PROJECT PROPOSAL

COURIER MANAGEMENT SYSTEM

BY

ERICK LEWIS THETU

REG: 17YAD103100

SUPERVISOR: Mr. MATHEW THIONGO

Project proposal submitted in partial fulfilment of the requirements for the award of the Degree in Bachelors in Computer Science.

Declaration

I declare that this or any other University has not previously submitted this work for the awarding of the course marks. To the best of my knowledge and belief, this work contains no material previously published or written by another person except where due reference is made.

Student Name: Erick Lewis Thetu

Signature: ....

Date: ....

Supervisor's name: Mr. MATHEW THIONGO

Signature: ....

Date: ....

Dedication

.

I would like to dedicate my project to my parents for their support through my education. I would like to thank them for providing the necessary resources and continuous support to complete the project in time. I am grateful for the institution (Riara University) for providing the proper environment and support to carry out my project. I am sincerely grateful for my lectures and my mentor Dr. Chao Mbogo for the guidance and knowledge they instill in me. Lastly, to my fellow schoolmates for continual guidance and positive criticism throughout the writing of the project, I offer my sincere gratitude.

Acknowledgement

I thank God for giving me strength of mind and keeping me in parcel health to get this far.

I am very grateful for the support of my supervisor Mr. MATHEW THIONGO for his professional guidance and contribution that has led to this project's success.

I also acknowledge the support of my parents towards the success of my project. Their motivation and financial support are greatly appreciated.

ABSTRACT

The COURIER MANAGEMENT SYSTEM is a web based system that' designed primarily for the use in the couriers logistics industry this system will allow courier and logistical services company to increase scope of the business by reducing the paper work cost and accountability of goods involved this system also allows quick and easy management of transporting parcels from one point to another as they can be easily tracked compared to the use of manual systems of recording information as it includes message sent to the receiver and the sender to track the parcel .courier services employees use the system through an easy to navigate graphical interface for efficient processing . After the parcel being sent has been processed a sent is sent with estimated time of delivery and the customers will be updated once there is a delay moreover a notification will be issued to the customers for pick up however if the receiver is a distance away they can also request a delivery thereafter the customer dashboard is updated that the meal is sent out and the estimated time of delivery once the parcel arrives at the destination then the dashboard is updated to be delivered .Since this will reduce the man required at the front desk it will reduce the loss of goods and services and accountability in terms of credit.

This project is developed using PHP, JavaScript and MYSQL. This system is an online application which can be hosted online and therefore the user needs an internet connection or the company's local area network.

TABLE OF CONTENTS

Contents

CHAPTER 1: INTRODUCTION

1.1 BACKGROUND

The increase in sending parcels from one point to another has led to the development of sophisticated systems, to ease in accountability and ease of transport and logistics. In recent times we have seen the registration of courier, cargo and logistics companies in the country spanning from ground to air. There are many constituents in sending and receiving parcels which include caring and safely delivering people's belongings as requested at a fee.

Having a background in the old ways of logistics the explosion of sophisticated information and communication technologies (ICTs) creates new opportunities as well as challenges for the whole service delivery systems, particularly to fulfil the ever increasing demand of people who are mostly having high level of information technology (IT) literacy and advanced in knowledge and awareness of ease of transporting parcels from point to point . To remain competitive, companies have adopted different methods with IT advancement i.e. the introduction of platforms like sendy where people can easily access services to send and receive parcels without compromising the existing sending of parcels using trusted riders and other unorthodox methods. Records that capture various information serve as important institutional memory and central to efficient public service machinery (Halsey & Bettany, 2015).

 ("Gaps in electronic trial master file (eTMF) implementation: A study in the organization case," 2017) The advancements of the 21st century have led to an emergence of many disciplines with great potential to solve existing problems. One such potential field is Technology, which has over the years been increasingly adopted in many processes to avert the problems of ineffective and inefficient service delivery. One of the key areas of interest is automation of the courier services. Many challenges have been faced in the process of sending parcels and products from one place to another including delays due to misplacement of small parcels as a result of using written receipts and paperwork at the registry when reference is ought to be made. As courier services have become more technologically advanced, pressure mounts on the courier companies to join the flow of technological progress in order to provide parcel service delivery. In addition, to emphasize transparency, to build customer trust and confidence in courier and service delivery systems and companies.

My major first-hand experience was in my first week as an intern to an aviation company in January 2021 where I started working at the courier department at Wilson Airport Nairobi. The first thing I noted was the big files that my fellow workmates kept record in them in written form or excel records. This gave me the thought of developing a program which will ease this process. My thought was then enhanced after some research and knowledge of the big unordered file keeping in the offices and the company's library. I thought of developing a program which will record new incoming parcels, then recognize payment via card or MPESA, this would ease the work of the employee and the collector of the parcel and save on time during search and collection of parcel, moreover, the ease of accountability by the auditors on the performance of

the department. Different crime books were maintained, major crime, mail bag parcel list and sometimes dangerous parcels parcel list i.e. weapons or explosives on transit, basically this project will be all about new ways and methods where parcel and courier handlers can record new parcels on transit, delivered parcels, collected parcels and unpicked parcels. Any existing courier service management system was researched to get clues and hints on designing a suitable web application.

1.2 PROBLEM STATEMENT

Courier management has in the recent past received increasing support and attention in the public sector across the globe as people embrace information & communication technologies in the management of their corporate records due to accountability and auditing.

There has been a lot of complaints raised by the people especially in the country coming from more developed countries in relation to the manual system used in Kenyan courier management systems an example such parcel/envelope misplacement, parcels going missing and this leads to mistrust in the use of this systems and opting for the unorthodox methods. This causes the companies losses due to replacement of the parcels in money form.

For efficiency and effectiveness of courier services, a sound courier management system needs to be established. In 2010, in the Kenyan long-distance matatu and transport industry, the integrated courier management system was installed and rolled out to manage record processes and functions. Nevertheless, in the logistics and cargo sectors, there is still not a clear courier management system. This issue presents an investigation into the implementation in Kenya's logistics and transport industry of the web-based courier management system.

1.3 OBJECTIVES

Main Objective

The main objective is to discover the implementation of a better courier management system in Kenyan transport and logistic sector specifically at Wilson airport where I work.

Specific objectives

1. Develop a user friendly interface
2. To create a database to store, manage and backup parcel and courier records.
3. To establish a framework guideline for a legally accepted courier management system.
4. To establish the requirements, policies and procedures for managing the courier management system.
5. To develop and test a courier management system I solely developed

1.5 JUSTIFICATION

The reason why I decided to do a courier management system is because of the increasing laying off of employees, loss of cash due to unscrupulous customers and corruption among the dishonest employees. The system will benefit the courier services owners by providing rapid, reliable and time-definite delivery connecting remote places from the developed towns and city. The delivery will be made within 24 hours of sending the parcel.

The study will benefit the staff and management of the courier systems by highlighting the weaknesses in the using of the manual system to users. To other researchers, this system will help to add to the existing literature in the field of research. Therefore future scholars and researchers will be able to refer and use the findings of this project in their academic research. The system is used for daily activities, including sending, receiving, company information, pickup centers and sending rates for different parcels. Manually, this process is very difficult to do. It is therefore recommended that the process be computerized by developing relative software as the world adopts information and technology; in every area of life, computing is necessary. The system further cuts down the cost incurred while replacing the lost parcels to the owners and mishandling of parcels. More so, this project will equip other researchers with enough information to develop related or more advanced systems or to make some improvements.

1.6 SCOPE OF THE STUDY

This project is based on developing an electronic web application to automate the parceling management systems in different areas of logistics and cargo transport. The web based system will first get to Skyward Express, due to many parcels being sent to many counties; and have had cases of losses in parcel and cargo. This will help the cargo and parcel handlers in simplicity of their operations.

1.6.1 Limitation of Proposed System

The proposed system has some disadvantages due to the change made from operating from manual to computerized system.

These include:
1. **Unemployment:** some of the workers expressed fear that they will be laid off due to the introduction of computerized systems.
2. **Training cost:** the employees will be trained on the effective use of the courier system which will cost the company both time and finances.
3. **Maintenance cost:** the system will require modification due to new user requirements, upgrades and installations. However, the courier management system for the transport and cargo sector is worth undertaking as the benefits it will introduce are immense.

CHAPTER 2: LIRETAURE REVIEW

2.1 INTRODUCTION

"Logistics and cargo companies around the world are motoring down the digital highway and embracing web based courier and parceling management systems as a means to enhance their parceling or courier systems. Efforts are underway to computerize every aspect of cargo and parcel management, as well as accountability.

In this system first of all consignors placed their courier like covers, documents, no documents etc. to the officer/clerk of the courier branch. Here this branch acts as a source branch. Then the branch officer prepares the courier note. The details of the courier note are as follows.

DEST: It indicates the name of the city or destination to where the courier is sent.

DATE: On which courier is received.

SENDER: It indicates name & address of the person who sent the courier.

RECEIVER: It indicates name & address of the person who received the courier.

WEIGHT IN KGS: It indicates weight of the courier in kilograms.

CHARGES: According to the weight of courier they provide charges of courier.

Make 3 copies of the manifest. From which one is used for the source office, the other 2 are sent to the destination office. Then from these two copies one is return back to the source branch for confirmation of delivery.

After preparing Manifest all the courier are packed & then transship the courier.

After receiving courier, the destination branch checks the manifest, whether any courier is left or not. Then based on manifest the destination branch changes the status of the courier to 'Deliver'. In the courier services, charges of the courier are obtained from the rate table, which contains the different rate for the different weight of the courier.

The completeness of courier system delivery sets the standard for delivery service excellence. Effective records management system guarantees the accountability and integrity of an organization that provides services to the public at large and serves as a strategic resource for government administration (Lemley, 2010). A dependable and valid parceling and courier management system is basic to the effectiveness of day-to-day courier and parceling operations and fairness of logistical decisions. The maintenance of courier records directly influence the timeliness and integrity of courier and logistic processing.

This new system will overcome losing money and other resources by introducing a centralized database, implementing electronic records creation and preservation of meta-data. The major problem or issue in carrying out CMS (Courier Management System) is security, accessibility and interoperability. Interoperability here means the ability of computer systems or software to exchange and make use of information and data (Rogers et al., 2012).

Courier services today not only have to comply with regulations, but also have to maintain a balance between operational record keeping requirements, minimizing liability of storing private information and customer privacy preferences (Lunney, Jr., 2013).

The acknowledgement that computerized courier management systems have the capacity to improve flow of case management and access to information, but agreeing that computerization as a means of solving all management, resource and information problems.

This project will be based on a web application and will require a database for keeping records and storing users' credentials. The system gives rights to the admin to enter new case records and save, update existing case records in a fully searchable database. Besides that lawyers can file case document electrically, reducing the workload on the court system, and opening cases and ensuring

The explosion of sophisticated information and communication technologies (ICTs) creates new opportunities as well as challenges for the whole service delivery systems, particularly to fulfil the ever increasing demand of citizens who are mostly having high level of information technology (IT) literacy and advanced in knowledge and awareness of their rights. To remain competitive, government records have progressed in line with IT advancement i.e. the introduction of platforms like E-citizen where citizens and foreign nationals can easily access their services without compromising the existing strict government principles and regulations set through acts and policies. Records that capture various information serve as important institutional memory and central to efficient public service machinery (Halsey & Bettany, 2015) that all documents are filled correctly. Senior officials can view the system and know when a case file was modified and by whom.
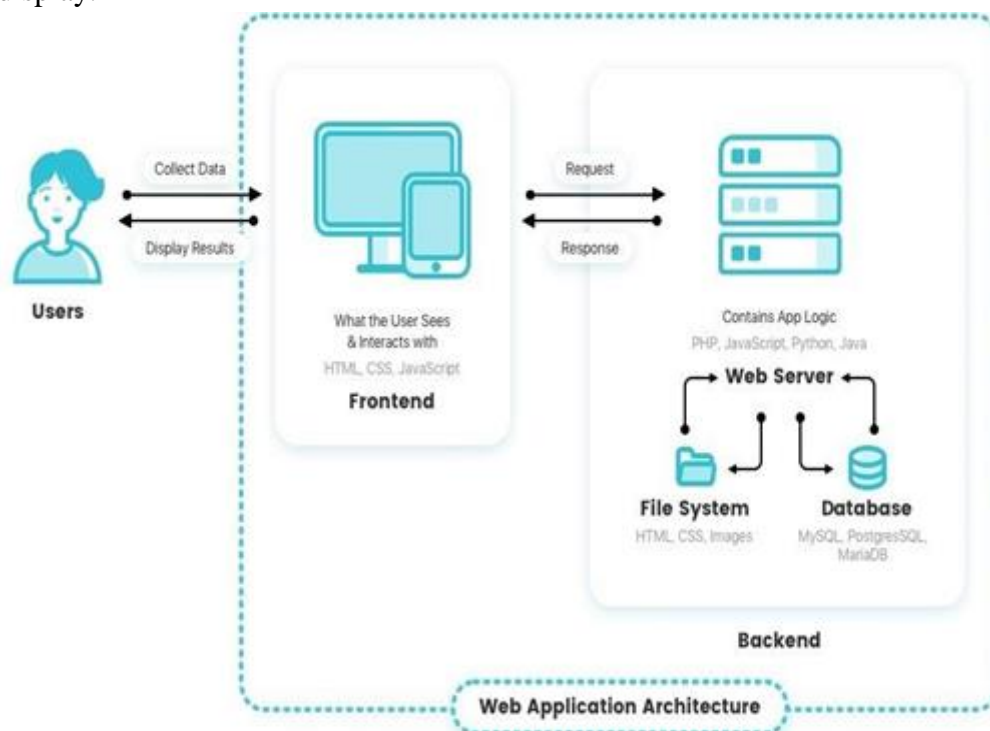
2.2 WEB APPLICATION

Online systems are systems where the input data enter the computer directly from the point of origin (usually a terminal or workstation) and/or in which output data are transmitted directly to that terminal point of origin. (Sippl, Computer Dictionary, 4th ed).

Web application is an application software or a computer program that runs on a web server and performs tasks over the internet. They are accessed by the users through a web browser such as Google chrome or Firefox with an active internet connection. They are programmed using a client- server based structure. Commonly used web applications include: Gmail and Google map.

2.2.1 HOW THE WEB APPLICATION WORK

Web applications are normally coded in many browser-supported languages such as python, JavaScript, PHP and Perl. Because these languages rely on the browser to make the program executable. These applications are divided into two types: dynamic which requires server-side processing and the static without requirement of server for processing. Web application needs a web server to manage clients' requests. A web server is a software and hardware that uses or understands a uniform resource locator (web addresses) and Hypertext Transfer protocol to respond to client requests made over the World Wide Web (www). The main role of a web server is to store database information, processing data and delivering web pages to users through displaying website content.

1. Users access a web application through either a web browser or a mobile application by making a request to the web server over the Internet.
2. The web server forwards the user's request to the web application server. The web application server is to perform the user's request task such as processing the data and then generates the output of the requested data
3. The web application server forwards the results back to the web server.
4. The web server delivers the requested data or information to the appropriate client and appears on its display.

Figure 1: Web application architecture

2.2.2 Advantages

As a result of the online courier management systems the following are the anticipated advantages and benefits of the proposed system:

Firstly, it will help in making efficient deliveries and more accountability due to ease pf follow up of the transportation of a courier from one destination to another.

The system will also help to reduce labor cost involved. This is because it needs few users compared to the manual system that needs a lot of users and more paper work involved.

The system will be less probable to make mistake, since it's a web based system. This will also lead to ease the speed of execution and number of optimum screens to accommodate the maximum throughput.

Lastly, it will make the job easier by hastening the work process therefore saving time.

2.2.3Disadvantages

The proposed system has some disadvantages due to the change made from operating from manual to computerized system.

These include:
4. **Unemployment:** some of the workers expressed fear that they will be laid off due to the introduction of computerized systems.
5. **Training cost:** the employees will be trained on the effective use of the courier system which will cost the company both time and finances.
6. **Maintenance cost:** the system will require modification due to new user requirements, upgrades and installations. However, the courier management system for the transport and cargo sector is worth undertaking as the benefits it will introduce are immense.

CHAPTER 3 METHODOLOGY

Introduction

In this chapter we will be looking at the research methods that were employed in the study in order to achieve the objectives of the study. This chapter will cover system analysis, system modeling and methodology used in the system.

Prototyping approach to be used will be to deliver the first model. In prototyping model, a system that mimics the real system is given to the users and the real system is developed by basing on the prototype or by improving on it. Thus: the users to use the system in part and see whether they find it a good system. To give users time to learn how to use and interact with the system. Oral and written interviews or questioners will be used to collect requirements information from the local courts since the other possible means like observation requires an existing system to learn from it.
.

3.1 SYSTEM ANALYSIS

What is system analysis? System analysis can be defined as ""the process of studying a procedure or business in order to identify its goals and purposes and create systems and procedures that will achieve them in an efficient way". Another view sees system analysis as a problem-solving technique that breaks down a system into its component pieces for the purpose of the studying how well those component parts work and interact to accomplish their purpose. (Lonnie D. Bentley p.160 7th edition.)

This also describes the plan that the investigator will undertake to develop the ways of solving problems and provide guidance in various steps of undertaking the research. This study uses descriptive research design because it is interested in describing the satiation as it exists during the time of study without making manipulations. It provides the researcher with an opportunity to gain deeper insights into the subject matter under study.

Robson (2002) points out that descriptive study portrays an accurate profile of persons, events or situation. Chandran (2004) also states descriptive study describes the existing conditions and attitudes through observation and interpretation techniques. In the present study, this design is the most preferable because it helps to deepen understanding of the current situation as it exists. It enables obtaining of both quantitative and qualitative data for the study because of utilization of questionnaires and the interview guides.

3.2 STAGES OF SYSTEM ANALYSIS

Basically System analysis has four stages that are:

- Investigate and analysis the current system in the organization
  1. Currently, most companies use the old paperwork written receipt systems. The process used has to be thoroughly analyzed and checked in order to implement the new system. This will make the companies be at per with the current technology.

- System requirement determination
  - The system that I am currently working on requires the following components that are: a database of SQL which is going to store the users details, a web based server and internet. I will also need a server to host the website and a domain name for the website, however, for this project I will use my computer to host the website and Xampp control panel to enable the hosting. The database will also be in my computer
- Third step is configuring and structuring the requirements
- Final step is selecting the best alternative design strategy

System analysis for the courier management system includes the followings steps

i.   Identify the issue at hand.

ii.   Establish the requirement for the new framework.

iii.   Make a criteria and rank the requirements in order.

iv.   Make a model to show how tasks can be carried out.

3.3 FEASIBILITY STUDY

A feasibility study is a detailed report that discusses the project's frames of analysis in depth. It also considers the strategy, operations, people and control as well as risk and constraints. The goal is to get a solution towards the completeness and revamp of a project.

There six type of feasibility which is shall discuss in the context of my project they include; economic schedule, technical, political, contractual and organizational feasibility. (Will Kenton, 2018)

3.3.1 Schedule feasibility

Typically this means estimating how long the system will take to develop, and if it can be completed in a given time period using some methods like payback period. Therefore, the time allocated for undertaking the project is three month, which is ample time to finish the project and ensure that it is working. (BrightHubProjectManagement, N.D)

3.3.2 TECHINICAL FEASIBILITY

Basically, this assessment is based on an outline design of system requirements, to determine whether the company has the technical expertise to handle completion of the project. Therefore this study will be aimed at examining whether the organization has

3.3.3 ECONOMIC FEASIBILITY

This concerns itself with the financial assessment of benefits of the project that may be tangible or intangible and the capital one is going to use to establish the project. All resources I am going to use during development are open and free source; therefore not a great amount of money has been incurred. (BrightHubProjectManagement, N.D)

For example; brackets, hosting and xampp.

Resource Table

SERVER EXPENSE	COST (Ksh.)
Computer (quad core, 2TB HDD, 16GB RAM)	160,000
Gateway	90,000
Net Connection	25,000
Database Server	62,000
Printer/ Photocopier	55,000
Toner	15,000
Uninterruptible Power Supplier (UPS)	16,000
Printing Rims	5000
Total	428,000

Figure 1: Resources table

3.3.4 RESOURCE FEASTIBILITY

This involves the resources to be used in developing of the project. Since the system is computer based it requires both hardware and software components. Therefore the software requirements include: Operating System: Windows (7/8 or above), web Browser: IE 10 or above, Mozilla 31 and above or Google Chrome, Drivers: Java Runtime Environment and brackets. (BrightHubProjectManagement,N.D

3.4 Requirement elicitation

Requirements elicitation/discovery includes those techniques to be used by systems analysts to

Identify or extract system problems and solution requirements from the user community and

Other relevant. (Morrill, 2013).

Techniques that can be used are Interviews, questionnaires, Journals Internet

3.5 METHODS USED

3.5.1 Interviews

After determining the steps the user is going to par taken in , I decide to conduct an interview to assess what the users would desire the withdrawal system to have and the features the would love. I opted to conduct the interview around my work place that is SKYWARD EXPRESS OFFICES.

The following are the responses that I received from my fellow workmates:-

- They want a simple platform with less complexities
- They also want a system that is accountable and produce accurate work at any given time
- They also wanted a system that is very safe especially as it deals with financial data.
- Other suggested the inclusion of all payment verification system such as

  mpesa express and MasterCard Question are at the appendix

3.5.2 Development Methodology

To enhance design, product management, and project management, the software development process divides software development work into smaller, parallel or sequential phases or sub processes. A software development life cycle is another name for it.

3.5.3 Importance of a Methodology

Information development methodologies serve paramount importance in any given system development process. Below represents a set of advantages arising from methodology.

1. It enables creation of improved quality of the product in relation to the various standards that have been stipulated internationally to enhance the system functionality, acceptance, accuracy and consistency

2. It enables integration of the user need in the system development which promotes the level of customer satisfaction
3. It promotes better control by the managerial team through accuracy in the estimation of costs, quality and time requirements in the project development and in same line enhance reduction of various overheads

3.5.4 Parallel Methodology

It refers to the act of promoting concurrent interactions between software development and testing in the whole lifecycle of the software. Four core values are emphasized in this methodology.

1.   Individual and team interactions over processes and tools.
2.   Working software over comprehensive documentation.
3.   Customer collaboration over contract negotiation.
4.   Responding to change over following a plan.

This method calls for incremental as well as interactive software design approach which is divided into various models. It enables the customer to have a chance of viewing the product and proposing their preferences if any in the process of product development.

Additionally, in this method, once the iteration is done, the customer is given an opportunity where the obtained product features are availed for review by the customer and make any adjustments.

The testing and development work is done concurrently at each phase where the level of user acceptance is evaluated. Regular communication is done with the developers to determine the requirements and as well conduct planning needed.

3.5.5 The Discovery of Facts

This system is expected to promote and fulfil the requirements of the customers through engaging them in a productive process. Business domain is very crucial and the designers need to have accurate information about it. Assembling information related to what people actually do in the organization and as well defines their roles to capture the requirements of the current system and those of the new system, the following methods will be utilized.

1.   Background Reading

Here, the analysis team shall be engaged in the organization with aim of fact mining exercise. They will be able to obtain clear details on the same through use of institutional reports, organizational charts and other relevant documents from the organization.

2.   Interviewing

Inn interviewing method, the teams involved i.e. the development team and the organizational personnel will make an appointment and meet. This will be followed by asking of the interview questions from the interview guide in relation to the domain of the organization. The interviews will enrich the information available for the study.

3.   Observation

Observation methods will be utilized by the analysis team where they will be observing the organizational personnel in their natural working environment and set up for a predetermined time. The method will involve observation of the routine tasks as they are being performed without any form of probing.

4.   Sampling of Documents

In this case, the various documents and dairies maintained by the staff in their normal workings will be examined. The various findings will be drawn from the records marinated in those documents which have been sampled.

5.   Questionnaires

Questionnaires will be developed containing both open and closed questions which will be then administered to the staff. They will be analyzed for completeness and analyzed through drawing conclusions from the responses provided by the staff.

3.6   Requirements Specification

It refers to the document which describes the functional and non-functional requirements of the end-users. It specifies various expectations potentially about the proposed system to be developed and what it aims to attain. In essence, it works as the agreement set between the development team and the end-users on the various requirements that have been specified or need to be included.

According to the IEEE 830 standards for software requirements, the following are benefits that arise from requirements specifications.

1. It establishes the basic agreement between the software development team and the end- users
2.   Helps in saving time and energy needed in development because it provides clarifications needed in the initial stages of development and in addition it ensure future safety from adverse effects of errors that could be committed
3.   It gives the bases for cost estimation before development
4. Requirements specification promotes validation of the subsequent phases through verification of the deliverables of these stages in reference to the initial stages.

The properties of parcel requirements specification includes:
   1. Accurate.
   2. Unambiguous.

3. Complete & Consistent.
4. Verifiable & Traceable.

3.6.1 Secondary Data

Secondary data are research data that has been previously collected and accessible to researchers. The term contrasts with primary data collected from the source. (Delphin, 2016) I collected data and information about online verification systems like mpesa one tap and specific code requirements for the functioning of the system from websites and pdf file

3.6.2 Personal Experience

This project should benefit every user using the system to assist the sender to send the courier in the shortest time possible or to find a delivered courier in the shortest time possible by searching. This will ease and hasten the process.

3.6 System Design

3.6.1 Introduction

Systems design is the process of defining the architecture, modules, interfaces, and data for a system to satisfy specified requirements. Systems design could be seen as the application of systems theory to product development. There is some overlap with the disciplines of systems analysis, systems architecture and systems engineering.((Smart Draw, N.D)

Research Design

Research design describes the plan that the investigator will undertake to develop the ways of solving problems and provide guidance in various steps of undertaking the research. This study uses descriptive research design because it is interested in describing the satiation as it exists during the time of study without making manipulations. It provides the researcher with an opportunity to gain deeper insights into the subject matter under study.

Robson (2002) points out that descriptive study portrays an accurate profile of persons, events or situation. Chandran (2004) also states descriptive study describes the existing conditions and attitudes through observation and interpretation techniques. In the present study, this design is the most preferable because it helps to deepen understanding of the current situation as it exists. It enables obtaining of both quantitative and qualitative data for the study because of utilization of questionnaires and the interview guides.

Figure 2: System Design

3.6.2 ENTITY RELATIONSHIP DIAGRAM

An entity relationship diagram (ERD) shows the relationships of entity sets stored in a database. An entity in this context is a component of data. In other words, ER diagrams illustrate the logical structure of databases. (Smart Draw, N.D)
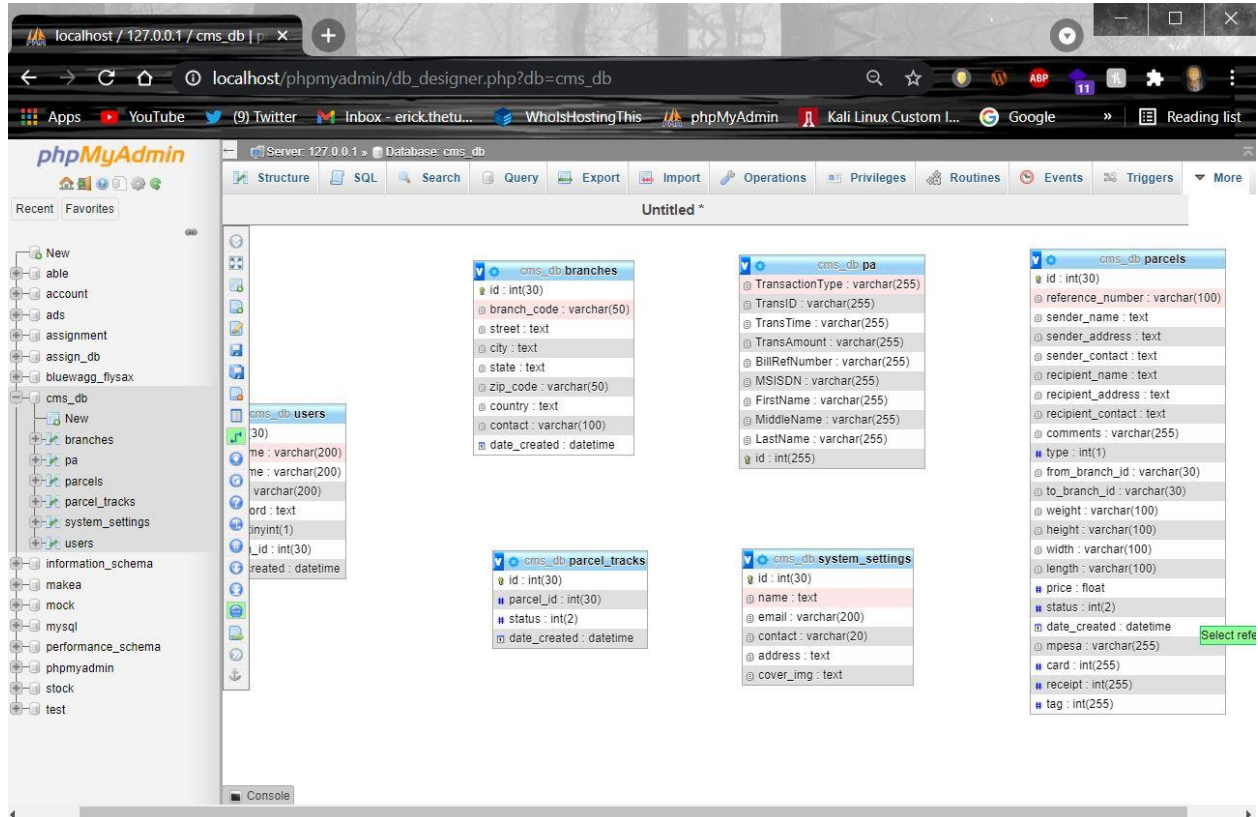
Figure 3: Design view of the database
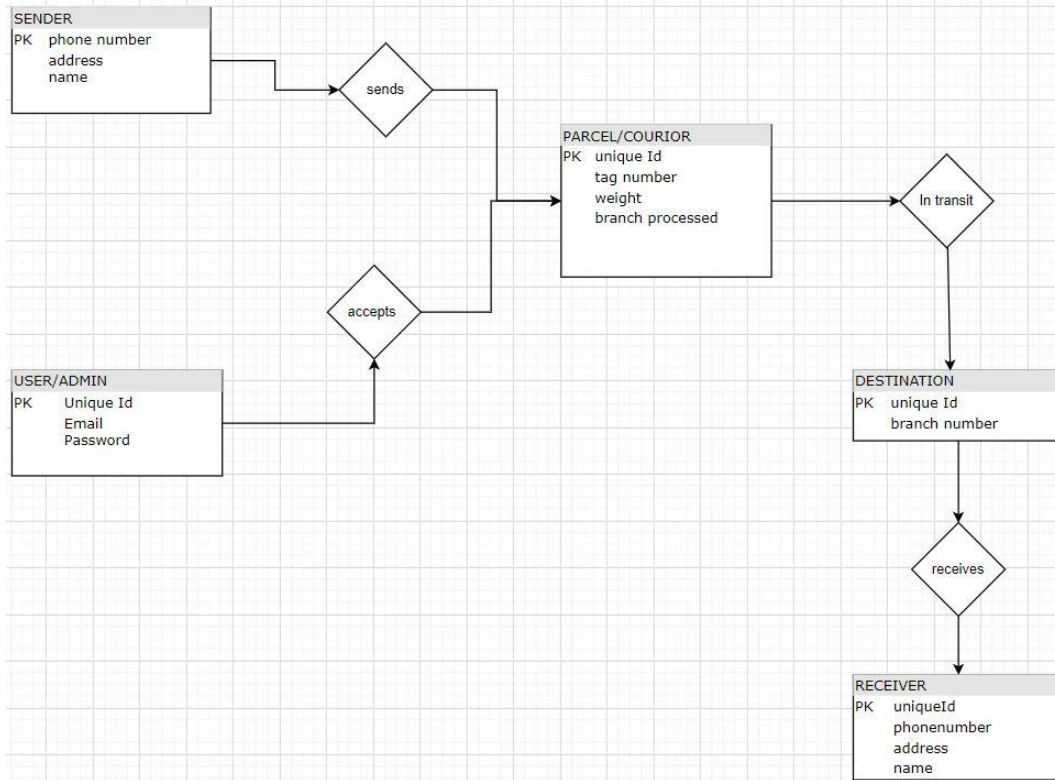
Figure 4 E.R diagram

3.6.3 Modelling the Database for CMS

3.6.4 Database & the Database Management System

Database basically refers to information that relates to one another that has been documented and controlled under database management systems. The main tasks for the DBMS are to control the database's security, concurrency, backups & restoring, transaction management & recovery from failures.

3.6.5 Advantages of having a database

Compared to the legacy data storing techniques, the Database systems are much more reliable than ever before with the following features:

1. Security & access control of the system for different users on different information.
2. Data Integrity & Integration
3. Reliability & Scalability.

3.6.6 The Database Management System for the CMS

Since the project is going to be an intranet based application the application data needs to be accessed from anywhere within the corporate LAN. So the DBMS should be able to handle so many connections at once in a networked environment. Also the database for this system should be able to handle an enormous amount of information regarding the parcel information and long term logistical history of the parcels being transported. By considering these factors the MYSQL Server 5.0 database management system has been chosen.

3.6.7 Unique features of the MYSQL 5.0

The Computing Center Management System (CCMS) system uses MYSQL as the DBMS due to the following reasons:

MySQL is characterized as a free, fast, reliable open source relational database. It does lack some sophistication and facilities, but it has an active development team and, as it goes from release to release, more capabilities are added. At certain times there will be a trade between speed and capabilities.

3.6.8 Security of the data in CMS (Courier Management System)

Shepherd and Yeo (2013), opine that records management policy should be endorsed by senior management and be made readily available to staff at all levels of the organization. They further assert that it should sit alongside policy on other matters where best practice is critical to the achievement of the organization's goals.
Some employees in the logistical company or Courier Company may try to manipulate paper-based systems in order to gain their own interest by using these terms such as document

falsification, duplication, non-production to counter accountability and auditing. Most courier companies use this paper-based record processes method due to the cheap cost incurred. Unfortunately, advancement of technology has made it very easy to create fake documents and stealing of courier tags from the internet if needed and using them to send the parcels without paying nevertheless the worst case scenario is manipulating the MPESA messages.

The CMS came to avoid fake documentation. CMS uses a combination of database entries and word processing software to generate notices, decisions and other documents. The clerk inputs the sender, receiver, weight of the item, tag number and destination into the system and the sender and receiver immediately gets a text on the arrival of the parcel to the destination. When the parcel is received the clerk changes the status from in transit to picked-up or delivered. The system can also print reports depending on days or weeks of the current amount of parcels to be sent or not picked up or any other status depending on the item. CMS might not be the first of itself but is aimed at making the work easier compared to the other systems in place. This means the item to be sent is not valid unless it's created and stored via the Courier Management System.

3.6.9   Conceptual framework

According to (Toy et al., 2013), conceptual framework is structured from a set of broad ideas and theories that help a researcher to properly identify the problem they are looking at, frame their questions and find suitable literature. Conceptual framework helps the researcher to clarify their research question and aims. According to this study independent variables are Cost of CMS, sender and receiver Data Security and Job Satisfaction. Cost of CMS is crucial as it helps in determining the total cost of the System and hence its importance. Sender and Receiver data security also helps in monitoring who has sent what to where to avoid loss of charging fee and bribes to clerks. It's also important in ensuring that

Legal issues are adhered to for instance when transporting prohibited parcels via aircraft such as flammables and weapons.

Independent variables are those which are likely to affect the implementation of CFMS. They include lack of management support, training and awareness and organization culture. Appropriate training and awareness has to be undertaken before installing the system and at the end (User training and acceptance). This is crucial as it prepares the users psychologically thus curbing resistance to change among them.

Cost of CMS
- Information capture, storage and retrieval
- Speed of report generation
- Presence of previous courior statistics

Data Security
- File construction
- Number of lost goods in transit.

Job Satisfaction
- Confidence at work
- Knowledge of sending the goods process

Effective service delivery
- Accountability of the courier services.
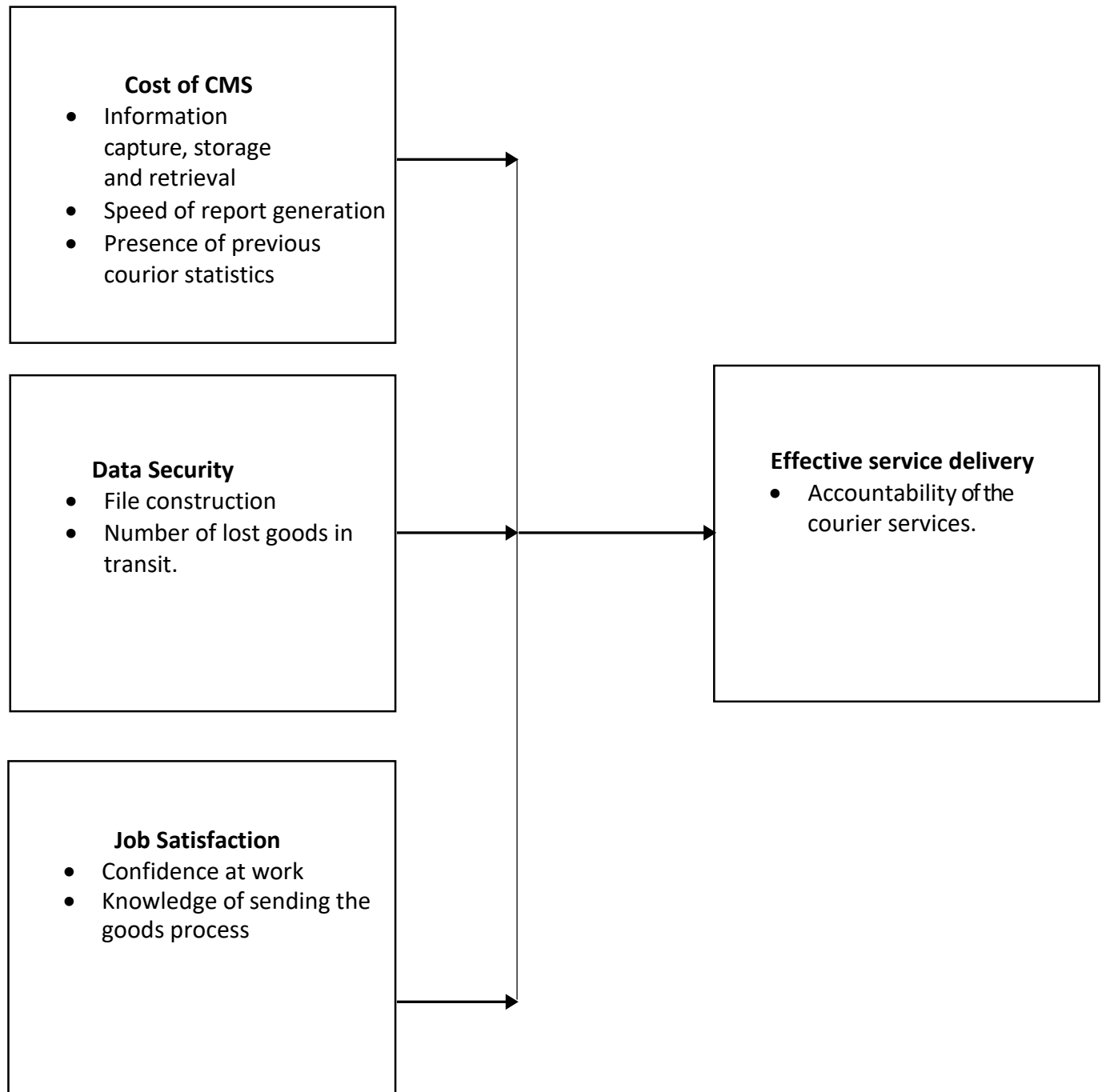
Figure 5 Conceptual Framework

3.6.3DATA FLOW DIAGRAM

A data flow diagram is a graphical representation of the flow of the data through an information system, modeling its process aspects

Figure 6: Data Flow Diagram

3.7 THE GANT CHART

WEEKS	1	2	3	4	5	6	7	8	9	10	11
RESEARCH AND PROTOTYPE DRAFTING	■	■	■								
FACT FINDING AND DATA COLLETION			■	■							
REPORT AND CODING				■	■	■	■	■	■		
EVALUATION									■	■	
FINAL REPORT											■

Figure 7: Project Schedule

CHAPTER FOUR: IMPLEMENTATION, TESTING AND RESULT

4.1 IMPLEMENTION

The coding for this system is done using simple programming languages which include, JavaScript, bootstrap, PHP, Sql, CSS, html and MySQL. The front end system is based on savory theme which I have incorporated to make it more appealing to the eye. The system has a front-end and back-end which is only accessible to an administrator. The backend pulls information from the database and displays it for an administrator. The implementation and testing for this project is using xampp control panel and a browser.

4.1.1Hardware/Software Interface:

This are the minimum hardware and software requirements needed to run the system efficiently.

Hardware Interface:

- Pentium Processor

- 60 MB of free hard-drive space

- 128 MB of RAM

Software Interface:

- Operating System: Windows (7 or above)

- Web Browser: IE 10 or above, Mozilla FF 31 and above or Google Chrome

- Drivers: Java Runtime Environment

- Integrated Development Environment: Eclipse J2EE or Apache Tomcat or Brackets

4.1.2 IMPLEMENTATION LANGUAGES

For the Online Restaurant System I extensively made use of HTML, PHP, CSS, and Sql. The reasons below illustrates the reasons for my choice of language

a) HTML

HTML is the standard markup language for creating Web pages. In full it stands for Hyper Text

Markup Language. Web browsers receive HTML documents from a web server or from local

storage and render the documents into multimedia web pages. HTML describes the structure of a

web page semantically and originally included cues for the appearance of the document. (w3schools.com, N.D)

HTML elements are the building blocks of HTML pages. With HTML constructs, images and other objects such as interactive forms may be embedded into the rendered page. HTML provides a means to create structured documents by denoting structural semantics for text such as headings, paragraphs, lists, links, quotes and other items. HTML elements are delineated by tags, written using angle brackets. Tags such as <img /> and <input /> directly introduce content into the page. Other tags such as <p> surround and provide information about document text and may include other tags as sub-elements. Browsers do not display the HTML tags, but use them to interpret the content of the page. In the online ordering system I have used HTML to display texts, information, tables and forms. (Wikipedia, 2017)

b) PHP

PHP (Hypertext Pre-Processor) is a server-side web programing language that is widely used for web development. PHP is widely used for web development because PHP language has its roots in C and C++. PHP syntax is most similar to C and C++ Language syntax, so programmers find it easy to learn and manipulate.(Techotopia, N.D) MySQL is used with PHP as a back-end tool. MySQL is the popular online database and can be interfaced very well with PHP therefore and excellent choice for web developers. I have used PHP for both the back end and front end of the system.

c) MySQL and SQL

SQL is a standard language for storing, manipulating and retrieving data in databases. Therefore, I have used Sql and MySQL for my database and to store user's information, orders, products and staff information.

4.2 How the system Works

All users/clerks of the system are provided with below log in page:

Email and password
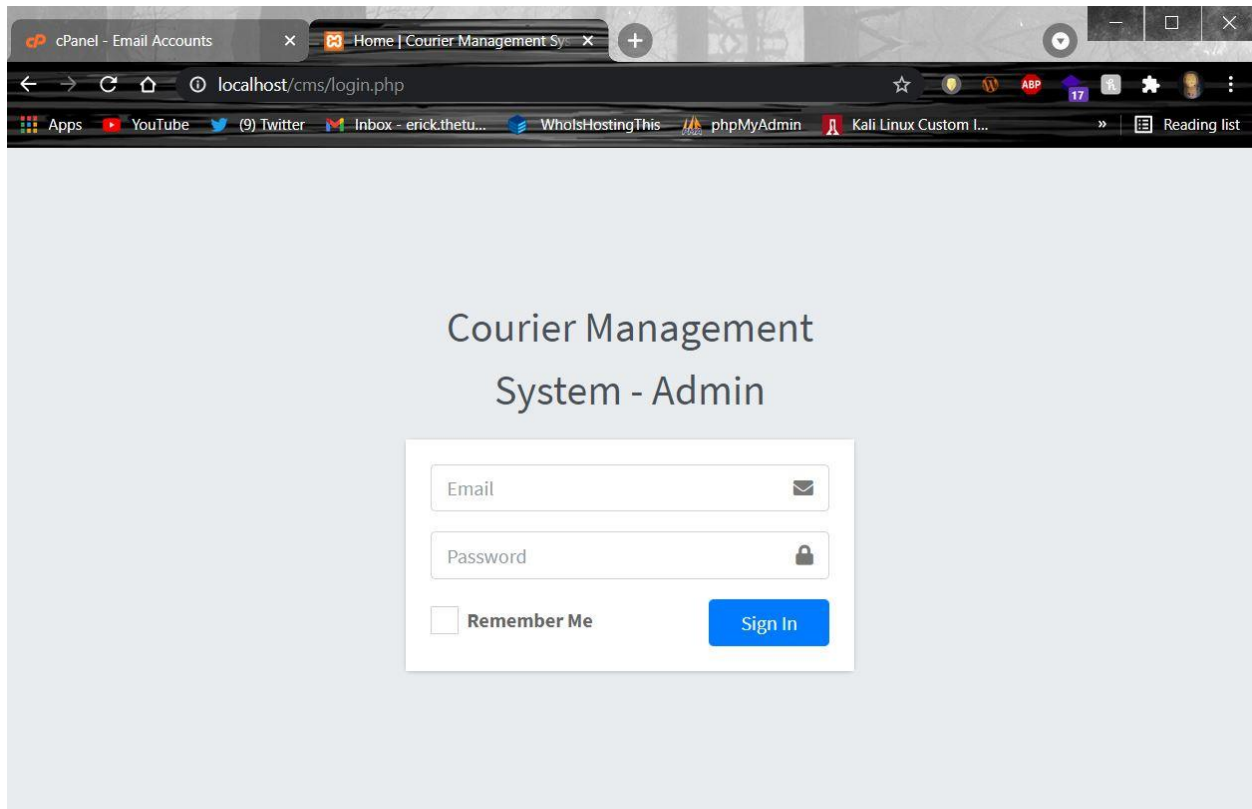
Figure 8: Login Page

4.2.1 User Courier System Module

The clerks of the courier management system will interact with the application through an easy to use log in by use of the web page the home page. The home page contain the dashboard with a clear view of the history of the parcels and branches. Some functions can only be seen by the admin while others the user only. The only part the user/clerk cannot see is the total staff and branches.

The clerk can only access the parcel, track the parcel and see the reports.
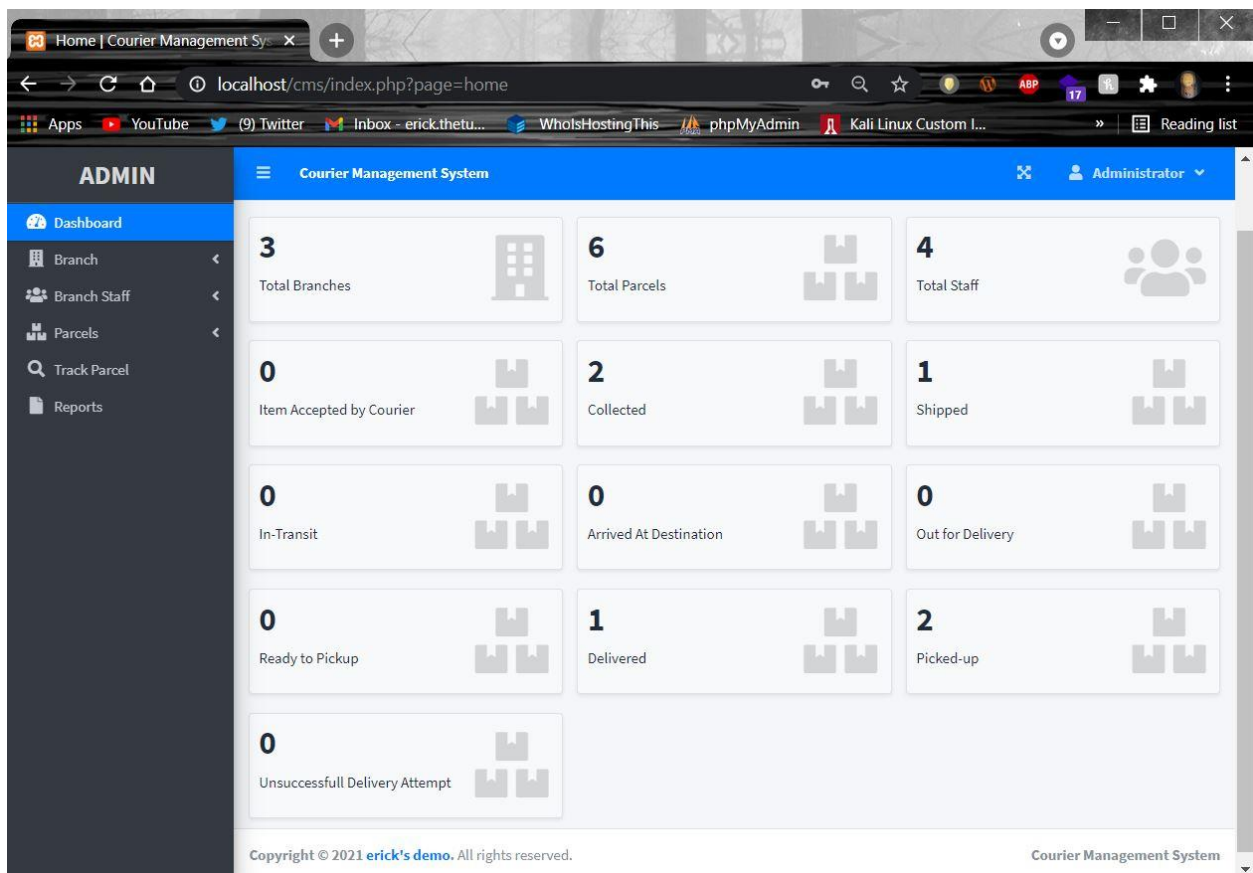
Figure 9: Home Page

The staff home page is seen as below.

Figure 10: Staff Home Page

4.2.2 Administrator Interface module

Administrator of the backend will interact with the application through an easy interface as shown below. The admin is able to add the users, add the branches, can also add the parcels and track the reports shown in the figure below.
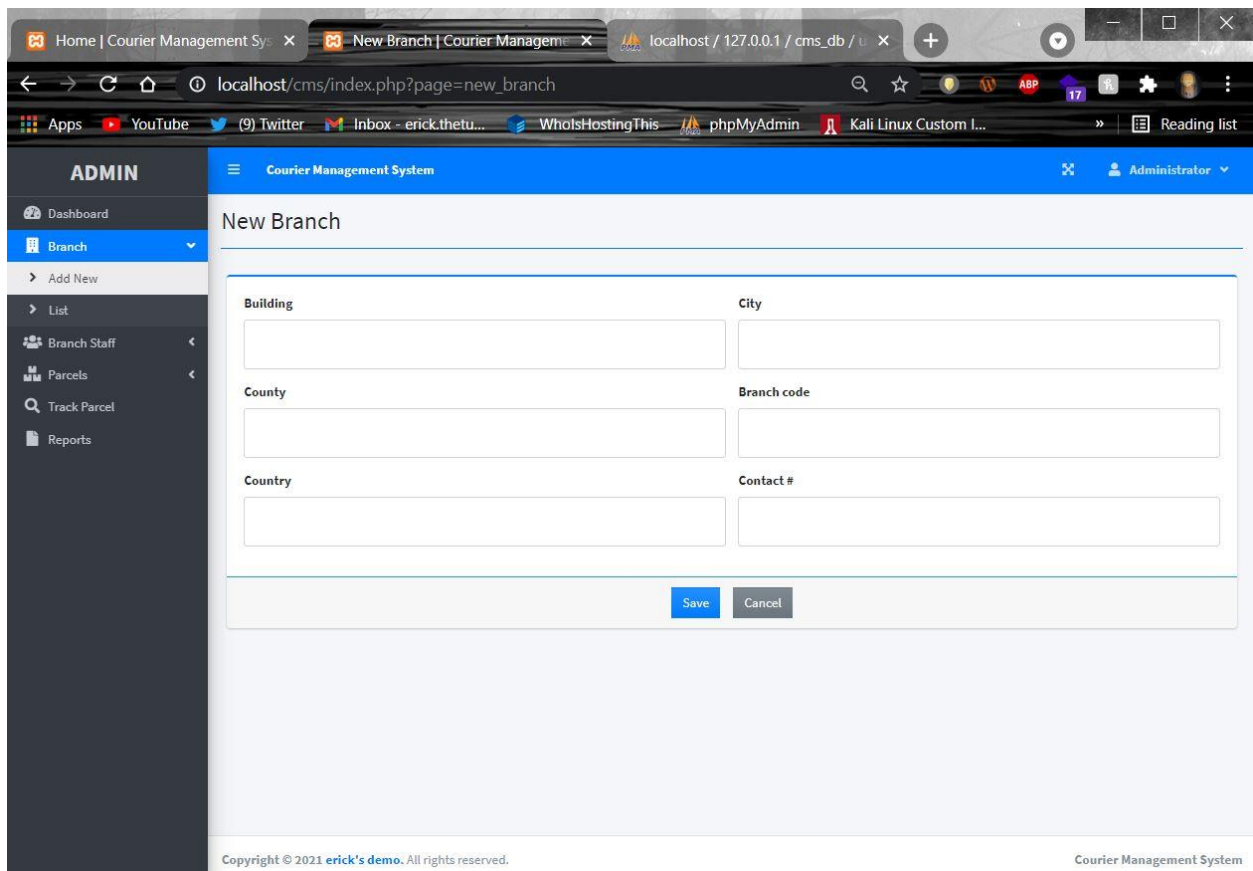
Figure 11: Admin control panel

4.2.3 How the backend works

The Backend pulls records that have entered by the user and stored in the database and it display the records for manipulation by an administrator of the backend. The administrator can update the branches, add new users, check the parcels and also see the reports; the administrator can also see all the users, braches, parcel details and can see mpesa transactions.

4.2.4 Key Demonstrations

Parceling: When a client comes to send a parcel, he/she inputs the name of the sender and the receiver and their details. They then verify the payment of the parcel and hand over a receipt to the sender. The receiver then receives a message with the details that the courier is in transit to them. This makes sure that the receiving branch can already see the goods in transit to their destination.

Figure 12: Administrators Add New Parcel

4.2.4.2 In Transit

Once a user/clerk declares the parcel in transit and is entered into the database then pulled and
Displayed in the receiving station clerk and admin account.

Figure 13: In Transit page

4.2.4.3Change Status

This is where the status of the parcel is changed from in transit to deliver to collect. Helping in accountability and the follow up of the parcel .usually done by the receiving branch.

Figure 14/15: Administrators Change Status

4.2.4.4 Parcel Process

The parcel is process is a detailed process done after a parcel has been shifted from one status to another. The admin and the clerks can easily check and follow up on the parcel. Moreover they can also easily navigate through the system through the easily made interface.

Once the parcel is added with the details required it's changed to in transit, them the admin can change it to shipped if it is going to an overseas branch or in transit. If there was a delivery option the status is changed to out for delivery. In all this pages the reference number remains the same and the tag number. This is mainly for accountability and ease of finding and retrieval of parcels/couriers.

Figure 16: Administrators Home Page

4.3TESTING

4.3.1TYPES OF SYSTEM TESTING

There are different types of system testing techniques which include: unit testing, Integration testing, System testing, sanity testing, smoke testing, Interface testing, regression testing, and beta/acceptance testing only to mention a few. (Software Testing Help, 2018)

For the purpose of this project I conducted the following types of test:

a) Backend testing
b) Browser Compatibility Testing
c) End-to-End Testing
d) Integration Testing
e) Graphical User Interface (GUI) Testing
f) Performance testing
g) Functional testing

4.3.2BACK-END TESTING

It is used to test the functionality and workability of the back-end system. Whenever an input or data is entered on front-end application, it stores in the database and the testing of such database is known as Database Testing or Backend testing. There are different databases like SQL Server, MySQL, and Oracle etc. Database testing involves testing of table
Structure, schema, stored procedure, data structure and so on. In back-end testing GUI is not involved, testers are directly connected to the database with proper access and testers can easily verify data by running a few queries on the database. There can be issues identified like data loss, deadlock, data corruption etc. during this back-end testing and these issues are critical to fixing before the system goes live into the production environment. (Software Testing Help, 2018)

4.3.2.1 Test conducted
I was able to test all the tables in database rms and multi_login and all the tables and no issues were identified that is no data loss, no deadlock or data corruption.

4.3.3 Browser Compatibility Testing

It is a subtype of Compatibility Testing (which is explained below) and is performed by the testing team.

Browser Compatibility Testing is performed for web applications and it ensures that the software can run with the combination of different browser and operating system. This type of testing also validates whether web application runs on all versions of all browsers or not. (Software Testing Help, 2018)

4.3.3.1 Test Conducted

I tested the system with Microsoft edge, Chrome, work stream browser and opera. In all the browsers the system was operational, however on other browser the system was slower to launch such as Microsoft edge which took 100 seconds as opposed to the rest which ranged from 40 seconds to 55seconds.

4.3.4 End-to-End Testing

Similar to system testing, End-to-end testing involves testing of a complete application environment in a situation that mimics real-world use, such as interacting with a database, using network communications, or interacting with other hardware, applications, or systems if appropriate.

In a mimic of the real world the system worked perfectly no matter the number of users logged in to the system. (Software Testing Help, 2018)

4.3.5 Integration Testing

Testing of all integrated modules to verify the combined functionality after integration is termed as Integration Testing. Modules are typically code modules, individual applications, client and server applications on a network, etc. This type of testing is especially relevant to client/server and distributed systems.(Yusuf Malik,2018)

4.3.5.1 Tests conducted

I was able to test all components of the courier management system.

The first test I conducted was registering a user as a normal user and an administrator user, thereafter I logged in into the system. Once a registration was made it reflected in the database and in the back-end where the administrator can add or remove a user or upgrade a user. The second test conducted, I simulated sending a parcel and the changing the status to see if ut will reflect to the database and it happened as expected.

4.3.6 Functional Testing

This is where a select group of the target population will test the system to ascertain the functional requirements are attained. (Yusuf Malik, 2018)

4.3.7 Performance Testing

The various non-functional requirements as contained on the business requirements document will be tested by the team piloting the system. In particular, the system will under stress testing to see whether it can handle errors. Since the time is limited, complete performance, testing will only be possible once the system is published and starts being used by residents. (Yusuf Malik, 2018)

4.3.8 Graphical User Interface (GUI) Testing

The objective of this GUI testing is to validate the GUI as per the business requirement. The expected

GUI of the application is mentioned in the Detailed Design Document and GUI mockup screens.

The GUI testing includes the size of the buttons and input field present on the screen, alignment of all

Text, tables and content in the tables. It also validates the workability of the application, after selecting different side menus and changing different names, it validates that the page does not fluctuate and the alignment remains same after moving from one module to another. (Software Testing Help, 2018)

4.3.8.1 Test conducted

I was able to test the system on different devices such as a laptop, computer, smart-phone and large-screen smart phone in all instance the system function properly and the buttons and screens adapted according to size of the screen and I was easy for users to use on the different devices.

5.0 CHAPTER FIVE: CONCLUSION AND FURTHER RESEARCH

5.1 OBJECTIVES ATTAINED

At the beginning of the project I set out certain objectives which ought to be accomplished by the end of the system creation, at the end I was able to achieve most of the objectives set out.

5.1.1 Developed a user friendly interface

The system incorporates a user friendly interface whereby customers can easily access different elements at ease and have the option to go back to the top of the Login Page at ease. The user can access home, menus, reservations, services, contact, Staff Home Page s at easy and manipulate the components such as making orders sending messages and checking out.

5.1.2 Developed a database for storing all the information

This system incorporates a database by the name multi_login. The database stores information of the users in user table, it stores system setting in system setting table, the parcel information in parcel table, parcel tracks in parcel track table mpesa verification in pa table and branches in branch table.

Figure 18: Tables in the database

5.1.3 Incorporated Fast payment of the courier

The system does not yet incorporate the m-pesa API however, I incorporated payment verification that verifies whether the payment has been received in the account to ease in lying by unscrupulous merchant.

5.1.4 Developed a back-end system only accessible to the administrator

This system incorporates a database by the name multi_login. The database stores information of the users in user table, and the changes that the admin makes at any given time.
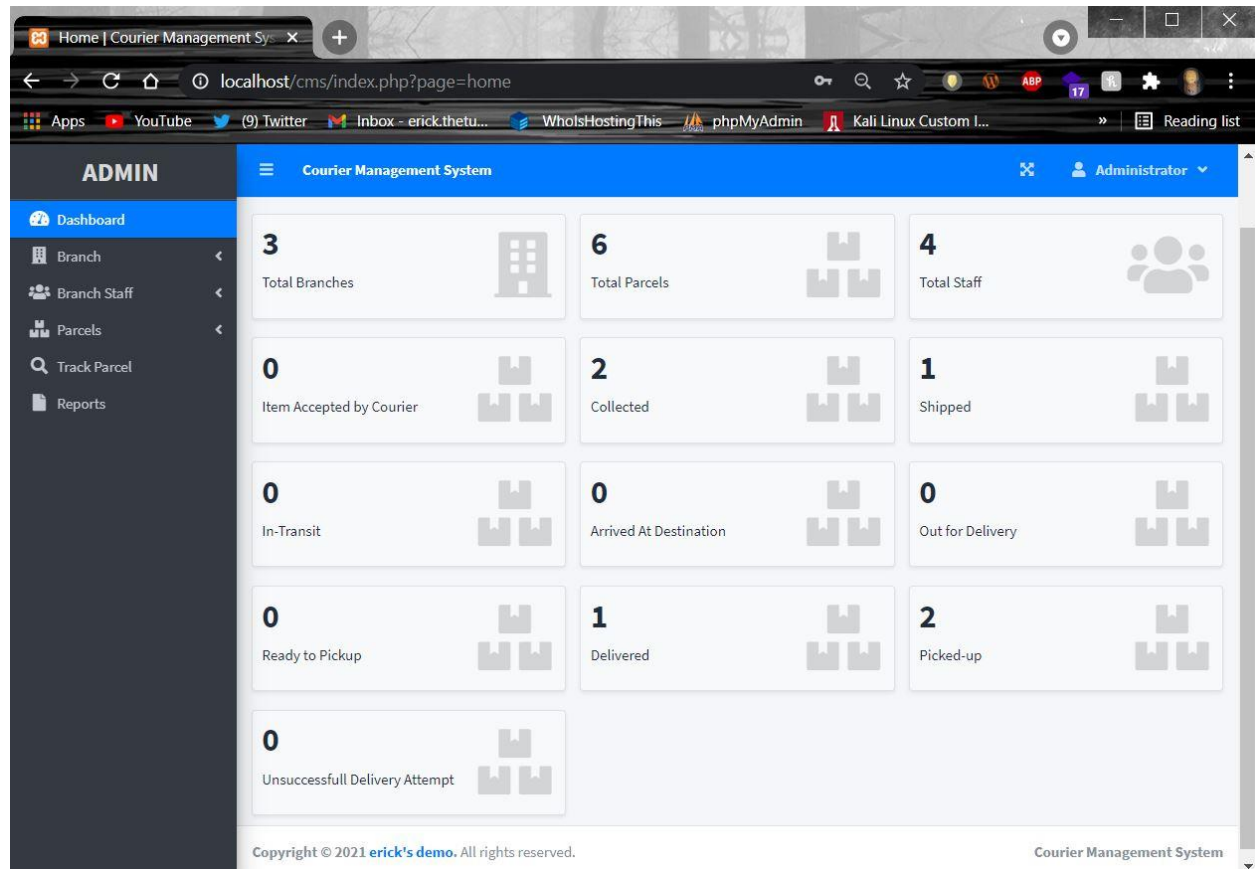

Figure 19: **Administrators Control Panel**

5.2 CONCLUSION

To summarize, the world is rapidly evolving and heading toward technical expertise. Technology is not a static or stagnant field, but rather one that is constantly changing as new trends arise. As patterns change and improve, it's past time for us to change with them. The use of online courier management systems is important for getting accountability and making goods get delivered quickly and making the work easier. As a result, this system would make it easier for Kenya's courier companies be accountable for all their services.

5.3 FUTURE RECOMMENDATIONS

Future Projects:

The work that will be applied with future releases of the program is described in the following section.
• Add more functionalities to the system like users can have bar codes to ease the job.

• Enhance User Interface by adding more user interactive features. Provide Deals and promotional

Offer details to home page. Provide Recipes of the Week/Day to Home Page

• Payment Options: Add different payment options such as PayPal, Cash, Gift Cards etc. Allow to save payment details for future use.

5.4 CHALLENGES FACED DURING DEVELOPMENT

- o   Incorporating M-pesa verification

- o   Integration of better and improved phone layout

- o   Hacking and user untrustworthy.

- o   Learning the new language to code

REFERENCES

1 (Yusuf Malik, 2018)- How to perform System Testing using various types of techniques? Retrieved from

https://www.loginworks.com/blogs/how-to-perform-system-testing-using-various-types-of-techniques/

2 (Software Testing Help, 2018) - Types of Software Testing: Different Testing Types with Details. Retrieved from (https://www.softwaretestinghelp.com/types-of-software-testing/)

3. (Lorri Mealey, 2018) - Different Types of Restaurant Concepts. Retrieved from

https://www.thebalancesmb.com/different-types-of-restaurant-concepts-2888698

4. (Lonnie D. Bentley p.160 7th edition.) System Analysis and Design Methods

5 (Will Kenton, 2018) Feasibility study. Retrieved from:

https://www.investopedia.com/terms/f/feasibillity-study.asp

6 (BrightHubProjectManagement, N.D) Explaining the different types of feasibility study Retrieved from https://www.brighthubpm.com/project-planning/56372-types-of-feasibility-studies/

7) (w3schools.com, N.D) HTML Intro Retrieved from https://www.w3schools.com/html/default.asp

8)   (Techotopia, N.D) PHP Constants Retrieved from

https://www.techotopia.com/index.php/PHP_Constants

9). (Wikipedia, 2017) HTML Retrieved from https://en.wikipedia.org/wiki/HTML

10) (HuffPost, 2014) Pizza Hut Tells Twitter It Made The First Online Sale In 1994 Retrieved from https://www.huffpost.com/entry/pizza-hut_n_3894981

11)   (Corcoran, 2000) How to Make Lunch an Adventure Retrieved from

https://archive.nytimes.com/www.nytimes.com/library/tech/00/12/biztech/technology/13corc.html

12). (Bryson, 2009) Why Pizza Giants Want Customers To Click, Not Call, For Delivery Retrieved from https://adage.com/article/digital/pizza-giants-customers-click-call-delivery/136087

13(Bomkamp, 2016) Restaurant food delivery heating up. Retrieved from https://www.columbian.com/news/2016/jan/10/home-delivery-pay-restaurant-meal-2016/

14Cornick, M. S. (2014). *Using computers in the law office*. Cengage Learning.
Desai, M. (2019). *Rights-based integrated child protection service delivery systems: Secondary and tertiary prevention*. Springer Nature.

15Ford, G. S. (2014). What is the effect of file sharing on the creation of new music? A critical review of 'A case study of file sharing and music output'. *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.2407145

16Gaps in electronic trial master file (eTMF) implementation: A study in the organization case. (2017). *Journal of Applied and Physical Sciences*, *3*(3). https://doi.org/10.20474/japs- 3.3.2
Halsey, M., & Bettany, A. (2015). Troubleshooting the windows file system. *Windows File System Troubleshooting*, 97-108. https://doi.org/10.1007/978-1-4842-1016-1_6

17Lei Zhang, Ligu Zhu, & Saifeng Zeng. (2012). Tiered replica consistency techniques for cluster file system. *2012 4th Electronic System-Integration Technology Conference*. https://doi.org/10.1109/estc.2012.6485825
Lemley, M. A. (2010). Where to file your patent case. *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.1597919
Lunney, Jr., G. S. (2013). Empirical copyright: A case study of file sharing and music output. *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.2372630

18Rogers, P., Hering, R., & Redbooks, I. (2012). *Z/OS distributed file service zSeries file system implementation Z/OS V1R13*. IBM Redbooks.

19Toy, E., Loose, D., Tischkau, S. A., & Pillai, A. S. (2013). *Case files pharmacology* (3rd Ed.). McGraw Hill Professional.

APPENDIX