

**DESIGN AND IMPLEMENTATION OF A WEB BASED FLIGHT  
AND SHIPPING LOGISTICS MANAGEMENT SYSTEM  
A CASE STUDY OF KENLLOYD LOGISTICS**

**BY**

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**A GRADUATION PROJECT PROPOSAL SUBMITTED TO THE  
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### DECLARATION

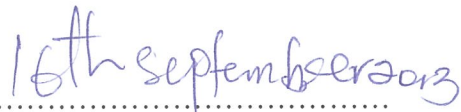
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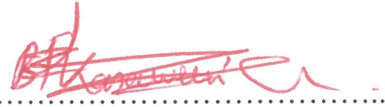
### APPROVAL

This is to satisfy that my approval has been given for this research proposal to be submitted to the Collage of Applied Science and Technology as a requirement for the partial fulfillment for the award of a Degree in Information Technology of Kampala international university.

Eng. Kasawuli Faik

(SUPERVISOR)

SIGNATURE



DATE



### **DEDICATION**

This Report is dedicated to my beloved Family. I also dedicate it to My Friends for the guidance and financial assistance they rendered to me during the study.

I further dedicated this to all the personnel staff of Kampala international university especially those dealing with computer studies and My beloved supervisor Eng. Kasawuli Faik

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## ABBREVIATIONS

MIS:.....Management Information System

SQL:.....Structured Query Language

IS:.....Information System

ERD:.....Entity Relationship Diagrams

DFD:.....Data Flow Diagrams

DBMS:.....DataBase Management System

DD:.....Data Dictionary

ICT:.....Information Communication Technology

## **ABSTRACT**

When dealing with Flight and shipping there are substantial risks and potential for disaster in the form of environmental problems, bankruptcy, and delivery failure, lack of materials, poor performance or even product defects.

Monitoring a web based flight and shipping management system performance on an ongoing basis will help organizations mitigate some of the risks faced with suppliers. This dissertation was therefore concerned with the planning, design; development and implementation of a web based flight and shipping management system that would help a company's avoid costly and potentially devastating supply disruptions. Kenlloyd Logistics Limited was used as the case study organization which is using an excel work book to track its requisitions and supplier information.

The methodology used for the study comprised of the research and development methodology. Different tools like interviews and questionnaire were used for data collection, Dynamic Essential Modeling of Organization for the analysis and coming up with the new system requirements, the Software Development Life cycle and Unified Modeling Language was also to design the system which was implemented using Visual Studio and Microsoft SQL server

This benefits of this system is that there will be improved collaboration between the organization and the suppliers, improved relationships among stakeholders, then enhanced security and data accuracy and finally improved turnaround time among others

## CHAPTER ONE

### INTRODUCTION

#### 1.1 Background to the study

Logistics management is that part of the supply chain which plans, implements and controls the efficient, effective forward and reverse flow and storage of goods, services information between and the point of origin and the point of consumption in order to meet customer requirements.

Logistics as a business concept evolved in the early 1950s. This was mainly due to the increasing complexity of supplying one's business with materials and shipping out products in an increasingly globalized supply chain, calling for experts in the field who are called Supply Chain Logisticians. This can be defined as having the right item in the right quantity at the right time at the right place for the right price. It is the science of process having its presence in all sectors of the industry. The goal of logistics work is to manage the fruition of project life cycles, supply chains and resultant efficiencies.

This study was based on operations that automate the logistics operations of Kenlloyd Logistics Uganda Limited. A system was developed, which keep track of cargos and goods at particular time and place, Clients are able to know where there goods have reached and how long they can wait. The system keeps track of logistics activities like the integration of information, transportation, and inventory, warehousing, material-handling and packaging. The system is used for automating logistics activities which helps the supply chain industry in automating the work flow as well as management of the system.

Kenlloyd Logistics Limited is a private limited liability company incorporated under the Company Act Cap 110 of the Laws of Uganda after being fully registered on 2nd May 1997. It is located on Plot 6, Luthuli Lane, Bugolobi, Nakawa division, Kampala Uganda. On inception the business of the company was clearing and forwarding having customs agency license from the Uganda Revenue Authority & Kenya Revenue Authority. The company has now diversified into Petroleum Marketing and Commodity Trading. Logistics has continued to be integral in all company business. The company has its Head Office in Kampala and has diversified over the

years. The company is now a regional conglomerate with interests in Trade and Logistics. Kenlloyd Logistics limited has steadily grown its operations over the years from 100 to 500 per month.

## **1.2 Statement of the problem**

Kenlloyd logistics ltd is one of the leading logistics companies with over 500 clients per months, the company handles several clients' daily making deliveries to various points of the world. There for this attracted the researcher's attention to do his study with company.

On average the hospital handles about 500 clients per month shipping turns and turns and of goods across the globe. Out of the services (shipments, flights and door to door deliveries etc), the import and exports products or raw material from suppliers and business partners, a lot of paper work is handled per day and a lot of records are generated and handled manually. Incomplete of shipping documents which has always caused delays of the clearing process, extra charges and effect the stock on hand has always been great problem. Duplication of records resulting from multiple registration and misplacement of some of the documents makes the situation worse. With the current system, the clients are not able to track their goods and services to the status of their goods in transit.

This project therefore is intended to develop a system for computerizing web based flight and shipping logistics management system that could track down the orders and shipment statuses

## **1.4 Objectives of the study**

### **1.4.1 Main Objectives**

To develop computerized web based flight and shipping logistics management system that could track down the orders and shipment statuses.

### **1.4.2 Specific Objectives of the study**

- i. To investigate into the existing manual information system used in Kenlloyd Logistics Uganda in order to identify all their problems to be solved.
- ii. To analyze the existing management systems used at kenlloyd logistics
- iii. To design and develop the proposed system according to user requirements

- iv. To test and implement the proposed system

## **1.5 Research Questions**

1. What are the challenges faced by the existing system?
2. What are the user requirements for the proposed system?
3. What is the design for the current management system?

## **1.6 Scope of the study**

### **1.6.1 Geographical Scope**

This study was carried out in Kenlloyd Logistics Uganda Limited, Plot 6, Luthuli Lane, Bugolobi, Kampala-Uganda.

### **1.6.2 System Scope**

This study was limited to clients Credit/Billing Application, Online Booking Registration, Known Shipper Request and core information.

This study focused on order status and requested documents for clearing process, which would be divided into;

- i. To check the shipment status and approximate arrival date
- ii. To check the complete of documents and alert if they need to be corrected or if they are missing any information.
- iii. To report in case of partial shipments exist.
- iv. To manage authority access level.

### **1.6.3 Time Scope**

This study took a period of two months, from March 2013 to April 2013. 2 weeks for proposal writing; 1 week for data collection and analysis; 3 weeks for system design, implementation, testing and validating; and 2 weeks for final reporting writing and approval.

## **1.7 Significance of the study**

There is an automation and streamlining of staffs work flow. This reduces on unnecessary errors, as there is readily availability of necessary information on which to base their decisions.

The system supports working flow for both shipping agent and sales agent. For sales person, they could reach shipment detail instead of waiting and check from the shipping agent. While shipping agent concentrate more in their working process, instead of rechecking the same information more than once.

The clients benefit from 24x7 operating: since the system is online, the clients keep track of their items at any time, just like as if they are providing 24x7 services. Because the whole system are maintained by computers and computers never sleep.

The system saves time for both the clients and the staff: Because via online one gets all the details about his or her goods without leaving his or her chair.

Others researchers will use the findings of this study to carry out related studies



## CHAPTER TWO

### LITERATURE

#### 2.0 Introduction

In this chapter the different systems and development methodologies of similar studies were analyzed. Theories and arguments by the different scholars in regard to this study were reviewed. An analysis

#### 2.1 Information Systems

An information system can be defined technically as a set of interrelated components that collect (or retrieve), process, store, and distribute information to support decision making and control in an organization (Jane & Kenneth, 2006). Other scholars define An Information System as “A set of interrelated components that collect, Manipulate, store and disseminate data and information and provide a feedback mechanism to meet an objective” (Stair & George W, 2009). In this sense, the term is used to refer not only to the information and communication technology (ICT) an organization uses, but also to the way in which people interact with this technology in support of business process

Information systems usually depend on the existence of Information technologies which are designed to enable humans perform tasks for which the human brain is not yet well suited, such as: handling and processing large amounts of information and performing complex calculations.

##### 2.1.1 Types of Information system

IS consists of five parts which include: people, procedures, software, hardware, and data. There are various types of information systems, at the various levels of the organization. These include the office Automation systems, transaction processing systems, knowledge management systems, decision support systems, and office information systems. These systems are further explained below:

- i. **Office Automation Systems (OAS):** Office automation helps in optimizing or automating existing office procedures. These systems serve the organization with tools that help to automate the organization. Otherwise Office automation refer to the different computer machinery and software used to digitally create, collect, store, manipulate, and

transmit office information needed for accomplishing basic tasks and goals (Jane & Kenneth, 2006).

The backbone of office automation is a LAN which allows users to transmit data, mail and even voice across the network. All office functions, including dictation, typing, filing, copying, fax, Telex, microfilm and records management, telephone and telephone switchboard operations, fall into this category. Office automation was a popular term in the 1970s and 1980s as the desktop computer exploded onto the scene.

- ii. **Transaction processing system (TPS):** These systems automate the handling of data about business activities or transactions, which can be thought of as simple, discrete events in the life of an organization.

Data about each transaction are captured, transactions are verified and accepted or rejected and validated transactions are stored for later aggregation. Reports may be produced immediately to provide standard summarizations of transactions and transactions may be moved from process to process in order to handle all aspects of the business activity.

The analysis and design of a TPS means focusing on the firm's current procedures for processing transactions, whether those procedures are manual or automated. The focus on current procedures implies a careful tracking of data capture, flow, processing and output. The goal of TPS development is to improve transaction processing by speeding it up, using fewer people, improving efficiency and accuracy, integrating it with other organizational information systems or providing information not previously available.

- iii. **Management Information Systems (MIS):** These systems can be used to make structured and semi structured decisions. MIS is a subset of the overall internal controls of a business covering the application of people, documents, technologies, and procedures to solve business problems such as costing a product, service or a business-wide strategy.

Management information systems are distinct from regular information systems in that they are used to analyze other information systems applied in operational activities in the organization.-Academically, the term MIS is commonly used to refer to the group of information management methods tied to the automation or support of human decision making. Like, Decision Supports Systems and Expert systems. The proposed system is expected to have reporting and analysis functionalities and tools that will help support human decision making. In this particular case it will help in managing suppliers and hence increasing on the growth and profits of the customers.

An 'MIS' is a planned system of the collecting, processing, storing and disseminating data in the form of information needed to carry out the functions of management. In a way it is a documented report of the activities that were planned and executed. According to *Philip Kotler* "A marketing information system consists of people, equipment, and procedures to gather, sort, analyze, evaluate, and distribute needed, timely, and accurate information to marketing decision makers." (Kottler & keller, 2006).

- iv. **Decision Support Systems:** are a specific class of computerized information systems that supports business and organizational decision-making activities. A properly-designed DSS is an interactive software-based system intended to help decision makers compile useful information from raw data, documents, personal knowledge, and/or business models to identify and solve problems and make decisions.

Typically, a DSS would gather information such as an inventory of all of the current information assets, comparative sales figures and projected revenue figures based on new product sales assumptions. Executive dashboard is an example of a DSS and it allows for faster decision making, identification of negative trends, and better allocation of business resources.

- v. **An expert system** is software that attempts to provide an answer to a problem, or clarify uncertainties where normally one or more human experts would need to be consulted. Expert systems are most common in a specific problem domain. A wide variety of methods can be used to simulate the performance of the expert however common to most or all are:

The creation of a knowledgebase which uses knowledge representation formalism to capture the Subject Matter Expert's (SME) knowledge and then a process of gathering that knowledge from the SME and codifying it according to the formalism, which is called knowledge engineering. Once the system is developed it is proven by being placed in the same real world problem solving situation as the human SME, typically as an aid to human workers or a supplement to some information system.

The supplier management system was placed as having components of an MIS and DSS, given the functionalities derived from it and also Given that the information system developed is a database management system, The developer used the above methodologies to guide in determining the kind of system developed

### **2.1.2 Examples of Management information System**

#### **a) Enterprise Resource Planning Systems**

Enterprise Resource Planning (ERP) systems that have been implemented by many organizations. These systems are designed to support relevant operations. For example, a finance system might keep track of every single stamp bought; when it was ordered, when it was delivered, when it was paid and the system might offer accounting principles (like double bookkeeping) that further complicates the data model. Microsoft Dynamics Solomon is an example of an ERP System. This system has the Inventory management Module, accounts payable module, accounts Receivable module, General Ledger module, fixed assets module, payroll, purchasing module. The system integrates most of the business processes and it operates on client server architecture. The system uses MSSQL as the database management system.

#### **b) Voyage-estimating DSS system:**

An interesting, small, but powerful system of a subsidiary of a large American metals company that exists primarily to carry bulk cargoes of coal, oil, ores, and finished products for its parent company. The firm owns some vessels, charters others, and bids for shipping contracts in the open market to carry general cargo. The voyage-estimating system calculates financial and technical voyage details. Financial calculations include ship/time costs (fuel, labor, capital), freight rates for various types of cargo, and port expenses. Technical details include a myriad of

factors, such as ship cargo capacity, speed, port distances, fuel and water consumption, and loading patterns (location of cargo for different ports).

The system can answer questions such as the following: Given a customer delivery schedule and an offered freight rate, which vessel should be assigned at what rate to maximize profits? What is the optimal speed at which a particular vessel can optimize its profit and still meet its delivery schedule? What is the optimal loading pattern for a ship bound for the U.S. West Coast from Malaysia? The system operates on a powerful desktop personal computer, providing a system of menus that makes it easy for users to enter data or obtain information. (Loudon and Loudon.2006)

## **2.2 Description of the Tracking and Tracing Technologies**

The tracking and tracing of logistics networks is recently considering a very important issue in the global supply chain management (SCM). It is identified as the search for competitive advantage, where manufacturing firms have recognized the potential importance of their logistics networks. There is no universally accepted definition of tracking and tracing in the logistics literature. In most occasion tracking is usually been attached with tracing commonly termed as 'tracking and tracing' (van Dorp, K-J., 2002, Stefansson, G., and Tilanus, B., 2001). The term tracking can be identified as the collecting and managing the information of the present location of a product(s) or delivery item(s). On the other hand, tracing system signifies to storing and retaining the life cycle history of the manufacturing and distribution of product(s) and its components (van Dorp, K-J., 2002, Jansen, M.H., 1998).

The tracking system is usually considered as the link between the information systems and the physical reality (the material flow) in the logistics network (Stefansson, G., and Tilanus, B., 2001). This system is seen as a key service component for the transportation industry to fulfill the needs of manufacturing companies. In logistics chain, the delivery notification at real-time is very important and the immediate status of delays or other delivery problems are required to notify as soon as possible. By tracking and tracing the materials flow, it is possible to detect and to react in any uneven or unexpected events before they cause significant problems or at the very least, the damage can be reduced (Kärkkäinen, M., Hölmström, J., Främling, K., and Artto, K., 2003, Stefansson, G., and Tilanus, B., 2001).

The generic technology behind the tracking and tracing system is that when a track item arrives at a predefined place in the logistics network, the arrival is notified and a message regarding the arrival is sent to a tracking database. The arrival message contains three basic information regarding the materials or shipments such as the identity of the predefined point, the location of the point and the arrival time to the predefined point (Stefansson, G., and Tilanus, B., 2001). There might other related information regarding the shipments too such as quality and quantity of the shipped items, previous and next delivery point, etc.

### **2.3 Supply Chain Management**

SCM has been interpreted by various researchers. Based on the relatively recent development of the supply chain literature, it is not surprising that there has been much debate as to a specific SCM definition. Gnashing and Harrison (1995) has defined SCM as a network of facilities and distribution options that performs the functions of procurement of materials, transformation of these materials into intermediate and finished products, and the distribution of these finished products to customers.

Lee & Corey (1995) stated that SCM consists of the integration activities taking place among a network of facilities that procure raw material, transform them into intermediate goods and then final products, & deliver products to customers through a distribution system. Christopher (1998) defined the supply chain as the network of organizations that are involved, through upstream and downstream linkages, in the different processes and activities that produce value in the form of products and services in the hands of the ultimate customer.

SCM is the " strategic and systematic coordination of the traditional business functions and the tactics across these business functions within a particular firm and across businesses within a supply chain, for the purposes of improving the long-term performance of the individual companies and the supply chain as a whole" (Metzger et al.2001).

## 2.4 Reservations Systems

Because of the effect of the September 11th attack, each airlines began polishing the system and holding the importance of the airline reservation system. It has a purpose in enhancing the risk assessments among the flights from the point of embarkation to the point of destination. This process is known as the Passenger Name Record (PNR). As traced into the early reservation systems done by the travel agents, the electronic systems are here emphasized. The operation of the reservation system might have different requirements from the competing companies. The earliest versions of the reservation system were not designed to support the exchange of data between operators, as the concept of interlining (transport involving two or more carriers under a single ticket) was not yet fully developed. When the exchange of data was required, it often involved the use of other processes outside of the carrier's own reservation systems. This promotes in the construction of the PNR that systematically records each of passenger's travel requirements which contains all information necessary to enable reservations to be processed and controlled by the booking airline and the airline(s) participating in the carriage (IATA, 2004). The record includes the following:

- i. The passenger's name (or names, as a PNR can be for a single traveler or for a group of many);
- ii. Itinerary or routing;
- iii. Received from (the person making the reservation);
- iv. A phone contact (which is basically the number of Travel Agent made the booking); and
- v. Ticketing information

### 2.4.1 On-Line Reservations

Because of the rapid spread of the internet, the airlines adopted a reservation system that is a strong factor to gain new sales. The airlines began to introduce their own on-line reservation system. These systems allowed airlines to avoid commissions by bypassing travel agents. Thus, it has a tendency for the users to repeat the business transactions. The airline reservation systems are frequently liked to the various programs and special offers which adds to their ability to capture the travel and leisure market. These are some strategies that the online travel agencies

and travel agents cannot achieve because of the limitation in their services. However, this system also experience drawbacks. Most of the airline sites do not allow for easy price comparison, some will only book reservations on the airline which owns the site. Itineraries which require travel to cities not served by that carrier usually cannot be booked (Kearney & Robinson, 2004).

#### **2.4.2 On-Line Travel Agencies**

There are many traditional travel agencies that are operating on-line, but only few are known by the passengers. The transaction between the travel agents and airlines is through the commission basis. However, because of the direct booking of other passengers the commission basis is slow diminishing and they have to charge the customers for the service fee. The usual offers they give depend on their strategy and advertisement and not part of the airlines (Kearney & Robinson, 2004).

#### **2.4.3 Differences in Airline Reservation Systems**

The reservation systems contain the information concerning the passengers and his transportation. This information can be exchanged between the carriers through the facilitation of well-defined method. The differences of the methods are based on the way wherein the various systems interact with the airport system during the operations. For some instances, the passenger's records in the reservation system can be updated with the information and check-in operations.

Some carrier includes the additional information or has no formal structured PNR and sometimes the risks occur. For example the Tour Operator entered the contact of the passenger that may lead to the security of the clientele. In today, many carriers do not operate in their own reservation systems, and instead rely on the products and systems developed by the commercial Computerized Reservation Systems (CRS) or Global Distribution Systems (GDS). In these cases, a carrier operating from one country may be relying on a CRS for reservations and check-in services that is based in another country – and accordingly – potentially bound by differing laws (IATA, 2004).



## **2.5 Systems and methodologies**

The development of Information systems is dominated by the use of Database management Systems and various scripting languages like java, php, and VB.Net. A study on how other developers applied the use of those various development tools shows that many Information Systems have been developed from the time of the industrial revolution to date.

### **2.5.1 Methodologies**

A methodology is a collection of procedures, techniques, tools and documentation aids which will help the system developer in their effort to implement a new information system. A methodology will consist of phases, themselves consisting of sub phases which will guide the systems developer in their choice of the techniques that might be appropriate at each stage of the project and also help them plan, manage, control and evaluate Information systems projects (Avison and Fitzgerald, 1988).

### **2.5.2 Systems Development Methodology**

A system development methodology in software engineering is a framework that is used to structure, plan, and control the process of developing an information system. According to Elliott (2004) the systems development life cycle (SDLC) can be considered to be the oldest formalized methodology framework for building information systems. The main idea of the SDLC has been "to pursue the development of information systems in a very deliberate, structured and methodical way, requiring each stage of the life cycle from inception of the idea to delivery of the final system, to be carried out in rigidly and sequentially" (Elliot, 2004)

A wide variety of such frameworks have evolved over the years, each with its own recognized strengths and weaknesses. One software development methodology framework is not necessarily suitable for use by all projects. Each of the available methodology frameworks are best suited to specific kinds of projects, based on various technical, organizational, project and team considerations.

Every software development methodology framework acts as a basis for applying specific approaches to develop and maintain software. Several software development approaches have been used since the origin of information technology. These are

**The Waterfall model**, which is a sequential development approach, in which development is seen as flowing steadily downwards (like a waterfall) through the phases of requirements analysis, design, implementation, testing (validation), integration, and maintenance. The waterfall model is applicable if the problem to be solved is well structured with a well defined problem and requirements.

**Then the Prototyping model**, which tends to solve some of the limitations of the traditional approaches and is therefore more appropriate to many of the problem situations found today. It's not a standalone, complete development methodology, but rather an approach to handling selected parts of a larger, more traditional development methodology (i.e. incremental, spiral, or rapid application development (RAD)) (Software development methodology, 2011).

- **The spiral model** is a software development process combining elements of both design and prototyping-in-stages, in an effort to combine advantages of top-down and bottom-up concepts. It is a meta-model, a model that can be used by other models. Each cycle involves a progression through the same sequence of steps, for each part of the product and for each of its levels of elaboration, from an overall concept-of-operation document down to the coding of each individual program." (Boehm, 1996)
- **Rapid application development (RAD)** is a software development methodology, which involves iterative development and the construction of prototypes. Rapid application development is a term originally used to describe a software development process introduced by James Martin in 1991.
- In **Incremental development** various methods are acceptable for combining linear and iterative systems development methodologies, with the primary objective of each being to reduce inherent project risk by breaking a project into smaller segments and providing more ease-of-change during the development process. The initial software concept, requirements analysis, and design of architecture and system core are defined via Waterfall, followed by iterative Prototyping, which culminates in installing the final prototype, a working system

While using the prototyping software development approach, a basic understanding of the fundamental business problem is necessary to avoid solving the wrong problem.

Many different development methodologies exist for developing information systems but the most popular alternatives are the structured methodologies which are the **traditional approaches** and are still widely used. RAD, Agile methodologies and object Oriented approach which is a recent approach that many analysts prefer.

### **Object Oriented Approach**

Object oriented approaches came about based on Object Oriented Programming which was first used at the end of the 70s in a simulation programmer's environment. (Booch, 1986) stated the following regarding object oriented methodologies: "Organisations expect to produce high quality software because the object-oriented methodologies provide a better abstraction of the data and better concealing of information thus responding better changes in the real world".

**Object-oriented programming (OOP)** is a programming paradigm using "objects" – data structures consisting of data fields and methods together with their interactions – to design applications and computer programs. Programming techniques may include features such as data abstraction, encapsulation, messaging, modularity, polymorphism, and inheritance.

Object-oriented features have been added to many existing languages during that time, including Ada, BASIC, FORTRAN, Pascal, and others. Adding these features to languages that were not initially designed for them often led to problems with compatibility and maintainability of code.

More recently, a number of languages have emerged that are primarily object-oriented yet compatible with procedural methodology, such as Python and Ruby. Probably the most commercially important recent object-oriented languages are Visual Basic.NET (VB.NET) and C#, both designed for Microsoft's .NET platform, and Java, developed by Sun Microsystems. Both frameworks show the benefit of using OOP by creating an abstraction from implementation in their own way

#### **-Java**

Java is a general-purpose, concurrent, class-based, object-oriented language that is specifically designed to have as few implementation dependencies as possible. It is intended to let

application developers "write once, run anywhere". Java is currently one of the most popular programming languages in use, and is widely used from application software to web applications. Platform-independent Java is essential to the Java Enterprise edition strategy (Wikipedia, 2009), and an even more rigorous validation is required to certify an implementation. This environment enables portable server-side applications, such as Web services, Java Servlets, and Enterprise JavaBeans, as well as with embedded systems based on OSGi, using Embedded Java environments.

### **- Php**

It is a general-purpose scripting language originally designed for web development to produce dynamic web pages. For this purpose, PHP code is embedded into the HTML source document and interpreted by a web server with a PHP processor module, which generates the web page document. It also has evolved to include a command-line interface capability and can be used in standalone graphical applications. PHP can be deployed on most web servers and as a standalone interpreter, on almost every operating system and platform free of charge (O'Reilly, 2001).

PHP 5 released in 2004 is more Object oriented and supports XML. PHP 5 is simpler compared to java as an application server and a platform for web applications and web services. It simplifies the use of XML, MySQL, SQLite. It is most commonly used for building content management systems (Wikipedia, 2011)

### **Fourth Generation languages**

All 4GLs are designed to reduce programming effort, the time it takes to develop software, and the cost of software development. They are not always successful in this task, sometimes resulting in irrelevant and unmaintainable code. However, given the right problem, the use of an appropriate 4GL can be spectacular. The usability improvements obtained by some 4GLs (and their environment) allowed better exploration for heuristic solutions than did the 3GL.

A quantitative definition of 4GL has been set by Capers Jones, as part of his work on function point analysis. Jones defines the various generations of programming languages in terms of developer productivity, measured in function points per staff-month. A 4GL is defined as a

language that supports 12–20 FP/SM. This correlates with about 16–27 lines of code per function point implemented in a 4GL. (Domain Specific languages for software Engineering)

Examples of 4GLs are **SQL**,

### **SQL:**

Officially pronounced as "sequel" (Beaulieu & Treaseler, 2009 ),often referred to as **Structured Query Language**, is a database computer language designed for managing data in Relational Database Management Systems (RDBMS), and originally based upon relational algebra and calculus. (Darwen, 2005)Its scope includes data insert, query, update and delete, schema creation and modification, and data access control. SQL was one of the first commercial languages for Edgar F. Codd's relational model, as described in his influential 1970 paper, "A Relational Model of Data for Large Shared Data Banks". Despite not adhering to the relational model as described by Codd, (Codd, 1970) it became the most widely used database language

**Agile software development methodologies** refer to a group of software development methodologies based on iterative development, where requirements and solutions evolve via collaboration between self-organizing cross-functional teams. The term was coined in the year 2001 when the Agile Manifesto was formulated (Beck, 2001)

Agile methods break tasks into small increments with minimal planning, and do not directly involve long-term planning. Iterations are short time frames (time boxes) that typically last from one to four weeks. Each iteration involves a team working through a full software development cycle including planning, requirements analysis, design, coding, unit testing, and acceptance testing when a working product is demonstrated to stakeholders. This minimizes overall risk and allows the project to adapt to changes quickly. Stakeholders produce documentation as required. Iteration may not add enough functionality to warrant a market release, but the goal is to have an available release (with minimal bugs) at the end of each iteration (Beck, Kent. 1999) Multiple iterations may be required to release a product or new features.

Although agile methods are relatively new, IT departments have sought to avoid systems that were developed without sufficient input from the users. Over time, many companies discovered

that's system development teams composed of IT staff; users and managers could complete their work more rapidly and produce better results. Two methodologies became popular that is JAD and RAD. RAD attempts to create an application more quickly through strategies that include fewer formal methodologies and reusing software components. The RAD methodological was developed to respond to the need to deliver systems very fast. (Ganttthead, 2010)

### **Prototyping:**

The Prototyping model is a systems development method (SDM) in which a prototype (an early approximation of a final system or product) is built, tested, and then reworked as necessary until an acceptable prototype is finally achieved from which the complete system or product can now be developed.

This model works best in scenarios where not all of the project requirements are known in detail ahead of time. It is an iterative, trial-and-error process that takes place between the developers and the users.

### **Why Prototyping:**

One of the key advantages prototype modeled software has is the time frame of development. Instead of concentrating on documentation, more effort is placed in creating the actual software. This way, the actual software could be released in advance. The work on prototype models could also be spread to others since there are practically no stages of work in this model. Everyone has to work on the same thing and at the same time, reducing man hours in creating software.

Another advantage of having prototype modeled software is that the software is created using lots of user feedbacks. In every prototype created, users could give their honest opinion about the software. If something is unfavorable, it can be changed. Slowly the program is created with the customer in mind.

Developer receives quantifiable feedback and developers are exposed to potential future system enhancements (Mcclendon, Regot, & Akers, 1999)

“Over Design” could also be avoided using this model. “Over Design” happens when software has so many things to offer that it sacrifices the original use of the software. This also goes back in giving only what the customer wants.

### **Data modeling concepts**

A data model can be sometimes referred to as a data structure, especially in the context of programming languages. Data models are often complemented by function models, especially in the context of enterprise models

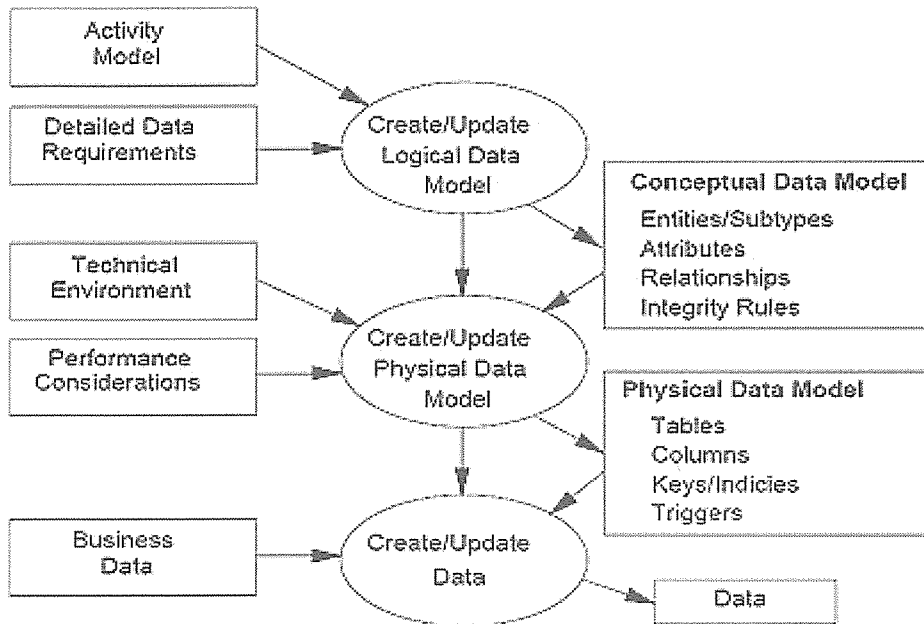
Data modeling is a method used to define and analyze data requirements needed to support the business processes of an organization. The data requirements are recorded as a conceptual data model with associated data definitions. Actual implementation of the conceptual model is called a logical data model. To implement one conceptual data model may require multiple logical data models. Whitten et al.. States that the actual model is frequently called "Entity relationship model", because it depicts data in terms of the entities and relationships described in the data (Whitten, Lonnie, & Kevin, 2004). An entity-relationship model (ERM) is an abstract conceptual representation of structured data. Entity-relationship modeling is a relational schema database modeling method, used in software engineering to produce a type of conceptual data model Data modeling defines not just data elements, but their structures and relationships between them. Data modeling techniques and methodologies are used to model data in a standard, consistent, predictable manner in order to manage it as a resource. The use of data modeling standards is strongly recommended for all projects requiring a standard means of defining and analyzing data within an organization, e.g using data modeling:

- to manage data as a resource;
- for the integration of information systems;
- for designing databases (aka data repositories)

Data modeling is an abstract activity in that the details of the values of individual data observations are ignored in favor of the structure, relationships, names and formats of the data of interest, although a list of valid values is frequently recorded.

It aims to bring the data structures of interest together in a cohesive, inseparable, whole by eliminating unnecessary data redundancies and relating data structures by relationships

Figure 1:Software development phases



In the early phases of the software development project, emphasis was on the design of a conceptual data model. This can be detailed into a logical data model sometimes called a functional data model. In later stages, this model may be translated into a physical data model.

For the database modeled for the procurements process, data modeling is a very important concept since it is the basis against which a sound and reliable database was developed, to store the data of procurement.

The data model attained can be thought of as the logical design of the base data structures used to store the data. In the relational models, these are the tables and views whereas in an object oriented database the entities and relationships map directly to object classes and named relationships. It also includes the design of forms and queries used as part of the overall database application within the Database Management System (DBMS).

### Modeling with UML:

Modeling with UML has been accepted and established as a means of analyzing and designing software. In order to create the best software, the businesses in which the software systems operate must also be modeled, understood, and sometimes improved. (Eriksson & Penker, 1999)



.Working with the models increases an understanding of the business and, hopefully, also awareness of new opportunities for improving business.

### **Conclusion**

This literature review explores the basic concepts and reviews the literature that was used in the study and in the development of the application software that is to be used by the Kenlloyd Logistitics. It presents information communication and technology, Information systems and database management systems, Data modeling concepts that will guide in the development of the system. In the next chapter, the methodology for the study shall be reviewed

## **CHAPTER THREE**

### **METHODOLOGY**

#### **3.1 Introduction**

To develop a web based of flight and shipping logistics management systems, the work was started by gather information about the topic. The technology such as software and hardware needed to develop the system was decided. To gather requirements of this system, discussion was held within flight and shipping staffs.

The initial stage of project development was to find out system requirements and define project scope. Scope or boundary of project is important to anticipate the time of completion. By a clearly defined scope, specified time was assigned to develop each module in the application. From here can conclude that, virtual tour on flight and shipping logistics took more time to flight and shipping logistics. Other module needed less time for completion. By well-organized tasks and duration, the application was developed on time, within scope and fulfill all the system requirements.

After defining the project scope, the first step of implementing was designing the system's interfaces. After designing the interfaces, the next step was to gather information about the concepts that can be used in order to achieve the function. The best concept was chosen to be implemented in the coding of the project. Testing action was applied to the module that was fully functional to find any of the bugs that occur after testing the whole program, the application can be fully be used.

Development of a web based of flight and shipping logistics management systems was scheduled by using Gantt chart. The Gantt chart were depicting the project tasks against calendar. Gantt chart offers the advantage of clearly showing overlapping tasks. The chart also demonstrates which phases are ahead and behind schedule at a glance. This is important to help to develop the application on time.

A web based of flight and shipping logistics management systems was developed by using the methodology of Software Process Waterfall Paradigm. By using this methodology, development of this application was divided into few stages. These stages implemented in sequence and specified duration was assigning to each stage.

The matters that was considered in doing the research are time, resources, technology and skills. The unavailability of time during the project development, such as several tasks that need to be handle in one time need to be consider when building the schedule. The resources availability, such as expertise, references books or Internet online also needs to be considered.

### 3.2 High-Level Project Requirements

In this section, high-level project requirements such as project facilities, software and hardware requirements are stated and explained.

#### 3.2.1 Project Facilities Requirement

For project facilities, laser printer is required to print the project documentation. Scanner is using to scan pictures that are needed to place in this document.

#### 3.2.2 Software Requirement

In this project, the application developed is called a web based of flight and shipping logistics management systems, which is a web-based application. This online flight and shipping logistics management systems application is accessible through Internet and local area network. The programming languages and software involved in this project are identified. Table below shows the software requirements in developing this system.

**Table 3.1: Software Requirements**

Software	Description
UltraEdit-32	<ul style="list-style-type: none"> <li>▪ A text editor for PHP, HTML, JavaScript and other Scripts or web language</li> <li>▪ Using to write and edit codes for PHP, HTML, JavaScript and CSS</li> </ul>
Adobe Photoshop	<ul style="list-style-type: none"> <li>▪ Adobe Photoshop is used to create graphics such as Title Images, banners, buttons and advanced photographic effects</li> </ul>
Macromedia Dreamweaver	<ul style="list-style-type: none"> <li>▪ A software to create web page's content in graphical mode.</li> <li>▪ Dreamweaver is using to arrange web page's content such as text, picture or hyperlink.</li> </ul>

For the server side, Apache Web Server combining with the server side scripting, PEIP is using. The database system is MySQL. Table below shows the server-side software requirements in developing this system.

**Table 3.2 : Server-side Software Requirements**

Software	Description
Apache Server	<ul style="list-style-type: none"> <li>▪ Apache is a freely available web server that is distributed under an “open source” license, It is a server to run and interpret PHP codes</li> </ul>
PHP	<ul style="list-style-type: none"> <li>▪ Pre-Hypertext Processing, a scripting language that can modify a page before sending it to the user. It can run on Microsoft or open-source web servers. PHP is a server side language for web pages</li> <li>▪ The PHP codes are using to write query to retrieve data from database.</li> <li>▪ The codes are used to insert, update and delete record from database. The codes also are using to display the data on web pages.</li> </ul>
MySQL	<ul style="list-style-type: none"> <li>▪ MySQL is open source database software and an object- relational database management system to store and retrieve data according to various parameters given in query.</li> <li>▪ MySQL is used to create table and store data. This database system also is used to edit the properties of table, edit or delete records in table.</li> </ul>

The client-side scripting languages involved in developing the Web-based application are:

**Table 3.3 : hardware Requirements**

Software	Description
HTML	<ul style="list-style-type: none"><li>▪ A hypertext markup language to arrange and display the page's content.</li><li>▪ The HTML codes use tags to format the document, create hyperlinks, and mark locations for graphics</li></ul>
DHTML	<ul style="list-style-type: none"><li>▪ A dynamic hypertext markup language to display the page's content in a dynamic way.</li><li>▪ This markup language is used to create special effects on the menu, text and pictures.</li></ul>
Javascript	<ul style="list-style-type: none"><li>▪ A scripting language that is embedded in web pages, and run by the browser.</li><li>▪ Javascript is used to include the CSS file into web pages. The script also is using to validate form's data.</li></ul>
CSS	<ul style="list-style-type: none"><li>▪ A scripting language to simplify the task of maintaining web sites by offering the capability to separate web content from appearance.</li><li>▪ CSS is used to control the style and presentation of multiple web pages at once.</li></ul>

### 3.2.3 Hardware Requirement.

Table below shows the hardware requirements in developing the online reservation portal.

**Table 3.4 : hardware Requirements**

System	Processor	At least Intel TM Pentium II 256 MHZ
Memory	Cache Memory	513 Kilobyte
	Random Access Memory	At least 524 Megabyte
Storage	Hard Drive	At least 20 gigabytes or above
	Floppy Drive	One 1.44 Megabyte 3.5" Floppy Drive
Input Devices	Keyboard	102-key Keyboard
	Mouse	Standard 2 button Serial Mouse
Output Devices	Display	15" inch monitor
	Printer	Laser Printer
Others	Server Casing	ATX Tower

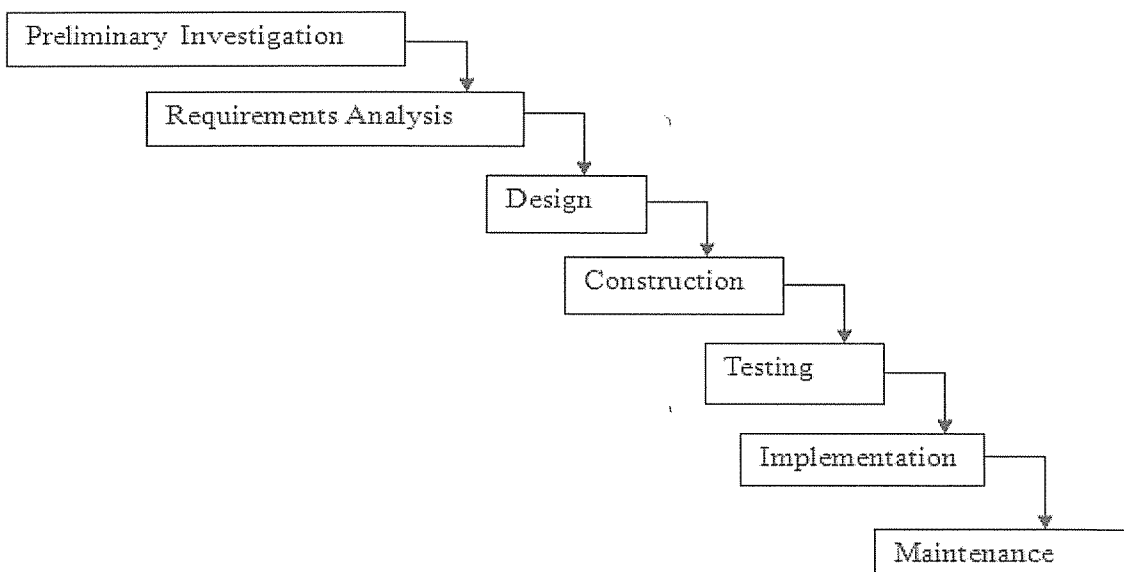
### 3.3 System Development Approach

The Software Process Waterfall Paradigm was chosen as the methodology in developing the a web based of flight and shipping logistics management systems. Software Process Waterfall Paradigm methodology is a conventional approach that has been first introduced. The idea of a Waterfall Paradigm includes principle of management, planning, organization, problem solving, coordination, control, division of labor, scheduling, and so forth.

#### 3.3.1 Methodology Description

Waterfall Paradigm is important to note a large successful of projects development. Without the structure and organization provided by a Waterfall Paradigm method, development projects would be at severe risk of missing deadlines, escalating budgets and a low quality system As a methodology, the Waterfall Paradigm provides the structure, method, controls and checklist needed to ensure successful development. Figure below shows the phases in Software Process Waterfall Paradigm.

**Figure 3.1: Waterfall Paradigm**



Waterfall Paradigm prescribes stages and activities performed in each stage are described as follow:

#### a) Preliminary Investigation

The web based of flight and shipping logistics management systems is developed for Kenlloyd Logistics Uganda Limited because through the observation, its system was lacking some important features. It is identified that the major requirements for the web based of flight and shipping logistics management systems is to provide a back office' for System content management. These features are in order to enhance the efficiency and performance to its online system and also the service to the guests. Therefore, it was concluded that, this online system is truly needed by Kenlloyd Logistics Uganda Limited. From here, I proceeded in establishing the scope, preliminary requirements and constraints, project participation and schedule. Ultimately, the stage concludes by means of the system owner agrees with the proposed scope.

#### b) Requirements Analysis

System's requirements needed were defined clearly and requirements' gathering becomes more intensive. The objective of requirements analysis is to identify what the users would require from the software elements of the system. In requirements gathering, the fact-finding techniques will help to identify the requirements. The fact-finding techniques using are:

- Interviewing users realizing that people is also one of the most important element in the system project. The Flight and shipping personnel were interviewed. The interview process explained about the project and objectives. From there, shipping and logistics personnel had given the basic requirements in developing a web based of flight and shipping logistics management systems and also a brief explanation about the flight and shipping management process.
- Carried out observation only for the online function by browse through the logistics official website. From here I found out what is in the website and how the website works. Through observation, the website was lacking flight and shipping function. Besides gathering user requirements, the requirements for software and hardware also were identified. Software is chosen carefully so that they are suitable for development of web based of flight and shipping logistics management systems. Hardware requirements are fixed accordingly to suit the platform and support software used in developing the system.

### C) Design

Once it was known what was required from the system, the design process determined how best to construct a system that delivers these requirements. In this stage, the database, input, user interface (application) and output need were designed, as these elements are important for developing a system. Following explains the need to take serious consideration in designing these elements:

- Database design: The database for a web based of flight and shipping logistics management systems is designed using MySQL to connect online and offline function. This feature was designed to support automatically update of the system. A well-designed database also shares non-redundant data and overcome all the limitations of convention files. Database architecture is built around a database management system (DBMS) that provides a data definition language to create and maintain the database

structure and rules; and a data manipulation language that is the SQL is used to create, read, use, update and delete records in the database.

- Input design: Input design takes into consideration mainly of human factors. Several concepts that are important to input design are data capture, data entry, and data processing. It is notice that alternative input media and method must also be understood before designing the inputs. Two common data input media that have chosen are using the keyboard and the mouse (a pointing device). Keyboard allows users to input data by typing through it to the text boxes. Mouse allows users to input data by clicking it because check boxes, radio buttons, buttons and drop down lists are included as methods of input. From here, it is identity that the needs for designing simple input and good-flowed forms are to maintain user-friendliness and easy-to-use.

- Output Design: Output available in this project is booking ID generation, room virtual tour and notification. Notification can be in the form of showing booking status. Description labels, highlights and format are carefully designed to ease users' visibility and readability.

- User interface design: User interface design is concerned with the dialogue between user and the computer. It is concerned with everything from starting the system or logging into the system to the eventual presentation of desired outputs and inputs. Interface is designed in a way that user will need minimal or no training at all in using the system.



#### d) Construction

The completed design was now translated into program code. In this project, the same programming language is utilizing for a web based of flight and shipping logistics management systems and 'back office'. One database management system is used to connect both web based of flight and shipping logistics management systems and 'back office'.

#### e) Testing

The system is tested to ensure that it satisfies the user requirements accurately and completely. Typically, two levels of testing are performed. First, the unit testing is where each unit or module is tested independently to ensure each of them function correctly. Some of the modules include flight and shipping reservation, content management, etc. Second, the system testing is where modules, which comprise the system's interface and database is integrated together in a correct, stable and coherent manner to ensure all modules interact correctly.

#### f) Implementation

Implementation includes system installation and training system users. Once the system has been tested satisfactorily it is delivered to the customer and installed for used. In this project, the system is publishing on the Internet for web based of flight and shipping logistics management systems and the back office' is installed in the logistics and shipping terminal.

#### g) Maintenance

It is most likely that the system will subject to change during its operating life. The delivered system may operate erroneously and corrections may have to be made to the software (corrective maintenance). Certain aspects of the system's behaviors may not have been fully implemented (because of cost or time constraint), but are then completed during the maintenance stage (perfective maintenance). The operating environment may also change in various ways causing requirements changes that have to be accommodated (adaptive maintenance).

The techniques, methods that been used to help in the research includes Microsoft Project and Rational Rose. Microsoft Project is the software program that assists in building and maintaining a (3antt chart. Microsoft Project is used to maintain project schedule. Rational Rose is a tool from Rational Software ([www.rational.com](http://www.rational.com)) that specifically supports the object-oriented

approach. Rational Rose is referred to as a visual modeling tool rather than case tool. The object-oriented models in this text conform to the UML standard developed primarily by researchers at Rational Software. Rational Rose can be used with the rational unified process (RUP) or with any methodology that uses UML Diagrams. The tool provides reverse-engineering and code-generating capability as well as repository and can be integrated with additional tools to provide a complete development environment.

### **3.3.2 Justification of Methodology Selection**

Methodology is very important in developing the web based of flight and shipping logistics management systems. Choosing a right methodology will help to produce a better quality product, in terms of documentation standard, acceptability to the user, maintainability and consistency of Software.

Waterfall Paradigm methodology can ensure that user requirements are completely met and also help the development of project by giving better control of project execution. The Software Process Waterfall Paradigm methodology also promotes communication between project participants, by defining essential participant's kind interactions, and by giving a structure to the whole process.

If the application is develop using spiral approach development, which is an iterative development approach. Each iteration may include a combination of planning, analysis, design, or development steps. It is believe that the spiral models is more suitable be used for the project that needs modification, enhancement or upgrade. It is not a suitable model for this web based of flight and shipping logistics management systems, which is doing all the planning and analysis for the system before starting to design.

The Waterfall Paradigm methodology also compare with the incremental development approach that completes parts of system in one or more iterations and puts them into operation for users. This model is not possible for the web based of flight and shipping logistics management systems to implement because it develops part by part and put them into operation. Therefore,

the development of this application will choose the most suitable methodology, which is Waterfall Paradigm methodology.

### **3.4 Project Schedule and Milestones**

The activities were implemented in PSM I and PSM II as stated below. In order to complete the project PSM I, the activities involved are

- i. Gathering related web page information from Internet.
- ii. Literature research to the web page.
- iii. Business value research for online reservation.
- iv. Methodology research.

Conclude the best methodology for developing the project.

For the PSM II, the whole application needs to develop for the user. Before apply any coding, the whole system function is separated into many sub-functions. The plan is to develop module by module before combining it becomes the whole system. the whole system is divided to five main modules. The activities involved in PSM I and PSM II are stated against calendar in the Gantt chart (refer Appendix II).

### **3.5 Conclusion**

In conclusion, this chapter describes the project planning and the methodology to be applies in developing the web based of flight and shipping logistics management systems. The introduction explains how the application will be develop. High-level project requirements stated the type of hardware and software involved in developing this application. Project methodology discusses the methodology chosen and describes the activities included in the methodology. The Waterfall Paradigm methodology is chosen to help carry out the project in time and to go through all stages that is needed to develop a system. Methodology justification explains and justifies the reason of choosing Waterfall Paradigm as methodology in developing this application.

## CHAPTER FOUR

### ANALYSIS, DESIGN AND DISCUSSION OF FINDINGS (RESULTS)

#### 4.0 Introduction

This chapter covers data interpretation, systems analysis to gain a better understanding of the problems with the current system. It also shows how the researcher specified and designed the new system.

#### 4.1 Areas of major interest in the systems analysis

The researcher pointed out the following areas as key to gaining a better understanding of the old system. These include the following; on information Management System, Respondents' bio data regarding the logistics staff and Employees, Credit/Billing Application, Online Booking Registration and Known Shipper Request, problems associated with an flight and shipping logistics management system and finally the possible solutions to those problems.

##### 4.1.1 Respondents Bio data

The researcher found it necessary to identify the respondent's bio-data concerning Kenlloyd Logistics Uganda Limited, level of education and positions held.

**Table 4.1 Showing the respondents' statistics**

Respondents' position	No of Respondents	Percentage (%)
Director	6	26
non staff	7	30.5
Employees/workers	10	43.5

## **4.2 Primary Source of Data:**

From the above table, it can be observed that most respondents are people who have a good educational background meaning that they are competent enough to use and learn the new system which is an improvement of the old system of Managing information on Kenlloyd Logistics Uganda Limited.

### **4.2.1 Respondents' knowledge about using computer**

The researcher was interested in finding out the respondent's knowledge about using computers and the operation of the current information management system. This was also aimed at finding out what was needed to be improved from the current system to enhance its productivity, efficiency and effectiveness. It was found out that three quarters of the staff had basic computer knowledge and had interacted with the old system before.

### **4.2.1 Weaknesses of the Old system**

- i. Use of manual system to track information on Kenlloyd Logistics Uganda Limited which always made access and retrieval of information very difficult, wasted a lot of time and sometimes caused misplacement of information.
- ii. The system was error prone because billing was done manually basing on reports from every department.

## **4.3 Software requirements specification**

### **4.3.1 Functional Requirements of the Proposed System**

- i. It has a user friendly menu from which the user can select the transaction. This acts as an interface.
- ii. It captures data from the keyboard
- iii. It has a well-established database where records will be stored and giving provision for expansion.
- iv. It has a backup capability in case of any failures.
- v. It is be password protected.

### **4.3.2 Non-Functional Requirements**

The users also identified the following characteristics that the system must have.

- i. It must be easy to use. Someone must be able to use the new system with not more than two errors per hour after three hours of orientation.
- ii. The database must be designed using MySQL.
- iii. It must have a user friendly interface designed using Dreamweaver.
- iv. It must not fail more than three times in a day.

### **4.4 System Requirements**

Given the above specification, the researcher needed the following tools to develop the system.

- i. A full computer set with at least 40 GB of hard disk, 256MB of RAM, and at least 1000MHZ of processor speed.
- ii. Wamp server
- iii. Microsoft office (word) for documentation

#### **4.4.1 System Design**

The design phase was divided into two major phases that is; logical and Physical design.

#### **4.4.2 Logical design**

The researcher used level ERDs, system flow chart

## 4.5 ENTITY RELATIONSHIP DIAGRAMS

ERDs show how the different system components are related and how they interact with one another to give a complete Tracking Information Management System.

**Figure 4.1: Entity Relationship Diagram**

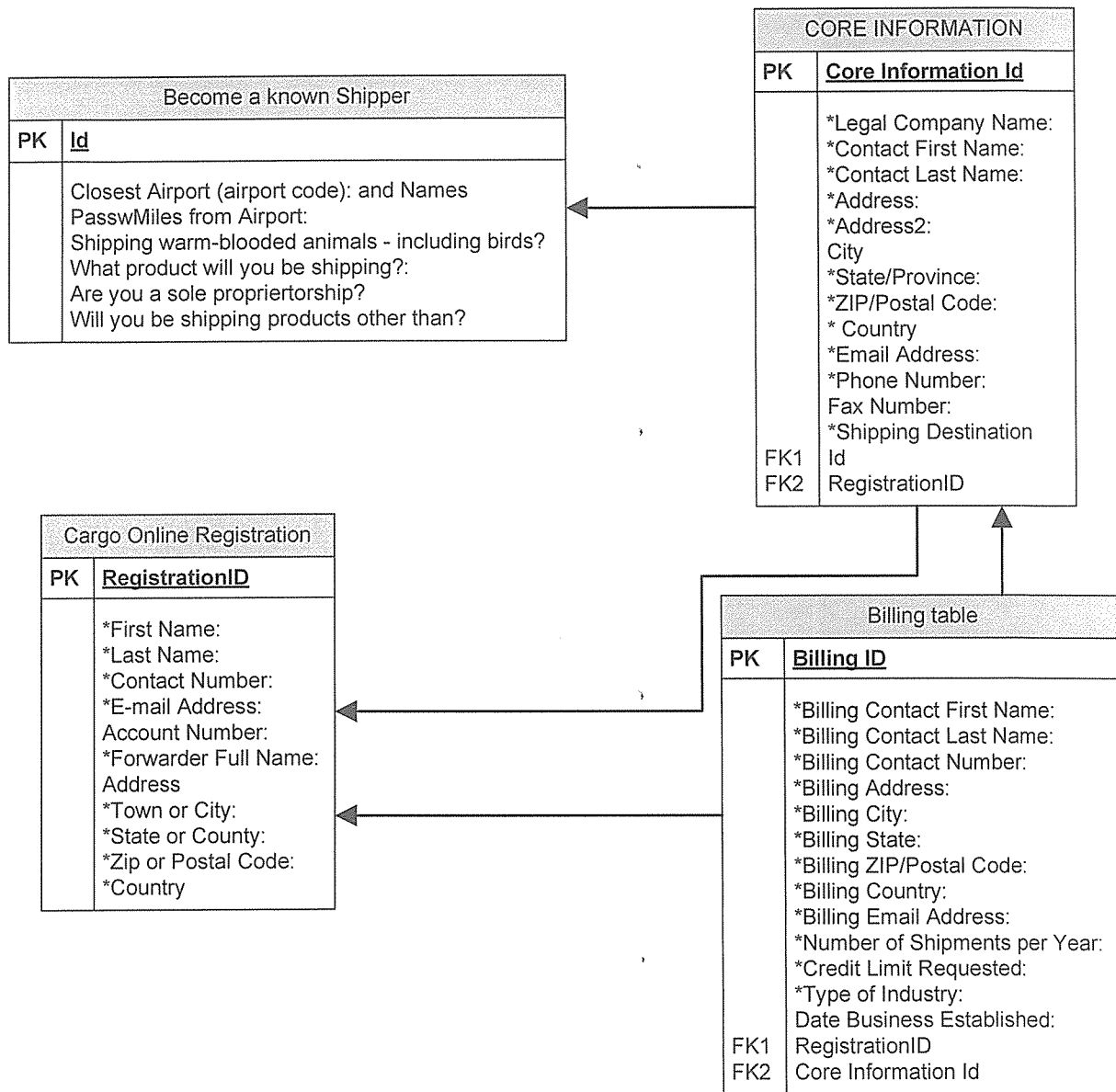
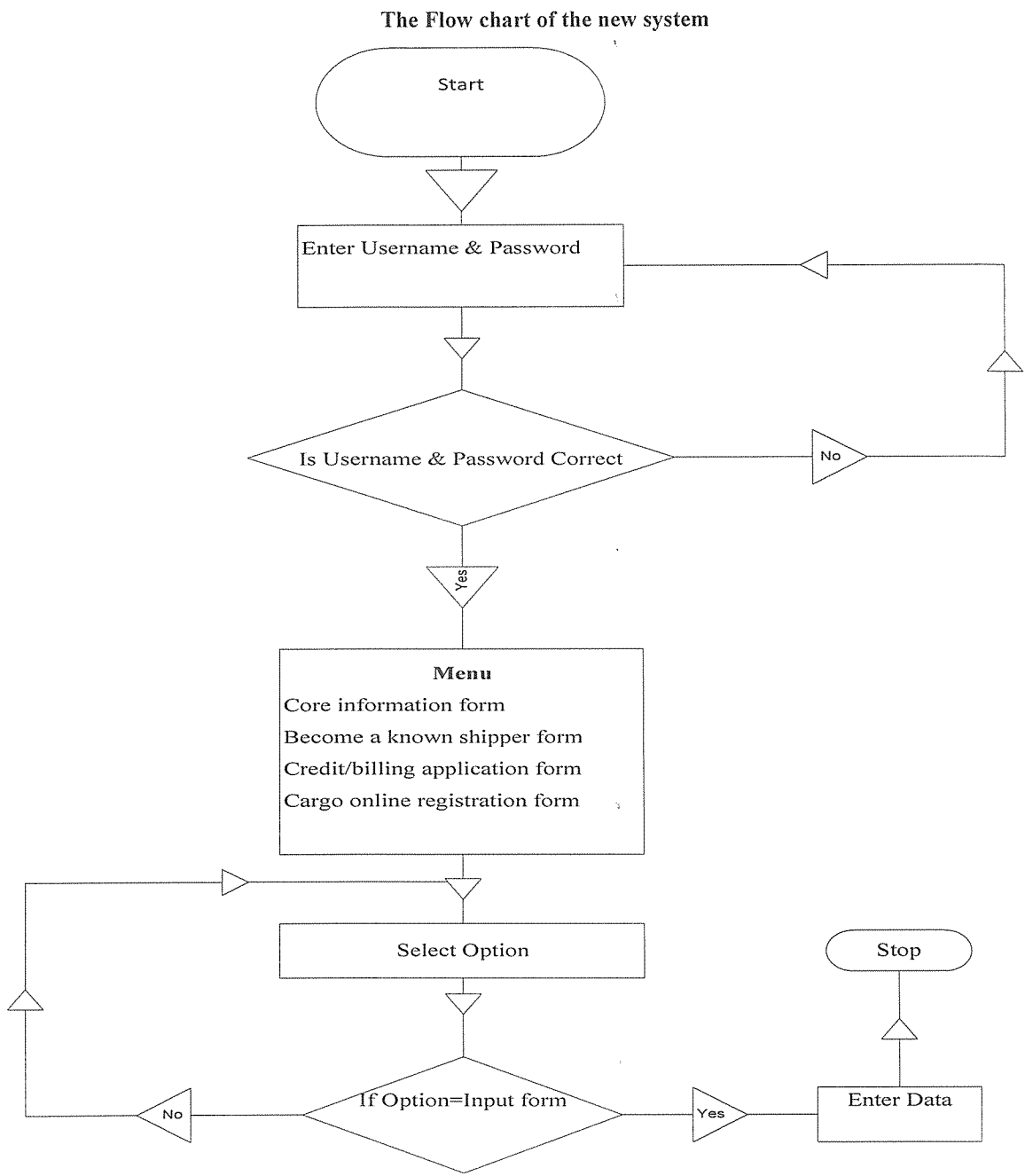


Figure 4.2: New System flow



**4.5.1 Physical Design**

The physical design shows how the design is actually presented on the computer. It shows the database structure and describes how the system processes the data. This includes the system architecture which is established to reflect the basic structure of the system.



## 4.6 DATABASE DESIGN

### Database structure

The most important task in designing database application is to identify the data that needs to be stored. Data that was collected carefully and organized made it easy to create and modify reports that provided information about the basic data operations of the department.

The general theme behind a database is to handle information as an integrated whole. A database is a collection of interrelated data stored with minimum redundancy to serve many users quickly and effectively. After designing the input and output, the analyst must concentrate on database design or how data should be organized around user requirements. The general objective is to make information access, easy, quick, inexpensive and flexible for other users. During database design, the following objectives were of concern:-

- i. Control redundancy
- ii. Easy to learn and use
- iii. More information and low cost
- iv. Accuracy
- v. Integrity

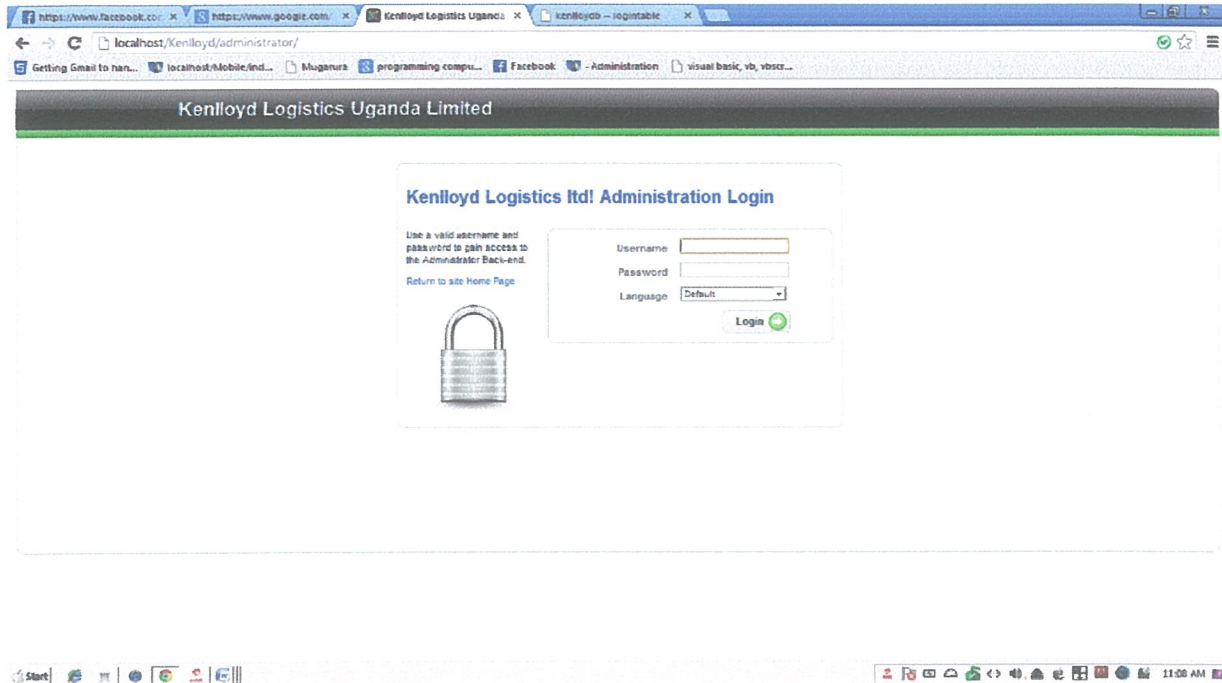
The following are the interfaces which the user will interact with.

Figure 4.3: Welcome form





**Figure 4.4: - Admin Login Back End**



**Figure 4.5: - Admin Login Front End**

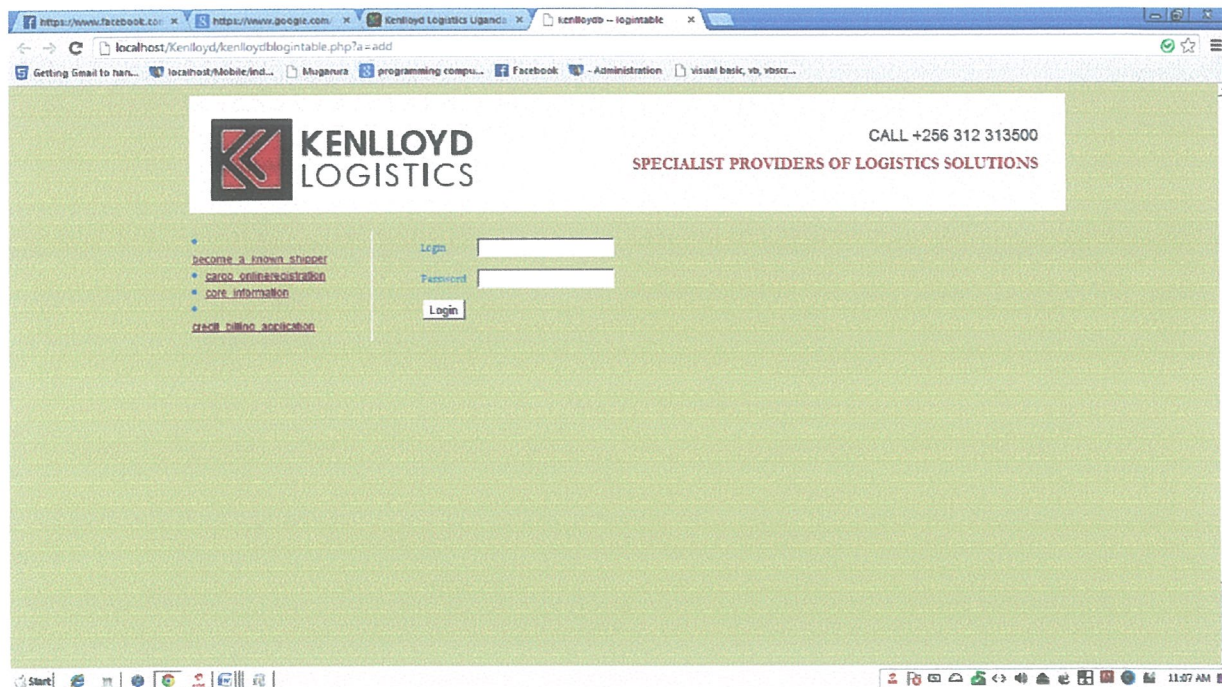


Figure 4.6: Front End User login

On inception the business of the Kenlloyd Logistics was a clearing and forwarding having

HOME ABOUT US OUR PARTNERS EXECUTIVE SUMMARY FLIGHT SCHEDULE FAQs SHIPPING REGISTRATION CONTACT US

**You must log in first**

To access the private area of this site, please log in.

Username  
Password  
Remember Me ☐

Login  
Forgot your Password?  
Forgot your Username?  
Register

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Webdesign by MUHAMMAD ELIAH

Figure 4.8: Core Information Form

KENLLOYD LOGISTICS

CALL +256 312 313500

SPECIALIST PROVIDERS OF LOGISTICS SOLUTIONS

Core Information Form

\*Legal Company Name  
\*Contact First Name  
\*Contact Last Name  
\*Address  
Address2  
City  
\*State/Province  
\*Zip/Postal Code  
\*Country  
\*Email Address  
\*Phone Number  
Fax Number  
\*Shipping Destination Select One

SEND Cancel



Figure 4.9: Become A Known Shipper Form

The screenshot shows a web browser window with the URL `localhost/KenLloyd/become_a_known_shipper.php?a=add`. The page header includes the KenLloyd Logistics logo, the text "SPECIALIST PROVIDERS OF LOGISTICS SOLUTIONS", and a phone number "CALL +256 312 313500". The form is titled "Become A Known Shipper Form" and contains the following fields:

- Closest Airport (airport code): and Name:
- Ways from Airport:
- Shipping warm-blooded animals - including birds?
- What product will you be shipping?:
- Are you a sole proprietorship?
- Will you be shipping products other than

At the bottom of the form are "Post" and "Reset" buttons. To the right of the form are two small images showing a warehouse interior.

Figure 4.10: Credit/Billing Application

The screenshot shows a web browser window with the URL `localhost/KenLloyd/credit_billing_application.php?a=add`. The page header includes the KenLloyd Logistics logo, the text "SPECIALIST PROVIDERS OF LOGISTICS SOLUTIONS", and a phone number "CALL +256 312 313500". The form is titled "Credit/Billing Application" and contains the following fields:

- \*Billing Contact First Name:
- \*Billing Contact Last Name:
- \*Billing Contact Number:
- \*Billing Address:
- \*Billing City:
- \*Billing State:
- \*Billing ZIP/Postal Code:
- \*Billing Country:
- \*Billing Email Address:
- \*Number of Shipments per Year:
- \*Credit Limit Requested:
- \*Type of Industry:
- Date Business Established:

At the bottom of the form are "Post" and "Reset" buttons. To the right of the form are three small images showing a warehouse interior.

Figure 4.11: Cargo Online Registration Form

**KENLLOYD LOGISTICS**  
CALL +256 312 313500  
SPECIALIST PROVIDERS OF LOGISTICS SOLUTIONS

Cargo Online Registration Form

\*First Name:   
 \*Last Name:   
 \*Contact Number:   
 \*E-mail Address:   
 Account Number:   
 \*Forwarder Full Name:   
 Address:   
 \*Town or City:   
 \*State or County:   
 \*Zip or Postal Code:   
 \*Country:

Figure 4.12: Admin System Control page

**KENLLOYD LOGISTICS**  
CALL +256 312 313500  
SPECIALIST PROVIDERS OF LOGISTICS SOLUTIONS

become a known shipper  
 core information  
 create billing application  
 login/register

Cargo Online registration Page  
 Records shown 1 - 6 of 6

Add Record

	*First Name	*Last Name	*Contact Number	*E-mail Address	Account Number	*Forwarder Full Name	Address	*Town or City	*State or County	*Zip or Postal Code	Country
<a href="#">View</a> <a href="#">Edit</a> <a href="#">Delete</a>	efg	gdfg	gacfg	gacd	cg	gdfg	cg	gdes	gosa	ga	ag
<a href="#">View</a> <a href="#">Edit</a> <a href="#">Delete</a>	efg	gdfg	gacfg	gacd	cg	gdfg	cg	gdes	gosa	ga	ag
<a href="#">View</a> <a href="#">Edit</a> <a href="#">Delete</a>	efg	gdfg	gacfg	gacd	cg	gdfg	cg	gdes	gosa	ga	ag
<a href="#">View</a> <a href="#">Edit</a> <a href="#">Delete</a>	efg	gdfg	gacfg	gacd	cg	gdfg	cg	gdes	gosa	ga	ag
<a href="#">View</a> <a href="#">Edit</a> <a href="#">Delete</a>	gtr	rwe	new	new	t	w	tw	wt	wt	wt	wer

## CHAPTER FIVE

### SYSTEM IMPLEMENTATION, TESTING, RECOMMENDATIONS AND CONCLUSIONS

#### 5.0 Implementation

According to John J Coyle, Bord, Lanadey (1984), implementation is the stage of the project where the theoretical design is turned into a working system. It is one of the most crucial stages in achieving a new system. It involves gaining the users confidence that the new system will work and will be effective and accurate. It is primarily concerned with user training and documentation. Conversion usually takes place about the same time the user is being trained or later. Implementation simply means converting a new system design into operation

#### 5.2 System testing

Software Testing is the process of executing software in a controlled manner, in order to answer the question – “Does the software behave as specified”? Software testing is often used in association with the terms verification and validation. Validation is the testing of items including software in order to confirm and to ensure consistency of an associated specification. Software testing is just one kind of verification, which also uses techniques such as reviews, analysis, inspections, and walkthroughs. Validation is the process of checking users’ specifications.

Software testing should not be confused with debugging. Debugging is the process of analyzing and localizing bugs/errors when software does not behave as expected.

Other activities which are often associated with software testing are static analysis and dynamic analysis. Static analysis investigates the source code of software, looking for problems and gathering metrics without actually executing the code. Dynamic analysis looks at the behavior of software while it is executing, to provide information such as execution traces, timing profiles, and test coverage information.

The techniques below have been used to test the program;

- i. For correctness
- ii. For implementation efficiency
- iii. For computational complexity

Test for correctness was carried out to verify that a program did exactly what it was designed to do. This was much more difficult than it appeared at first, even worse especially for large programs.

### **5.2.1 Test plan**

A test plan implies a series of desired course of action to be followed in accomplishing various testing methods. The Test Plan acts as a blue print for the action that is to be followed. The software engineer creates a computer program, its documentation and related data structures. The software developers are responsible for testing the individual units of the programs, ensuring that each performs the function for which it was designed. There is an independent test group (ITG) which is used to remove the inherent problems associated with letting the builder to test the system that has been built. The specific objectives of testing should be stated in measurable terms, so that the mean time of failure, the cost to find and fix the defects, remaining defect density or frequency of occurrence and test work-hours per regression test all should be stated within the test plan.

The program has been tested following the levels below;

### **5.2.2 Unit testing**

Unit testing was used to focus on verification effort on the smallest unit of software design – the software component or module. Using the component level design description as a guide, important control paths were tested to uncover errors within the boundary of the module. The modular interface was tested to ensure that information could properly flow into and out of the program unit under test. The local data structure was examined to ensure that data stored temporarily maintains its integrity during all steps in an algorithm's execution. Boundary conditions were tested to ensure that all statements in a module were executed at least once. Finally, all error handling paths were tested

### **5.2.3 Integration testing**

Integration testing is a systematic technique for constructing the program structure while conducting tests to uncover errors associated with interfacing. The objective of this test was to take unit tested components and build a program structure that was dictated by design. The entire program was tested as a whole. Correction was difficult because isolation of causes was



complicated due to vast expansion of entire program. Once one error was corrected, new ones appeared and the process continued in a seemingly endless loop.

After unit testing in Sell-Soft System all the modules were integrated to test for any inconsistencies in the interfaces. Differences in program structures were removed and a unique program structure was evolved.

#### **5.2.4 Validation testing or system testing**

This is the final step in testing; the entire system was tested as a whole with all forms, code, modules and class modules. This form of testing is popularly known as Black Box testing or System testing

Black Box testing method focused on the functional requirements of the software. That is, Black Box testing enabled the software engineer to derive sets of input conditions that fully exercised all functional requirements for a program.

Black Box testing also attempted to find errors in the following categories; incorrect or missing functions, interface errors, errors in data structures or external data access, performance errors, initialization errors and termination errors.

#### **5.2.5 Output testing or user acceptance testing**

The system considered was tested for user acceptance; this was meant to satisfy the firm's need. The software kept in touch with perspective system, the user at the time of developing and making changes whenever required. This was done with respect to the following points

- i. Input Screen Designs,
- ii. Output Screen Designs,
- iii. Online message to guide the user and the like.

The above testing was done taking various kinds of test data. Preparation of test data played a vital role in the system testing. After the data was prepared, the system under study was tested using that test data. While testing the system by which test data errors were again uncovered and corrected by using above testing steps and corrections were also noted for future use.

### **5.3 Training**

Once the system is successfully developed the next important step is to ensure that the administrators are well trained to handle the system. This is because the success of a system invariably depends on how it is operated and used. The implementation depends upon the right people being at the right place at the right time. Education involves creating the right atmosphere and motivating the user. The administrators are familiarized with the run procedures of the system, working through the sequence of activities on an ongoing basis.

The systems personnel check the feasibility of the system. The actual data was input to the system and the working of the system was closely monitored. The master option was selected from the main menu and the actual data input through the corresponding input screens. The data movement was studied and found to be correct, queries option was then selected and this contained various reports. Utilities provided various data needed for inventory, it was input and the module was test run. Satisfactory results were obtained. Reports related to these processes were also successfully generated.

### **5.4 System Maintenance**

The system was developed purposely for Kenlloyd Logistics Uganda Limited. For better maintenance, the users shall be thoroughly trained on how to use the system. There will also be a system administrator who will be monitoring the system and updating its components whenever needed.

### **5.5 System Documentation**

Getting started with a web based of flight and shipping logistics management systems, follow the procedure below; Go to start menu, my computer, and select Firefox, internet explorer or any browser from the list of folders, Type the url the welcome page will appear and then navigate through the site.

After the necessary operations have been performed, the user should always remember to save changes if necessary and log out.

### **Problems encountered**

- i. Time was not enough since we had to attend other duties and attending lectures. I didn't meet all the respondents we had intended to meet
- ii. Some respondents were biased when giving the information to the researcher.
- iii. Financial resources, the researcher being a private student, did not get enough funds to facilitate the research work.

### **5.6 Recommendations**

Basing on the findings, the researcher made the following recommendations:-

There is need to develop a full Tracking system which covers flight and shipping logistics and then they should be merged together to improve the productivity of the system.

The researcher also recommends that the departments should establish a network for easy sharing of information and software from one office to another.

### **5.7 Conclusion**

A web based of flight and shipping logistics management systems is a great improvement from the manual system using case fields and paper for taking and storing Kenlloyd Logistics Uganda Limited details. The computerization of the system has accelerated the process.

## CHAPTER SIX

### DISCUSSIONS , CONCLUSIONS AND RECOMMENDATION.

#### 6 Discussions

How to speedily deliver products to consumers' hands is a common consensus of operators. Integration of logistics and e-business is the future trend. In order to get more advantageous position and build a complementary and dependent relationship, networking industries, such as Yahoo and e-Bay, usually cooperate with logistics industries. The integration could reduce the middle-level procedures. The producers could immediately give the products over to the terminal customers. This could reduce expenses and also administer sources more efficiently.

Besides, the companies do not have to take the costs of inventory and warehouse, and therefore they become modernized industries of low cost, more efficiency and division of specialty. For example, customers could get ordered goods from convenience stores. Through e-logistics, the competition condition of industries could be promoted in knowledge economics.

Based on the discussions of previous paragraphs, the integration and promotion of business activities have to involve transportation systems at various stages. The integration of various applications brings the convenience through promoting the system of information flow and business operations. Customers and firms could make business more efficient and easier through the help of e-commerce and the Internet. However physical delivery still relies on the transportation system to finish the operations. The cost of transportation operation may be one-third of logistics costs. Meanwhile, transportation systems and techniques are needed in almost every logistics activity. Thus the reform of business patterns has to consider transportation systems.

#### 6.2 Conclusions

This Report covers broadly from flight activities to transportation systems and attempts to determine the role of transportation in logistics systems through extensive review. The main contents of the research include a review of logistics development, the characters of various

transport operations in logistics activities, the applications of logistics in various fields, city logistics, future direction in logistics development, and its cooperation with transport systems.

To sum up, Flight and shipping logistics have some relevance.

- (1) Logistics system has a more and more important position in our society activities.
- (2) Flight and shipping logistics systems have interdependent relationships that logistics management needs transportation to perform its activities and meanwhile, a successful logistics system could help to improve traffic environment and transportation development.
- (3) Since transportation contributes the highest cost among the related elements in logistics systems, the improvement of transport efficiency could change the overall performance of a logistics system.
- (4) Transportation plays an important role in logistics system and its activities appear in various sections of logistics processes. Without the linking of transportation, a powerful logistics strategy cannot bring its capacity into full play.

The review of logistics system in a broad sense might help to integrate the advantages from different application cases to overcome their current disadvantage. On the other hand, the review of transport systems provides a clearer notion on transport applications in logistics activities. The development of logistics will be still vigorous in the following decades and the logistics concepts might be applied in more fields.

### **6.3 Recommendation**

Future prospects of logistics

Facing the worldwide competition, the improvement of logistics system should be advanced by both private companies and government. Weeld and Roszemeijer (Ho, 1997) discerned three revolutions in business that have substantial impacts on the purchasing and supply strategies of the manufacturing sectors. These three revolutions are:

- (1) the globalisation of trade;
- (2) the coming of the information era;
- (3) more demanding consumers and continuously changing consumer preferences.

The main characteristics of future logistics development are:

- **Government role:** To keep competitiveness of industries, the government has to lead the way to assist the logistics industries. For instance, the idea of freight village of city logistics provides the environment to promote logistics efficiency and to reduce operation costs. However it involves large of investments and some problems relating laws and national policies. Without the lead and support of government, achieving the plan is difficult.

- **Growth of international goods transport:** The up-growth of international freight transport is contributed by several factors. Firstly, the blossoming of E-commerce pushes ahead the international business activities. Secondly, the change of production strategy needs international cooperation, e.g. importing the semi-finished products from countries with Proceedings of the Eastern Asia Society for Transportation Studies, Vol. 5, pp. 1657 - 1672, 2005-1669 cheaper human resources to those with higher technology to assemble the final goods.

Thirdly, the pressure of globalised market, such as World Trade Organization (WTO), pushes local industries to promote themselves to reach an international standard and face the worldwide competition.

- **Improvement of services:** Providing a good customer service becomes a necessary requirement of business operation with the intense competition of global market. The quality of services is the main factor to affect consuming behaviour among the enterprises with high similarity. The service systems involve several developed techniques now, such as Efficient Consumer Response (ECR) and Quick Response (QR). In the near future, more new techniques would be applied in providing better services for customers.

- **Revolution of logistics operation:** IT techniques and its products bring efficiency and fluency to the logistics systems. Radio Frequency ID (RFID) is one of these techniques.

The main difference between the bar-code system and RFID is that RFID does not need the action of scanning the barcode on goods. RFID could save manual operation time dramatically. RFID systems could sense the amount of goods input in the tags automatically and immediately when the costumers push their trolley through the exit (Carroll, 2004).

• **Shorter product life cycle:** With the current trend, the merchandise design is changing day by day, and therefore, the product life cycle is shorter and shorter, especially in computer science. To confront the impacts, logistics system must improve its efficiency and reliability of goods delivery. Otherwise an inappropriate logistics system would hinder the competitiveness of new products and the business profits.

• **Improvement of logistics facilities:** The advancement and development of logistics are based on several techniques and complete theories. High-tech facilities and systems, e.g. ITS, could bring more possibilities and advantages to logistics. For example, the improvement of related facilities, e.g. Forklift Trucks, is necessary for transport efficiency.

In the future, factory automation is the main target for the whole supply-chain procedures.

It could help to improve efficiency and also reduce the operation costs.

• **Channel cooperation between companies:** In order to save the logistics costs, a key concept is to maximize the usage of available transport capacity. Integrating the logistics demands between numerous departments helps achieve this purpose. In practice, a conglomerate could develop its own logistics service for the branches. For some medium size companies, they could cooperate transport channels with others.

• **Specialized logistics delivery:** One of the notable trends of logistics industries is specialized delivery service. For instance, delivering fresh food from the place of origin needs low-temperature containers. Compute chips, gases and petroleum need particular conveyances to carry. These demands are rising since the products became more and more delicate.

• **Logistics centres:** The development of logistics centres is good for industry promotion and the development of national economic system. Logistics centres could successfully shorten the distance between production and marketing vertically and also integrate various industries horizontally, and thus decrease the costs. Governments can propose special areas for storehouses and logistics to reduce land acquisition. The future logistics will cooperate e-commerce, the Internet and the newly door-to-door service to create new business prospects.

- **Freight transport:** The alliance between middle-small size delivery companies is an important trend in the future. The strategy could help to expand service areas and increase service quality, and meanwhile raise the loads of single trips to reduce delivery costs.



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## APPENDICES

### Appendix I

#### APPENDIX A QUESTIONNAIRE SCHEDULE

I Muhanguzi Eliah a student of Kampala International University pursuing a Bachelor Degree in Information Technology, One of the requirements for this award is a project Report for a running software system. This questionnaire is designed to find out the requirements for the above tool. I therefore kindly request you to assist me with the required information in this questionnaire. I promise to keep all the given information confidential and highly guard due rights. Thank you for your cooperation.

Name of the Company

.....

**Qn1 Does your company have a policy on use of web based of flight and shipping logistics management systems)WBFSMs?**

Yes ☐

No ☐

If yes, please summarise the policy or attach a copy.

.....

**Qn 2 What priority does your company give to considering use of WBFSMs when:**

a) tendering for work or ☐

b) implementing contracts? ☐

c) Both ☐

**Qn3 Does your approach to using WBFSMs vary depending on the geographical location of the work?**

Yes ☐

No ☐

If yes, please summarise any differences

.....

**Qn4. Do you have targets for percentage use of WBFSMs on contracts?**

Yes ☐

No ☐

If yes, please provide further details

And if so, do you meet/exceed these targets – if not, are there any particular reasons?

.....  
.....

**Qn 6. Has your company signed up to the Supply Chain Charter?**

.....

**Qn 7 Are there any comments you would like to make on the use of SCRRs?**

.....

## Appendix II

### TIME FRAME (GANTT CHART)

	Month	Mar	April	April	May	June	Aug- Sept
Activity							
Feasibility study							
Data collection							
Proposal/analysis							
Design							
Coding							
Testing							
Implementation							
Report writing and documentation							
Presentation							

### Appendix III

#### BUDGET

PARTICULARS	AMOUNT
Transport cost	10,000/=
Paperwork	100,000/=
Hardware	2,200,000/=
Software	200,000/=
Labour	400,000/=
Total	3,050,000/=