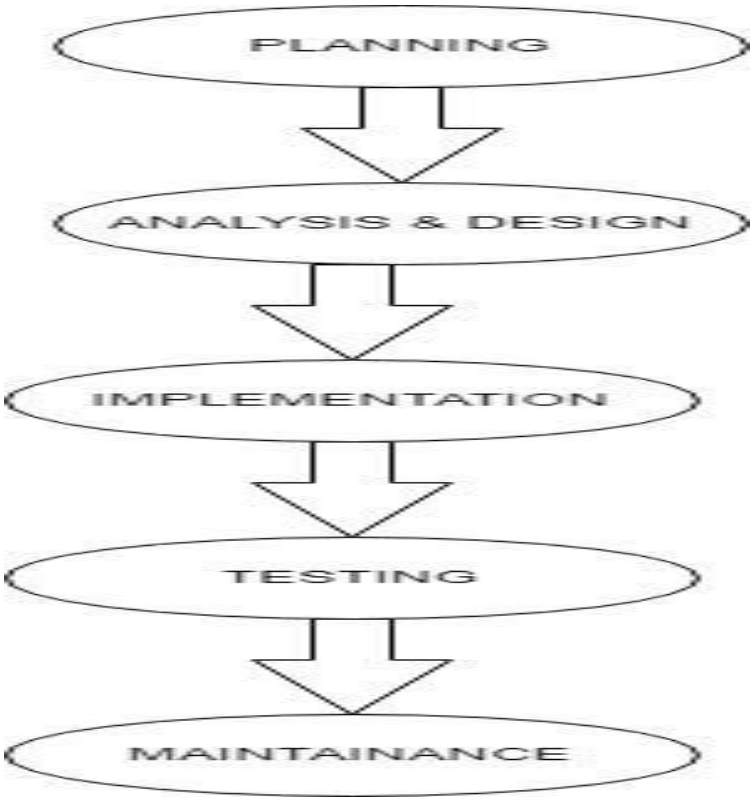


Figure 3.0 Diagram of the various stages in Waterfall model

1.1 Why Waterfall Model Is Not Suitable For The Proposed System;

1. Rigidity: Waterfall projects are rigid and inflexible, as they do not allow for changes or feedback during the project

execution. This can lead to problems such as scope creep, missed requirements, poor quality, or customer dissatisfaction.

2. Difficulty in making changes: The waterfall model follows a set of steps that always keep a team moving forward. When you use the traditional methodology of this approach, then there is almost no room for change if something unexpected occurs during a project.
3. Lack of customer interaction: In the waterfall model, very little customer interaction is involved during the development of the product. Once the product is ready, then only it can be demonstrated to the customer.
4. Late detection of defects: Testing is done only after the development phase is completed, which means that defects are detected late in the process, making it more difficult and expensive to fix them.

2. Spiral Model; The spiral model is a risk-driven process model. This SDLC model helps the group to adopt elements of one or more process models like a waterfall, incremental, waterfall, etc. The spiral technique is a combination of rapid prototyping and concurrency in design and development activities. Each cycle in the spiral begins with the identification of objectives for

that cycle, the different alternatives that are possible for achieving the goals, and the constraints that exist.

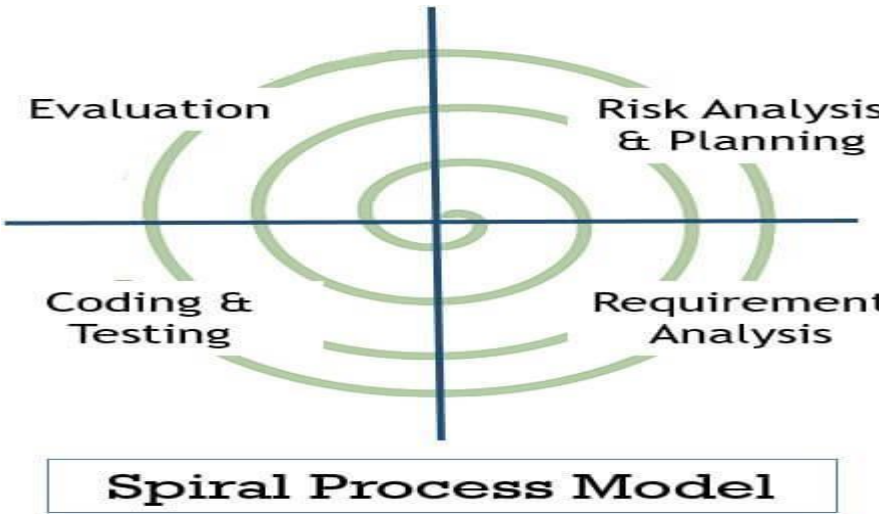


Figure 3.1 Spiral Model Diagram of Proposed System

2.1 Why Spiral Model Is Not Suitable For The Proposed System;

1. Complexity: The Spiral Model is more complex than other SDLC models, making the process more difficult to understand and implement.
2. Cost: The Spiral Model can be costly to use, making it less suitable for small projects with limited budgets.
3. Time Management: Difficulty in time management is another disadvantage of the Spiral Model. As the number of phases is unknown at the start of the project, time estimation becomes challenging.

4. Dependence on Risk Analysis: The success of the Spiral Model is highly dependent on the risk analysis phase, which requires highly specific expertise. If the risk analysis is not done correctly, it can lead to project failure.

3. Iterative Model; It is a particular implementation of a software development life cycle that focuses on an initial, simplified implementation, which then progressively gains more complexity and a broader feature set until the final system is complete.

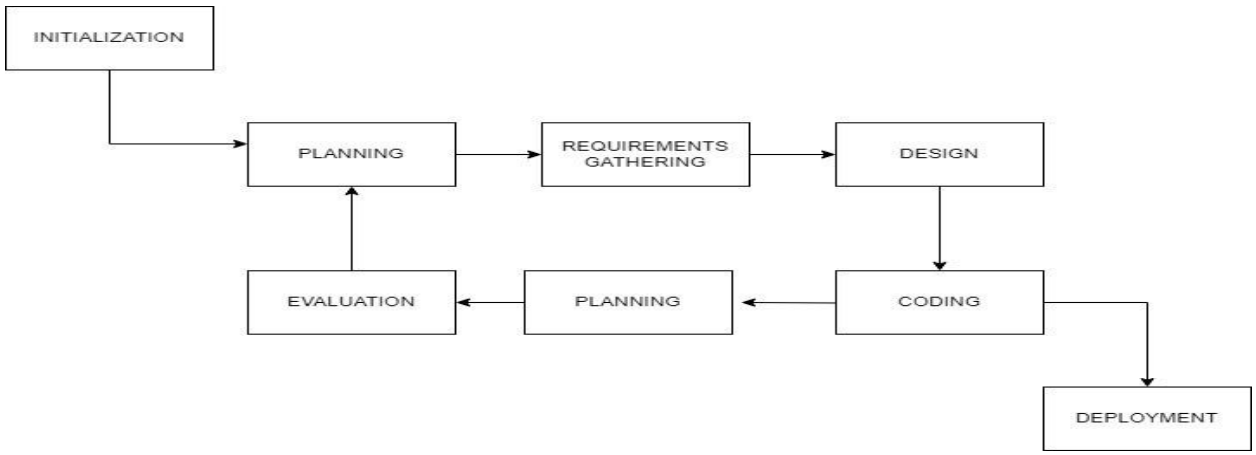


Figure 3.2 Iterative Model

Diagram of Proposed System

3.1 Why Iterative Model Is Not Suitable For The Proposed System;

1. More resources may be required: Iterative development often requires more resources, such as time, money, and personnel, compared to other development models.

2. Each successive phase is rigid with no overlaps: In the iterative model, each phase of an iteration is rigid and does not overlap with other phases. This can lead to a lack of flexibility in the development process.
3. Costly system architecture or design issues may arise: Since not all requirements are gathered upfront for the entire project, there is a possibility of costly system architecture or design issues arising during the development process.

4. Agile Model; Agile methodology is a practice which promotes continues interaction of development and testing during the SDLC process of any project. In the Agile method, the entire project is divided into small incremental builds.

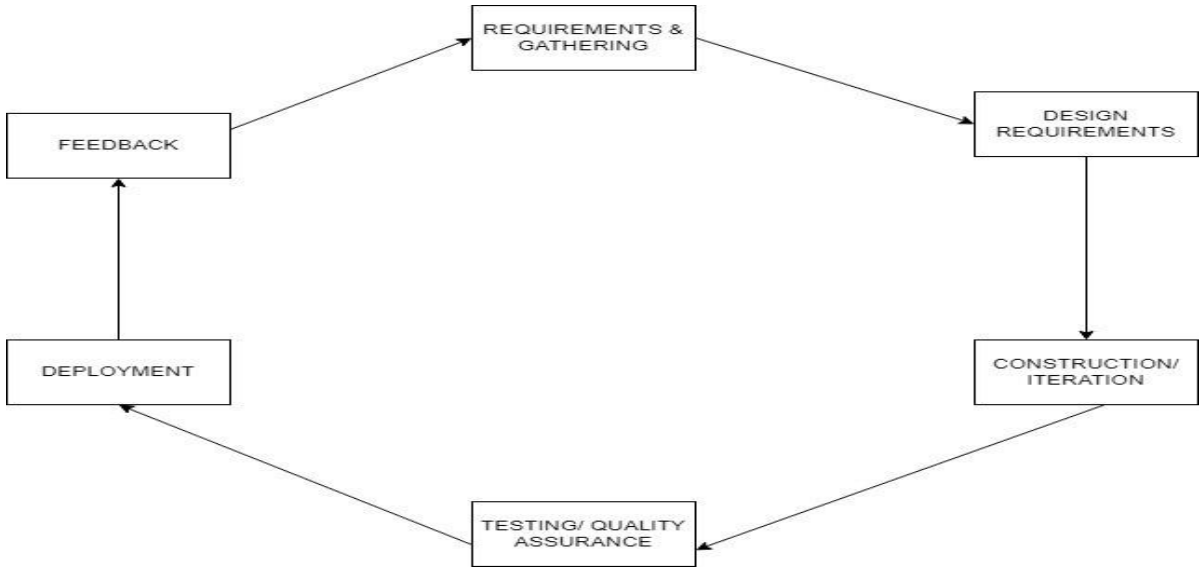


Figure 3.2 Agile Model Diagram of Proposed System

3.5 Justification Of Agile Model For The Proposed System;

Agile software development methodology is a flexible and collaborative approach that focuses on delivering quality products efficiently. Here are some reasons why the Agile model is justified for the proposed system:

1. Flexibility: Agile methodology is designed to be flexible and adaptable to changes in requirements, which is particularly useful for software development projects where requirements can change frequently.
2. Customer involvement: Agile methodology prioritizes customer involvement throughout the development process, from prioritizing features to iteration planning and review sessions to frequent software builds containing new features. This ensures that the final product meets the customer's needs and expectations.
3. Early and predictable delivery: Agile methodology focuses on delivering working software in short iterations, which allows for early and predictable delivery of features. This helps to ensure that the project stays on track and that the final product is delivered on time.
4. Stakeholder engagement: Agile methodology provides multiple opportunities for stakeholder and team engagement, which

helps to ensure that everyone is on the same page and that the project stays on track.

5. Quality: Agile methodology values working software over indepth documentation, and stakeholder engagement, customer collaboration, and transparency over process. This helps to ensure that the final product is of high quality and meets the customer's needs.
6. Efficiency: Agile methodology focuses on delivering working software in short iterations, which allows for rapid and frequent releases of new features. This helps to ensure that the project stays on track and that the final product is delivered on time.

In summary, the Agile model is justified for the proposed system because it is flexible, customer-focused, and efficient. It allows for early and predictable delivery of features, stakeholder engagement, and high-quality software development.

CHAPTER FOUR

ANALYSIS OF THE PROPOSED SYSTEM

4.0 The proposed system overview

The proposed package delivery system aims to offer a secure, efficient, and reliable solution for senders and recipients. By providing real-time tracking, flexible delivery options, and a user-friendly interface, it ensures a seamless and satisfying experience for all stakeholders. The integration of sustainability initiatives and eco-friendly options further emphasizes social responsibility and environmental

consciousness. Additionally, the system's adaptability to evolving customer needs and technology trends is essential for its long-term success.

4.1 Requirements gathering and analysis

4.1 .1 System User Requirements

The system is expected to meet the following requirements;

a. Should allow secure entry of driver, package and receiver’s information.

b. Retrieval of these records should be done with ease.

c. Should allow users to enter new records.

d. Also the ability to edit, search, delete the existing records.

e. Should be able to create hard copies as well as system backup for all records in the system.

f. Data entered by users, should be fast, give instant responses to inquiries.

g. Should provide security for data entered through authentic users to the system only.

4.1.2 Functional Requirements

This project will focus on developing a WEB based application software, and these functional requirements are defines as a set of attributes that describe the external system output behavior and the software providing the listed functional requirement below:

1. To develop a robust tracking system .
2. To create an intuitive and user-friendly web application interface that caters to both senders and recipients.
3. To simplify the package booking process.
4. To Implement a secure and reliable authentication system for users.

4.1.3 NON-FUNCTIONAL REQUIREMENT

1. **Response time**

   a) Response time or waiting time while accessing the android application should be less than 3 seconds. Queries and retrieval of information from the database should be less than 7 seconds.

   b) The system should be able to handle at least 100 transactions per second.

2. **Reliability**

   a) System shall be available 24 hours a day,7days a week

   b) The Should be able to recover from hardware failures and power failures and put database in their recent valid state

   c) The system shall have a high degree of fault tolerance.eg. If a user enters a wrong input the system shouldn’t crash but rather echo invalid input to the user.

3. **Usability**

   a) The system will have an easy to use and interactive interface.

   b) It shall be intuitive

   c) It shall be easy to navigate

4. **Security**

   a) The system shall be secure by using encryptions to protect database.

   b) Authentication of users before they access system

4.2 Feature/Components of the proposed system.

The system would have the following features:

1. **User Registration and Authentication:** User accounts with secure authentication mechanisms. Personal profiles for users to manage their delivery preferences and history.
2. **Package Booking:** Online booking and scheduling of package deliveries.

   Ability to select delivery addresses and time slots.

   Integration with GPS to input delivery location accurately.
3. **Delivery Options;** Various delivery options (standard, express, same-day, next-day, etc.).

   Customizable delivery preferences (leave with a neighbor, safe drop location, etc.).

4.3 Benefits /Advantages of Proposed system.

This project will focus on developing an **WEB** based application software, and the software providing the listed functional requirement below

- Accessibility
- Convenience
- Cost-effectiveness
- Time-saving
- Comprehensive database.

4.4 System Modeling Of Proposed System(TransportEase);

1. Context Models; Context models are used to illustrate the operational context of a system, ie they show what lies outside the system boundaries. The figure below shows the context model design of TransportEase

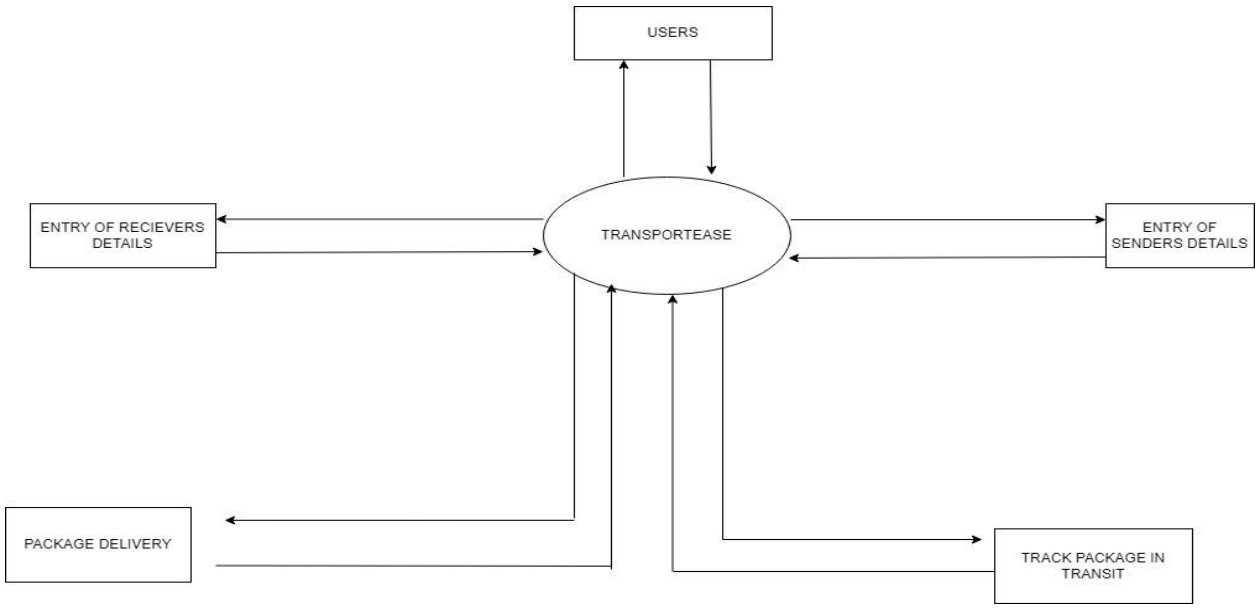


Figure 4.0 Context diagram of TransportEase

2. Interaction Models; Interaction model helps to identify user requirements of a system

and also how users will interact with the system. The figure below shows the use case diagram of the interaction model of TransportEase.

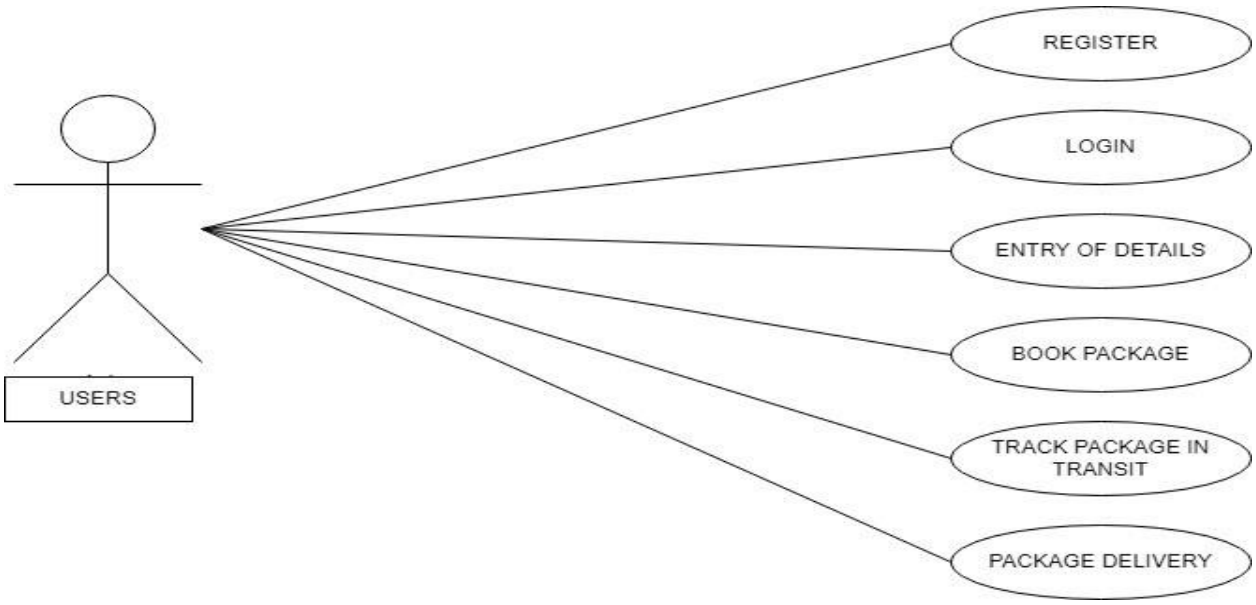


Figure 4.1 Interactive model Use Case diagram of TransportEase

3. Behavorial Model; These are models of the dynamic behavior of a system as it is executing ie they show what is happening or what is suppose to happen in a system. The figure below shows the use case diagram of the Behavorial model of TransportEase.

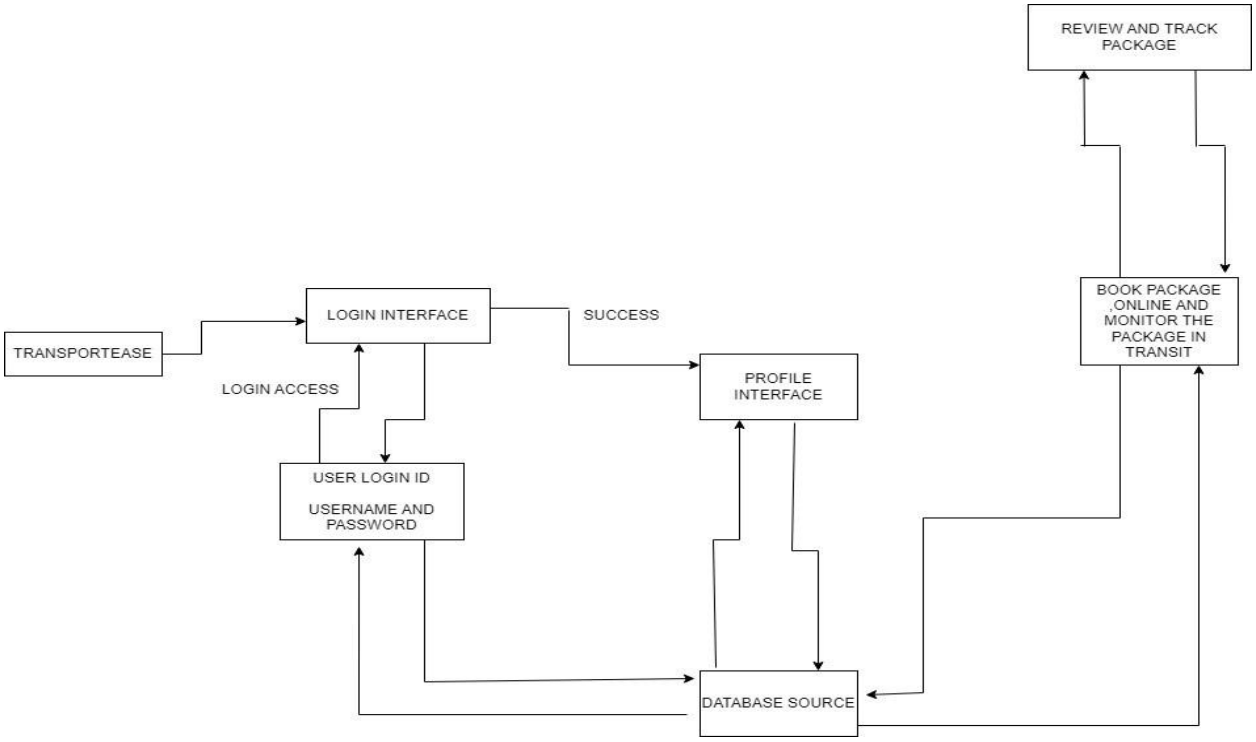


Figure 4.2 Behavorial model diagram of TransportEase

CHAPTER FIVE

DETAILED DESIGN OF THE PROPOSED SYSTEM

5.0 Proposed Methodology

Having conducted research, the package delivery application was developed using a software development lifecycle (SDLC) model. An SDLC is a process followed for a software project which consists of a detailed plan that describes how to develop, maintain, replace and alter or enhance software.
(Tutorialspoint, 2019).

In analysis, design and development of the Package Delivery System (TransportEase), we will use the Agile methodology which will be discussed below.

5.1 The Agile Methodology;

Agile methodology is an iterative approach to managing software development projects that focuses on continuous releases and customer feedback. It involves breaking the project into phases and emphasizes continuous collaboration and improvement. The Agile methodology is not defined by a set of ceremonies or specific development techniques, but rather a group of methodologies that demonstrate a commitment to tight feedback cycles and continuous improvement.

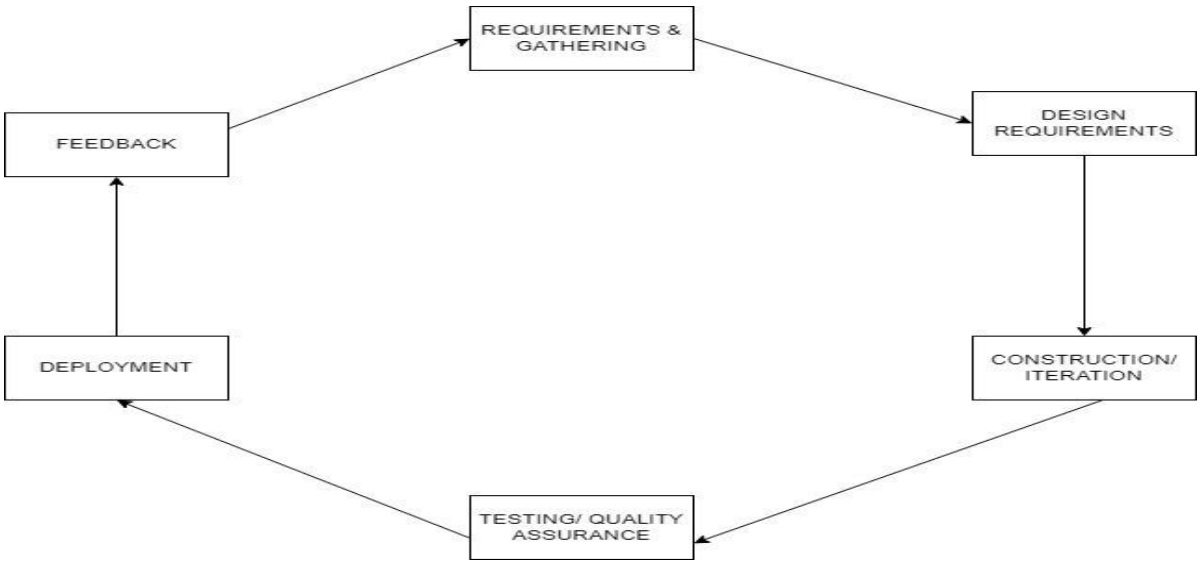


Figure 5.0 Diagram Of The Agile Methodology **5.1.1**

Justification Of Choosing Agile Methodology;

Agile software development methodology is a flexible and collaborative approach that focuses on delivering quality products efficiently. Here are some reasons why the Agile model is justified for the proposed system:

1. Flexibility: Agile methodology is designed to be flexible and adaptable to changes in requirements, which is particularly useful for software development projects where requirements can change frequently.
2. Customer involvement: Agile methodology prioritizes customer involvement throughout the development process, from prioritizing features to iteration planning and review sessions to frequent software builds containing new

features. This ensures that the final product meets the customer's needs and expectations.

3. Early and predictable delivery: Agile methodology focuses on delivering working software in short iterations, which allows for early and predictable delivery of features. This helps to ensure that the project stays on track and that the final product is delivered on time.
4. Stakeholder engagement: Agile methodology provides multiple opportunities for stakeholder and team engagement, which helps to ensure that everyone is on the same page and that the project stays on track.
5. Quality: Agile methodology values working software over indepth documentation, and stakeholder engagement, customer collaboration, and transparency over process. This helps to ensure that the final product is of high quality and meets the customer's needs.
6. Efficiency: Agile methodology focuses on delivering working software in short iterations, which allows for rapid and frequent releases of new features. This helps to ensure that the project stays on track and that the final product is delivered on time.

5.2 Proposed System Development Methodology

TransportEase was developed as a web application and the following are the requirements that were required during development phases: PHP Language as a server-side scripting language, MySQL database server for database management, Apache Server as a web server., HTML, a markup language and CSS as a style sheet scripting language, JavaScript, and Web browser: Mozilla Firefox or chrome.

PHP: It is a widely-used open source general purpose language that is suited for web and web application development and can be embedded into HTML (The PHP Group,
2000) To mention various advantages; PHP is focused on serverside scripting, command line scripting and writing desktop applications. It also runs on all operating systems such as windows, Linux and MAC. PHP supports wide range of databases including MySQL, ODBC and PDO. (The PHP Group, 2000). Yii framework was used as a PHP web framework that eased application development and made it faster.

MySQL: Owned by the Oracle Corporation. The latest version is MySQL 8.0 It is an open source relational database management system. Reason as to why it is preferred is that: it is free, reliable and secure.

HTML, CSS, JavaScript and Bootstrap: HTML were used for the frontend web pages design. CSS (cascading stylesheets) used for styling. JavaScript will handle web page requests by sending

client-side scripts to the browser. Bootstrap is the framework that would be used to develop responsive and interactive web app.

5.3 Designing of TransportEase

During design, a database was created and named orphanage, with various tables having orphanage records. System Modeldesign was used to design the system, which entails use case, data flow diagram and the interface design.

5.3.1 Use Case Diagram

A use case diagram is used to describe a set of actions (use cases) that some system (subject) should or can perform in collaboration with one or more external users of the system (actors). stakeholders of the system. The use case of TransportEase only has one player: the user of the system (who is the super user), who does the following operations:

a. Registers or Login
b. Adds, updates or deletes records
c. Retrieves records
d. Assigns packages to Vehicles
e. Adds new records

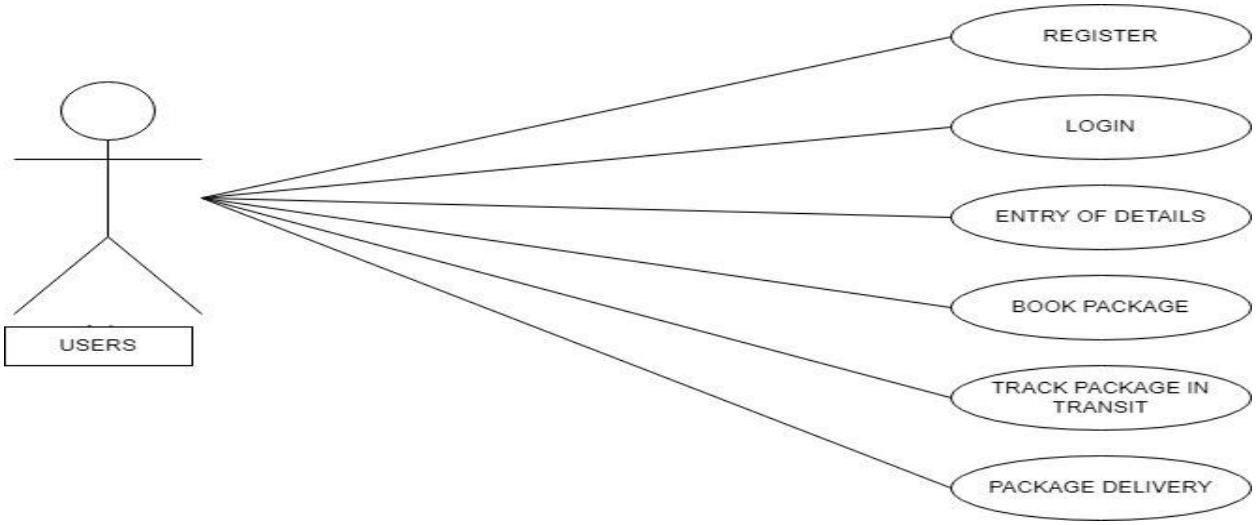


Figure 5.1 TransportEase Use Case Diagram

5.3.2 **Data Flow Diagram**

A data flow diagram (DFD) is graphical tool used to describe and analyze movement of data through a system. It is the central tool and the basis from which the other components are developed. The transformation of data from input to output, through processed, may be described logically and independently of physical components associated with the system. A DFD is also known as a "bubble Chart" and clarifies the system requirements and identifies major transformations that will become programs in system design. Therefore, it the starting point of the design to the lowest level of detail. It consists of a series of bubbles joined by data flows in the system. The diagrams below outline the TransportEase application's DFD.

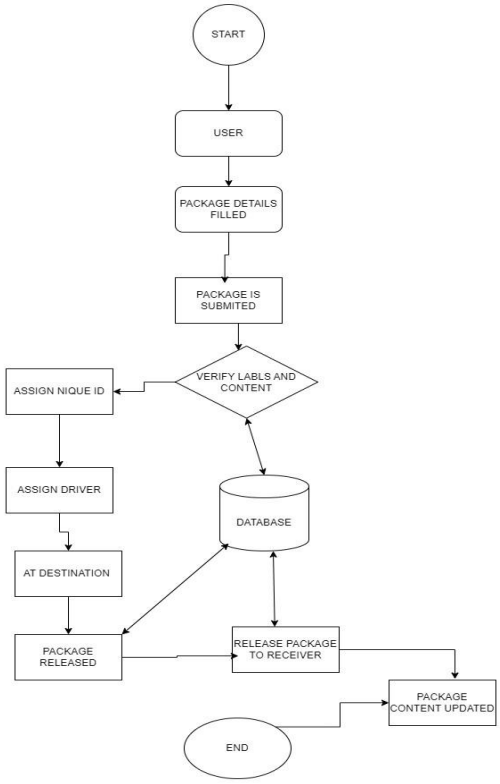


Figure 5.2 Data Flowchart Diagram of TransportEase 5.4

Database Design

Database design is the organization of data according to a database model, determining what data should be stored and how the data elements interrelate (Wikipedia, 2020). The purpose of the database is to store information about users, details of tickets and events etc. in a structured way for it to be populated, accessed, modified, and maintained easily.

5.4.1 Design Process

1. Gathers all information to be populated in the database such as, user details, officer details, ticket details etc. for each includes the id and name etc.
2. Groups the information based on entities of the database which includes, admin, users.
3. Each entity becomes a table in the database.
4. Stores the appropriate information required in the table. Each information becomes a field, and is displayed as a column in the table.
5. Each table in the database was assigned a primary key which uniquely identifies record in each table.

CHAPTER SIX

SYSTEM IMPLEMENTATION AND TESTING

6.0 INTRODUCTION;

Introduction to design System testing is an essential step for the development of a reliable and error-free system. Once source code has been generated, software must be tested to uncover and correct as many errors as possible before delivering the product. The goal is to design a series of test cases that have a high likelihood of finding errors but how, there are different methods that provides a systematic guidance for designing tests that, Exercise the internal logic of software components, and Exercise the input and output domains of the program to uncover errors in the program function, behavior, and performance. Software testing is a crucial element of software quality assurance and represents the ultimate review of specification, design, and code generation. The work product is a set of test cases designed to exercise both internal logic and external requirements is designed and documented, expected results are defined, and actual results are recorded.

6.1 SYSTEM METHODOLOGY

The proposed system will be developed using the Prototype Method of Approach. The Prototype model is a system development method in which an early approximation of the system is built, tested and then reworked or reviewed as necessary until an acceptable Prototype is finally achieved from which now the complete system

will finally be developed. The reason why this system will be developed using the Prototype approach is simply because the desire system needs to have a lot of interaction with the end user. The system will be developed using the following Web Technologies (computer languages/tools). Prototyping based methodologies perform the analysis, design and implementation phases concurrently. All three phases are performed repeatedly in a cycle until the system is completed. A prototype is a smaller version of the system with a minimal amount of features. It provides a system for the users to interact with, even if it is not initially for users.

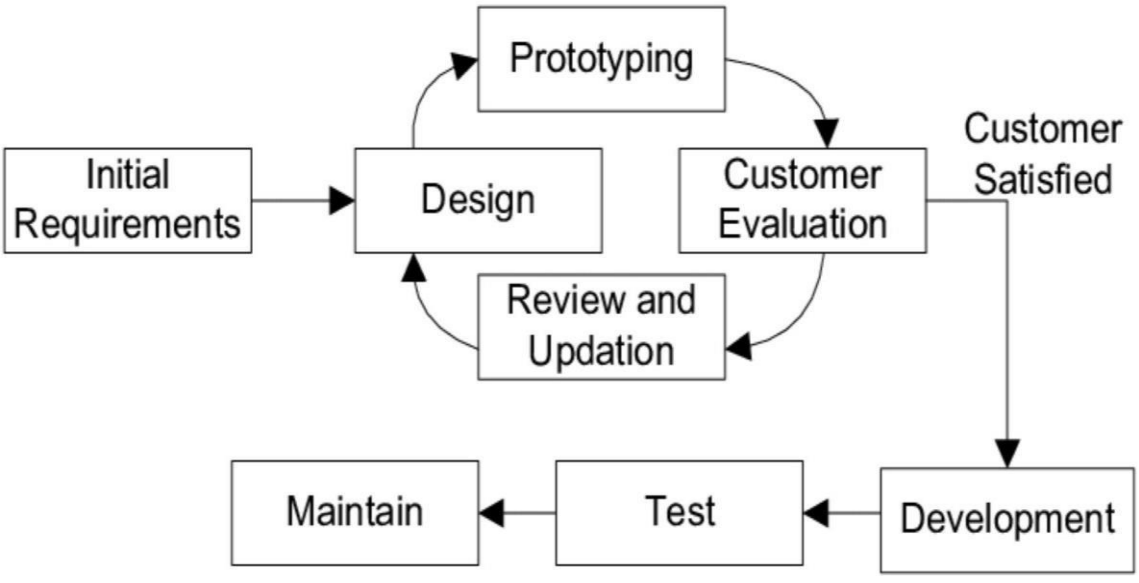


Figure 6.0 Diagram of Prototype Design Model

6.1.1 Justification For Choosing Prototype Model

The prototype model is a software development model that involves creating a partial model of the end product, testing and refining it based on customer feedback, and using it as the basis for developing the final product. Here are some justifications for choosing the prototype model:

1. Flexibility in design: The prototype model is flexible in design, allowing for changes to be made easily based on customer feedback.
2. Early detection of errors: Since a working model of the system is provided, errors can be detected much earlier in the development process, saving time and effort.
3. Greater customer satisfaction: Customers get to see the partial product early in the life cycle, ensuring a greater level of customer satisfaction and comfort.
4. Accommodation of new requirements: New requirements can be easily accommodated as there is scope for refinement.
5. Identification of missing functionality: Missing functionalities can be easily figured out.
6. Quicker user feedback: Quicker user feedback is available leading to better solutions.

6.2 Methods used in Project construction

The various diagrams above presented an idea of the design of the system. The developed system is a web application. This means the system can only be accessed through a web browser. This system includes the front end of the system which shows the interfaces of the features of the system such login page, user registration page, interface for both users and admin etc. The back end of the system which is the actual development of the functions of the system. The development and design of the system is based on the following tools and technologies.

6.2.1 Front End development tools and technologies

HYPERTEXT MARK UP LANGUAGE (HTML)

HTML (Hypertext Mark-up Language) is the set of mark-up instructions or codes that are directed to a web client to interpret. It's a standardized system for tagging text files to achieve font, color, graphic, hypertext effects on world wide web. Each code in an HTML file is termed as an element and they are formed with the less than and greater than sign (" < > ") known as html element tags

CASCADING STYLE SHEET (CSS)

Cascading style sheets are used to format the layout of Web pages. They can be used to define text styles, table sizes, and other aspects of Web pages that previously could only be defined in a page's HTML. CSS helps Web developers create a uniform look across several pages of a Web site. Instead of defining the style of each table and each block of text within a page's HTML, commonly used styles need to be defined only once in a CSS document. Once the style is defined in cascading style sheet, it can be used by any page that references the CSS file. Plus, CSS makes it easy to change styles across several pages at once

JAVASCRIPT

JavaScript is a client side scripting language commonly used in web development. It was originally developed by Netscape as a means to add dynamic and interactive elements to webpages. This means that the source code is processed by the client's web browser rather than on the web server. This means JavaScript functions can run after a webpage has loaded without communicating with the server. For example, a JavaScript function may check a web form before it is submitted to make sure all the required fields have been filled out. The JavaScript code can produce an error message before any information is actually transmitted to the server.

XAMP

XAMP is a free and open source web server application package developed by Apache Friends, consisting mainly of the Apache HTTP Server, MariaDB database, and interpreters for scripts written in the PHP . XAMP stands Windows (W), Apache (A), MySql (M) , PHP (P) . It is a simple, lightweight Apache distribution that makes it extremely easy for developers to create a local web server for testing and deployment purposes. Everything needed to set up a web server – server application (Apache), database (MariaDB), and scripting language (PHP) – is included in an extractable file. Since most web server deployments use the same components as XAMP, it makes transitioning from a local test server to a live server extremely easy as well.

BACK END TECHNOLOGIES

MySQL

MySQL is an open source relational database management system (RDBMS) based on Structured Query Language (SQL). MySQL runs on virtually all platforms, including Linux, UNIX, and Windows. Although it can be used in a wide range of applications, MySQL is most often associated with web-based applications and online publishing and is an important component of an open source enterprise stack called LAMP.

HYPERTEXT PREPROCESSOR (PHP)

PHP is a script language and interpreter that is freely available and used primarily on Linux Web servers. PHP, originally derived from Personal Home Page Tools, now stands for PHP:

PHP executes on the server, while a comparable alternative, JavaScript, executes on the client. PHP is an alternative to Microsoft's Active Server Page (ASP) technology. As with ASP, the PHP script is embedded within a Web page along with its HTML. Before the page is sent to a user that has requested it, the Web server calls PHP to interpret and perform the operations called for in the PHP script. is embedded within a Web page along with its HTML. Before the page is sent to a user that has requested it, the Web server calls PHP to interpret and perform the operations called for in the PHP script.

6.3 IMPLEMENTATION

System elements are made, bought, or reused. Production involves the hardware fabrication processes of forming, removing, joining, and finishing, the software realization processes of coding and testing, or the operational procedures development processes for operators' roles. The purpose of the implementation process is to design and create a system element

conforming to that element's design properties and/or requirements. The element is constructed employing appropriate technologies and industry practices. This process bridges the system definition processes and the integration process.

6.3.1 Implementation Method

A product software implementation method is a prototype to get users and/or organizations running with a specific software product. The method is a set of rules and views to cope with the most common issues that occur when implementing a software product: business alignment from the organizational view and acceptance from human view. The secured method converting from the old system to a new system is to use the Phased method of implementation. It involves a gradual introduction of the new system and whilst the old system is progressively discarded. This can be achieved by introducing new parts of the new product one at a time while the older parts being replaced are removed. Often phased conversion is used because the product, as a whole, is still under development.

MERITS OF PHASED IMPLEMENTATION

1. Users gain early process and software knowledge now that they can use in the subsequent phases.

2. Issues with one phase only affect a small area of the business
3. The adoption rate is slow and steady unlink in the big band
4. The burden on the IT team is minimal in this approach

6.4 Strategic Approach to Software Testing

Testing is the process of evaluating a software item to detect differences between given input and expected output. It also seeks to execute a program or application with the intent of finding the software bugs. It can also be stated as the process of evaluating, validating and verifying that a software or an application product. Testing range of values expected including both valid and invalid data. It helps in finding discrepancies between the system and its original objective.

6.4.1 Usability Testing

6.4.1.1 Blackbox Testing

Black Box Testing, is a software testing method in which the internal component of the software being tested is not known to the one testing it. These tests can be functional or nonfunctional, though usually functional. Black-box testing is conducted at the software interface. In Black Box testing only the functionality was tested without any regard to the code

written. If the functionality, which was expected from a component is provided then black box testing is said to be complete.

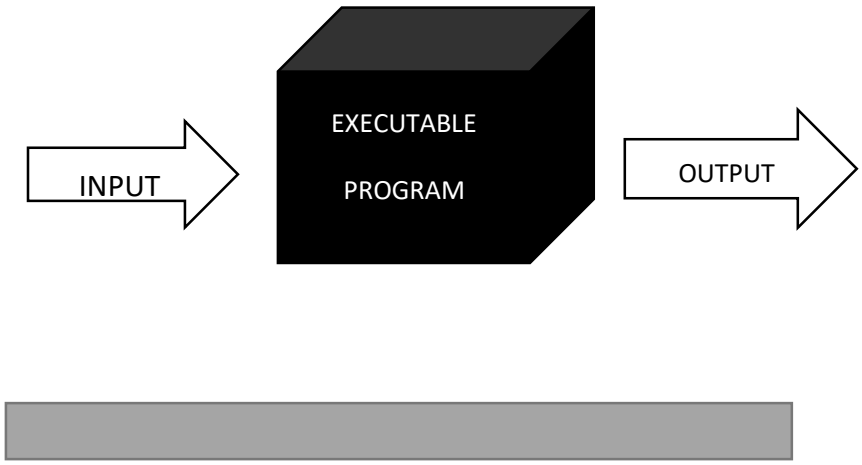


Figure 6.1 blackbox testing image

This method attempts to find errors in the following categories:

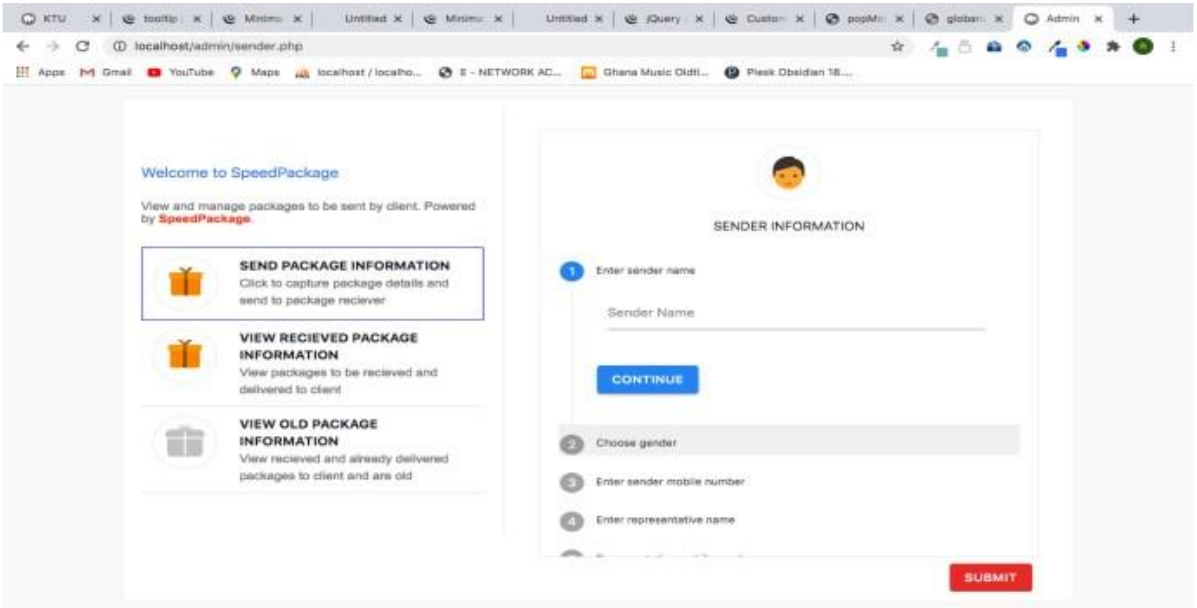


Figure 6.2 black box testing

Our research showed that there are a lot of error or mistakes which are being made by transport union, station master and their drivers as well in the course of sending a package from one destination to another. Some of human error could be improper handle of package by same of drivers to deliver it at the destination, sometime also missing of the address attached by the package and also exchange of someone item to authorized recipient. This system has design to elevate or take away all the human error being occurs among the union, it drivers and sender and receiver by IT computerized structure to improve upon transport activities and avoid human error that normal occurs.

1. Incorrect or missing functions
2. Interface errors
3. Errors in data structures or external database access
4. Initialization and termination errors

During this testing the system responded with error code (0) which means that the system passed the test.

White Box Testing

White-box testing, sometimes called glass-box testing is a test case design method that us

White Box Testing White-box testing, sometimes called glass-box testing is a test case design method that uses the control structure of the procedural design to derive test cases. In White Box testing internal code written in every component was tested and it was checked that the code written is efficient in utilizing various resources of the system like memory or the utilizing of input and output.

TESTING STRATEGIES

These are some of the techniques used in system testing to better evaluate, validate and implement a system. Strategies also gives you the guidelines of how the various component of a system is tested. Below are some of the techniques used in testing the system

1. Unit Testing.
2. Performance Testing.
3. Requirement Testing.
4. Volume Testing.
5. Compatibility Testing.

6.5 UNIT TESTING

It is a level of software testing where individual units/ components of a software are tested. The purpose is to validate

that each unit in the system or the various system modules are working as designed. In unit testing we checked that all the individual components were working properly. Before integration of the entire components, unit testing is essential because it gives a confidence that all the individual components are working fine and ready to be integrated with the other ones.

6.5.1 Performance Testing

Performance Testing deals with how responsive the designed system is. It seeks to determine how the system will respond or will be able to operate under stress (Load). Its main goal is to check for the following system attribute

1. Speed - Determines whether the system responds in-time
2. Scalability - Determines how the system can scale to accommodate more users
3. Robust - Determines if the system can contain invalid input.
4. Recoverable – Determines if the system can recover to is normal state after system failure.

Here the application was installed on computer devices with different operating system build types, accessing database on one server to insert data, and it passed, in response time. Invalid input also enters to check the system behavior and it’s also passed with an output responds code (“Invalid input”). The system was

also able to recover after it has suffered a crush out of intentionally killing it starting processes.

6.5.2 Requirement Testing

Requirements testing is a testing approach in which test cases, conditions and data are derived from requirements. It includes functional tests and also non-functional attributes such as performance, reliability or usability. With this aspect of testing, the system was fed with data and the requirement were met.

6.5.3 Volume Testing

Volume testing refers to testing a software application with data. Hence the system was tested with several data, such as reporting emergencies in text-format and pictures, all passed with output code ("success"). In conclusion all the project objectives were achieved, because the application was able to:

1. Capture sender and receiver details and store it into the database
2. Instantly send text to sender on package sent.
3. Provide a code for package collection
4. Provide report on periods used by the user.

6.5.4 Non-Functional Testing

Via this section, all the non-functional of the application were tested and they all proved successful.

1. Response Time

The application should have a fast response time. This was tested by accessing all the available features of the application.

2. Easy to Use

The application should be easy. This was tested and proven true in all aspects of the application, the user was able to easily navigate through the application.

BELOW IS THE TEST RESULTS WITH SCREEN SHOTS AND TABLE DISPLAY

Unit Test Results Table

TEST	**CONDITION**	**ACTION**	**EXPECTED RESULT**	**ACTUAL RESULT**	**REMARK**

Login test 1	usename and Password field are empty	Login Button Initiated	Please fill in the fields	Login without any credential	Rectify the connection mistake between the UI and the database.
Login test 2	Invalid username and password	Login button initiated	Invalid username. and password,	Invalid usernmae. and password	Excellent
Login test 3	username and password	Login button initiated	Login successful, Home page loaded	Login successful, Home page loaded	Excellent
Submit package	fields empty	Done button initiated	Please fill in all required fields	Request package	Fields must be a required field.

Submit package	Package name., package type Type	Done button initiated	submited successfully	submited successful	Excellent

TABLE 6.3 SOFTWARE TESTING

6.6 **TEST RESULT**

The diagram below is for the first objective that is to improve package system among the GPRTU transport unions. Package send at various station was not improve. The already existing way of delivering package for sending and receiving was too tedious. Transport unions had difficult in keeping the records of the various package which were send, store, and delivered at the station for the owners. The union face some challenges with drivers, car owner the station masters in the delivering of package, relationship between those parties (drivers, car owner the station masters) are not effective because each one went to have an advantage over the other such as the owner is more concerned about his profit than the activities which is the driver does for the union. The driver also sometime handles the

car to different driver on their way to the destination to other activities without concerning the package being sent by him. This gives it an advantage over the existing way of sending and receiving package within the various drivers, station masters, senders, receivers and union as a whole. The existing system however made it difficult for package to be delivered at a time especially where the receiver sometimes receive a wrong package delivered because of how record are kept in the station without any IT computerized format The driver who deliver the package do not give details information about the package been send introducing IT in the situation would enhance good record keeping for package delivering.

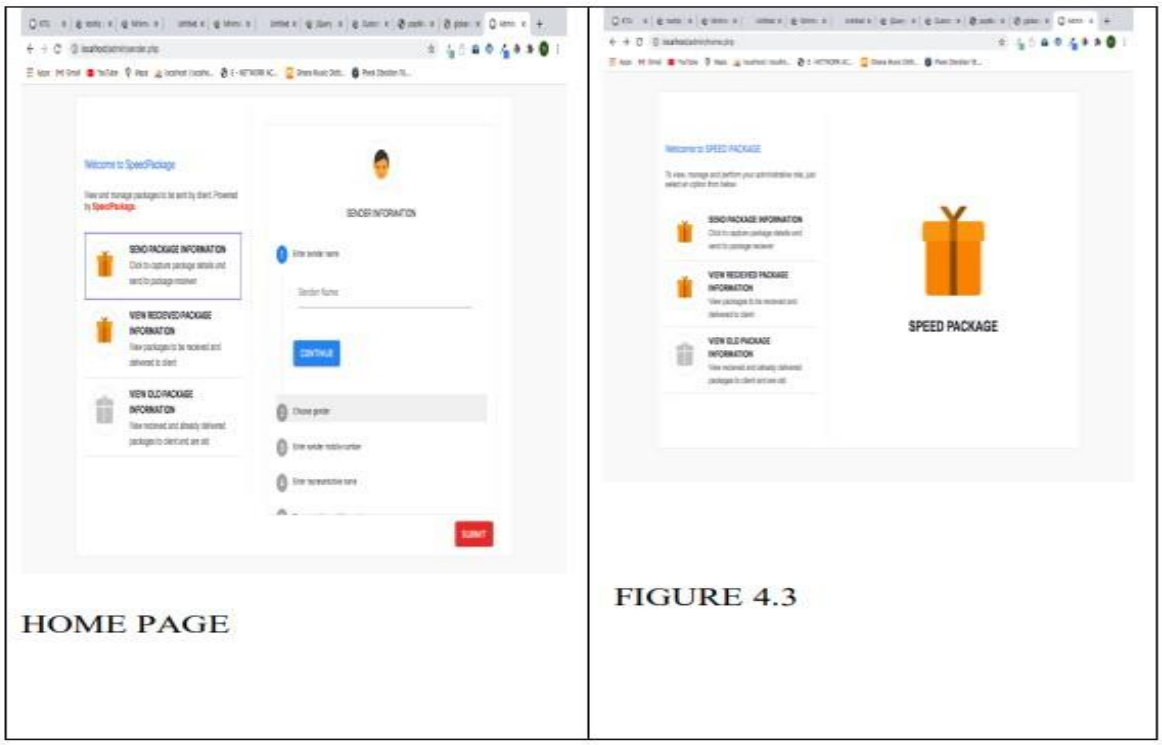


Figure 6.3 Testing Result

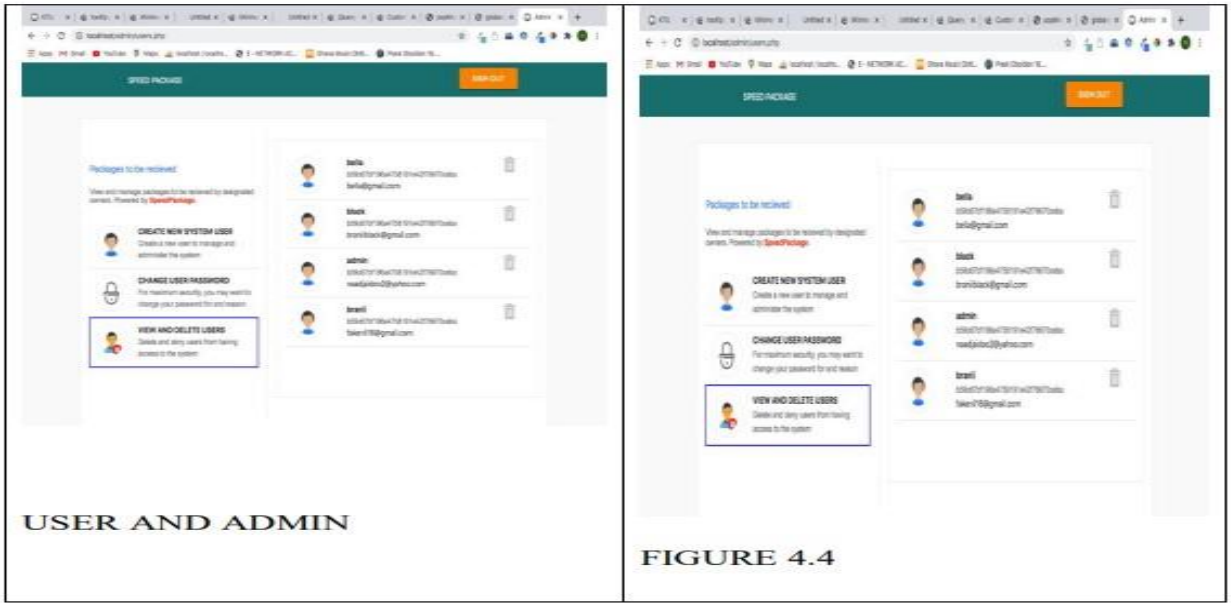


FIGURE 6.4 TESTING RESULT

6.7 PERFORMANCE TESTING

This shows the test result of performance testing. Customer or passengers who use the union services especially package delivering has low interest for it. Because records kept and exchange during package delivering are sometime lost or exchange to different recipient or senders Customer (senders and receivers) made to pay when sending a package and made to pay again when receiving without their knowledge because the union has no proper way of package payment by the sender and receiver which make the drivers and station master to have advantage over them. Introducing IT will to this will help to reduce corruption among them.

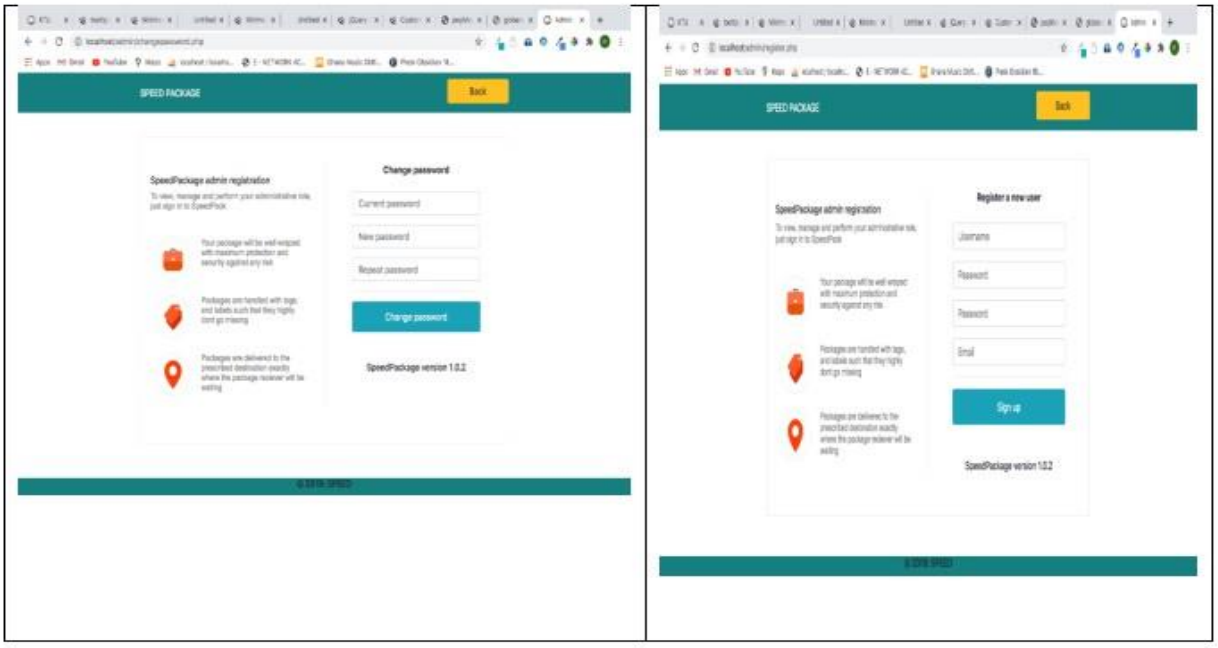


Figure 6.5 PERFORMANCE TESTING

6.8 Conclusion.

This chapter was to document the implementation method and testing approaches used to verify and test the developed proposed system. The above testing approaches were conducted to ensure that the system is efficient and effective as well. Out of testing, all test cases carried were successful. There may be errors that might be discovered during the usage of the application which were not discovered during the testing. The approach or methodology use in development of the system project is in a way that changes, update and errors can be easily fixed.

CHAPTER SEVEN

SYSTEM DOCUMENTATION

7.0 Introduction;

This chapter includes user manual, software and hardware resources and how to install the system. System design

specifies how the system accomplished the set objectives. It consists of both logical and physical design activities. The coding of the system design in a particular programming language, in the case of this research work, the design/implementation were done using the hypertext preprocessor (PHP) and MySQL as a database

7.1 System Overview

Package delivery system is a web application that allows you to perform the following functions below

1. Users should be able to sign up to create accounts.
2. Should receive requests for adding a package and respond to them.
3. Should be able to do data searches.
4. Reports ought to be able to be printed.
5. When logout is selected, the user should be able to leave.

7.2 System Requirement

1. A computer or laptop.
2. Processor: 450 MHz or faster processor / 32-bit (x86) or 64-bit
3. (x64) processor

4. RAM: 256 MB (512 MB recommended).

5. BROWSER: Latest version of Chrome, Firefox, Opera Mini.

6. Operating Systems: Window 7, 8 and above or later Mac OS.

7. Third Party Software: XAMPP.

8. Hard Disk Space:300 MB for PASS (plus space for XAMPP).

9. A mobile phone

7.3 Authorized Use Permission

The Admin is the only entity that creates account for users to get access to the system. The user only resets password after getting access to his/ her details. Every user needs to login into the system to be able to access the features of the system listed above

7.4 Installing the Software.

In order to successfully install and use this software, follow the steps below:

1. Download the XAMPP Software by visiting the official website of XAMPP https://www.apachefriends.org/download.html with your

preferred browser (Note: If your system is 32bit, you download the 32bit version otherwise download the 64bit version of XAMPP)

2. After downloading XAMPP, you double on the executable file, and follow the instructions to successfully install it (Remember to create a desktop shortcut during the installation process in order to easily access the XAMPP control panel)
3. After successfully installing XAMPP, you will launch the XAMPP control panel.
4. For the application to run successfully, on the control panel of the XAMPP, you need to activate both Apache and MYSQL by clicking on start
5. The next step, is to open the zip file with any extraction software of your choice and extract the content of the zip file to the following directory C:\xampp\htdocs.
6. To access the application, you open your browser and visit this URL localhost/idcard, in a few seconds the homepage of the application should display.
7. The administrator credentials can be located in the C:\xampp\htdocs\emergency\login.txt.

7.5 System Features

7.5.1 Login; Open Internet Explorer, key the web address below and press Enter. https://localhost/transportease, The login page will display.

Type the username and Password.

Click Log in button
Below is a screenshot of the login page.

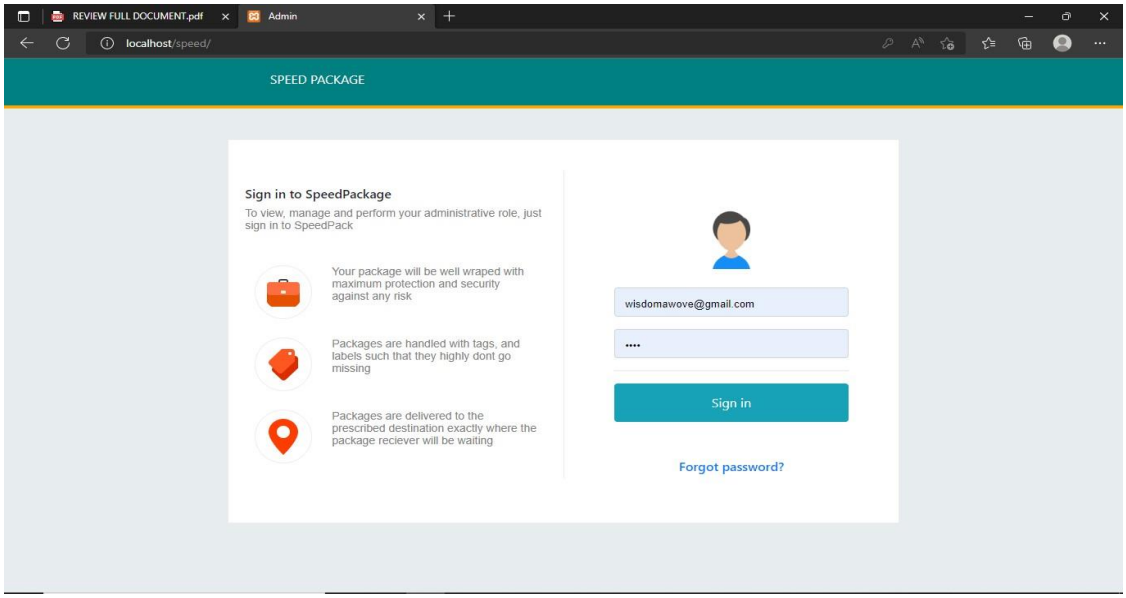


Figure 7.0 login form showing that each field is required

7.5.2 Successful Login

On Successful login you will be redirected to your dashboard

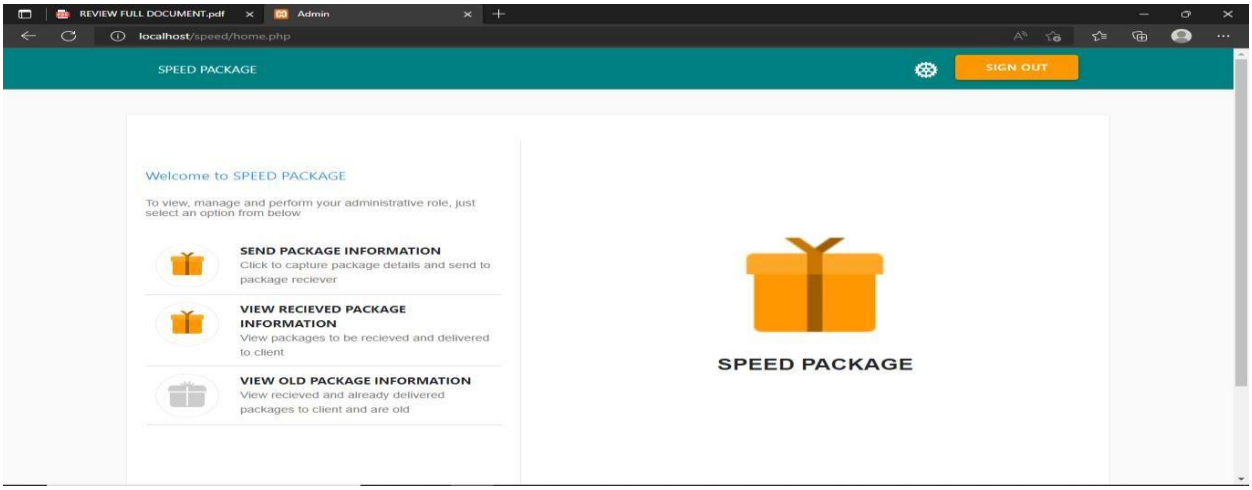


Figure 7.1: Dashboard after successful login

7.5.3 SEND PACKAGE

In order for a user to lodge complaint the user has to follow the following steps:

1. Click on send package information

2. Click fill in required details.

3. Save and submit

4. You will receive a message when successfully saved.

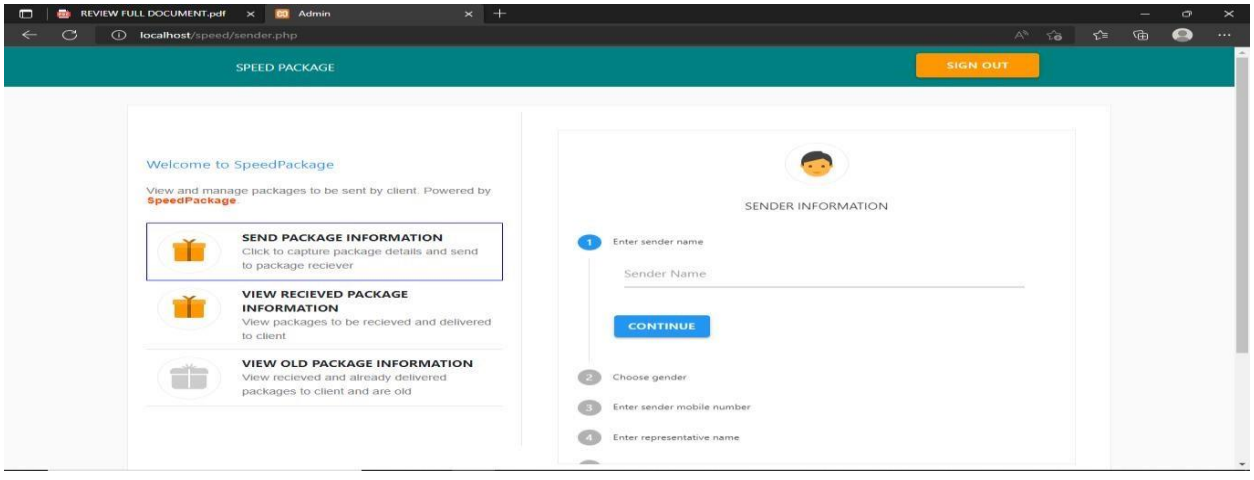


Figure 7.2: send package page

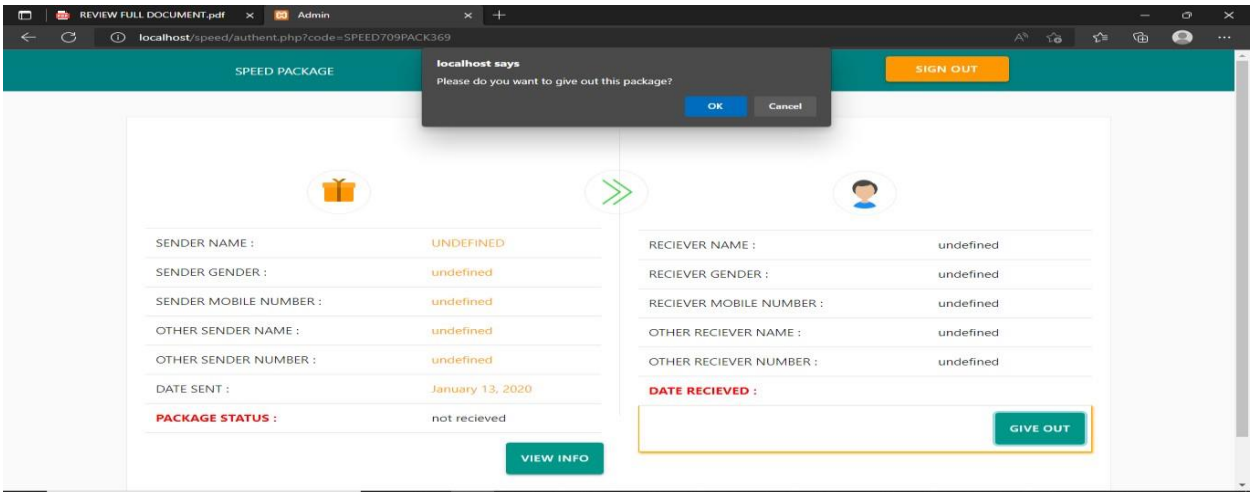


Figure 7.3 View package To

view package and give out

1. Click on view package.

2. Search package to view

3. Click on item to view and click give out to release package .

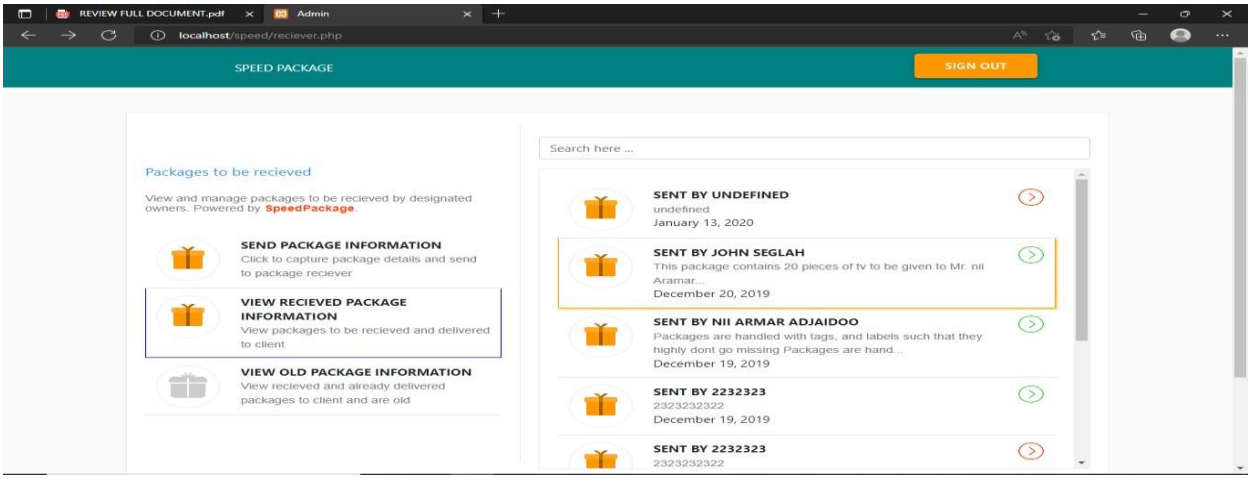


Figure 7.4: view and give out package

VIEW OLD PACKAGE

1. Click on view on package
2. Search package to view
3. View the package by clicking on view info button

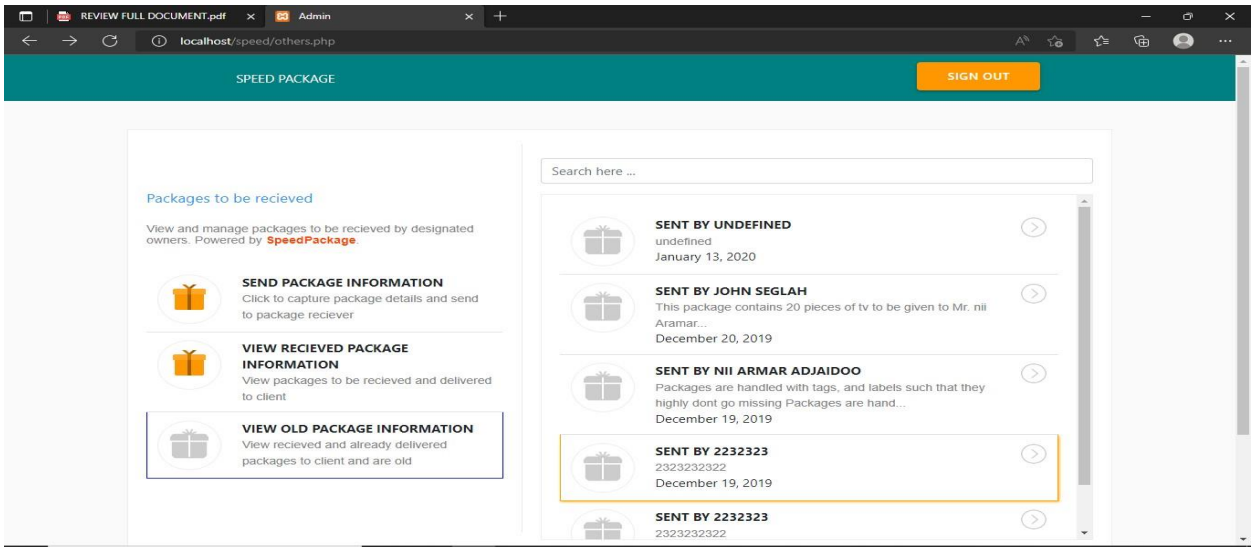


Figure 7.5: view and give out package

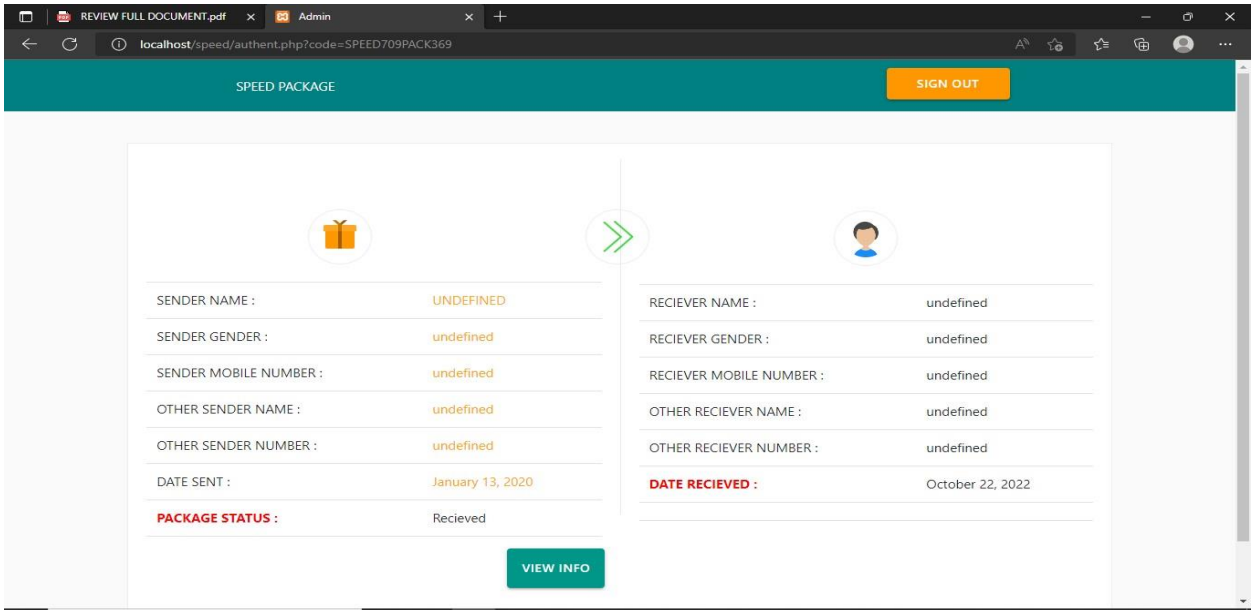


Figure 7.6: view and give out package

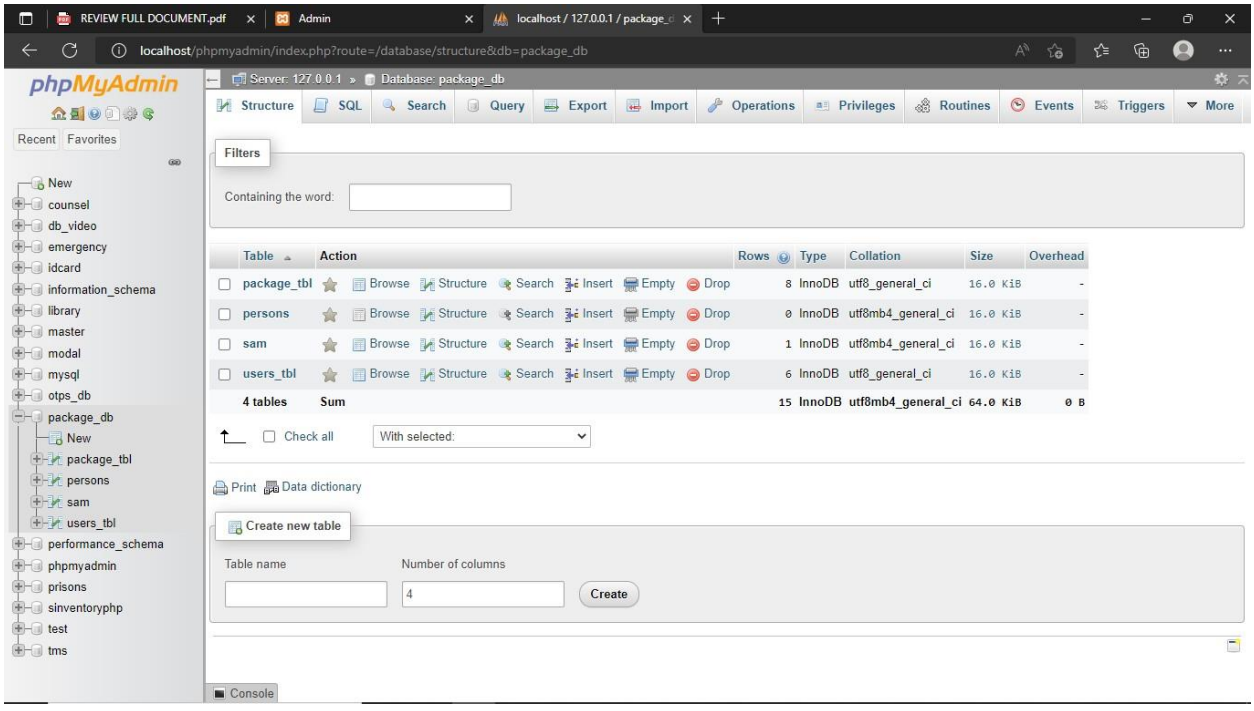


Figure 7.7: Database Structure

CHAPTER EIGHT

SUMMARY, CONCLUSION AND RECOMMENDATION

8.0 Introduction;

In this chapter , conclusion and summary of the entire project Documentation would be discussed with general overview of the chapters. It includes recommendation and further enhancement that can be done to improve the efficiency of the project as well as the general idea of the system.

8.1 Conclusion;

The various interfaces which automate' data capture and review that is kept in the database, the command buttons on each interface are well coded to allow only the required information to be entered into the system and error messages displayed in case invalid input is entered, it allows the authorized users to perform specific duties such as; inserting or adding records, deleting a record, editing and searching through the database.

With the developed system being used, problems such as records misplacement, data redundancy and inconsistencies, difficulty in updating the existing data, illegal access to data and time delay in processing data are easily handled by the system.

8.2 Recommendation

The following recommendations are made from the analysis of the system.

There are a lot more features that can be added to the system; one of them is to make the system to cater for other employees in the department.

More effort into computer literacy training so as to equip the other users with the necessary skills needed to operate the system.

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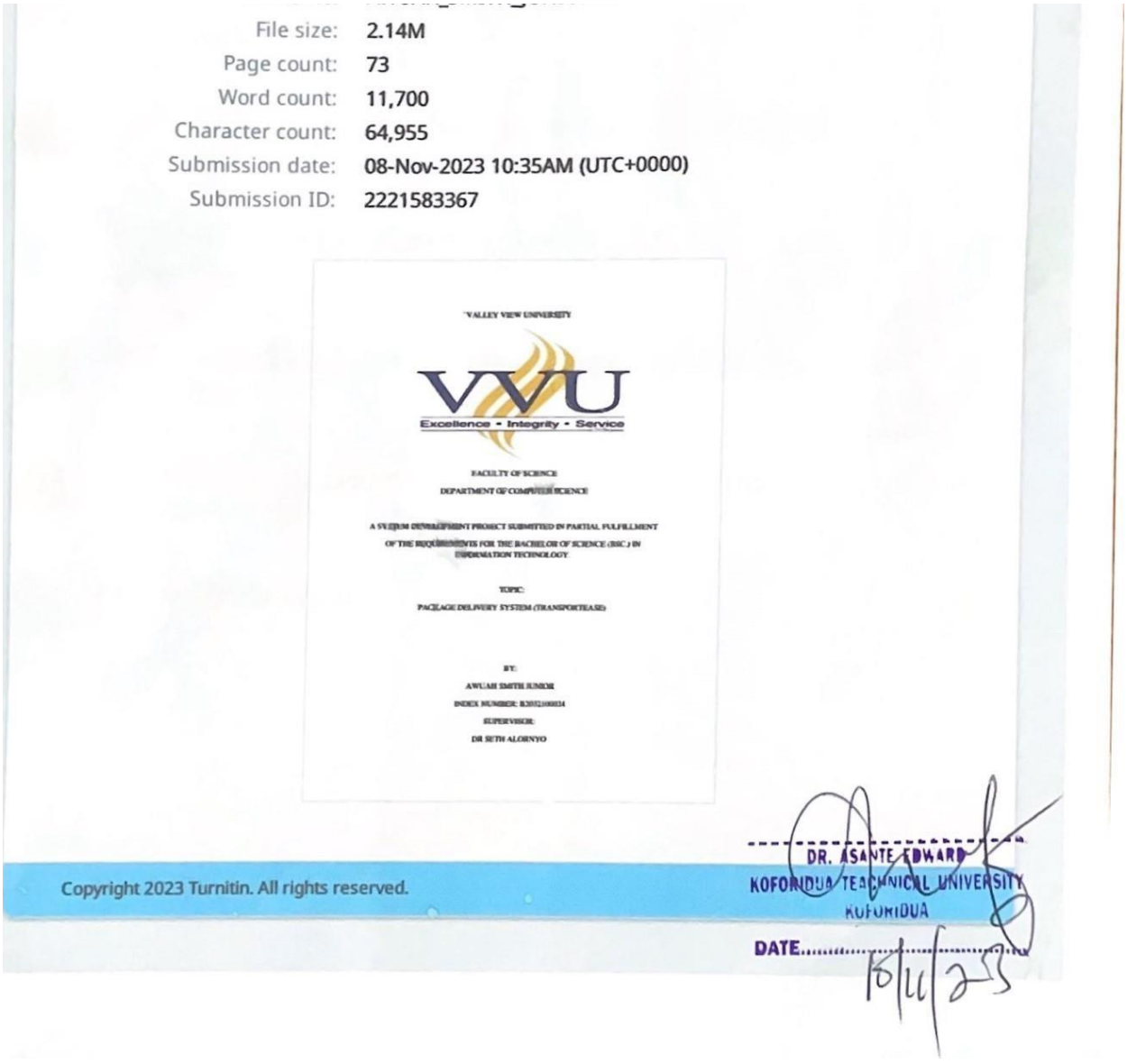

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