AN ENHANCED MOBILE BASED DELIVERY SERVICE SYSTEM

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CERTIFICATION

This Project titled, **AN ENHANCED MOBILE BASED DELIVERY SERVICE SYSTEM,** prepared and submitted by **ETENABE PRECIOUS** in partial fulfilment of the requirements of the degree of **BACHELOR OF SCIENCE** (Computer Science), is hereby accepted

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DEDICATION

This project is dedicated to God, Almighty.

ACKNOWLEDGEMENTS

I wish to express my profound gratitude to those who contributed to my parents Mr. and Mrs. Etenabe for their encouragement and his advice, may God bless you. An exceptional gratitude goes to our supervisor in the person Dr. (Mrs.) Chinwe P. Igiri who was always there for us in time of assistance and advice to make this project a successful one. I also extended my gratitude to our Ag. H.O.D of computer science department in the person of Dr. M. O. Adewole and other lecturers, Mr. Jeremiah Balogun, Dr. (Mrs.) Kasali F.A, Professor Idowu P.A., Mr. Ebo I.O, in this department and we pray to God to see them through.

I will not forget my good friends, well-wishers and loved ones that in one way or the other contributed immensely to success of these projects, I ask almighty God to bless you all Amen.

Finally, I am loyal to the great and everlasting Father in Heaven who has been so faithful and kind in all ramifications of my life and my days in these schools in partial fulfillment of my Bachelor Degree Award. I say may His name alone be exalted. Amen.

ABSTRACT

The logistic service industry is defined as the obtaining, producing, and distributing of materials and products in the right quantities to an end-user or final destination. Different forms of business triggered the high demand for courier services. However, information of the different couriers was measly provided. It is also very important for the courier service to deliver the package as soon as possible. One of the most important and responsible business processes of courier service is to deliver packages. Necessity is the mother of inventio. It is therefore necessary to develop an effective system to facilitate the interaction between courier service providers and users of these services. This project introduces the application system based on Android to manage the courier services. This is a mobile application that allows small and medium-scale businesses to have access to information on the different types of courier services. In addition, the system is incorporated with a Geographic Information System for the tracking of these packages via the use of Google Map API. Information on these packages as well as the courier services are stored in firebase (a back-end for mobile application development). The UI of the system was built using a framework called flutter. This system was designed to ease the users to access information and with added functionality such as product tracking and courier service orders, it makes delivery of products easy for the users of the system.

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CHAPTER ONE

1.1 BACKGROUND TO THE STUDY

The logistic service industry is described as the process of collecting, producing, and distributing resources and goods in sufficient numbers to a certain end user or destination. It is the science of designing, executing, and controlling methods for the most effective storage and movement of products. (News, 2017). Logistics services serve as a channel between the seller and the buyer, they serve as easy means of distribution of materials and products. The availability of such logistics services in Nigeria aids organizations like Jumia, Konga, E-Commerce sites, and the likes.

The volume of business transactions has increased massively because of the internet. Getting items across different cities and continents quickly and effectively is more important than ever. The logistics services in Nigeria are being disrupted by technology. However, with all these innovations and disruptions, finding reliable delivery companies in Nigeria can be quite a hurdle. As the volume of e-commerce transactions is constantly increasing in Nigeria, smaller players other than the bigger e-commerce players like Jumia and Konga are entering the market. The bulk of these small players are using social media channels to sell products (Koboline, 2018). With Nigeria's poor infrastructure, moving items around the country can be a bit tedious and expensive. The project is in a form of E-commerce software whereby the sellers are linked with the different delivery services. This aids Small and medium scale enterprises involved in the sales of materials and products find an easy and affordable means to transfer such goods.

Transportation of these products requires the sellers to trust in this system, allowing their products to be transported over a long distance without being stolen or go off course. These sellers ask questions like "Can I trust this service", "How can I verify my product got to the customer", "How would I know where my products are at the moment", etc. The required services such as tracking of products and validation of delivery will be automated into the system to answer the regular question of the sellers.

1.2 STATEMENT OF PROBLEM

As explicitly discussed in the background of this study. There are some limitations in the existing delivery services in Nigeria. This challenges as summarized as follows:

I. Different businesses appear from time to time, which leads to the emergence of various services that need to transport goods from one place to another.
II. Transporting goods through the country, but with the help of the space logistics system, helps to make up for business interruptions.
III. Most SMEs tend not to trust their products to unknow services; some might be due to the distance of their product delivery; will their product be able to meet up with the time deadline.

1.3 AIM AND OBJECTIVES

The aim of this study is to create awareness of the available logistic services in Nigeria. The objectives of the study are:

I. To serves as a medium of interaction between SME and delivery services.
II. To create awareness for logistics services.

III. To assure safety of products by incorporating a GIS system.

1.4 PROPOSED METHODOLOGY

The proposed system will follow all processes related to software development, including software requirements, software design, software development, and software testing. The adopted model that was used in the development of the system is the waterfall model. The proposed system aims to establish a link between SMEs and courier services by providing a list of services provided to SMEs so that SMEs can choose from the list. The proposed system is built with a GIS system (Google Map API) to ensure the safety of transported products. I will use Flutter and Firebase to build the app.

1.5 SIGNIFICANCE OF STUDY

The study is relevant in the sense that it will create awareness for SME and upcoming delivery services, reduces the rate of employment in the country, provides a means of transportation of either large or small goods through the state/country. The aim of this study is to create awareness of services between the sellers and buyers by the making the middlemen of the trade known amongst the sellers thereby creating different form of services to people of the country such as creation of new upcoming SMEs, employment opportunities for people in the area of transport as dispatch riders for the transporting of the goods around the state and leading to many undiscovered opportunities in the both sides of the business.

1.6 SCOPE AND LIMITATION

The study of this system will aid in the re-infrastructure of the economy of Nigeria by creating multiple opportunities around the country. It serves as a medium of job opportunities to the citizens of the country either by creating business ideas, transport service entrepreneurs, opportunities to seek jobs as dispatch riders in the various delivery service organization, and the likes.

This are the limitations to systems are as follows:

I. The availability of this delivery service organization to cooperate with the system.
II. The ability to promote the system amongst SME in the designated areas.
III. The software is developed only on an android system which can only be accessed by an android device and not an IOS or window system.
IV. The test case audience of this study is limited to Lagos state.
V. It is limited to have up to only seven different types of courier service.
VI. The amount of people that can register to the system is limited to a small number.

1.7 DEFINITION OF TERMS

Small and Medium Scale Enterprise (SMEs) - Small and medium-sized enterprises or small and medium-sized businesses are businesses whose employees' numbers is below a certain limit.

Geographical Information System (GIS) - A geographic information system (GIS) is a theoretical framework that allows for the collection and analysis of geographical and geographic data.

Global Positioning System (GPS) - It is one of the global navigation satellite systems (GNSS) that sends geolocation and time information to a GPS receiver anywhere on or near the Earth when four or more GPS satellites have an unobstructed line of sight.

Logistics - Transporting products to consumers is a commercial operation.

Courier - A courier is a person or organization who is in charge of transporting information, goods, and mail.

E-Commerce - Electronic commerce refers to the purchasing and selling of products and services, as well as the transmission of cash or data, through an electronic network, most notably the internet.

Logistics Service Provider (LSP) - Logistics Service Providers, often known as 3PL (third-party logistics) providers, are third-party businesses that shippers use to manage their company's warehousing, distribution, and freight transportation.

Software Development Life Cycle (SDLC) - The software development life cycle (SDLC), also known as the application development life cycle, is the process of planning, building, testing, and implementing an information system.

Global Navigation Satellite Systems (GNSS) - Global Navigation Satellite Systems (GNSS) are composed of constellations of Earth-orbiting satellites that

broadcast their positions in space and time, networks of ground control stations, and receivers that determine ground positions using trilateration.

CHAPTER TWO

LITERATURE REVIEW

2.1 INTRODUCTION TO RELATED CONCEPTS

Logistics is generally the detailed organization and implementation of a complex operation. According to the dictionary of logistics terminologies logistics is the management of the flow of things between the point of origin and the point of consumption to meet the requirements of customers or corporations (Vitasek, 2013). Physical resources such as materials, equipment, and supplies, as well as food and other consumables, are all controlled in logistics. Inbound logistics and outbound logistics are the two types of logistics The main fields of logistics include Procurement Logistics, Distribution Logistics, After-sales logistics, Disposal logistics, Reverse logistics, Green logistics, Global logistics, Domestics logistics, Asset control logistics, Point-of-sale material logistics, etc.

This project focuses on distribution logistics (delivery services) which entails delivering finished products to the buyer Order processing, warehousing, and shipping are all part of it. Because the time, location, and amount of production varies from the time, place, and quantity of consumption, distribution logistics is required.

2.1.1 OVERVIEW OF COURIER SERVICES

Beginning in the mid-1980s, bike express delivery for shorter trips replaced motorcycle express delivery in big cities. Rising costs, including insurance premiums and gasoline, have reduced the competitiveness of motorcycle express delivery (Scott, 2015). Couriers all over the country are now using small delivery trucks. In the current financial situation, companies often weigh the cost of express delivery, give up the same-day express service, and use the cheapest overnight delivery solution (Scott, 2015). There are different types of courier services listed below:

DHL - It is a subsidiary of the German logistics firm Deutsche Post DHL. When it comes to sea and airmail delivery, it is the world's leading firm. It was formed in 1969 and is now the uncontested market leader in its industry. (Gronkvist, 2018). Its worldwide headquarters are located at the Bonn headquarters of Deutsche Post. It also provides services in nations such as Iraq, Afghanistan, and Burma, so it's no surprise that it's ranked first. (Gronkvist, 2018).

UPS, or United Parcel Service, is an American courier service conglomerate that operates in express mail delivery, logistics, and freight services. UPS is one of the world's oldest parcel delivery companies, having been founded in 1907, and has grown to have many branches and segments that handle global shipping to over 220 countries. The company has one of the best fleets of cargo planes and freight trucking systems in the industry, and it has recently added drone delivery to its list of services. UPS is headquartered in Atlanta, Georgia, and employs over 450,000 people worldwide.

Aramex is a global courier, express mail, logistics services, and freight forwarding firm based in Dubai, United Arab Emirates. Founded in 1982 as one of the leading courier service providers in the Arabian sub-region, it was the first company in the Middle East to be registered on the NASDAQ exchange. Aramex now operates

operations in 54 countries across the world and employs approximately 14,000 people. The company began operations in Nigeria in 2015, and by 2017, it had founded a new service called "Shop & Ship," which is an easy online shopping delivery service that allows online customers to purchase products and services from popular online stores worldwide and have them delivered directly to Nigeria at a very low affordable rate. (Bola, 2020).

This service is presently available in around 80 countries worldwide, allowing online buyers to send items directly to major destination nations such as the United States, United Kingdom, Germany, Canada, Australia, and India, to mention a few.

2.1.2 E-COMMERCE

For many people, the term e-commerce (Whiston & Kalakota, 1996) refers to purchases made on the Internet, the World Wide Web. However, e-commerce is more extensive than online shopping and includes more stores. Some people and companies use the term e-commerce (or e-commerce) when it is more related to e-commerce. In this document, we use the term e-commerce in the broadest sense. Although the Internet has enabled many businesses and individuals to shop online, e-commerce has generally existed for many years. For decades, banks have used electronic money transfers (EFT) (Gary & James, 2001), which is the electronic transfer of account information through private communications.), for many years. One company transmits machine-readable data to another company in a standard format. By the 1960s, companies realized that most of the documents they exchanged were related to the transportation of goods, such as invoices, purchase orders, and bills of lading, and contained the same information. Almost all transactions. They also had to spend a lot

of time and money entering this information on their computers, printing out paper forms, and then re-entering the information at the other end of the transaction.

Companies participating in EDI are called business partners. The standard format used in ED contains the same information that the company has always included in its standard paper invoices, purchase orders, and shipping documents.

A good definition of e-commerce should refer to the use of electronic communications to implement or improve business processes. Some people use the term "Internet commerce" to refer to e-commerce that exclusively uses the Internet or the Internet as a medium for transmitting data. E-commerce is defined as "the transformation of important business processes with the help of Internet technology".

E-commerce requires multiple technologies, the most obvious of which is the Internet. In addition to this interconnected network system, many other complex software and hardware components are needed to provide the necessary support structures: database software, network switches and hubs, hardware and software encryption, multimedia support, and the World Wide Web. Features of e-commerce technology (Stephen, 2002).

Simplicity of automated processing: One document can now be easily created and processed multiple payments with minimal effort and cost. The lack of ubiquitous and cheap communication technology makes the automation of the payment process an expensive and complex process.

Instant results: Payment speed is ensured by automation and the ability of intermediary systems and providers to process payments in real time. For manual paper systems, there is a time lag due to manual intervention.

Loss of collateral information: New technology makes it possible to delete or change the collateral information accompanying the transaction. This information is traditionally part of the transaction, and the parties to the transaction rely on this information to confirm individual payments.

Globalization: Globalization or minimization of geographic factors in payment processing is an obvious aspect of the new payment system.

2.1.3 PACKAGE TRACKING

Package tracking, also known as package logging, is the process of locating cargo containers, mail, and parcel post at various points in time throughout sorting, storage, and delivering packages in order to authenticate their authenticity and forecast and facilitate delivery. Web-based parcel tracking has been utilized from the early days of the Internet to systematize customer care and as a less affordable option to mobile contact centers, allowing you to follow the progress of a shipment "within minutes." The service became quickly popular: for UPS the number of packages tracked on the web increased from 600 a day in 1995 (Flynn, 1995) to 3.3 million a day in 1999 (U.P.S. Results Meet Forecast, But Fail to Impress Investors, 2000). On-line package tracking became available for all major carrier companies, and was improved by the emergence of websites that offered consolidated tracking for different mail carriers. With the rise of smart phones, package tracking mobile apps were able to send tracking info to customers' cell phones. With improved data processing, e-mail programs were able to automatically detect tracking numbers in messages and receipts and print the real time location of the package. Fast delivery of items to buyers is essential for a smooth e-commerce shopping experience, and professional courier services play a vital role in this regard.

Tracking packages or couriers requires the cumbersome task of locating packages and containers and various packages during the classification and delivery process, which helps to verify their movement and origin, and estimate the expected delivery date. The package tracking system is designed to provide customers with detailed information about the package route, delivery status, estimated delivery date and estimated delivery time. The primary goal of this parcel tracking system is to give consumers with information about the package's path, delivery status, expected arrival date, and approximate arrival time. (Bhalla, 2021).

A geographic information system (GIS) is a conceptualized framework that provides the ability to capture and analyze spatial and geographic data. GIS applications (or GIS apps) are computer-based tools that allow the user to create interactive queries (user-created searches), store and edit spatial and non-spatial data, analyze spatial information output, and visually share the results of these operations by presenting them as maps [(Clarke, 1986), (Maliene, Grigonis, Palevičius, & Griffiths, 2011), (Kent & Vujakovic, 2020)]. Geographic information science (or, GIScience) the scientific study of geographic concepts, applications, and systems is commonly initialized as GIS, as well. Geographic information systems are utilized in multiple technologies, processes, techniques and methods. They are attached to various operations and numerous applications, that relate to: engineering, planning, management, transport/logistics, insurance, telecommunications, and business. For this reason, GIS and location intelligence applications are at the foundation of location-enabled services, that rely on geographic analysis and visualization (Goodchild, 2010).

The Global Positioning System (GPS), originally Navstar GPS, is a satellite-based radionavigation system owned by the United States government and operated by the United States Space Force (Global Positioning System Standard Positioning Performance Standard, 2008). It is one of the global navigation satellite systems (GNSS) that provides geolocation and time information to a GPS receiver anywhere on or near the Earth where there is an unobstructed line of sight to four or more GPS satellites (What is a GPS?, 2018). Obstacles such as mountains and buildings block the relatively weak GPS signals.

2.2 RELATED WORKS

According to the author, Irish Forestry has been using route planning to optimize the transportation of wood from the forest to the sawmill by combining GPS technology with GIS for tracking and monitoring. Produced wood. Regarding sales deposits as suggested by Devlin et al. Route optimization includes not only selecting the shortest route, but also planning early pick-up and delivery to reduce cost per mile and increase revenue per mile. GIS and GPS technologies can make it easier to create such a system. Forster emphasized in his research that the greatest use of software packages with GIS components occurs at the operational level, including routing, programming, tracking, and navigation (Devlin, Mcdonnell, & Ward, 2008).

Karimi and Krishnamurti developed Telegeoinformatics, a system that combines wireless communication with GPS and GIS to solve the problem of packet routing. They developed the routing software NetRoute, with the help of this software, GPS receivers can be used to calculate the exact location of mobile nodes at any time. Derekenaris et al. An ambulance control system based on GIS, GPS and Global System for Mobile Communications (GSM) technology was developed to ensure

effective route guidance and ambulance allocation, and to minimize response time (Karimi & Krishnamurthy, 2001).

Therefore, the ambulance system improves the efficiency of accident handling. Jung et al. developed an intelligent monitoring system for the Korean postal package delivery service. They used wireless technology, GIS, and GPS to develop a system to manage collection and delivery. Postal agencies work more efficiently. As the author emphasized, the system has significantly improved package transportation and delivery services in the region, thus demonstrating the effectiveness of the technology used (Jung, Lee, & Chun, 2006).

Dijkstra algorithm is a well-known method to solve the shortest path problem modified from Alazab et al. service. For the Malaysian transportation system, Abousaeidi et al. A web analytics application was developed to determine the fastest route to deliver new vegetables to Kuala Lumpur and Selangor. The most important factor in creating faster vegetable distribution routes is land use, such as residential areas and population. These factors are determined using regression analysis methods to determine the parameters that affect route selection in order to select routes more quickly. These are only a handful of the studies that have successfully built, tested, and used path optimization networks to increase the efficiency of transportation systems in their respective working settings (Moreri, Maphale, & Nkhwanana, 2017). The challenges identified by these studies were generally similar, and they included: a lack of up-to-date traffic information to avoid traffic jams and busy roads, the complexity of resolving cases when the shortest route differed from the fastest route, and Complications in route planning due to drop-off time windows established by

clients, as well as a lack of current land use information, such as building sites, which might cause traffic delays.

E-commerce has grown exponentially over the years. The expansion has been marked by high customer demand and an expanding variety of different items accessible online. As a result, there is a logistical difficulty as well as a strong need for an efficient courier service to serve the expanding markets. It is critical for the courier service provider that the item is delivered as soon as feasible.

A. Mohd., R. A. Rashid, A. H. F. Abdul Hamid, M. A. Sarijari, M. R. A. Rahim, H. Sayuti and M. R. Abdul Rashid created a system to counter this issue. In addition, the overall system is the web-based and application management for the system will provide the back-end service for parcels and customers information management (A. Mohd., 2019).

Most courier firms, particularly indigenous ones in underdeveloped countries such as Nigeria, continue to face several challenges in the delivery chain of courier service operations. The current express delivery system lacks mobile features for consumers to submit complaints and track shipment while on the move, while courier agents cannot access courier information while on the road. Azeta, A. A., Ogunlana A. O. and Ezeh C. O. from Covenant University worked on paper which discussed the design and implementation of a Mobile Express Delivery system which counters the issues stated above. In addition, the operation that can be performed on the system ranges from adding shipment, cancelling delivery, viewing complains, to customer being able to track their shipment, lodge complains, make payment through the mobile system (Azeta, 2010).

In a big globe like ours, shipping packages from one location to another via a third party is unavoidable since package owners cannot visit all of the intended locations in the time allotted. Courier service systems provide the service, but with less efficiency in terms of delivery, comfort, cost calculation from the user's perspective, and tracking of things in transit. Agu, M.N, Nwoye C.I. and Ogbuokiri B.O. form University of Nigeria, Nsukka worked on a paper titled Enhancing Courier Service with the Development of an interactive Mobile App in Android Platform. The Mobile courier service system provided in this paper, when fully deployed, will help to improve the services rendered by courier companies in Nigeria. (Agu M. N., 2015).

2.3 SUMMARY OF RELATED WORKS

S/N	Author(s)	Title of Paper	Problem Statement	Method used	Results	Limitation
1.	Agu, M. N., Nwoye C. I. and Ogbuokiri B. O.(YEAR)	Enhancing Courier Service with the Development of an Interactive Mobile App in Android Platform	The uncertainty of the cost of sending the package, ineffective tracking system in the existing courier service	Object Oriented Analysis and Design Methodology	The result of this project shows a good improvement in the security secure of package transportation, making it easier to transport packages from one location to another	It is limited to only one courier movement a d service
2.	Azeta, A. A., Ogunlana A. O. and Ezeh C. O.	Design and Implementation of a Express Delivery System	The existing express delivery system lack mobile facilities for customers to lodge complains	Case Study		

			and track shipment on the move and courier agents are not able to access courier information while on the field.			
3.	Faizal Johan Atletiko (Atletiko, 2017)	Development of Android Application for Courier Monitoring System	A complicated ordering flow happens in the distribution of medicine to pharmacies or hospitals. The management of this process becomes tedious due to the large amount of information that needs to be managed	Case Study	The system was able to counter the management of large amount of information in the system when it comes to distribution of this drugs. In addition, it also has a tacking and mapping system for smooth and fast delivery of this drugs	It is limited to one courier service and limited to android systems.

4.	A. Mohd., R. A. Rashid, A. H. F., Adbul Hamid, M.A., Sarijari, M. R. A. Rahim, H. Sayuti, M. R. Abdul Rashid	Development of android-based apps for courier service management	The problem is due to high demand for efficient courier service to support the growing markets. Delivery of packages are done on a much slower and non-efficient rate.	Information sourcing via the web	The paper was able to counter the availability of the system by creating it for both web and android systems. Easy management of package and its information.	It is limited to one courier service.
5.	Ajay Tyagi (Tyagi, 2016)	Courier Management System	The existing systems made use of manual recording of information which was a lot tedious, information on export and import, consignment information and	Case Study	The proposed system was able to counter the manual process of recording information and computerized the whole process.	It is limited to web applications. Does not involve tracking of packages.

			billing information.			
6.	Kealeboga Kaizer Moreri, Lopang Maphale, Nyaladzani Nkhwanana.	Optimizing dispatch and home delivery services utilizing GIS in Botswana: Botswana Post case study	Vehicle Routing problems, time taken to deliver a package	Case Study, Research	This paper worked on the overall improvement on the routing problems thereby reducing the time taken to deliver a package.	It is limited to Bostwana. It is limited to only tracking of packages
7.	Arfan Muhammad (Muhammad, 2010)	Advanced Pickup. & Delivery of Parcels Using GPS/GIS Technologies	The main focus of this project addresses some of the key problems in the postal industry which are adhoc pickups, efficient and quick delivery, increase in vehicle maintenance, overtime and fuel	Research	The system is improved to be fast and provide reliable service to the customer, reduces the average mileage per courier which in turns reduces the fuel cost as well as vehicle maintenance.	It is limited to only tracking of packages

			cost.			
8.	Katsuhiko Hayashia, Toshinori Nemotob, Satoshi Nakaharai (Katsuhiko Hayashia, 2014)	The Development of the Parcel Delivery Service and its Regulations in China	It is difficult to keep same service quality throughout the network	Case Study	It counters the issue of tracking and routing issue.	It is limited to only to China.
9.	Okemiri Henry A., Nweso Emmanuel Nwogbaga, Francis N. Nwebonyi (Okemiri Henry A, 2017)	Critical Review of Courier Service Management System with Emphasis to Its Relevance If Adopted in Nigeria	Recording of information is done manually in the system	Waterfall Model	It solves the issue on manual documentation of records by making it computerized	It is limited to only web application

CHAPTER THREE

DESIGN IMPLEMENTATON

3.1 INTRODUCTION

The purpose of the project is to make it easier for small and medium-sized enterprises to obtain express delivery services. With so many information materials available on the internet, it may be difficult to obtain the courier service you want. Finding this information makes it easier for companies or individuals to trace their products to the point of delivery. There was different method used in acquiring information needed to start the project. These includes:

I. Internet

II. Reference to printed and unpublished material

3.1.1 INTERNET

The purpose of this project is to make it easier for small and medium-sized enterprises to use courier service, because there are too many information materials, it is difficult to obtain the courier service they want. Finding this information makes it easier for companies or individuals to send their products to the place of order to pursue.

3.1.2 REFERENCE TO PRINTED AND UNPUBLISHED MATERIAL

I was provided me with composite content for areas that require other reasons. In order to increase the amount of extensive and complete information, I often visit the library and compiled an archive guide that is currently being prepared.

3.2 RESEARCH METHODOLOGY

The software development method in project development is based on a top-down approach. The top-down approach (also called hierarchical design or deductive reasoning) is essentially a system decomposition of the system to understand its constituent subsystems. Represents the first-level designated system, but is not a detailed subsystem. Then refine each subsystem in more detail, sometimes down to the level of many additional subsystems, until the entire specification is reduced to basic elements.

3.3 SYSTEM ANALYSIS

It is necessary to analyze the existing system. In this study, we will analyze the messaging system that accesses the input data and understand how the system achieves its goals. This will help identify problems with the existing delivery system. Existing courier service.

3.3.1 ANALYSIS OF THE EXISTING SYSTEM

The existing express delivery system is specially designed for cooperation with express delivery companies. Some unpopular express delivery companies are not welcome or unable to communicate with potential customers.

I. **INPUT ANALYSIS**

Data analysis and delimitation is to analyze and reorganize the collected information on the basis of determining the basic requirements and structure required by the project to effectively implement subsystems and modules so that the system can input data into the input form.

II. **PROCESS ANALYSIS**

The collected information has been processed into a more meaningful format for input into the system. Most processing is done in the package file.

III. **OUTPUT ANALYSIS**

The designed system output is generated from the system input. Most of the output generated is in the received package and delivery information.

3.3.2 LIMITATION OF THE EXISTING SYSTEM

This guide means that small and medium-sized enterprises have encountered many problems when signing contracts with various express companies and the manual tools used by express companies to store package information, including:

I. Delay in processing parcel files.

II. Loss of vital documents as the filing system is manual.

III. Damage of documents due to fire incident.

IV. Illegal removal of files by fraudulent staff leading to insecurity

3.3.3 OVERVIEW OF THE PROPOSED SYSTEM

The new system adds additional functions to the existing systems mentioned above. The new system is designed to promote customer experience and increase awareness of the rapidly growing messaging service.

3.3.3.1 ADVANTAGES OF THE PROPOSED SYSTEM

The following are the advantages of the proposed system:

I. Provides better customer support.

II. Easy to use GUI that does not require specific training.

III. Accuracy in handling data.

IV. Fast rate of operation and excellent response time.

V. Better storage and faster retrieval system.

3.3.3.2 LIMITATIONS OF PROPOSED SYSTEM

There are some limitations and problems I encountered during the development of this project:

I. Availability of other users (SMEs") to test the system

II. Not enough time

III. The courier service listed are limited to 7 different type of organization offering the same service.

3.4 SOFTWARE DEVELOPMENT LIFE CYCLE METHODOLOGY

The software methodology used in designing and implementing this system is the waterfall method as it allows for departmentalization and control and development proceeded phase by phase.

3.5 SYSTEM DESIGN, ARCHITECTURE AND IMPLEMENTATION

This section discusses the external and internal system architecture of the application, and describes the various requirements for implementation. The architecture diagram shows the various components of the system and their relationship with the system structure. The recording and evaluation of road traffic accidents are based on meeting requirements.

3.5.1 DATA MODELLING

This application development phase is necessary in order to define and analyze the data requirements needed to support the implementation of the application process. The top-down approach came from conceptual modeling, which was later converted to logical modeling.

Table 3.1 Key System Entities

Parcel	This entity represents a unique parcel detail that has been posted and stores all the parcel attributes
Parcel Types	This classifies the various type of parcel such as documents, boxes of items, etc.
Users	This entity stores all the registered user details as well as different users access rights.
Courier Services	This entity contains the list of courier service.

3.5.2 APPLICATION IMPLEMENTATION

The project adopts the software architecture of Three-tier Architecture, and the user interface, functional logic and data access layer are developed and managed separately as separate modules to achieve continuous changes in the application. Business logic is application logic running on a Web server, and data is stored in a geodatabase.

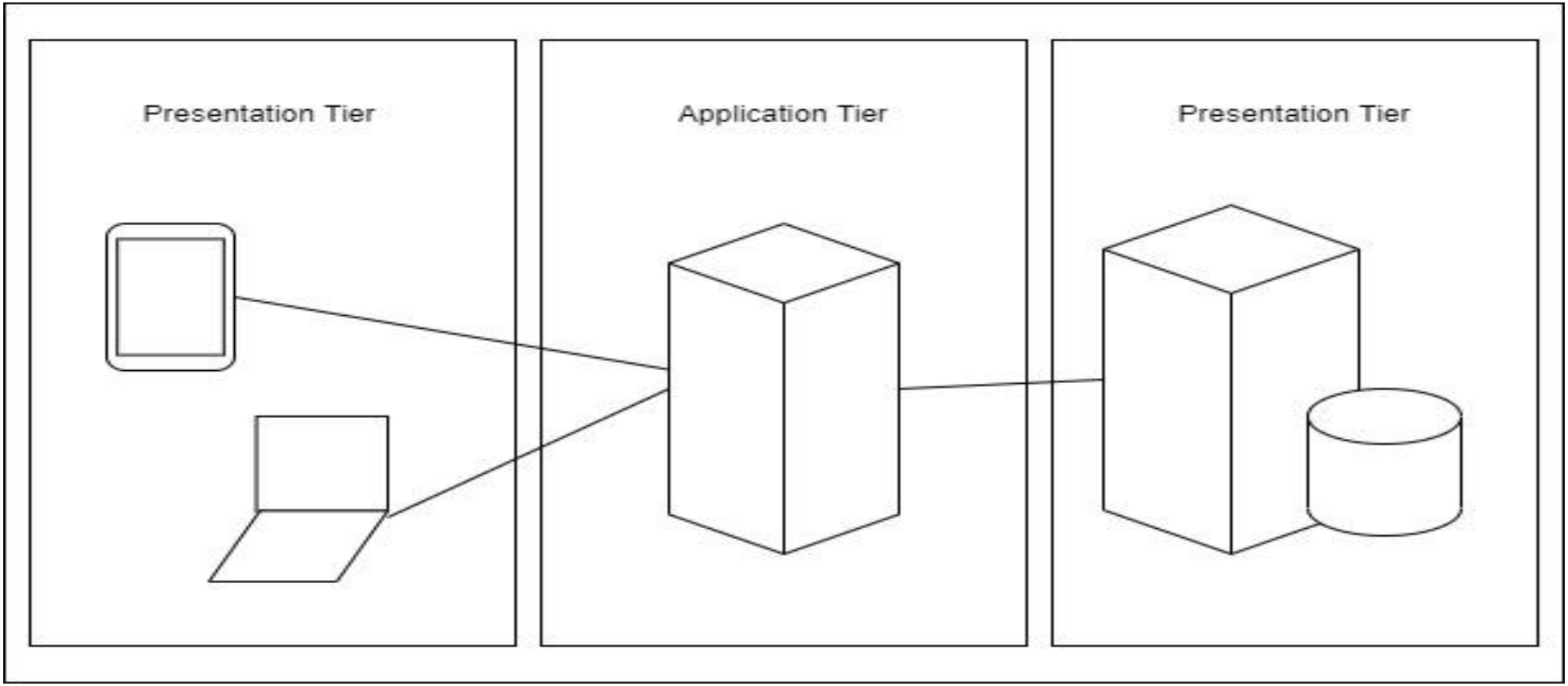


Figure 3.1 Three-Tier Architecture

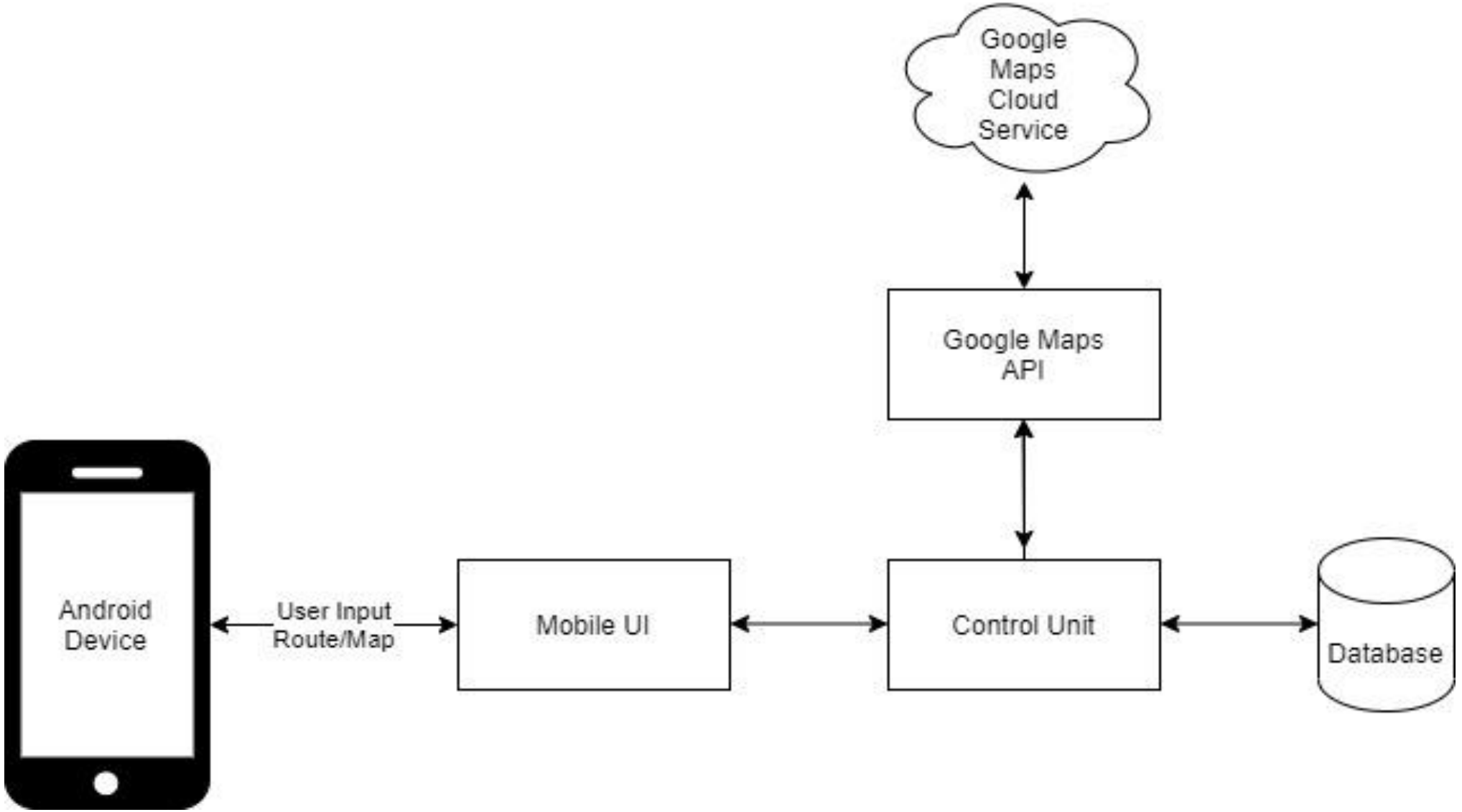


Figure 3.2 System Architecture Diagram

3.5.2.1 SYSTEM PROCESS FLOW

The front-end user are the SMEs' in possession of a mobile phone with delivery service application installed. The courier services are listed within the application an ordering of such services is done within the application. The parcel information is stored in the database and backend geodatabase server. The front-end users also have the options of tracking their products.

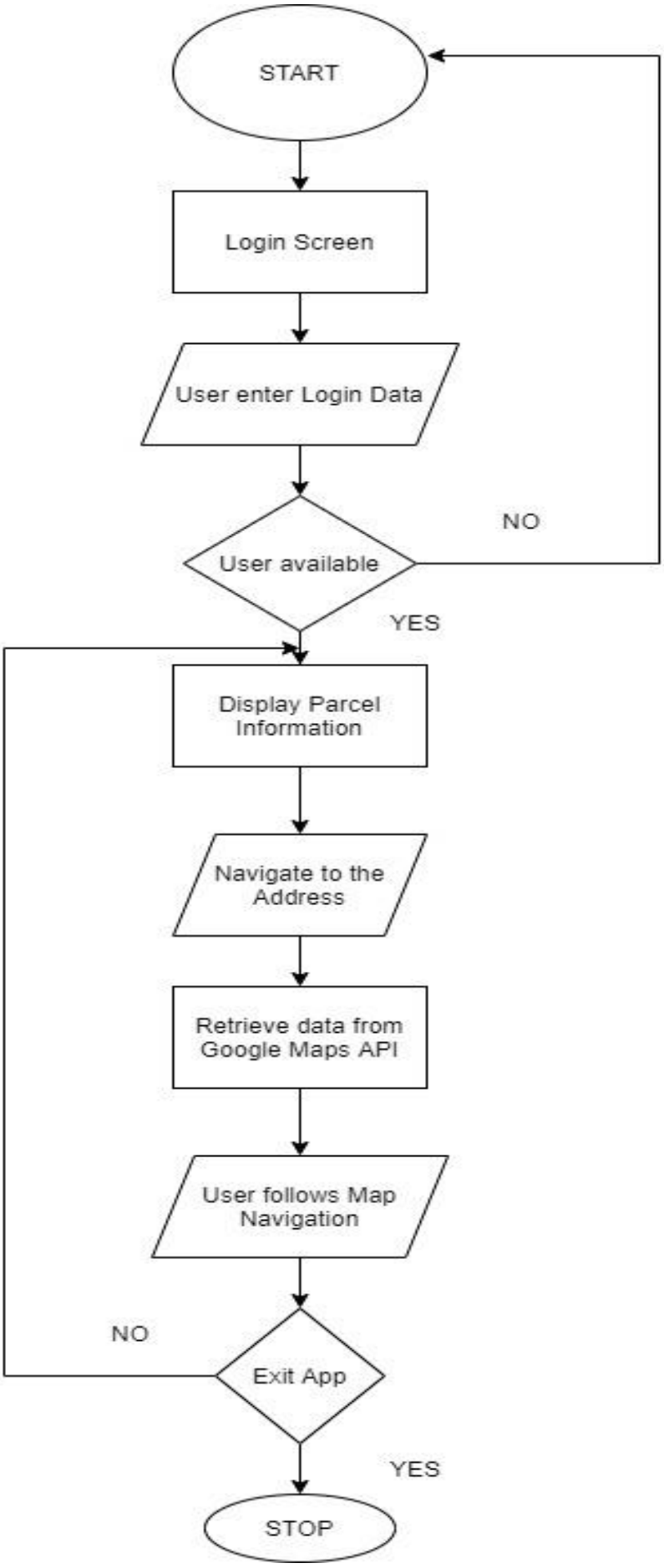


Figure 3.3 System Flowchart

3.5.2.2 USE CASE MODEL

This is used to graphically capture the interaction among the elements that was used in the system as well as identify and organize system requirements. Each case provides some observable and valuable result to the stakeholders of the system. Figure 3.3 shows a use case model for the system. The figure illustrated the various scenarios when using the system.

I. **Administrator**: The Admin has total control over the manipulation of data stored on the system. The Admin can perform task like login and out of the system, manage the overall process of the system which includes the courier services information, the customer and their information, the payment process, etc.

II. **Customer**: The user (Customer) is able to perform task such as log in and out of the system, make payment, track their products and change their password.

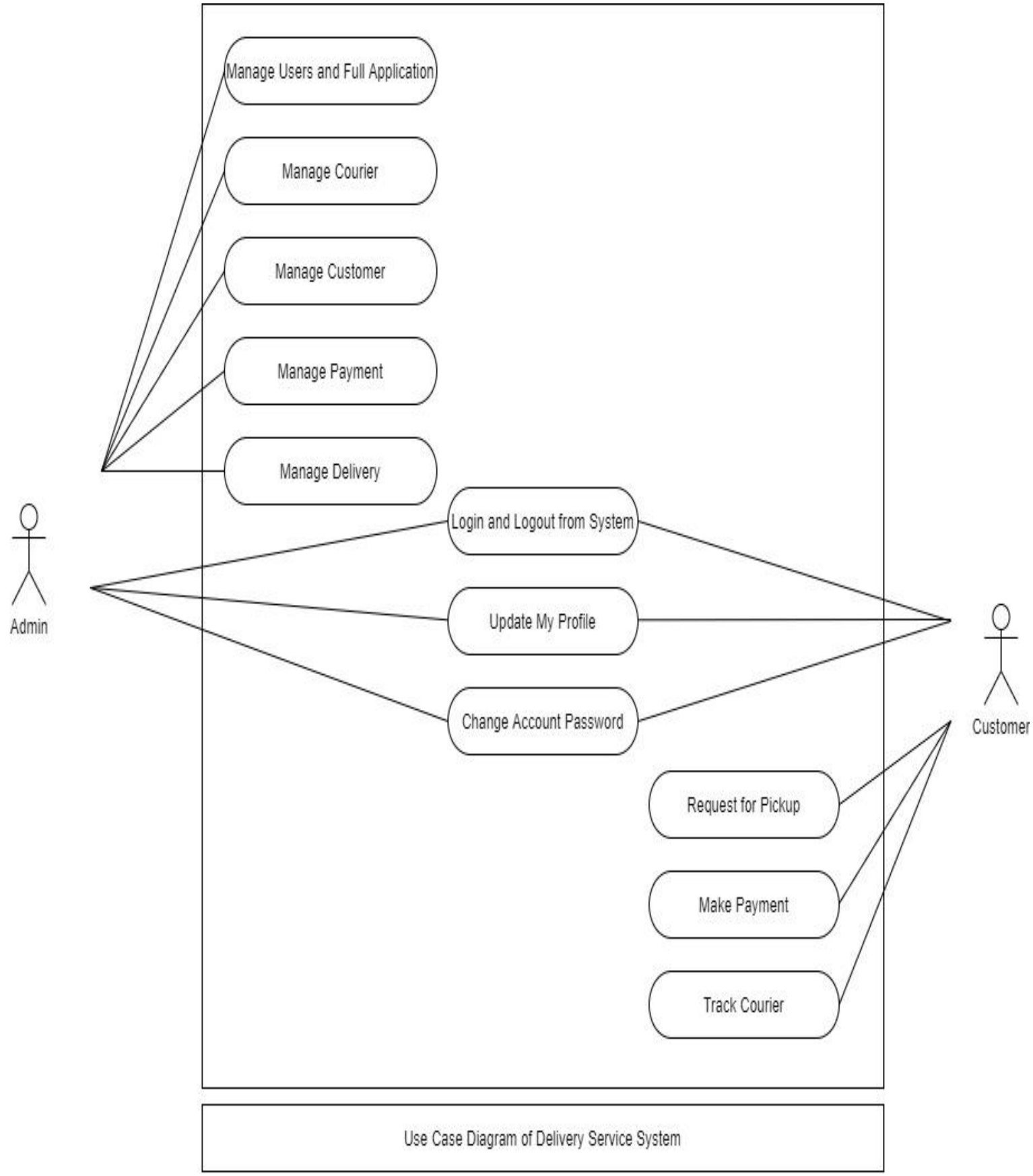


Figure 3.4 Use Case Diagram

3.5.2.3 SEQUENCE DIAGRAM

Sequence diagram talks on the sequences of activities that can be performed by the actor in the context of the diagram. The sequence diagram in figure 3.5 discusses the sequences of actions that can be done by the user (Customer). The user after successful logging into the system, he is able to book from the list of available courier service available to them. They can either cancel or continue to book this service, which by afterwards payment is made.

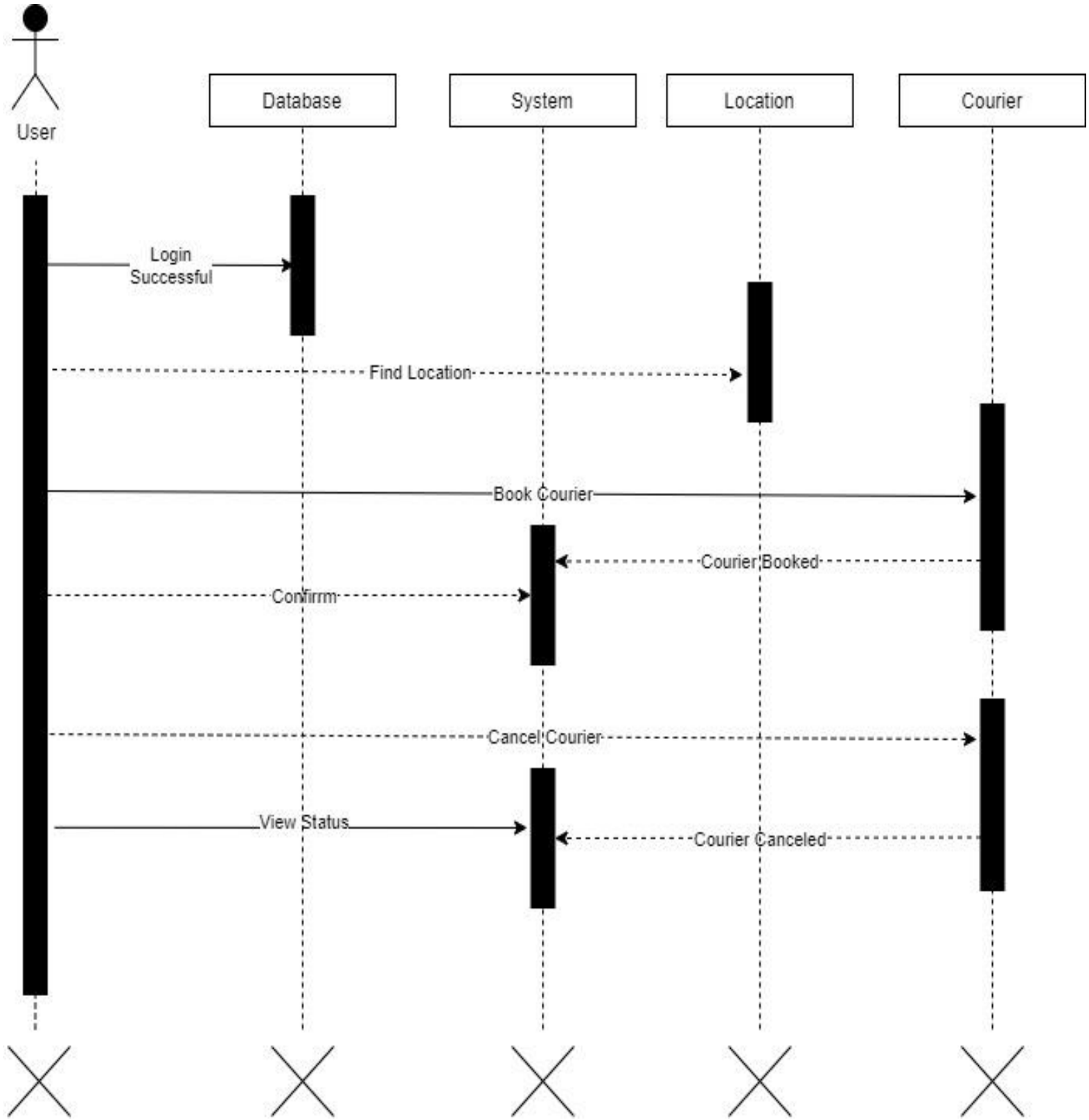


Figure 3.5 Sequence Diagram for User

The sequence diagram in figure 3.6 discusses the activities of the carried out by the administrator. The admin, once able to successfully log into the system is able to manage/manipulate this data;

I. Courier Service: The admin is able to add/edit, save/update and list/delete the information of the courier services stored in the database of the system.

II. Parcel Management: The admin is able to add/edit, save/update and list/delete the information on the parcel depending on the situation.

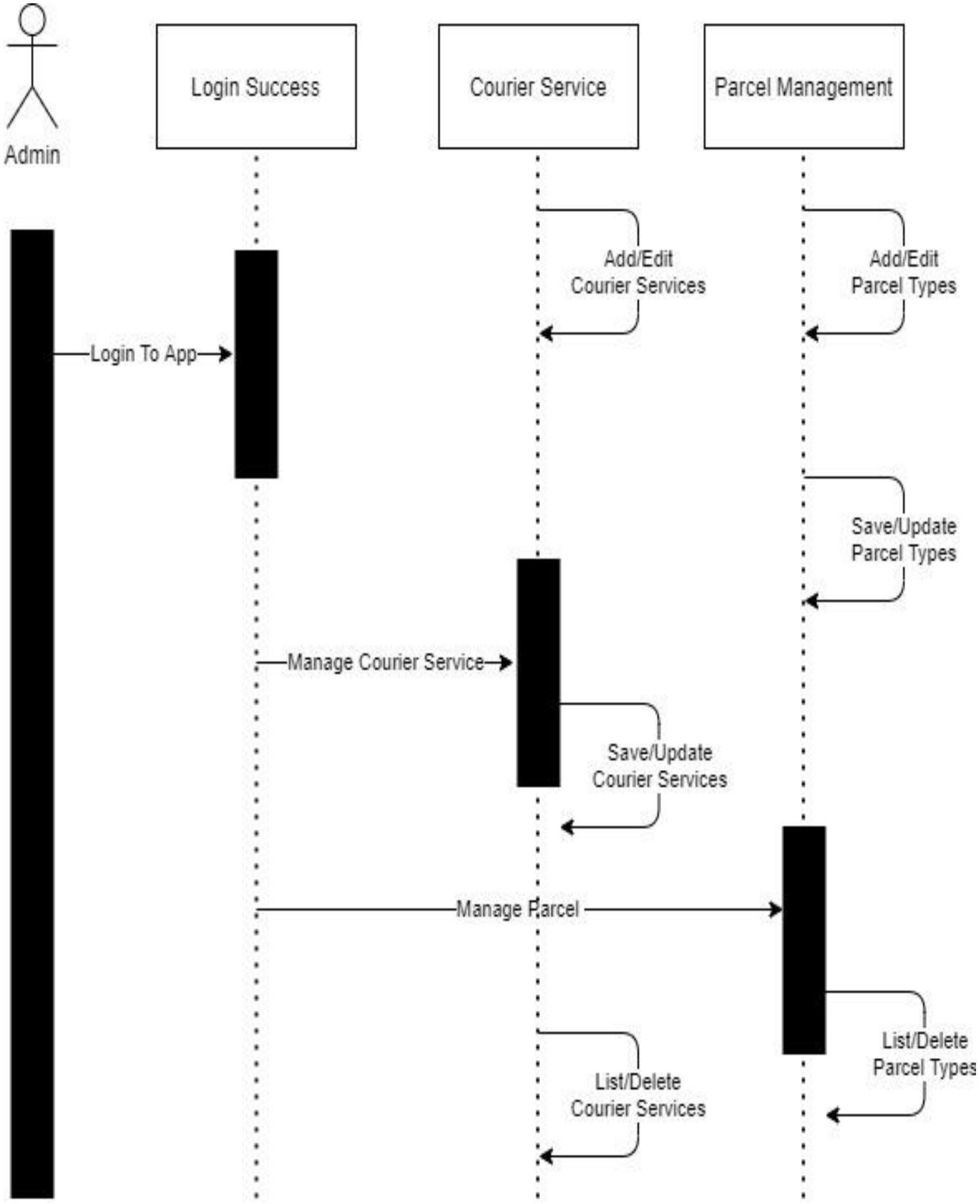


Figure 3.6 Sequence Diagram for the Admin

3.5.3 INPUT LAYOUT

Sender Info:

Sender name:

Phone:

Email:

Address:

Receiver info

Receiver name:

Phone:

Email:

Address

3.5.5 FUNCTIONAL REQUIREMENTS

The system after careful analysis had been identified to present itself with the following modules:

I. Routes information module

II. Receiver and Reporting module

III. Place order on Courier Services

IV. Payment

V. Tracking Produc

NON-FUNCTIONAL REQUIREMENTS

I. **Security:** The system should authenticate every user that tries to use the system. The system also authorizes specific users and grans them extra privileges.

II. **Usability**: The system must be quickly accessible to the users. The system must be intuitive and simple in the way it displays all relevant data and relationships.

III. **Reliability**: The system must provide a password enabled login to the user to avoid any foreign entity changing the data in the system. The system should not update the data in any database for any failed processes.

IV. **Performance**: All the functions of the system must be available to the user every time the system is turned on.

V. **Supportability**: The system is adaptable even if additional plugins or modules are added at a later point.

CHAPTER FOUR

RESULTS

4.1 USER INTERFACE DESIGN

This part details the implementation of the interface. In addition, screenshots are captured to illustrate the various system functionalities.

4.1.1 USER LOGIN AND SIGNUP SCREEN

The user is able to log in or if the user is new to the system he can register into the system. Filling in the necessary information.

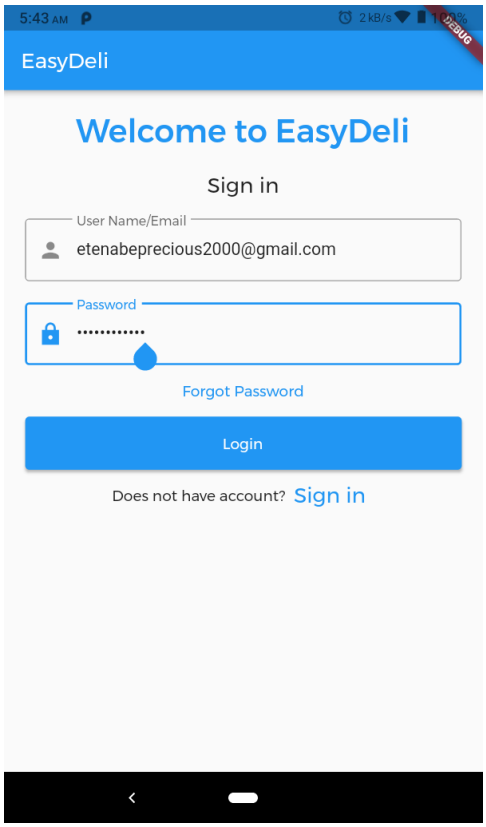


Figure 4.1 Login Screen

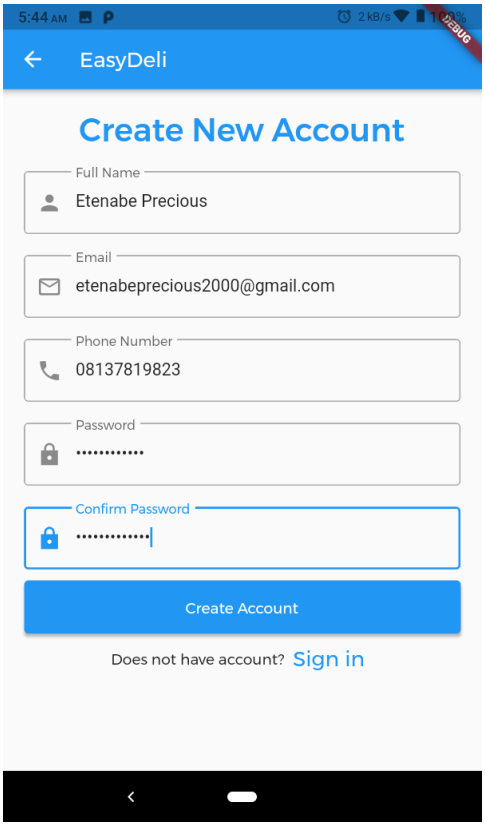


Figure 4.2 Sign Up Screen

4.1.2 USER ACEESS AND OPERATION

The various screenshot shown below shows a detailed information on the user dashboard, map location and the parcel upload information showing and stating different information that are needed to be filled in order for the delivery information to be completed. The user is also able to select any courier service stated in the application. The number, website and information on this courier service can be accessed via the application if he/she doesn't want to use the application.

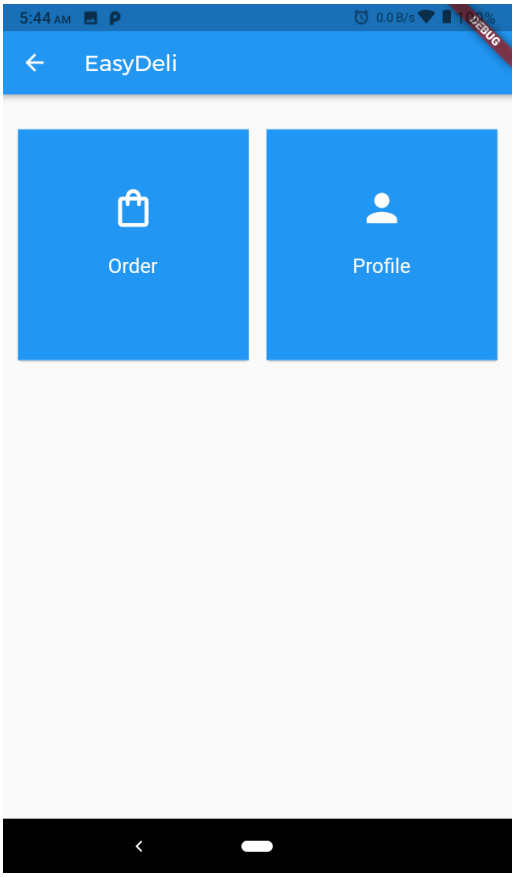


Figure 4.3 User Dashboard

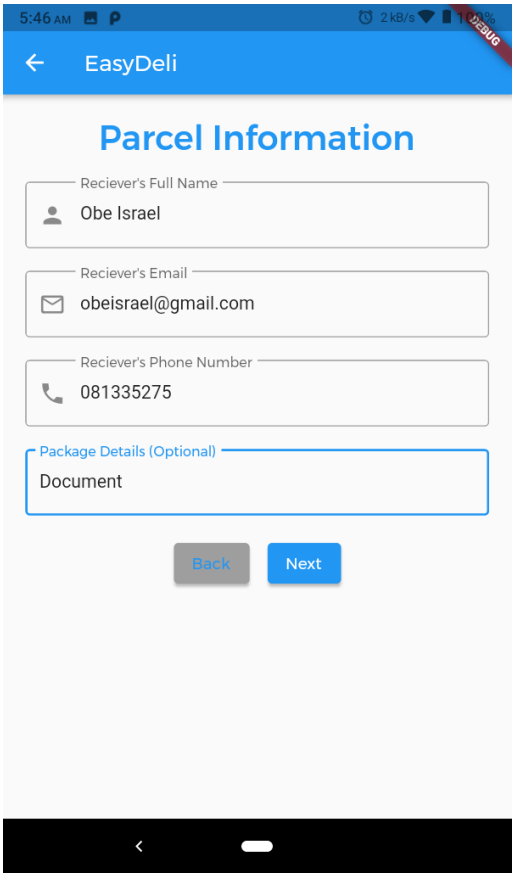


Figure 4.4 Parcel Information Provision Screen

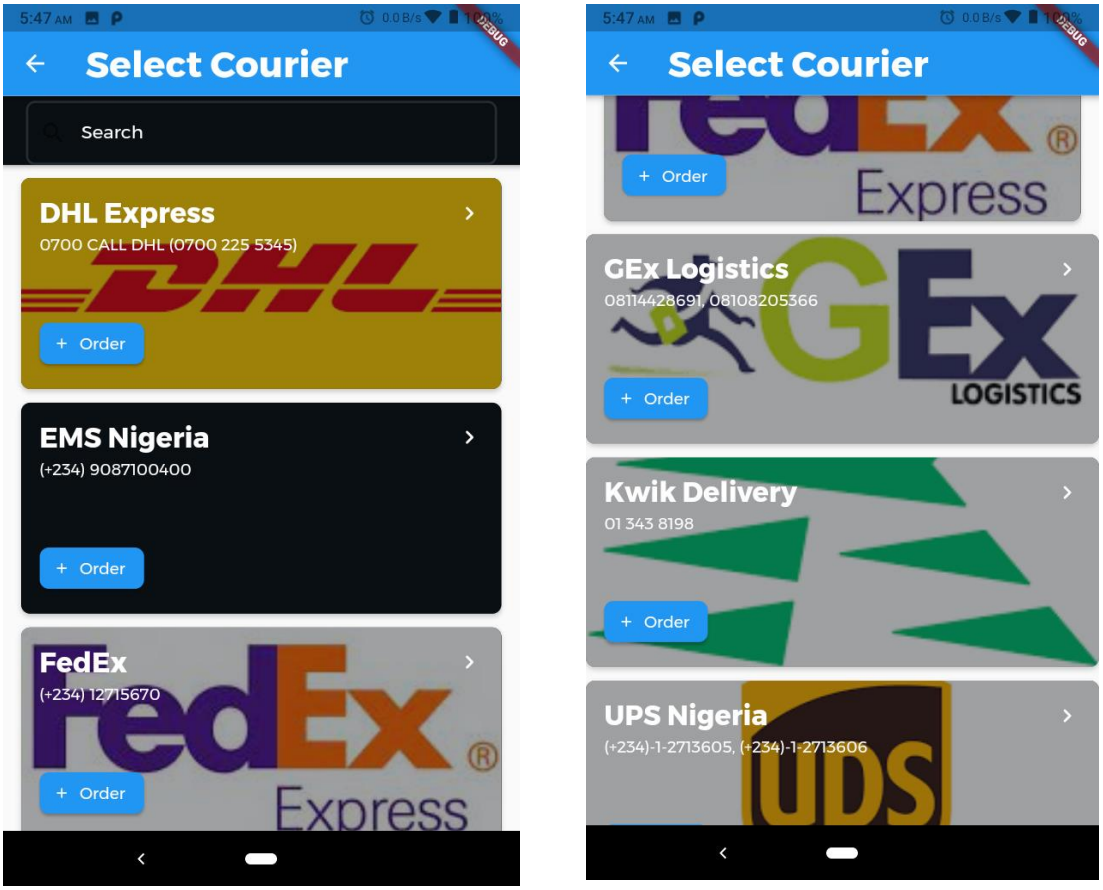


Figure 4.5 Courier Information

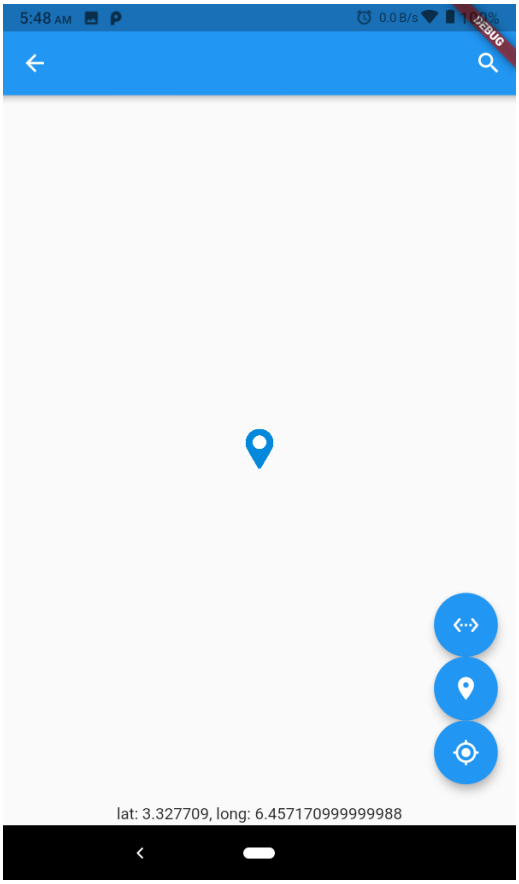


Figure 4.6 Map Screen

4.1.3 DATABASE

I made use of firebase for the back-end of my application

I made use of Google Maps API for the mapping of location of both senders and receivers.

Images in appendix B

4.1.4 SOURCE CODE

Images in Appendix A

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATION

5.1 INTRODUCTION

This chapter contains the summary, conclusion, recommendation and appendices.

5.2 SUMMARY

The rate of development in our world is moving at a fast rate and the rate of business coming up has increased as well, business that are involved with the production and delivery of their product to different location thereby creating means for services such as courier service to be created to aid this business in the aspect of product delivery. Not every business has access to information concerning this courier service. This system was designed to ease the users of it on the accessing of this information and with added functionality such as product tracking and courier service ordering, it makes delivery of products easy for the users of the system.

5.3 CONCLUSION

This project work has exposed us to a lot of information in the sector of logistics, courier services and e-commerce. With the upscaling of businesses and information there is a need for an easier method to access this information regarding to courier services. The system is design to ease the users of the system in this process and in addition comes with a easy tracking system.

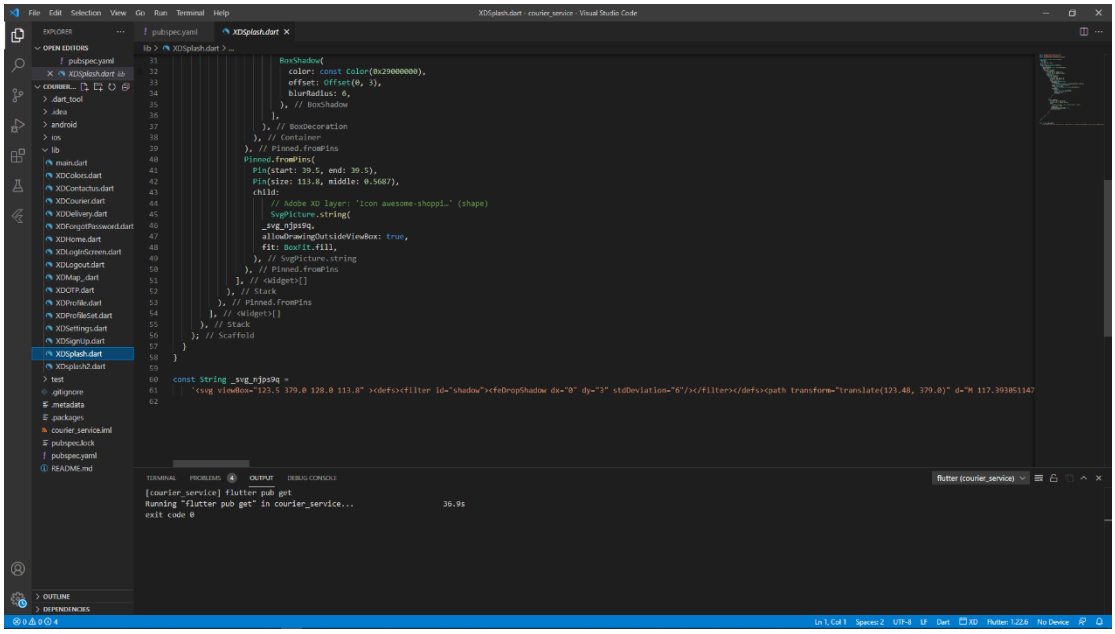
5.4 RECOMMENDATION

It is recommended that:

I. Buyers should be incorporated into the system in a later time to enhance communication between the buyer and the sellers.

II. More information on courier services should be included.

APPENDIX A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_svg_njps9q,
allowDrawingOutsideViewBox: true,
fit: BoxFit.fill,
), // SvgPicture.string
), // Pinned.fromPins
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); // Scaffold
}
}
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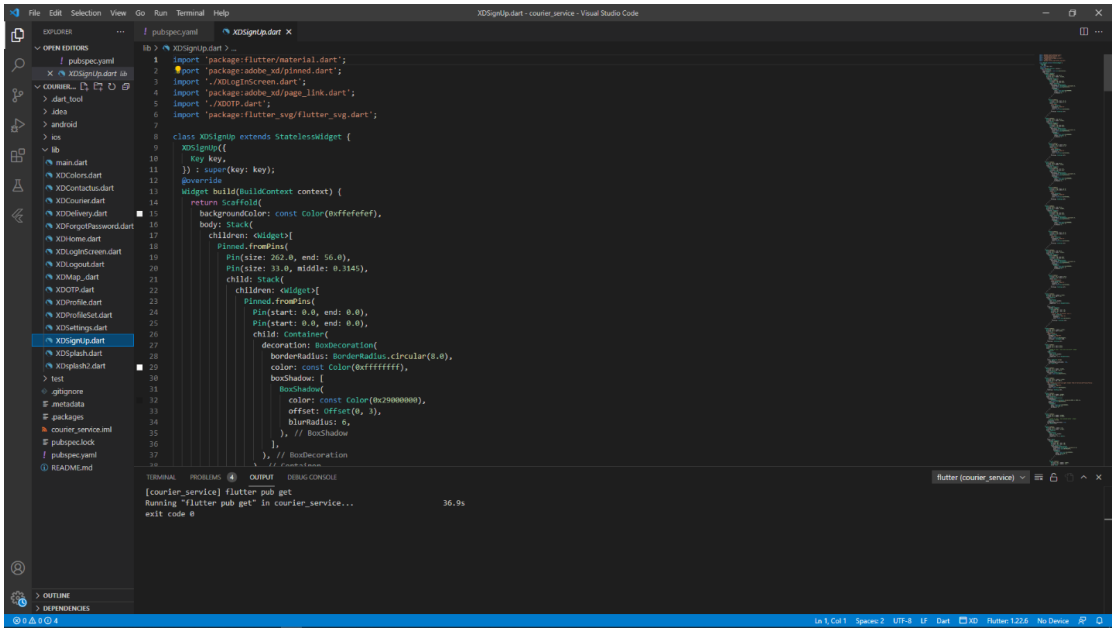
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pubspec.yaml
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import './XDLogInScreen.dart';
import 'package:adobe_xd/page_link.dart';
import './XDOTP.dart';
import 'package:flutter_svg/flutter_svg.dart';
class XDSignUp extends StatelessWidget {
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}) : super(key: key);
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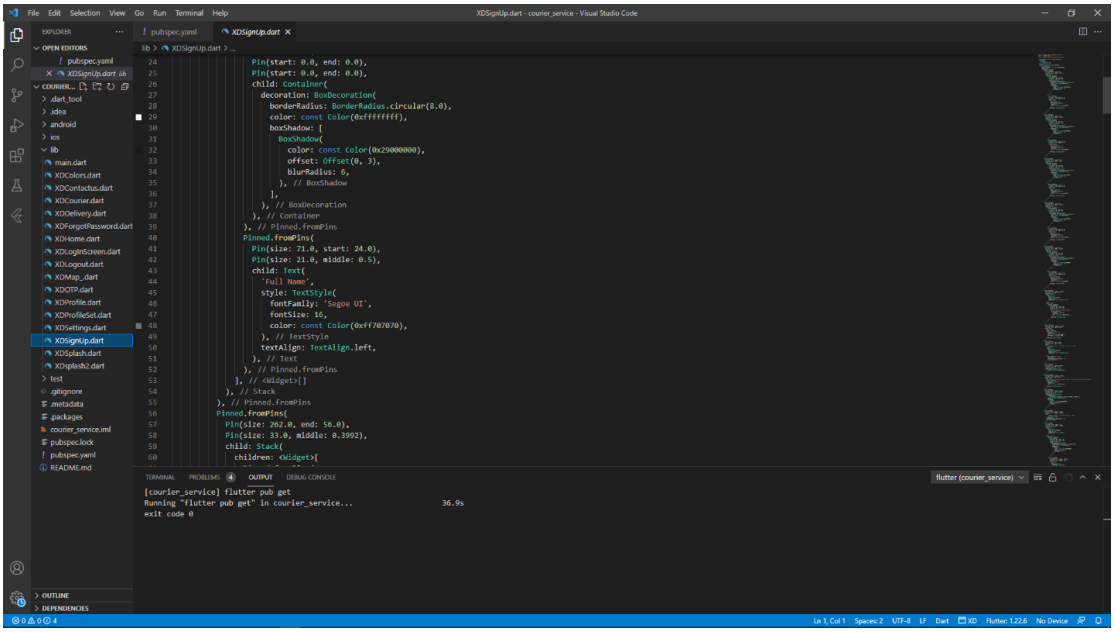
Running "flutter pub get" in courier_service... 36.9s
exit code 0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exit code 0
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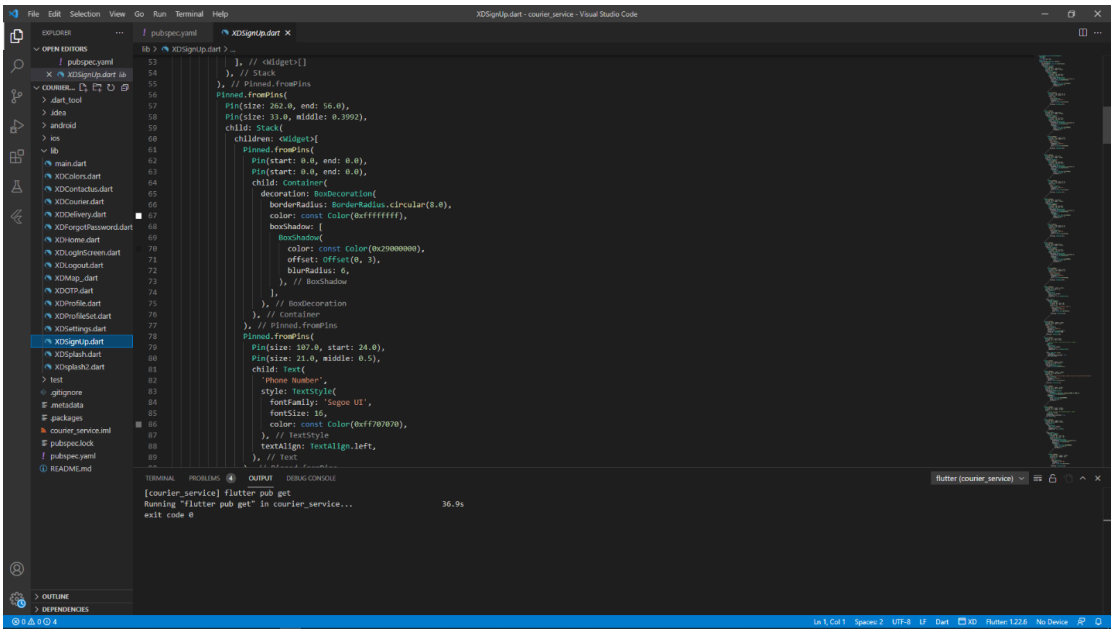
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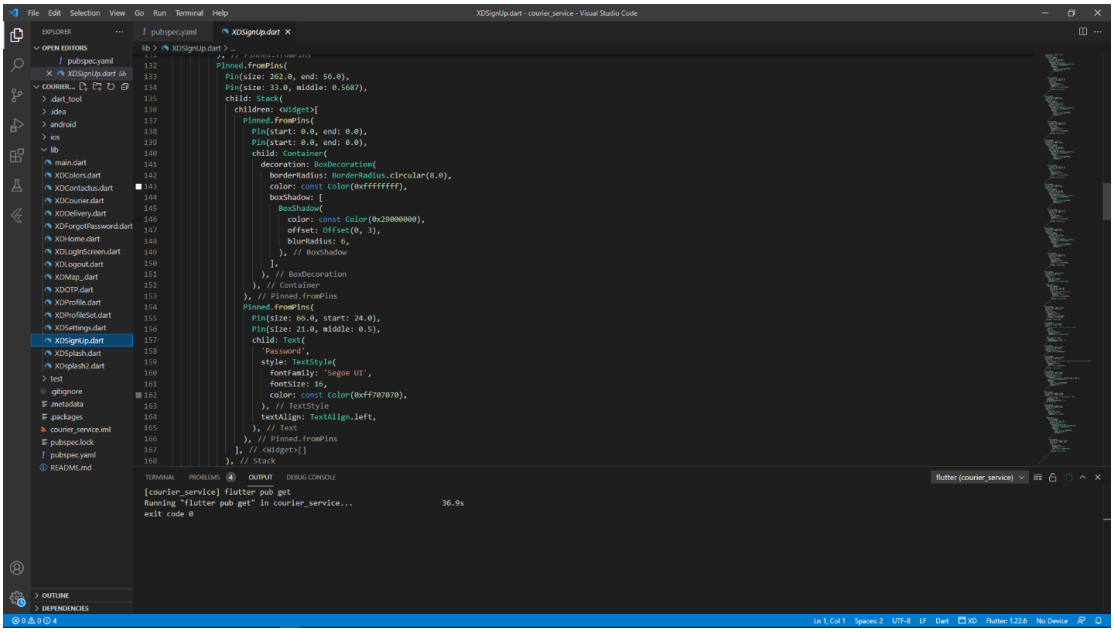
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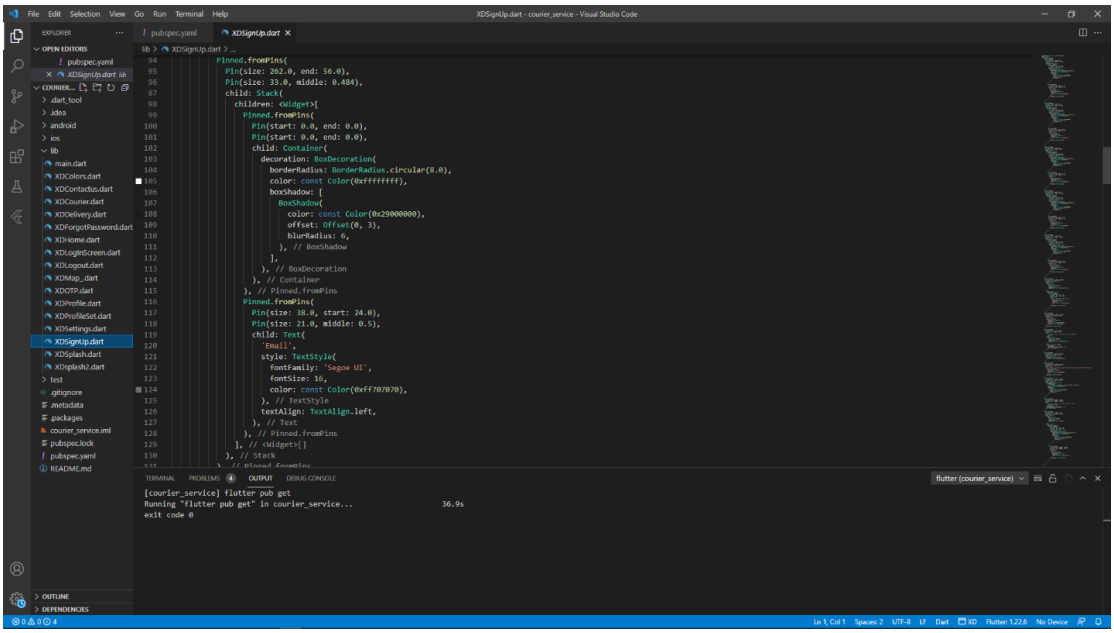
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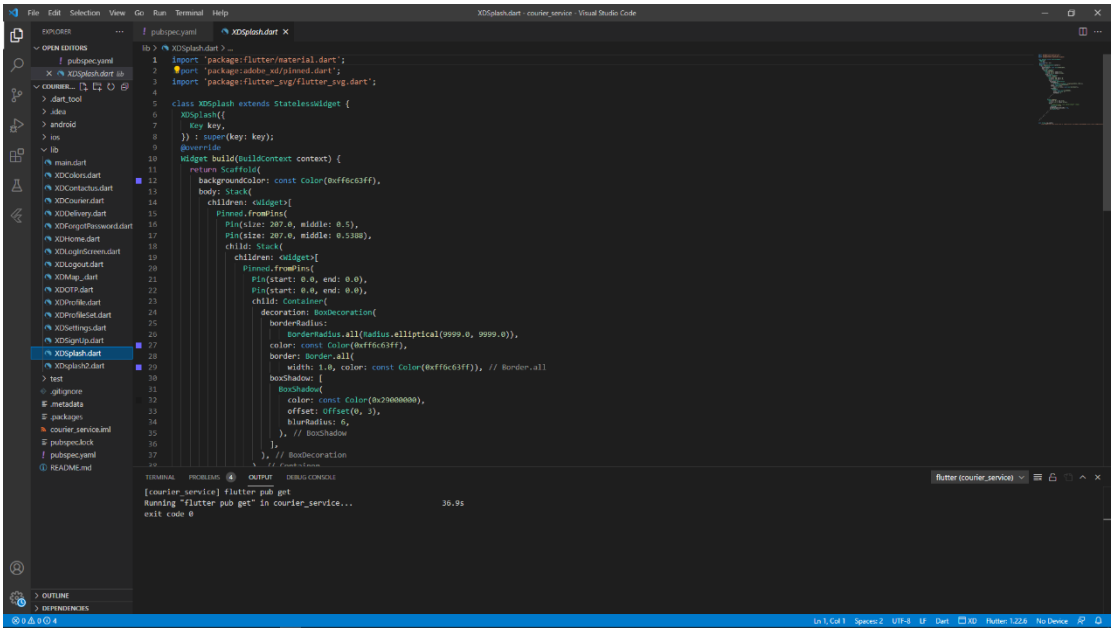
File Edit Selection View Go Run Terminal Help
XDSplash.dart - courier_service - Visual Studio Code
EXPLORER
OPEN EDITORS
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.dart_tool
.idea
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ios
lib
main.dart
XDColors.dart
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XDSplash.dart
XDSplash2.dart
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.gitignore
.metadata
.packages
courier_service.iml
pubspec.lock
pubspec.yaml
README.md
OUTLINE
DEPENDENCIES
pubspec.yaml
XDSplash.dart
lib > XDSplash.dart > ...
import 'package:flutter/material.dart';
import 'package:adobe_xd/pinned.dart';
import 'package:flutter_svg/flutter_svg.dart';
class XDSplash extends StatelessWidget {
XDSplash({
Key key,
}) : super(key: key);
@override
Widget build(BuildContext context) {
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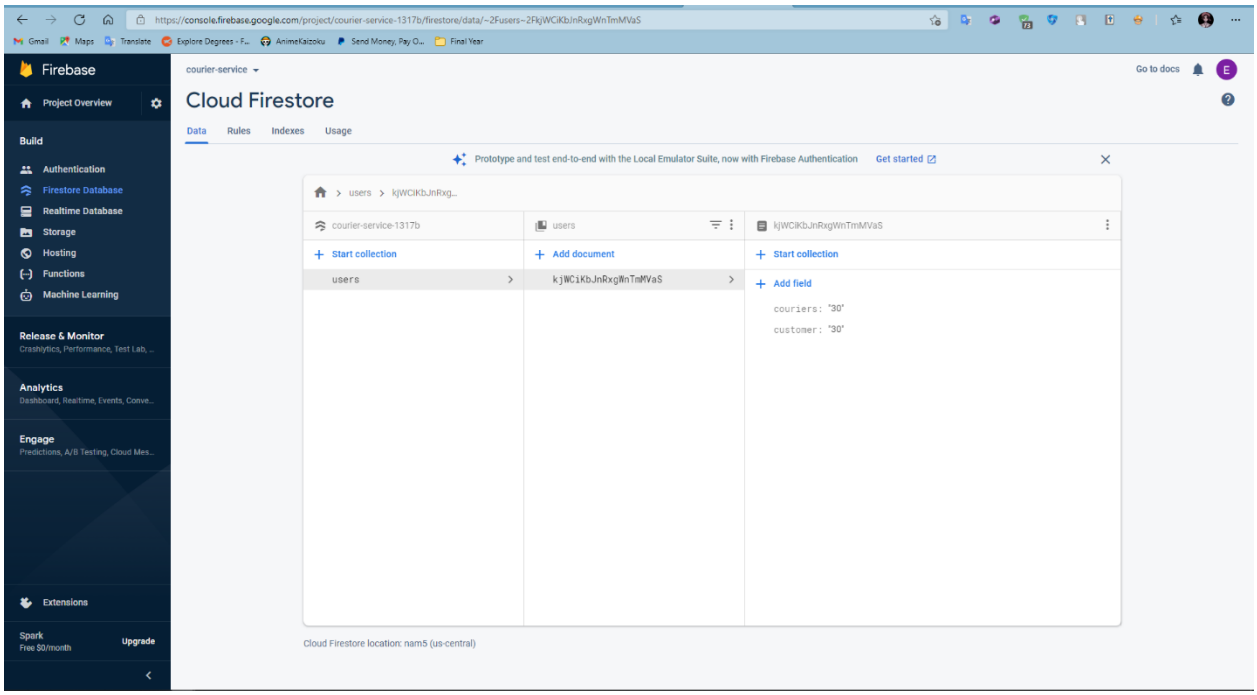
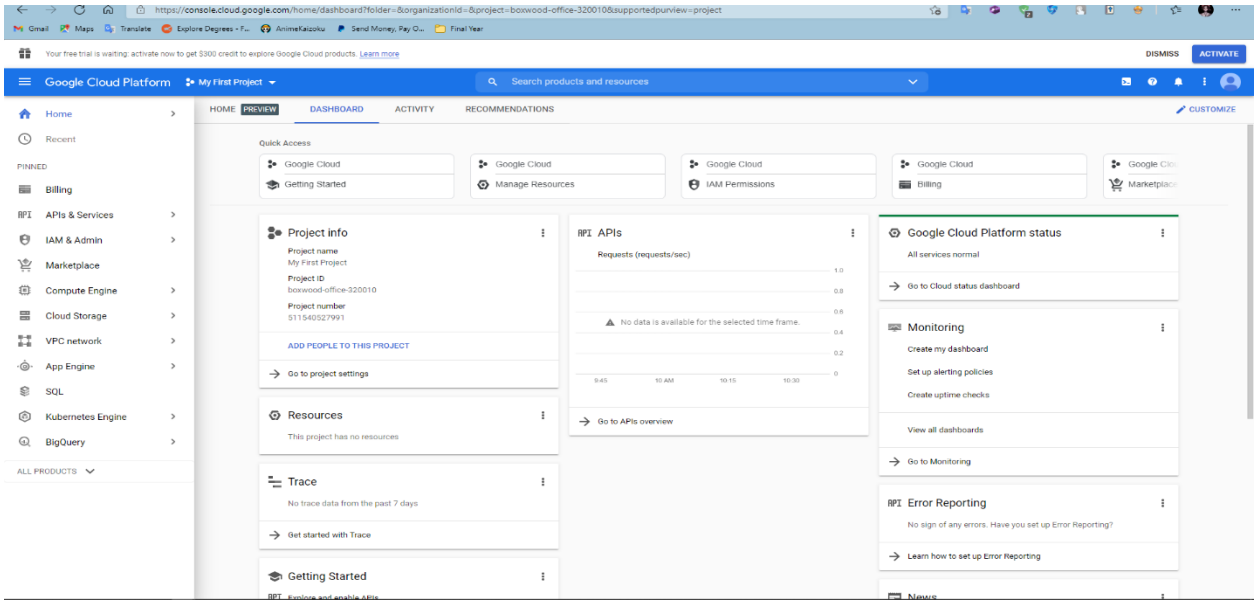
offset: Offset(0, 3),
blurRadius: 6,
), // BoxShadow
],
), // BoxDecoration
TERMINAL
PROBLEMS 4
OUTPUT
DEBUG CONSOLE
flutter (courier_service)
[courier_service] flutter pub get
Running "flutter pub get" in courier_service... 36.9s
exit code 0
Ln 1, Col 1
Spaces: 2
UTF-8
LF
Dart
XD
Flutter: 1.22.6
No Device

APPENDIX B


Firebase
Project Overview
Build
Authentication
Firestore Database
Realtime Database
Storage
Hosting
Functions
Machine Learning
Release & Monitor
Analytics
Engage
Extensions
Spark
Free $0/month
Upgrade
courier-service
Cloud Firestore
Data
Rules
Indexes
Usage
Prototype and test end-to-end with the Local Emulator Suite, now with Firebase Authentication
Get started
Go to docs
courier-service-1317b
Start collection
users
Add document
kjWCiKbJnRxgWnTmMVaS
Add field
couriers: '30'
customer: '30'
Cloud Firestore location: nam5 (us-central)


Google Cloud Platform
My First Project
Search products and resources
DISMISS
ACTIVATE
Home
Recent
PINNED
Billing
APIs & Services
IAM & Admin
Marketplace
Compute Engine
Cloud Storage
VPC network
App Engine
SQL
Kubernetes Engine
BigQuery
ALL PRODUCTS
HOME
DASHBOARD
ACTIVITY
RECOMMENDATIONS
CUSTOMIZE
Quick Access
Getting Started
Manage Resources
IAM Permissions
Billing
Project info
Project name
My First Project
Project ID
boxwood-office-320010
Project number
511540527991
ADD PEOPLE TO THIS PROJECT
Go to project settings
APIs
Requests (requests/sec)
No data is available for the selected time frame.
Go to APIs overview
Google Cloud Platform status
All services normal
Go to Cloud status dashboard
Monitoring
Create my dashboard
Set up alerting policies
Create uptime checks
View all dashboards
Go to Monitoring
Resources
This project has no resources
Trace
No trace data from the past 7 days
Get started with Trace
Error Reporting
No sign of any errors. Have you set up Error Reporting?
Learn how to set up Error Reporting
Getting Started

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DLkQFjAEegQIChAD&url=https%3A%2F%2Fwww.dictionary.com%2Fbrowse%2Fdelivery-system&usg=AOvVaw0psSiVsXBnKBGPwciaS-ZR

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