AN INTEGRATED WEB-BASED TRANSPORT MANAGEMENT SYSTEM

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A DISSERTATION SUBMITTED TO THE DEPARTMENT OF COMPUTER SCIENCE IN PARTIAL FULFILLMENT OF THE REQUIMENTS FOR THE AWARD OF MASTER'S DEGREE (M.Sc) IN COMPUTER SCIENCE

JUNE, 2016.

APPROVAL

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DEDICATION

This research work is dedicated to God Almighty whom His infinite mercies has made it possible that this research work be completed to this stage, to my parents, Mr./Mrs. Igboke Ekuma also to my lecturers especially my supervisor, Mr. Ekemezie W.N whose ideas and corrections resulted to the successfulness of this work.

ACKNOWLEDGMENT

I wish to appreciate the wonderful efforts of all those who have contributed in one way or the other to the success of this research work. My profound gratitude and unlimited praise goes to my supervisor, Mr. Ekemezie W.N, whose guidance and directives throughout the course of this research work is being made manifest. I also confer special thanks to the head of the department, (H.O.D), Dr. Ituma, C for his wisdom and advice which fine-tuned my research topic during the approval stage. Also, to the PG co-ordinator, Dr. Mrs. Alo and all tutorial and non-tutorial staff of the department, I say thanks to you all. My unalloyed gratitude goes to my parents, Evangelist Mr./Mrs. Roseline Ekuma, for their ever, unseasoned moral and financial support that always guided me through. My regards once more, goes to all my course mates and friends, especially, Ogah Sunday, Eneji Samuel, Igwe Sylvester, Eboigbe Samuel and Igboke Faith. All these people contributed in one way or the other to the success of this work.

To GOD Be The Glory.

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ABSTRACT

An investigation into the manual transport management system has been carried out with a view to design an Integrated Web-based Transport Management (IWTMS) for developing countries, particularly Nigeria. The blending of various services of different transport companies into one website is proposed. This is to enable transport company customers/users access the services of any company of their choice, at all times, from any location, for services such as bus booking, currier services, job application and online enquiries, etc. Sequel to the above reasons, necessary information was gathered to define the requirements of the new application from historical records and policies of the Federal Ministry of Transport and National Union of Road Transport Workers (NURTW). In addition, to design and develop this system, the Unified Modeling Language (UML) was used to model the software and Entity Relationship Diagram (ERD). Both have been established to describe a plan which executes the requirements gathered earlier. The system is designed with MYSQL and wamp server to read and extract data from database connectivity (ODBC) compliant at the back end. The front end is designed and fully implemented using PHP and dream weaver, thus making it user friendly and highly interactive. Object-oriented design methodology with structured programming approach were used in designing and program coding of the system, which ensured that all relevant components of system were incorporated in the design. This new system will help both the company customers and the administrator to analyze and establish a standard in transportation management process such as booking, currier services and recruitment exercise. The system when fully developed will not only assist company managers and the company customers/users to minimize uncertainty in the transport company's schedules and in decision taking tendency of the managers, but will enhance the company's efficiency effectiveness. The system will equally guarantee the credit payment system.

CHAPTER ONE

INTRODUCTION

1.1 BACKGROUND OF THE STUDY

If at all there were any better era to live on earth, it is at present simply because the computer era provides a lot of fantastic chances which our forefathers dreamt of. Toughest labour now is not seen to be the major determinant of monetary success empowerment other than smartness, knowledge and experience. Since the invention of computer over fifty (50) years ago, it has been closely linked with the development in every facet of human activity. In today's ferociously competitive world of push button technology, computer glaringly holds the ace over a nation's place of development. The computer world is on the fast lane and changes take place every two months.

Over the years, before the advent of computer technology, people toed the path that should better be described as "dark path". This ugly trend was imposed by lack of technical knowhow required to do things with relative ease. The capability of this smart machine is almost unlimited, the volume of information normally housed in archives are fast disappearing, since they can be cheaply stored in computer memories for quicker access in decision making. Computer can think and take decision based on instruction given to it with high speed, accuracy, greater efficiency productivity. Computer can act as human beings in areas of artificial intelligence as used in expert system, robotics, and speech recognition synthesis. According to Mbam (2002), the application of computers to the various facets of human endeavors has proved those professions by reducing the time needed to accomplish a given task and hence maximizing productivity and through put in the concerned establishment. In a bit toward handlings with the great flood of information, it has led to persistent quest for a more sophisticated means of dealing with information faster and better. Moreover, faced with the dilemma of contemporary age, it is pertinent to explore the dynamics of technologies within reach to build greatest of information channels today, in other to guarantee a successful tomorrow.

It is only through wide spread understanding and application of those potential that we can make choice of the future.

The pace with which computer develops is partly described as the third industrial revolution spearhead by USA, Japan and Western World. This revolution development pace is not much in developing countries like ours, that is, they are having a hard time keeping, for us in the underdeveloped country. Computers are underutilized in some sector like Banks, insurance companies, transport companies, oil sector are much better in terms of computer utilization, they are fully computerized and networked. Think of Bank how much it will cost them to employ (cashier), somebody to be paying customers/people twenty four hours every day, months and years even in the midnight on Sundays. That is gain of computer Network.

Computerization does not mean doing away with staff but using a computer package to run its offices, which can always be adapted to whatever they are doing.

Most of this sectors that adopted the application and use of computer have seen that computer is the simplest thing on earth to use, some calculators and phones are not even as simple as computers. With computer you will be able to rule the world where a Nigerian can earn multiple streams of income for life with simple business that flow thousands of dollars into your life daily even while you sleep or do other jobs. With knowledge and experience you can run multi-million naira earning business through the use of computer network called Internet. As at June 2001 over 23.7 million businesses were registered on the internet (yet, that close to 23,000.000) in dot.com" alone and over twenty thousand are registered daily. At present the number is staggering, more than three trillion dollars is transferred daily on the internet as e-currency for various business activities why this, massive rush to the internet? Why is virtually everyone taking his or her business to the internet? Well to me, I don't think more than a hundred million people can be crazy at the same time. There must be some big stuff about this internet that those of us who are not yet connected are missing

out on. If I were you instead of shine away the idea of internet, you have no choice other than to be part of the internet or you may be left behind still living in the Stone Age world.

The communication technologies have altered the way people look at life and business specially e-mails and e-commerce including the standing in a queue to pay bills or buy travel tickets is the toughest, especially in cities like Abakaliki, Enugu, Lagos, Port Harcourt and Abuja as the serpentine line of people never seems to end.

Bus Reservation and Ticketing are transactions which are currently done through phone calls or direct communication with the personnel in charge of it. With phone calls, the customer tells the basic personal information and some necessary data with regards to the availability of the bus like time of departure, bus type and desired seat. But that is just reservation: confirmation is done when the customer pays the bills. However, it is already considered as booked.

On the other hand, with the direct communication with the person in charge of the reservation and ticketing, the passenger needs to go to the bus company or in the bus terminal to fill in the form with the basic personal information. Also, the customer should give the payment right away. During peak season, passengers tend to go to the bus terminals ticket counters. With the existing processes of the bus companies in terms of reservation and ticketing, numerous inefficiencies and problems can be recognized. Firstly, it would be costly for the customer to go to the bus company or bus terminal just for the reservation. Secondly, it would be time consuming for the customers to fall in line just to get a ticket considering the peak seasons like November, December January, March and April. Thirdly, there are customers who are not satisfied with the chosen seats because the actual layout of the bus is not available for viewing. This would cause discomfort to the passengers.

With the help of this Integrated Web-Based Bus Reservation and Ticketing System, the customer can reserve a ticket anywhere and anytime with own choice and requirements. This provides the comfort that the customer doesn't have to stand in the long queue for the whole day and even night

to book a ticket. This also provides the actual layout of the bus which can help customer in choosing a desirable and comfortable seat.

Moreover, this will also assist the customer to book a ticket in case of emergency. With the help of this system, a ticket can be booked from any part of the country and for any part of the world urgently through online. It have been discovered that bus transport service companies in Nigeria have not understand the significance of having the new technology of Integrated Computerized Transport Management Systems (ICTMS) in place, which they employ labor-intensive systems in their daily activities. However these labor-intensive methods make most of the transport companies operation difficult to effectively manage their day to day activities. It is against this background that this paper identifies and characterizes the current challenges confronting transport management system in some cities like Abakliki, Enugu, port-Harcourt and Lagos.

Moreover, Web-Based Freight Booking and Tracking System is another aspect of the Transport Management System that is used to track all information pertaining to Freight Transportation.

1.2 STATEMENT OF THE PROBLEM

With the existing processes in transportation companies; in terms of Transport Management systems, numerous inefficiencies and problems can be recognized. Such as:

(i) Company customers are unable to access different Companies' information at the same time.

(ii) Inability to view the services of other company

(iii) There is little or no security control where the customers' transaction with the company could be tracked.

(iv) It requires more number of staff to carry out administrative task of the company.

(v) Ineffective payment system as it could be made to wrong account.

1.3 AIM AND OBJECTIVES

The research aim of this work was toward the design and implements an interactive, user-friendly and robust Integrated Web-based Transport Management System (IWTMS), for transport companies in Nigeria.

Specific Objectives

It is the hope of the researcher to critically analyze transport system in Nigeria, identify problems with the present transportation management system, proffer tentative solution to the identified problems, suggest to the dealers a way forward in the transport services if need be.

The Web-Based Transport Management System is hoped to achieve the following;

(i) To develop a module of the system that will display and integrated web pages of different transport companies.

(ii) To develop a module that will allow customers (users) book for bus reservation and print bus ticket online for any company of their choice.

(iii) To design a section of the module that will manage the online payment system (supply bank details) of the users.

(iv) To develop a module that will enable the company administrator track and control users' transaction with each company.

(v) To design a module that monitors fraud and criminal acts by the users.

(vi) To facilitate the effective generation and analysis of reports of any users.

(vii) To minimize the number of company staff for each company.

1.4 SIGNIFICANCE OF THE PROJECT

As mentioned in the previous section, the Integrated Web-Based Transport System (IWBTS) will be exceptionally essential to customers among others.

(i). IWBTS is essential to customer because customers can view services of different transport companies

(ii). IWBTS is ease of use with bus ticket online.

(iii) Book for goods shipment and access the personals' information online.

(iv). Moreover, customers' goods security is assured.

1.5 SCOPE OF THE STUDY

Integrated online transportation system is developed to be used by different transport Company users and the general public in any of the developing Countries; such as Ghana, South Africa and Nigeria as a case study. However, the features incorporated in the system can also be used by transport companies/transporters in other countries, this system can be used both in private and public transport industries. Some features can as well be applied by other institutional industries that her operation requires booking and job employment system.

1.6 LIMITATIONS OF THE PROJECT

This work titled Web-Based Integrated Transportation Management System (WITMS) is a generic web-based application designed for agents ticketing and clients' reservation. It therefore, does not include the followings:

(i) Tours

(ii) Discount/refund payments

(iii) Personnel payroll system and

(iv) Bus maintenance services

CHAPTER TWO

REVIEW OF THE RELATED LITERATURES

This chapter reviews literature relating to Transport Management and optimization System and procedures as well as the procedures contained by the freight company involved or engaged in freight services with a view to know their pro and con of their services.

2.1 TRANSPORTATION SYSTEM

Road transportation involves the transportation of goods and people from one location to other; in other word it involved the movement of goods and people on land. According to Cohen and Highan (2011), the movement of commodities on roads depends on the level of local infrastructure, distance travelled and the weight of luggage and volume of person s to be transported.

2.2 MODES OF TRANSPORTATION

Mode of transport is the word commonly used to differentiate between the different ways transportation are being done or are to be performed. The leading modes of transportation are land which includes rail, road, off road; others are aviation and ship transport. However the other modes of transportation that included the cable transport, space transport and the pipelines transport. There is human powered and animal transportation which are regarded mode of transport on their own but normally still into other major leading mode transport categories.

However each one of the mode of transport has different technological solution, infrastructures, and required a separate environment to operation. They often have unique regulations and separate subsystems.

2.2.1 Road Transportations Systems: This type of transportation system is identifiable route, through which a city or village and named streets are serving a dual function as urban space easement and route. The users of this type of transportation are the automobile such as buses,

trucks, motorcycles, bicycles and pedestrians. The automobiles in this transportation system offer high flexibility and deemed with energy and main source of air pollution.

2.2.2 Pipeline Transport: the pipeline transportation carries goods through a pipe which are mostly liquid and gases. The pneumatic tubes can also carries solid capsules using compressed air. In this mode of transport, any chemically stable liquid or gas (petroleum and natural gas) can be lifted through a pipeline.

2.2.3 Cable Transport: the cable transport is the broad mode where vehicles are pulled by cables instead of an internal power source. Cable transport is the most commonly used at steep gradient. Typical solutions include aerial tramway, elevators, escalator and ski lifts; some of these are also categorized as convey or transport.

2.2.4 Space Transport: The space transport is out of the earth atmosphere into outer space by means of a spacecraft. The researches done into its technology through the scientific experiment shows that it is rarely used expect to put satellites into orbit. However, man has landed on the moon, and probes have been sent to all the planets of the Solar System.

2.3 COURIER/FREIGHT TRANSPORTATION

The courier and freight transportation services accept cargo for road transport. In courier transport driver operate independently either working directly for the client or through freight carriers or shipping agents. For instance the Grocery Store Chain operates their own internal trucking operations Hongqili and Hongtao, (2010), according to Robert (2012), in American Trucking Association foundation.

2.4 ENABLING TECHNOLOGIES IN IWTMS

2.4.1 ICT and Internet

In recent past, the absence of proper mode of information flow and data communication subjected man to perpetual darkness. A number of measures and courier services were adopted in other to link up people at distanced location but it could not salvage the changing needs of the present time. The situation forced good spirited knowledge seekers to desire the acquisition of suitable technology that would help to unravel the ugly trend. This is as a result of the volume of data handled by continuous increase on daily basis. According to Inyiama and Okezie (2005) “ordinary mail services were often very slow and unreliable which never get to their respective destinations”. They equally observed that special currier service were very expensive which could not allow every person use it except the very desperate that are very rich to use that method of access to industrial data base information.

In view of the high advancement in the word of information and communication brought about by such technological innovations such as the introduction of computer services. Computer is virtually applied in every facet of human endeavor being very faster and safer. Manual method of transaction in places of economic, political and social interest such as governmental agencies, industries, private and public business enterprises has been phased off. That is to say that information and communication Technology (ICT) has tremendously imparted on the fabrics of both developed and developing societies like ours, Mbam (2002). This technology has facilitated free and easy flow of adequate industrial and managerial information. This is achieved through computer network especially the one called Internet a vehicle for accelerated information superhighway. In this context, data communication, and information flow by electronic means is an ICT tool generally pioneered by the computer Network. The Internet incorporates EDI, Electronic Mailing, live chart, browsing electronic data interchange EDI, Electronic Fund Transfer and newsgroup etc. this

achievement powered quick and reliable financial transaction, library services, education, sports, health service delivery and governance all done electronically.

In his report, Amosa (1998), maintains that "electronic formats of information transfer offered by the computer Network (Internet) has enhanced the ability of investor and their advisers to make informed investment decision so that data base of an organization can be analyzed more readily". According to Mbam and Ezeora (2006), "having recognized the potential of the computer Network and ICT for general socio-economic development, the Nigeria Government has a duty to ensure that technology policy assists in reducing the gap between the information and technology, rich and poor". They equally observed that the youth constituting the major part of Nigeria population and being the future leaders of the country should be a special target of the computer Network and ICT revolution. But any reliance on their subversion will be viewed by officials as an attempt to encroach into their exclusive arena of treasury lootings. It is my candid view that they do not even know the relevance of computer Network and software development and usage, if they know how well to do it, they would have incorporated one of their cronies. Nigerians should know that another industry with greater potentials than oil in terms of employment and earning is just what we need in this country to stem the current tide of unemployment, social unrest and poverty. This can be achieved if our software industry and computer are fully networked using men to greater potentials that can make good consultations and functional committees that are result oriented. Action is louder than voice.

2.4.2 The Online Booking/Reservation System

According to Pedone (2001), the widespread use of internet has led to the emergence of a variety of electronic services. Examples of such electronic service are e-service and e-electronic ticket. This gives evidence to their holders to have permission to enter a place of entertainment and used as a means of transportation or have access to some internet services. The users get the e-tickets by

purchasing them from web server or vendors. In Online Booking/Reservation System, a user first has to relay on its server for validation before using an e-ticket.

2.4.3 3G & 4G Technology

According to Guo and Guowei (2012) there is advances in cellular technology which have increased the demand of accessing the internet dramatically. The cellular technology not only enables mobility but also allows redundant connectivity using multiple wireless paths to improve availability, reliability and performance. The Ceserar and Gonzales (2008), said that with the hybrid approach, the WiFi 3G augment service was a smart interim solution that offloads data from ubiduits but shows 3G to intermittent yet fast WiFi networks. However, Rakesh and Jhgland (2012) this requires constantly switching between Wi-Fi and 3G technology and often breaks the existing connection into several short, possibly delayed sessions. These as follows are the features of the technology

The enhanced throughput: the basic aim of using this technology multi-path TCP is to improve and enhanced throughput of the system. Therefore the multi-path TCP connection should perform at least as well as a single-path TCP connection on the best of all used paths.

The balancing of load in the technology: The multi-path TCP connection moves traffic from its congested path to other paths as much as possible. A more extreme case would be when a path breaks, a multi-path TCP connection should move all the traffic from the broken path to other working paths, and maintains the connection as stable as possible.

Technology availability and its robustness: the travelling of goods from one place to another, the mobile users might receive services of certain technologies from all carriers at one place, or in suburban areas. Since service can die or degrade from cell to cell, data transport with multi-path TCP can still offer a quality service regardless of the poor performance from certain carriers.

2.5 VEHICULAR COMMUNICATION SYSTEMS

2.5.1 Enabling Technologies

In the enabling technologies, there are numerous technologies that have been deployed to assist and manage transportation system. Recently the concerted efforts in academia and industry point to a paradigm shift in intelligent transportation systems. Vehicles will carry computing and communication platforms, and will have enhanced sensing capabilities. They will enable new versatile systems that enhance transportation safety and efficiency and will provide infotainment. IEEE Communication Magazine, (2009), and Guan and Ning, (2014) a flat roof automobile antenna modulo foe LTE, GPS and SDARS applications.

2.5.2 Intelligent Transportation System.

Intelligent transportation systems (ITS) are advanced applications which, without embodying intelligence as such, aim to provide innovative services relating to different modes of transport and traffic management and enable various users to be better informed and make safer, more coordinated, and 'smarter' use of transport networks. The aim of intelligent transportation system is to enhance the effectiveness, efficiency and safety of the transportation system. However the intelligent transportation system technologies

depends in part on the knowledge of which technologies are most effective. Thus, it is important to understand the benefits of emerging and existing technologies.

2.5.3 Traffic Surveillance and Monitoring

In the traffic surveillance and monitoring, its crucial goal is to supply information about conditions in the field to other system components so that appropriate response and control actions can be taken. According to Rhandarkar and Xingzhi Luo (2005), the traffic surveillance and monitoring strategies include the use of closed-circuit television (CCTV), system detectors, and communications networks. These tools can help improve incident management, inform control

decision-making and determine traffic conditions for information dissemination, while surveillance enhanced traffic operations and planning by servicing the purposes. They include as found in http://www.benefitcost.its.dot.gov.

• Detection and verification of incidents that have an impact on traffic operations;

• Monitoring of incident clearance;

• Monitoring traffic for emergencies and special events;

• Monitoring of traffic operations and supporting the implementation of control strategies, such as adaptive ramp metering and automated traffic signal coordination systems (ATCS);

• Monitoring pavement and environmental conditions; and

• Monitoring of traffic operations to generate data for planning and research purposes. These data can lead to information on space-time series on link travel time, link space mean speed, traffic flow rate, space occupancy, and origin destination flows. Data collection can be accomplished through a number of detector surveillance technologies that measure traffic parameters including inductive loop detector and magnetometer, which are embedded in the roadway.

2.5.4 System Transit Management

As part of the Advanced Public Transportation Systems (APTS), automatic vehicle location (AVL) systems and computer aided dispatching (CAD) systems allow transit agencies to optimize vehicle resources, providing valuable information for operational control strategies that reduce the number of vehicles necessary to provide the required level of service . Another ITS application that has proven to be effective is transit signal priority (TSP) for improving the on-time performance of buses or light-rail Benefits of Intelligent Transportation Systems in Urban Areas. TSP allows buses that are behind schedule to increase the length of a green phase, shorten the length of a red phase or shorten opposing phases of a traffic signal and proceed through an intersection. TSP enhances the reliability of bus service, improving both customer satisfaction and the efficiency of the transit operation and resulting in cost reductions for transit service providers. TSP systems

require close collaboration between the transit provider and the local agencies that have jurisdiction over the arterials and traffic signal system.

2.5.5 Incident Management Systems

Incident management programs can reduce the effects of non-recurring congestion by decreasing the time to detect incidents, reducing the time for responding vehicles to arrive, thereby reducing the time to return the facility to normal conditions. (Redmill and Coifman, 2006). Congestion caused by incidents is estimated to cause approximately 50% of congestion delay on the nation's highway. The delays lead to major road closures and adversely affect the safety of the transportation network. When incorporated into a traffic management system, incident management systems can broadcast information about incidents to travelers suggesting alternative routes and broadcasting information through the media, HAR, and variable message signs that can reduce congestion and traveler delay. Incident management also includes improving the efficiency of hazardous materials (HAZMAT) response. The premier incident management program evaluation was a true before and after study conducted on Interstate 880 in Hayward, California in 1995. The Bay Area Freeway Service Patrol (FSP) evaluation focused on a 9.2-mile freeway test site and collected 276 hours of incident and freeway data. This experiment was conducted during morning and afternoon peak periods on 24 weekdays prior to the implementation of the FSP and 22 weekdays after implementation.

2.5.6 Emergency Management Systems

Improved notification, dispatch and guidance of emergency or other response equipment are among the benefits of an emergency management system. Safety and response times of emergency vehicles can also be enhanced by emergency vehicle preemption. In Albuquerque, New Mexico a map-based computer-aided dispatch system is used for its fleet of ambulances. The exact location of an

emergency is given and guidance is provided by the dispatch center using the system. The response efficiency has increased 10-15% as a result of the system. Few data have been collected in the area of Emergency Management. As the ITS deployments become more prevalent and the U.S. Department of Transportation ITS Public Safety program develops, more information on the benefits should emerge in the future.

2.5.7 Road Traffic Management

Traffic is a social issue of enormous economic and environmental importance. Torday and Aymami, (2012). Due to the high cost of infrastructure and present financial constraints, a series of traffic control and management techniques have been developed to achieve a set of objectives: increase infrastructure capacity; increase efficiency; prevent congestion and reduce its extent and duration; increase road safety and reduce environmental impact. Traffic management relies on a set of tools or strategies that allow the optimization of the objectives mentioned above. These strategies can be characterized as user information systems (such as transmitting information via variable message signs or broadcasts) or traffic control systems (such as control of access ramps, reversible lanes, variable tolling and adaptive signal control).

2.5.8 Decision Support System for Traffic Management

The generic architecture of decision support systems (DSS) for traffic management contains the following elements: Australasian Transport Research Forum 2013 proceedings (Publication Website: http://www.patrec.org/atrf.aspx)

Real-time data: System input consists of real-time data from different types of detectors located in the network (detecting density, capacity, speed), as well as Present and future methodology for the implementation of decision support systems for traffic information relative to the day of the week, meteorological conditions, incidents, special events, road works and refurbishment on the road network.

Historical data: System input consisting of previous real-time data stored for later use in determining situations or recurring traffic patterns.

Monitoring: The system has a module for monitoring the state of the road network in real time. This information can be:

complete or partial on a spatial level: complete monitoring at all levels of the road network (lanes, sections, turns, crossroads, intersections, axes, etc) or a subgroup of network elements (this subgroup is normally limited to network elements located in the same areas as the detectors. See the figure 1 for example).

Complete or partial on the level of traffic variables: the simultaneous monitoring of different traffic variables in the network elements (densities, capacities, speeds, queues, journey time, levels of services, emissions, consumptions, e.t.c) or limited to a subgroups of variables (this subgroups normally limited to variables provided by detectors located in the network, typically capacities and speed)

With different levels of physical aggregation (lane, turn, section, intersection, system etc) and temporal aggregation (5, 10, 15, 60 minutes)



Figure 1: Example of partial monitoring Casas and Torday,(2013), Research Forum Retrieved from website: (http://www/Scholar.google.com/scholar=Aimsun)

(d) Predictive System: The system has a module for predicting the state of the road network based on historical data and real-time data. Predicting the state of the network provided, depending on the methodology used, complete or partial future data in terms of space as well as the number of traffic variables.

(e) Strategy analysis: The system has a module that can determine the set of strategies to evaluate for the mitigation and anticipation of congestion(s) using network monitoring of the current state as well as the future state. As a result, this module a set of indicators for each strategy so that the operator can determine which strategy is best to implement on the streets.

Figure 2 shows the generic outline of a DSS

Present and future methodology for the implementation of decision support systems for traffic management

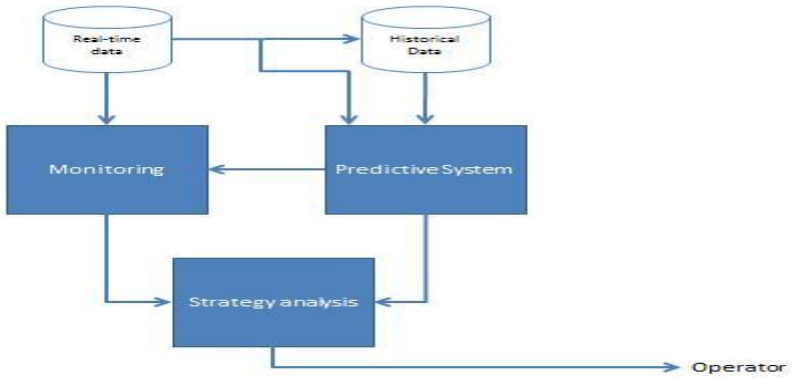


Figure 2: Architecture of DSS

(Figure 2), is the architecture of Aimsun Online (Torday and Aymamí, 2012).

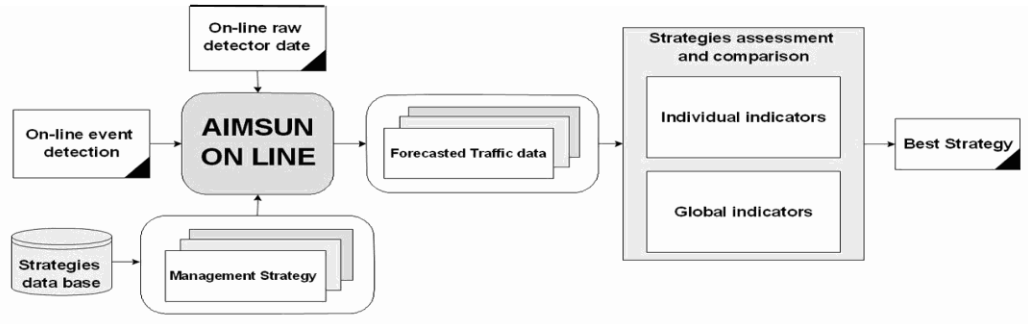


Figure 3: Architecture of Real-Time/Historical Data

2.6 REAL-TIME DATA /HISTORICAL DATA

Currently, real-time data in most cities is limited to what is available from detectors, which basically provide capacities and occupancy. The problem with the location of sensors is that this is determined by the specific objective of their original implementation, which is in Present and future methodology for the implementation of decision support systems for traffic general limited to traffic signal control. This initial objective does not always meet the requirements of spatial coverage necessary for good traffic monitoring.

Figure 3 shows different networks with the location of all the available detectors in real time and the partial coverage they provide. The predictive system should analyze real data to determine the future state of the network in the short term. To carry out the prediction requires the classification of the real data into ‘similar’ days, determining these days by classifying detection data into patterns. (Casas et al, 2012) show different methodologies for classifying patterns in the real data and the determining anomalous situations (outliers) Present and future methodology for the implementation of decision support systems for traffic management.

CHAPTER THREE

METHODOLOGY AND SYSTEM ANALYSIS

This chapter focuses on the review of related literatures, journals, books etc. on Intelligent Transportation Management System, considering both manual and computerized transportation systems. This review enhances effective and efficient analysis and design of the proposed system.

3.1 METHODOLOGY

The term methodology is defined to be the orderly compilation of techniques, procedure and guidelines on how to build and maintain or enhance software products (Gottesdiener, 1998). According to Gottesdiener, (1998)

> *"The term 'method' refers to an approach to activities generally adhering to common principles. 'Methodologies' go beyond this approach to incorporate guidance for business analysis, project planning and management, project processes (e.g. estimation, metrics, risk management), quality assurance, testing, role and responsibilities, reuse and architectural design)".*

Methodology describes the method in which the system to be developed is analyzed, structured, organized in order to achieve a workable software product. According to Elliot (2004), the method that is used to structure, plan and control the process of developing an information system is referred as system development methodology.

System development methodology is needed in order to drive home the expansion of information system in methodical way needed for each stage of the life cycle of the information system from the inspection of the idea to delivery of the final system.

Different methodologies are always employed in analyzing information system. Among them are waterfall method, iterative and incremental development method, extreme programming method, object oriented method, spiral application development method, prototyping method, rapid development prototyping method, Structured Systems Analysis and Design Methodology (SSADM), etc. (Elliot, 2004).

One particular system development methodology might not fit in use for all kind of information system development base on the technicality of the system to be developed; as such a more convenient method is selected based on the analysis of the system.

3.1.1 Waterfall Development Methodology

In Waterfall Development Methodology, the information system is broken down into phases and presented serially flowing downward from the requirement stage to finally stage. In waterfall development methodology, tasks were building into sequential phases. Waterfall methodology emphasis deals with the planning, time schedule, implementation, budgeting and target date (Green and Dicarterino, 2014). It s good in the sense that progress are measureable alongside with development and it conserve resources. This method is good for less experienced project teams or managers, though it is inflexible, cumbersome especially for a large system, slow and costly and creates little room for use of iteration (Hurges, 2004).

3.1.2 The Structured Systems Analysis and Design Methodology (SSADM).

SSADM was known to be the set of techniques, standards and guides for the analysis and design of computer systems. The method consists of principles that describe the structure of the project in the form of explicitly defined tasks, with clearly defined interfaces between them, and clearly defined real products; it is the technical guides that provide a staff with a set of proven usable techniques and tools, and detailed rules and guidelines on when and how to use them. It deals with documentation standards, which provide the means of recording the products of development activity at a detailed level (Government of the Honkong Special Administration Region, 2012).

According to the Government of the Honkong Special Administration Region, (2012), the Structured Systems Analysis and Design Methodology are the most common available skill such as Data Flow Modeling, Logical Data Modeling and Jackson-like structure diagramming. However

in this context, SSADM techniques promote the forward planning and building up the skills base in particular projects. SSADM therefore improves quality, flexibility, and productivity of information system.

SSADM best suits in the development of system that requires quick delivery and meeting user's need as well as improving on the successful and profitable use of the skill available, and get better efficiency and output.

3.1.3 Object Oriented Methodology (OOM)

This methodology is a slight improvement on structured system analysis and design methodology where focus was on the data and the processes or attributes that make up the data called object. The methodology is a current technique which is useful in analyzing large software and encourage portability of codes as codes can be re-use. According to (Jones, and Richey, 2000), OOM has been able to handle problems of data and processes associated with the older methods by providing a convenient way of creating specific data and the processes that creates, read, update and delete data, and integrated into construct called an object which suits in managing software with ease and facilitates re-use of software (Whitten, Bentley, and Dittman, 2001), ("Object Oriented Methodology", n.d, para. 3). This method supports data hiding, polymorphism and data abstraction which makes it suit for the analysis of large information systems development.

3.1.4 Choice of Methodology

This work was design and analyzed using Structured System Analysis and Design Methodology and waterfall method as well as Object Oriented Methodology (OOM). As both methods were used, SSADM suits in analyzing and designing large system like the IWTMS which produce clearer view of the units, components, procedures, functions including some other sub-systems alongside their respective relationships, while OOM will give a clearer picture and the representation of the objects

(data and processes) as contained in the IWTMS. OOM also provide designs that can easily modified or updated.

3.2 THE EXISTING SYSTEM

In the existing system, System Analysis was critical study to the obtainable system as to come up with an improved system that will outweigh the previous system in both operation and economy. (Mbam, 2002), defines system analysis as the process of analyzing or evaluating the existing system to find out how it works and how it meets user's need.

In System Analysis, a whole system is broken down into its simpler components (sub-systems) to give room for critical examination and evaluation to gain in depth knowledge of the existing system as to make gainful and meaningful amends.

In this work, a thorough system analysis is required to know exactly how TMS goes about in transportation system, the associated difficulties and problems as to come up with a sound and dependable system for Transport Management.

This study seeks to provide efficient and effective ways of going about Transportation void of huge cost, double/multiple booking, encourage total application and eliminate totally the stress involved in queuing up to obtain traveling ticket in developing countries like Nigeria.

3.2.1 Information Gathering

Thorough investigation of the old system (Transport Management system) is required to have a clear view of the background data for effective automation of the old system. The following were the measures used to gathered relevant data for the background information about the old system;

1. **Experience:** The researcher having been engaged transportation exercise for over ten (10) years now has a wealth of experience in the subject matter which was articulated and used adequately.

2. **Review:** Documents from Transport Companies concerning Bus Reservation/Ticket Booking were adequately reviewed for the purpose of updating knowledge. This is very essential as to enhance directions and result achievement.
3. **Observation:** Records of the past Bus reservation exercise were carefully observed for tangible facts and events about operational realities.
4. **Interview:** Individuals, groups, and stakeholders were interviewed by asking relevant questions that relates their experiences to the research.
5. **Discussion:** High ranking transport officers/dealers were engaged in discussion about transportation which created room for the researcher to have the views of transport companies about modern trends required for the existing system.

These activities were applied in the review of the object system and also helped in making strategic decisions with respect to the system. Pertinent factors such as the data, the process, and the interface building blocks of the system were carefully analyzed to represent owners/users perspectives. At present, information at our disposal captured the required data and integrated same with the process.

3.2.2 Analysis of the Existing System

Bus Reservation and Ticketing are transactions which are currently done through phone calls or direct communication with the personnel in charge of it. With phone calls, the customer tells the basic personal information and some necessary data with regards to the availability of the bus like time of departure, bus type and desired seat. But that is just reservation: confirmation is done when the customer pays the bills. However, it is already considered as booked.

On the other hand, with the direct communication with the person in charge of the reservation and ticketing, the passenger needs to go to the bus company or in the bus terminal to fill in the form with the basic personal information. Also, the customer should give the payment right away. During peak season, passengers tend to go to the bus terminals ticket counters even in the wee hours and stand in large and long queue of people to book a ticket.

3.2.3 Organogram of Bus Transportation Company

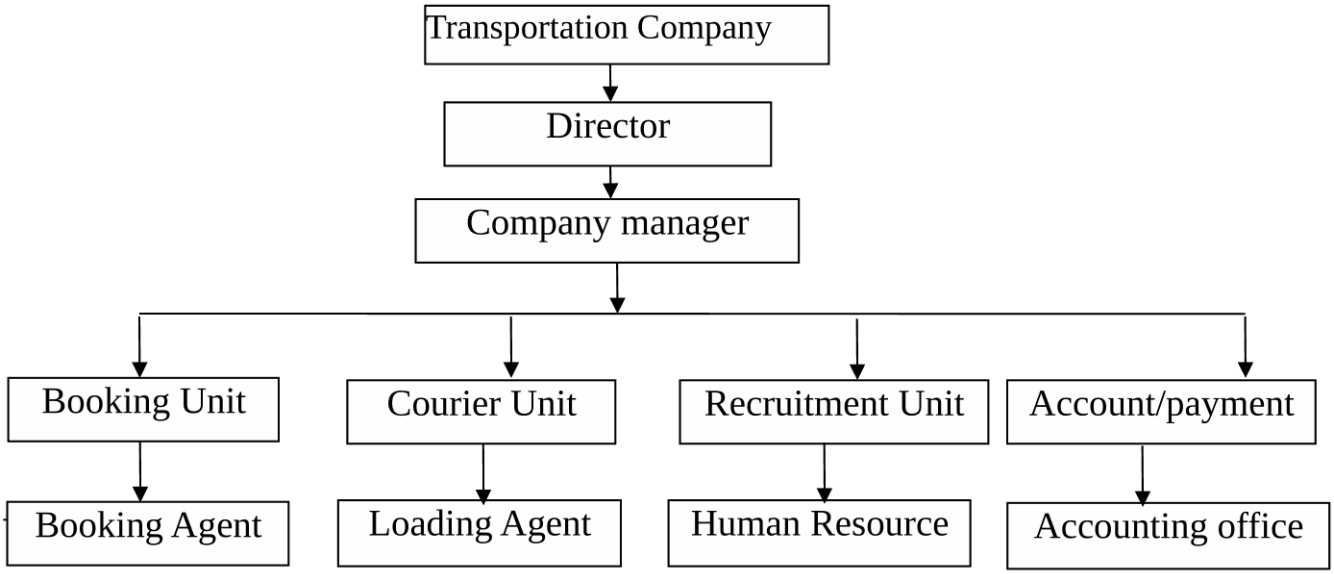


Figure 4: Organogram of Bus Transportation Company

Moreover, courier services refers to the transportation of goods and document from one region or location to another in order to meet up with our day-to-day economy and also ensure security of these goods. Courier services helps business and individuals transport important documents, packages, and other items. Here, the person using courier services of any particular transport Company takes his/her goods to the Company, the loading agents weighs the goods and quotes amount of shipping based on the weight and distance intending to travel, thereafter, payment is made to the account section and further registration/documentation of the parcel is done, taking note of its source and destination.

Finally, recruitment/employment of the workers/staff is run manually, in the sense that anybody desiring to be employed, puts up an application letter to the company and after due process of verification and examination, if found worthy, such person will be employed to work with the company.

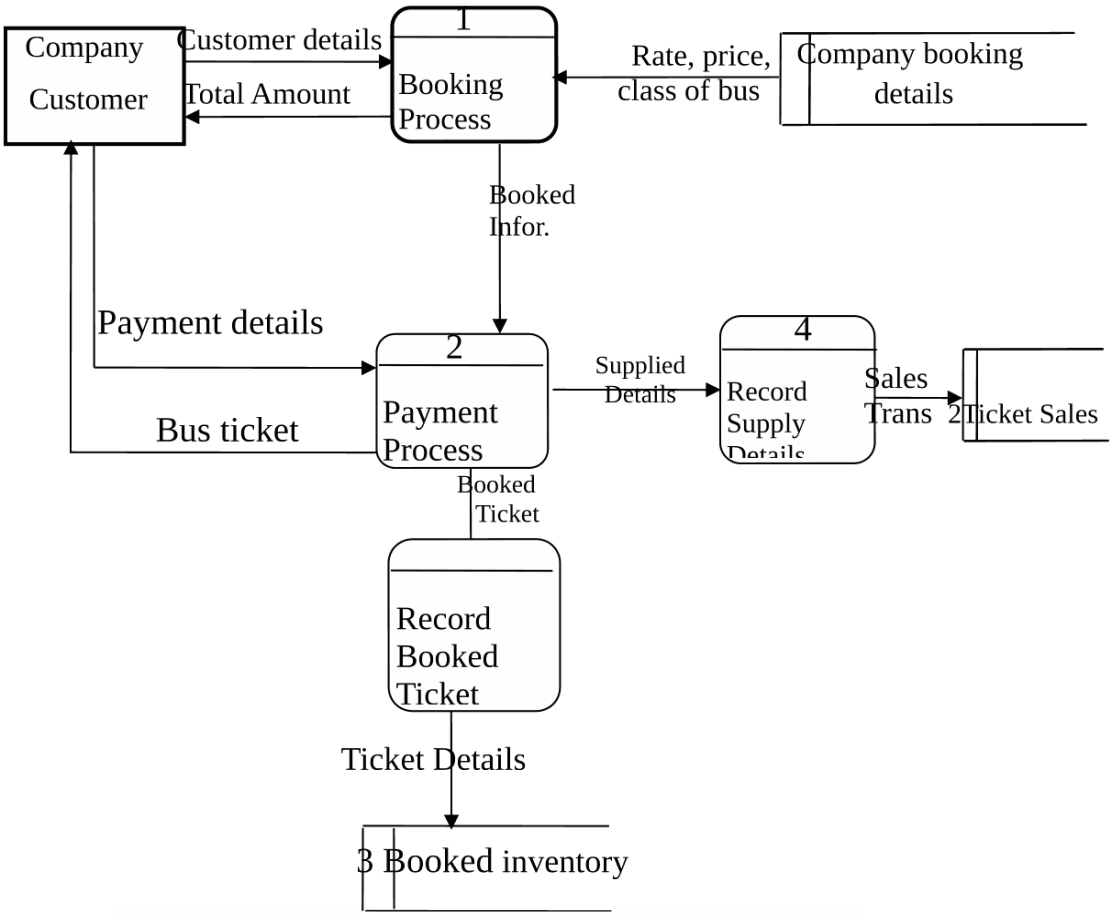


Figure 5: Data flow diagram of the existing (Bus booking) system

The following steps describe the old system as contained in the DFD diagram above.

(1) Any customer wishing to embark on journey goes to any transport company of his/her choice.

(2) The customer on reaching the booking counter, supplies his/her personal details.

(3) He further chooses a particular bus No, sit No, route, date, class of bus and pays for the charges.

(4) Thereafter a bus ticket is issued him; immediately after due payment.

(5) The customer then takes his ticket along on the day of travel to board a particular bus in his ticket.

(6) The accountant further records any financial transaction pertaining to the sold ticket and the supplied ticket in store.

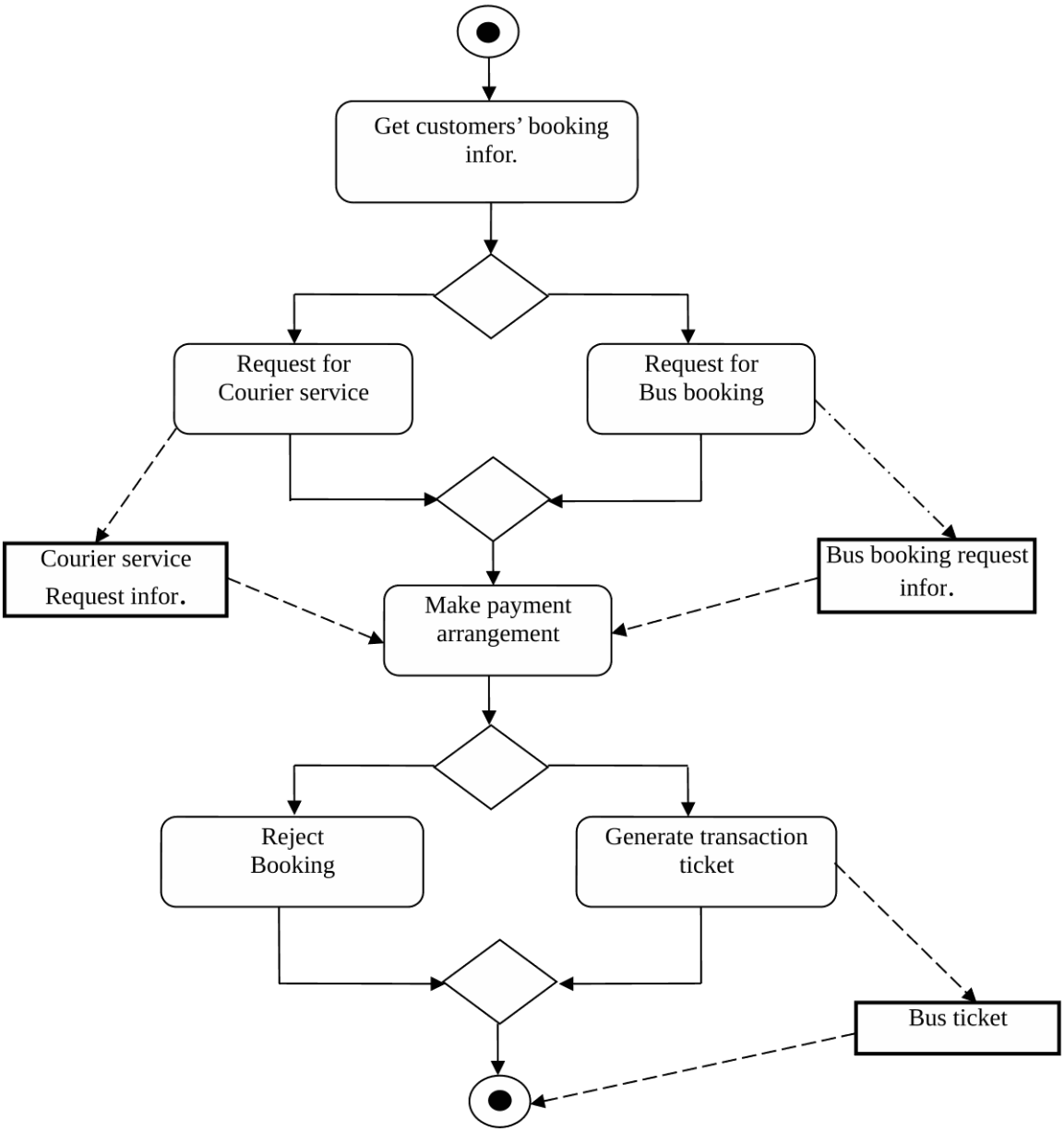


Figure 6: Activity diagram of the old system.

From the above diagram, the sequences of steps required by company customers for effective booking application are shown clearly. The activity diagram is made up of six different processes (activity); these are Get customers' Booking information Request for courier services, Request for Bus Booking, Make payment Arrangement, Generate Booking ticket and Request Booking. The operations carried out by company customers to get a bus booked for a particular trip are as explained below.

1. The customer goes to the company and queues on the counter to make request of either to book a bus

2. He request for company's courier services (shipment of goods)

3. The customer further proceeds to make payment of whichever request he/she has made to the company's cahier.

4. If the payment is actually made the ticket/receipt of the transaction is produced by the cashier otherwise the request is rejected if not backed by the corresponding bill payments.

Sequel to the diagram above, we have about three classes (objects) which include courier Request info, Bus Booking Request info, and Bus ticket objects. These represent different objects that are connected to a set of object flows.

3.2.4 Limitations of the Existing System

According to pressman (2006), every system in existence now is a solution or a support of a previously existing system. For a new system to emerge, the limitation of the existing system can be solved or supported.

The followings are the limitations of the existing systems that were reviewed:

(1) The manual system is very awkward to use

(2) The transaction documents of are held on physical files and are prone to manipulations by any staff.

(3) There is no technology to be used to identify administrators.

(4) The booking and courier services delay customers during the manual processing.

(5) There is no technology to track and monitor customers' goods on arrival.

(6) It wastes funds and resources.

(7) There is a lot of uncertainty and unreliability in the old system.

(8) There is no avenue to access the services of other transport companies.

(9) None of the existing electronic transportation management system has the feature to integrate different/multiple companies.

CHAPTER FOUR

SYSTEM DESIGN AND IMPLEMENTATION

This chapter aimed at specifying what the user would see both on the main system and composite sub-system and show what the entire design will look like.

4.1 SYSTEM DESIGN

In the system design, it is the study of the critical analysis of the unit and component of the system to arrive at. This stage defines issues the way there are, and the way things are done.

4.1.1 Design Objectives

The IWTMS has been structured to effectively relate in terms of the following design objectives;

1. **Input Definition:** Displaying the format of each data field or element coming into the system
2. **Output Definition:** Describing the printouts or providing terminal display.
3. **Data Element Dictionary:** Defining all data fields that are to be inputted, computed, stored and reported.
4. **Logic Definitions:** Illustrating complex logical relationships necessary for input, computation and reporting information using flowcharts and other known techniques.
5. **System Flowchart:** Providing a graphical representation of the system, using symbols to represent operations and data flow as earlier shown in the previous chapters.

The various design specifications will be linked together such that the input, computation, logical processing, storage reporting of each item of information can be accessed forward or backward from the point of origin to its final use which makes implementation easy.

4.2 Information Structure Design

This work makes the design specification quite precise without unnecessarily restricting the selection of the best available means for developing the final product. This establishes the fact that

the relationship between information structure design and hardware/software is similar to that of architectural design and building materials.

4.3 The Proposed System

The new/proposed system, “Integrated Web-Based Transport Management System” (ITWMS) refers to the online management of various company’s transportation activities; such as Bus Booking, Courier service and Recruitment exercise for multiple transport companies.

The system is “Integrated” in the sense that it presents multiple web pages of different transport companies in a single website and makes available different services offered by each company users (customers) to access these list of transport companies on one page, view their activity schedules and thereafter choose a particular company to use in making either a travel trip, courier service booking or apply for job vacancies.

Other Characteristics of the Proposed System Includes

(a) Easy to access records: these new system will provides the analysis of data effectively with efficient results

(b) It provides privilege access to a stored data in such a way that the system captures data from any customers that request (applies) for any service

(c) The system will be customers and user friendly: The proposed system when put in place will be user friendly because of its operational quality in retrieval, analysis including reporting of information.

(d) **Bus tickets are easily generated:** Tickets or verification codes are easily generated in the proposed system to complete a given transactions.

(e) Management Reports: Reports are dully generated, this enables the manager/and the admin to take urgent decisions pertaining to the welfare of the company.

(f) None paper works: this proposed system does not require paper work. All the data that will undergo analysis already exists in the target databases.

(g) Advantage of strategic support and competitive: The proposed system supports strategic competitive advantages. Since the proposed systems provide the easiness in report generation.

(h) Administrators' control: Company administrator will have complete control over the proposed system, there will be reoccurring defects.

4.3.1 The Proposed System Specifications

The new system will run on Microsoft Windows platform. It will run on any client workstation with minimum configuration. The system is designed to run offline on stored data.

For the system to run effectively, the hardware and software specifications are as follows:

Supported operating system is only Microsoft windows; the system will also supports the following databases at the back end MYSQL. The system can run on a minimum hardware configuration of 1GB FDD, 512MB RAM, Pentium 3 of 735 MgH_2 of processor.

4.3.2 High Level Model of the Proposed System

This entails developing a model to identify the data elements and components that requires web-based automation and data flow to represent the logical design of the proposed system.

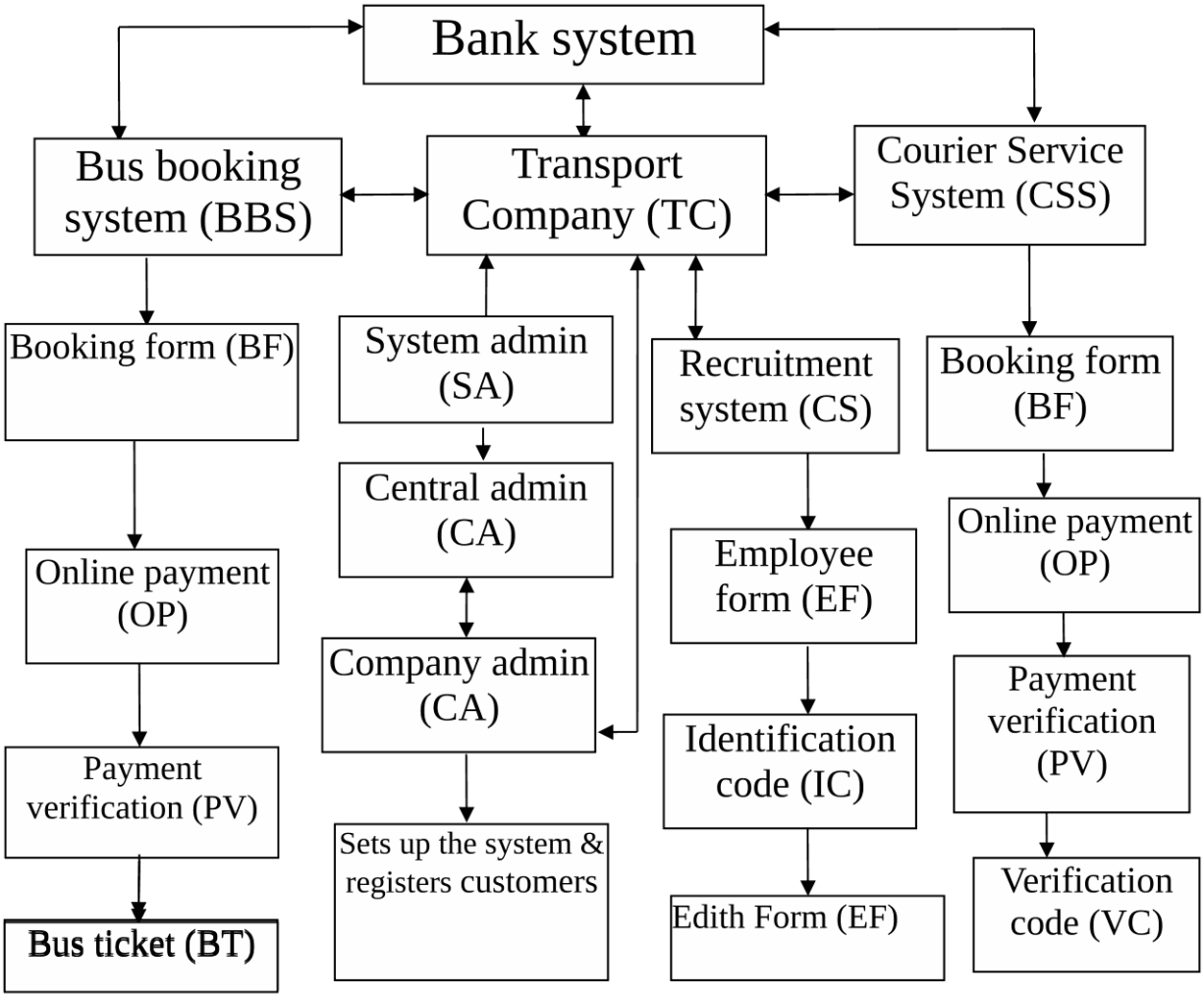


Figure 7: High Level Model Of The Proposed System

The diagram above represents the integrated web-based transport management system (IWTMS). It is made up of four (4) subsystem; Bus booking system (BBS), Courier Service System (CSS), Recruitment system (RS), and System Administrator (SA).

In the development of IWTMS, we shall in this work employ various flow diagrams such as; data flow diagram (DFD), Sequence Diagram, Activity Diagram, Context Diagram, etc. in various stages of the development depending on whichever may be so desired to explain the subsystems. A flow diagram generally helps users to understand how the system works and probably suggest necessary modifications in the proposed system.

4.3.3 Data Flow Representation of the Proposed System.

For the purpose of clarity, the IWTMS is represented in the following formats of data flow;

(A) Context Diagram Of The Proposed System

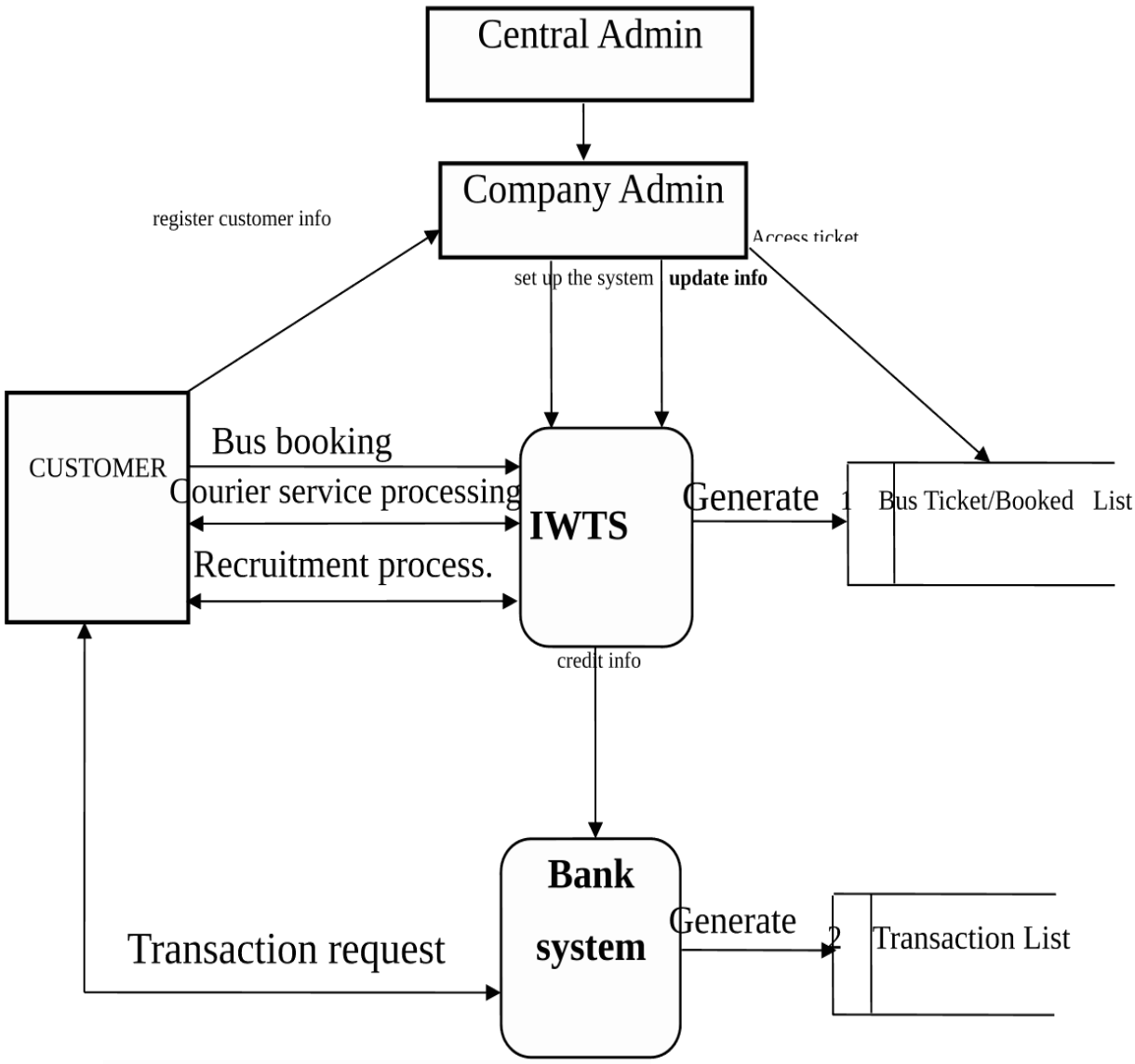


Figure 8: Context diagram of IWTS

The context diagram above identities six (6) entities which are the Company Customer (CC) or user, company Administrator CA, IWTS, Bank system (BS), Bus ticket (BT) and Transaction list (TL).

The Following Steps Describes the Context Diagram Above

1. The central Administrator (CA) Registers transport Company and create the company Administrators Account.

2. The company Admin (CA) in turn sets up the booking system and as well registers customer in terms of courier services; for different companies.

3. The customer/users can book for bus, courier and apply for job vacancies to any company of choice.

4. The customer's bank has inter-switch mechanism to all the company and can debit the customer whenever a valid transaction is made.

5. The customer after booking, requests for a deduction of a corresponding amount charged for the service from his bank.

6. The bank in turn credits the company and sends a debit alert to the user.

7. The bank as well generates a transaction list (Report) for the bank for further references.

8. The IWTS equally generates list of those that booked for a certain period of time (daily, weekly, monthly or yearly as the case may be) and the bus ticket as the main output for the system.

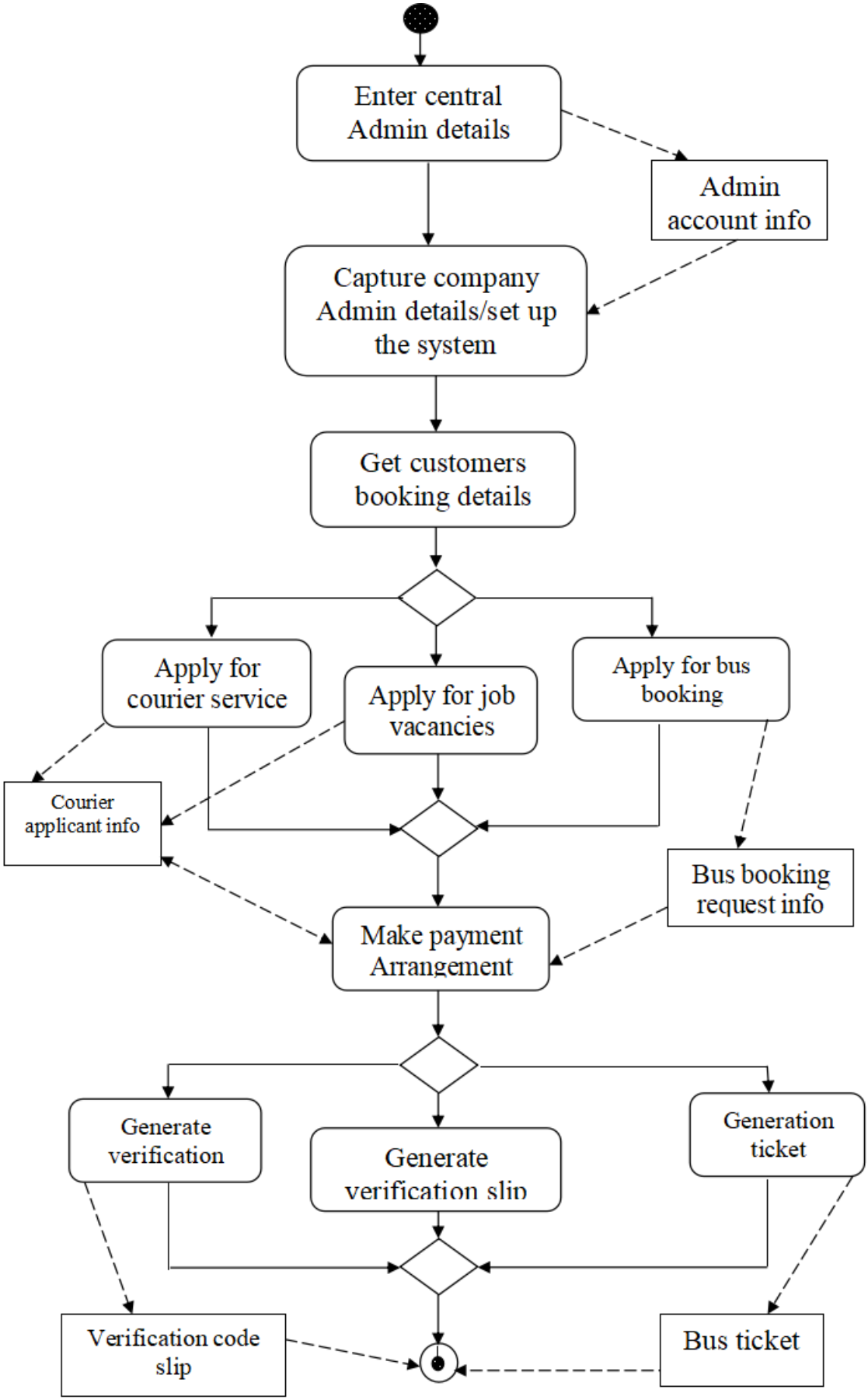


Figure 9: Activity Diagram

From the above diagram, the sequences of steps required by the company customers for effective services are shown clearly. The activity diagram is made up of ten (10) processes. This includes (1) enter central Admin Details (2) capture company admin details/set up system (3) get customers details (4) request for courier services (5) Request for bus booking (6) make payment arrangement (7) Apply for job vacancy (8) generate verification code (9) generate ticket and (10) Generate Verification Slip.

The objects include (1) Admin Account info (2) Courier service request info (3) Bus booking request info (4) Bus ticket and (5) verification code/slip.

The operations carried out by the IWTS in order to satisfy the users includes

(1) The central Admin, as the owner of the IWTS system, registers different transport companies into the system, and assign username and password to them,

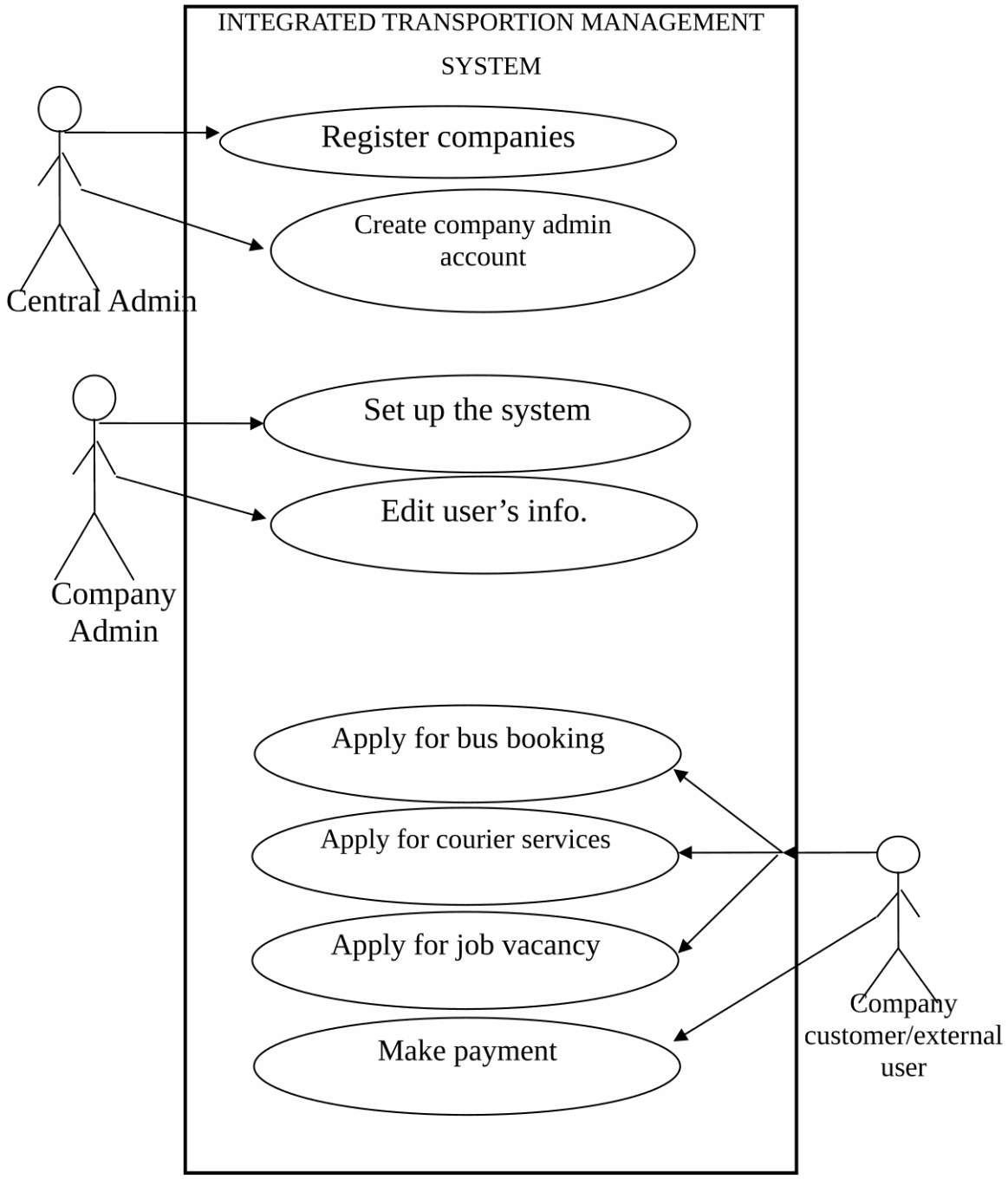
(2) The registered company then has right to set up her own transaction/information into the integrated system to permit users/customers to make use of the system.

(i) Applying for bus ticket by booking bus online, and make payment right there

(ii) Requesting for courier service online through the online service and obtain a verification code for clearing the goods by the recipient.

(iii) The customer can as well apply for job vacancies if advertised through the system; in which case a verification slip is generated to the user to come with on the interview day.

For the purpose of emphasis a use case diagram for the context diagram above is presented below



The illustration above demonstrates the simple functionality of the system and the t kinds of users that are meant to interact with it. We can see from the diagram above that the Central Admin, Company Admin and Company Customer will use the integrated system to register companies, create admin accounts, set up the transportation system for various companies, edit users' info; Apply for either bus booking, courier services or job vacancies and as well make transaction payments respectively.

The major actor in the above system is the company customer/external user who is expected to carry out the later actions (booking activities) in the system

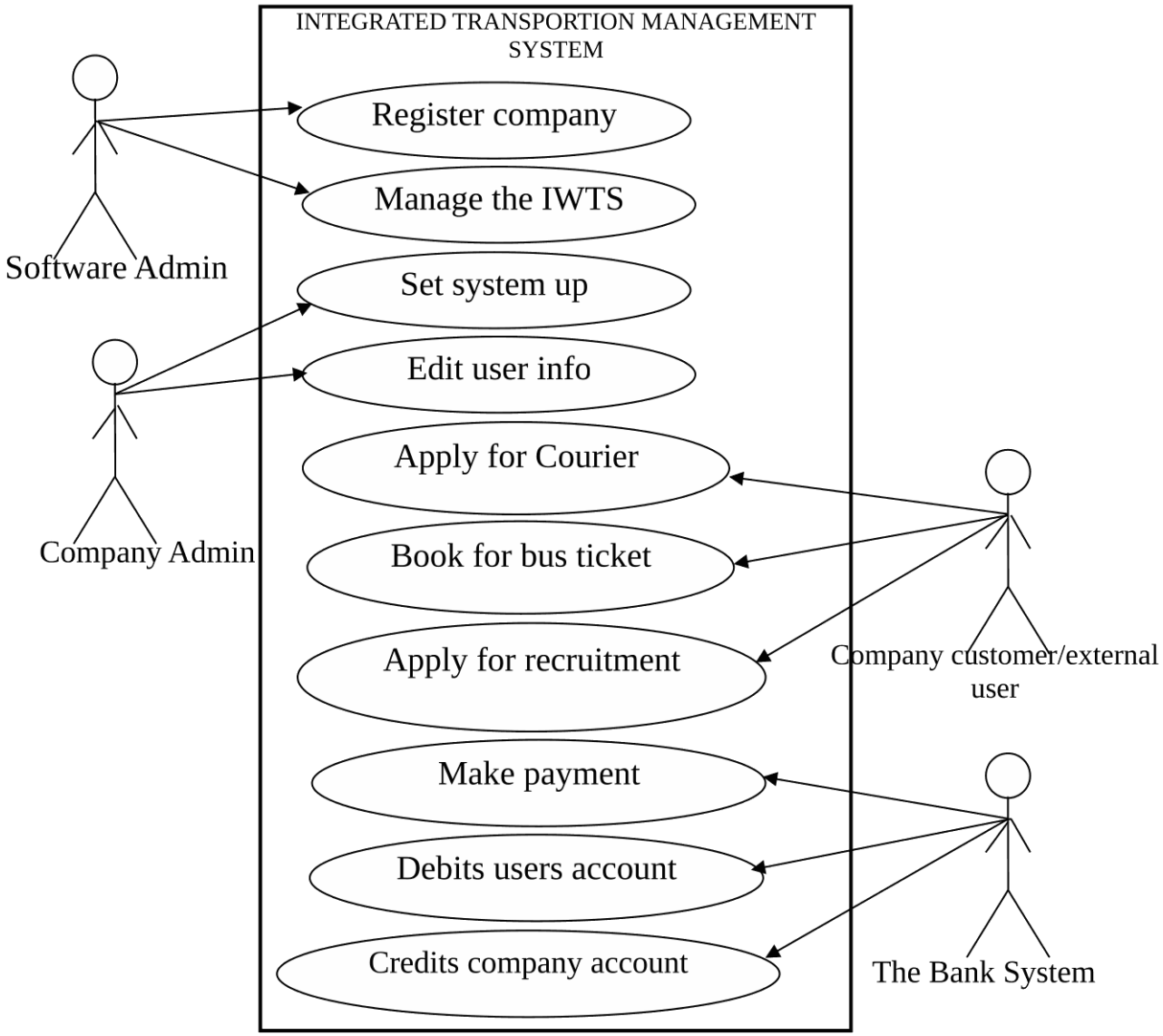


Figure 11: Use Case Diagram of IWTS

4.4 Architecture of the Systems

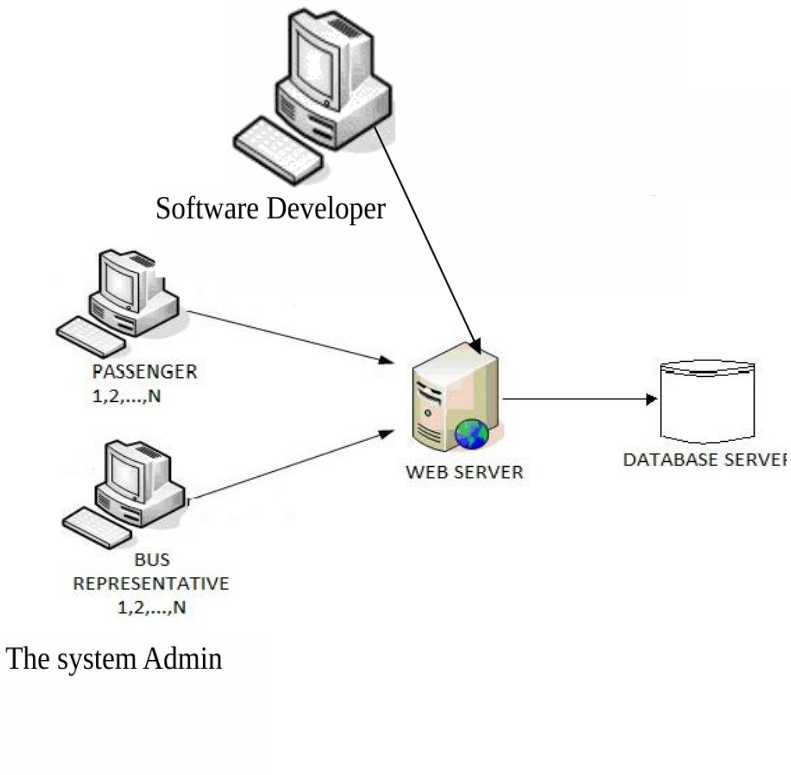


Figure 12: Architecture of System Design

The architectural design (See figure 12 above) of the project is four-tier architecture where in the Passenger and the Bus Representative will access the web application through the web server and if data storage will be needed during the access of the web application, it will access the database server to store the data. The leftmost level is the presentation tier wherein user can be seen. The major work of the interface is to convert tasks into the user understanding. The middle level is the logic that manages request, processes the commands and do the logical decisions by performing calculations.

4.5 SOFTWARE ADVANCED ANALYSIS TECHNIQUES

The study highlighted the use of software advanced analysis techniques such as Unified Modeling Language (UML) to design the web-based application. Class Diagrams to show graphically the visual model which presents the collection of static elements of this field. The class diagram of

IWTMS as shown below in Figure 13 below

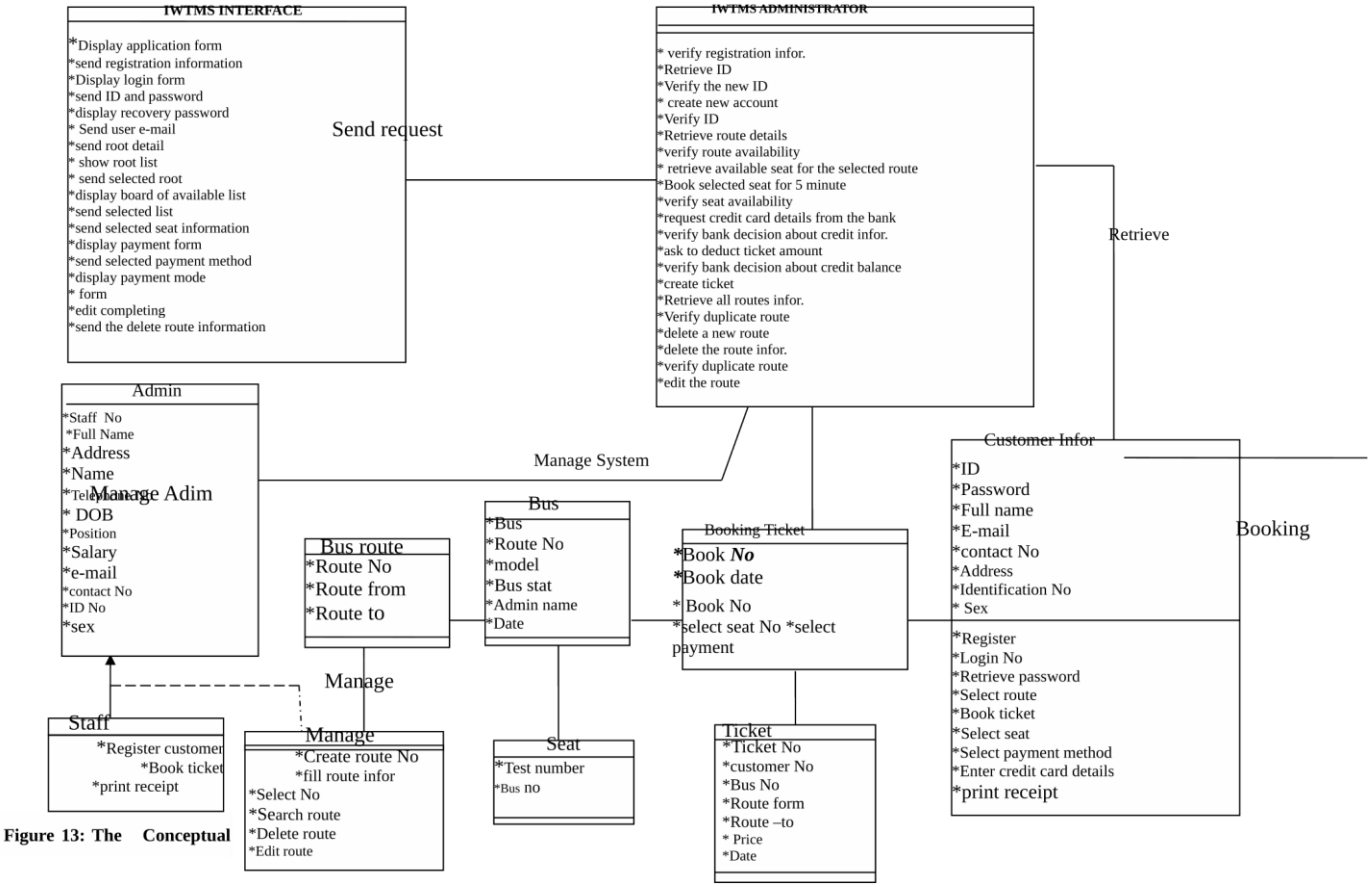


Figure 13: The Conceptual Model

Other software advanced analysis techniques used is the sequence diagram**:** This is the kind of diagram of interaction that show how the process of operate with one another in the system and in what order in which the system works. The sequence diagram involves the construction of a Message Sequence Chart. In this technique, the interaction processes the user and the booking ticket. The sequence diagram for this system is shown below.

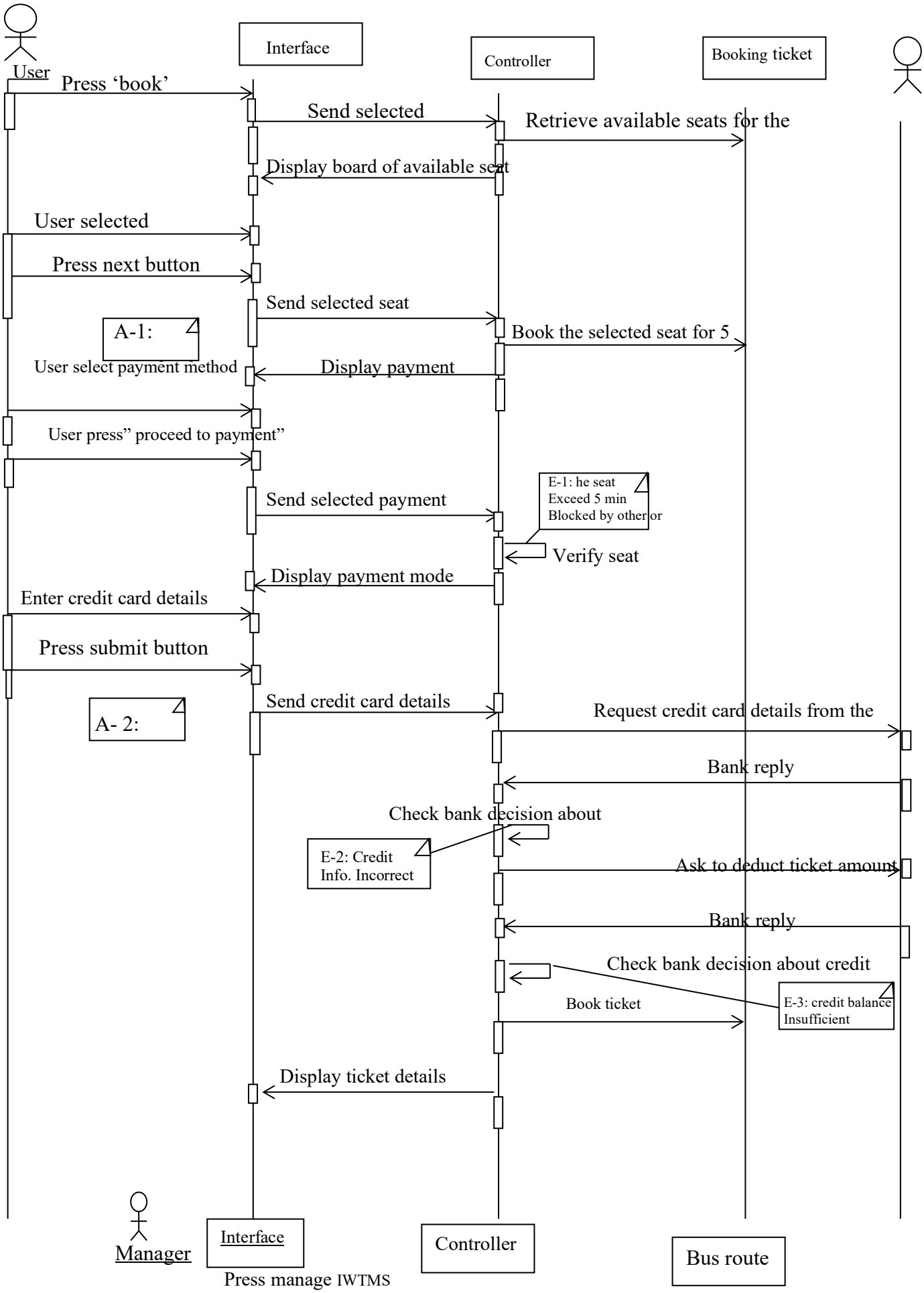


Figure14: Sequence Diagram for Use Case System

4.5.3 Entity Relationship Diagram

The techniques relationship in the system known as Entity Relationship Diagram (ERD) is a kind of graph or diagram that visually show the individual set, characteristic and the relationships between them in a database. The ERD uses to down approach to database design by recognizing the essential records called entities and the relationships among the records that represent the model. The entity relationship diagram designed for this project or system is show in the figure 15 below.

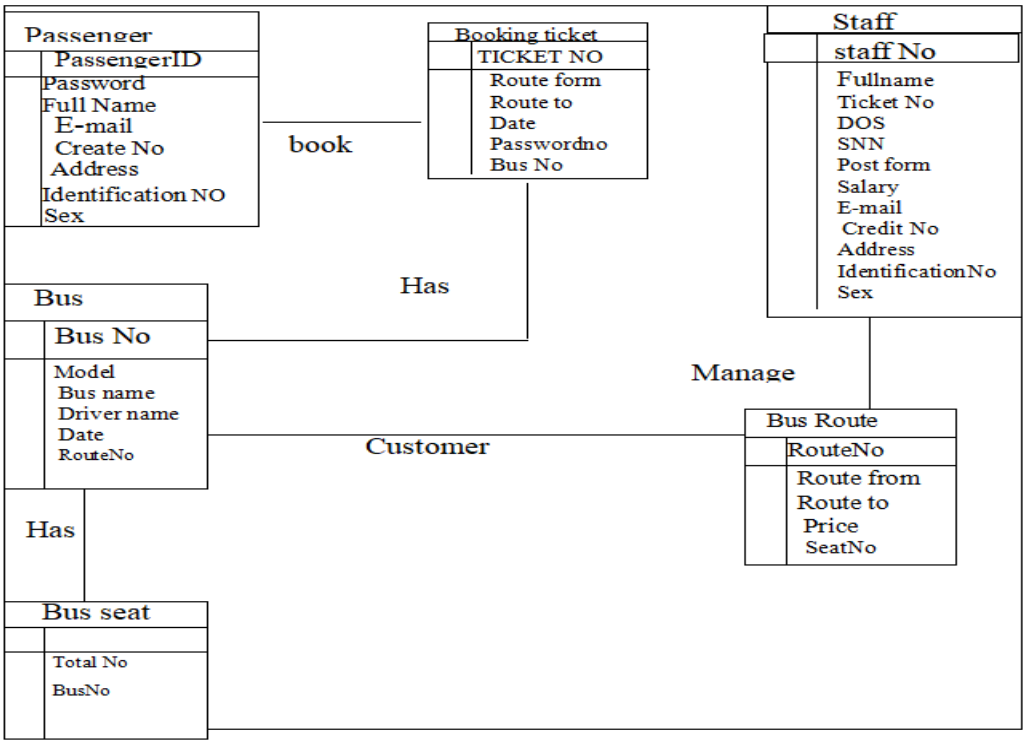


Figure 15: Entity Relationship Diagram (ERD) of IWTMS

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4.6 Justification on the New System

The users of the system are expected to buy bus tickets online which they pay for the ticket online through credit card. Other transport company will also take queue from the users by the using the system platform. Furthermore, the platform provided online in the system is expected to help ease the operational efficiency cooperation especially the counter staff at the selling counter who issuing a numerous tickets daily. The platform would also assist the others users of the system such as branch manager in their calculating their daily collections and in generating reports. However, Transnational which are be made are expected to increase as passengers' satisfaction is almost guaranteed with the availability of accurate information, shorter queues and better services.

4.7 Requirement Analysis of the System

Web-based system requires proper analysis of background facts regarding the system. It improves project goals by defining the functions and operation of the defined application, it analyzes end user's information needs, and it considers what is needed to come up with the new system which is achieved through the collection of detailed analysis of available records and the nature of transactions by the present system. In requirement analysis, (Kingsley 2013) is of the view that software professionals begin application development with analyzing the customer-defined objectives and goals for the project. These objectives are usually presented in the specification document and serve as a strict guide to model the system. In depth knowledge of what is obtainable in the moment and what is actually needed is the basis of the analysis.

The fundamental building block of this system consists of the data structure together with the operations performed on the data structure. The core objectives of analysis in this work include;

1. Identification of users/transporters' needs as contained in the specification documents

2. Feasibility study
3. Define allocation of functions
4. Define functional relationship among the objects
5. Technical and economic viability of the system

4.8 Program Flowchart of IWTS

The system flowchart below describes the overall structure of the design. It begins with the administrator login into the IWTS to register individual transportation companies into the system and further create account for each of them. The system is made up of about six sub systems which provides company information to the visitors, Bus Booking; performs bus booking task to generate bus ticket, Courier Service renders shipping services to the users, the Job/Career, provides recruitment services to the users, Contact Us provides a platform for the users to feed the company administrators back and the bank Details displays various bank details to any visitors to complete any commenced transaction. The design begins from the main menu driven interface so simplified that any visitor can progress without necessarily being a computer professional.

The flowchart in figure 16 below depicts the typical system flowchart from which the entire system design implementation was drawn

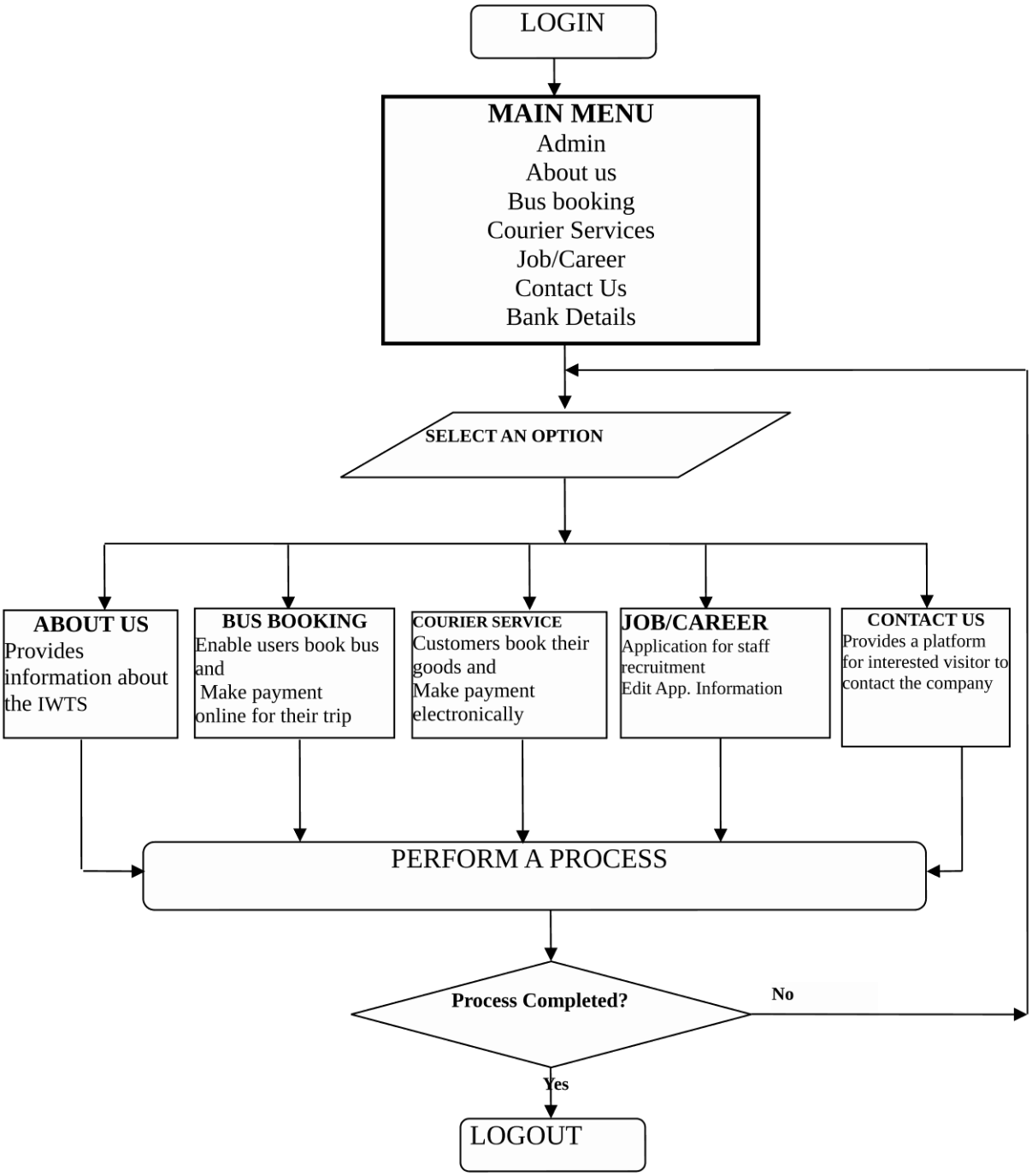


Figure 16: System Flowchart of IWTS

4.9 DESIGN OF USER INTERFACE

The interface design is one of the aspects of system design that needs much attention; hence it is the window through which the system is conveyed to the outside world. In most applications, the simplicity and captivating nature of the interfaces buy the interest of users not even minding what they will gain in turn from the onset. Onu (2005) is of the view that a good interface is

needed to insulate users from the underlying technology, making it easy to carry out the intended task. In interface design, the focus is the user, as such the designers of this system have taken time to put together self-explanatory and easy-to-use features such that it does not require computer expertise knowledge in order to use this application.



Figure 17: IWTS Main Menu Interface Design

4.9.1 System Login Design: The log in being a web-based application logs in users to the interface as shown in figure 18 Below from which a user of the system can log in as prospective software or company administrator.

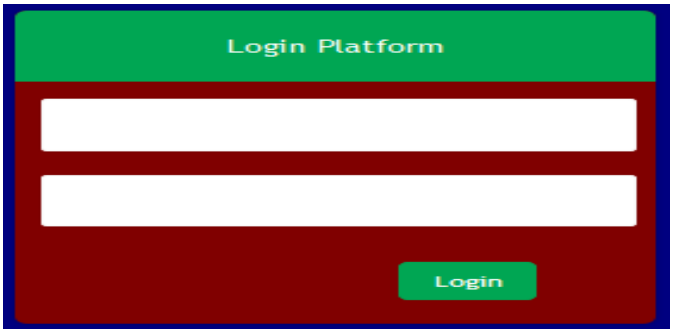


Figure 18: Software Login Interface

The software administrator registers and logs in each company that wishes to operate through the system and further create account for the company admin for regular updating of the respective company's information to the system.

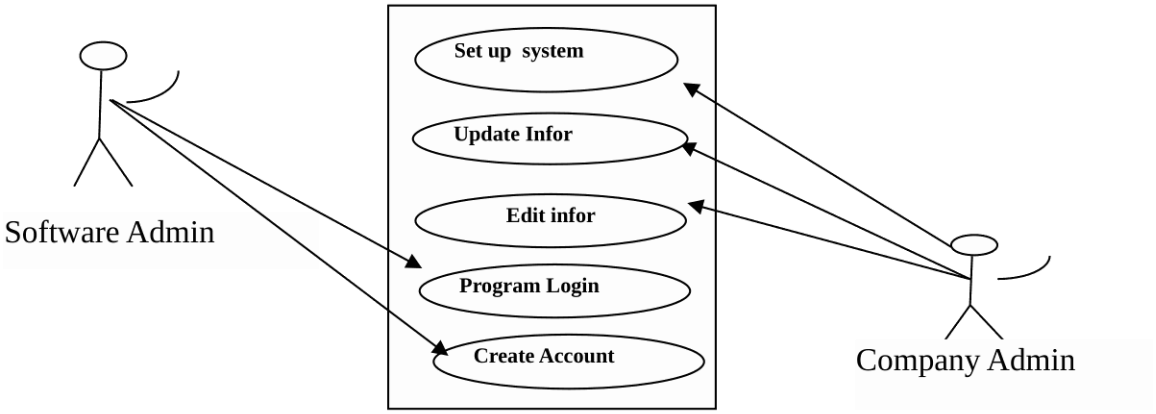


Figure 19: Login Use Case Diagram of IWTMS

The Use Case diagram above shows two actors (Software and Company Administrator) with the activities required to login. A brief description of the use case is as given below;
The Software Administrator can log into the system, register different transport companies and as well creates account for various company's administrators.

Consequently, the various company admins created by the software admin thereafter, manages the information of his company by setting up his company's information to run on the IWTS, he can as well update and edit customers' record at will.

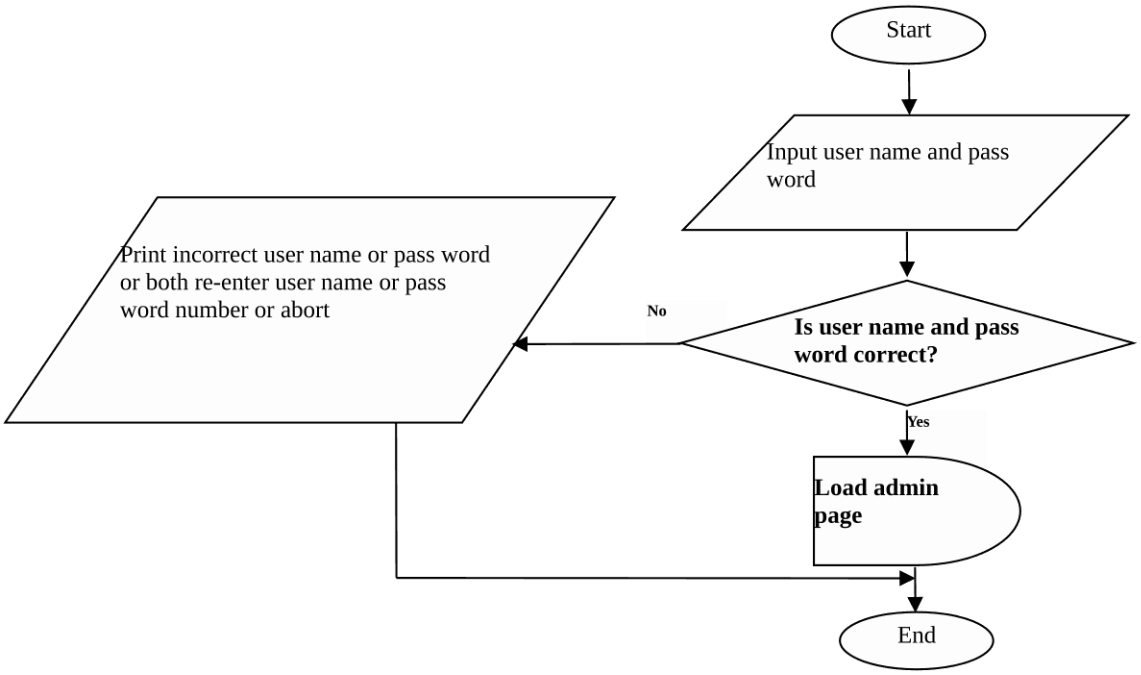


Figure 20: Flowchart Diagram of "Admin Login" Design

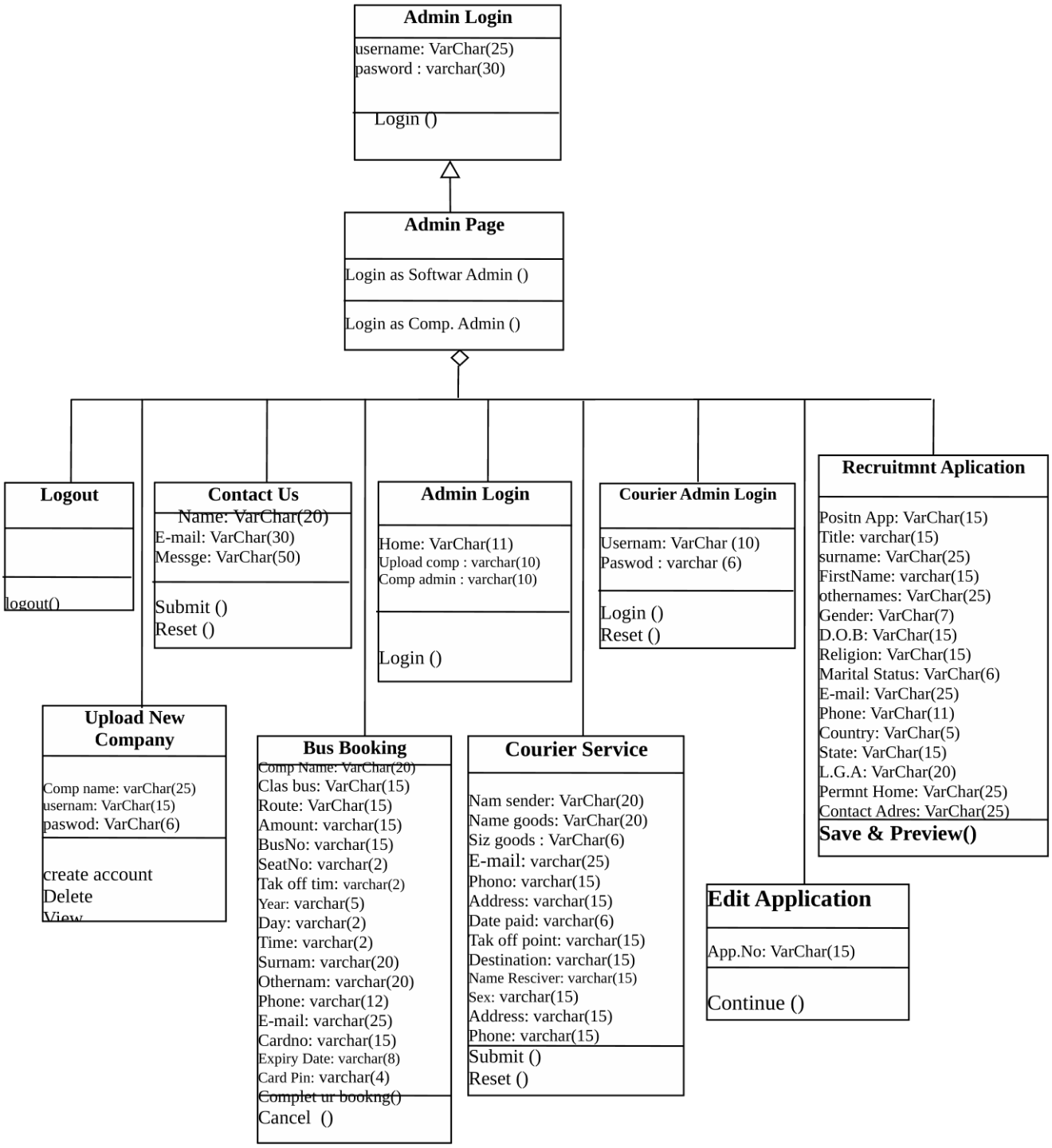


Figure 21: Class Diagram of "IWTS" Design

4.9.2 INPUT FORM DESIGN

The IWTMS creates Software and Company login input, Bus booking, Courier Service Form, Upload New Company Admin Set up Form, Company Admin login, Contact Input, Job Recruitment Input Form and Validate Check Form

(a) Software And Company Login Input: The software administrator created can log into the system, register different transport companies and as well creates account for various company's administrators.

Consequently, the various company administrators created by the software admin thereafter, manages the information of their company by setting up his company's information to run on the IWTS, they can as well update and edit customers' record at will.

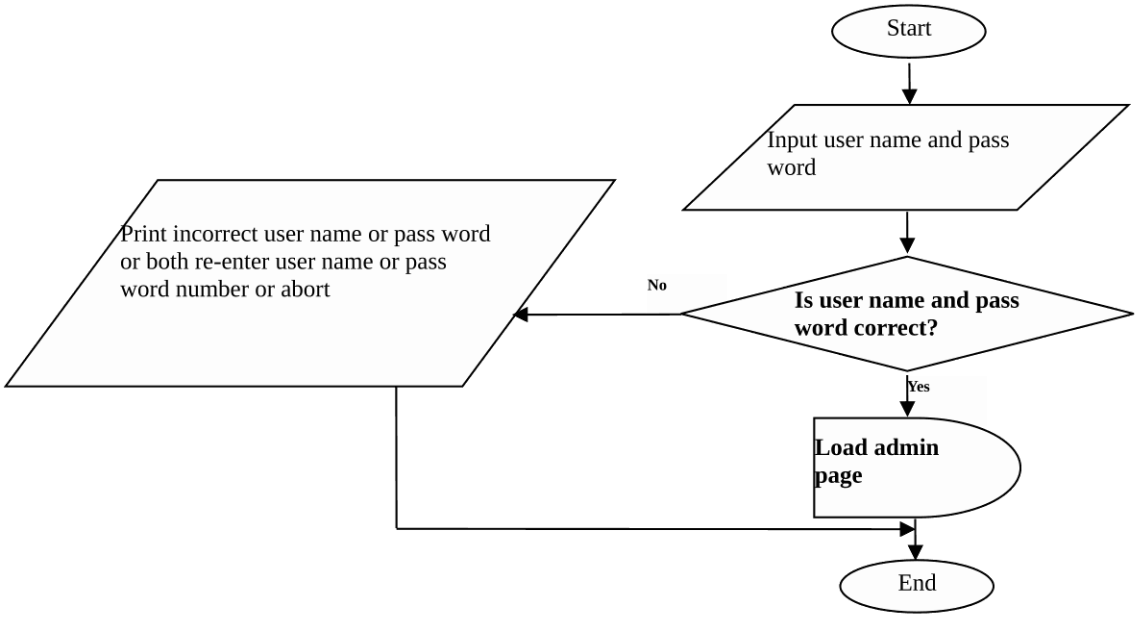


Figure 22: Flowchart Diagram of "Admin Login" Design

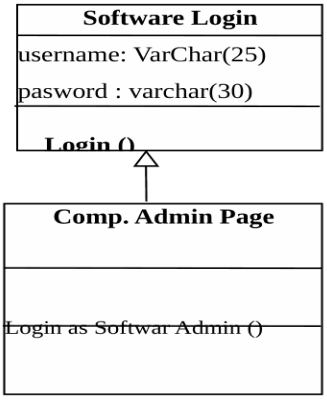


Figure 23: Class Diagram of "Admin Login" Design

(B) Upload New Company Input Form: The Software Administrator is obligated to log into the system, register different transport companies and as well creates account for various company's administrators.

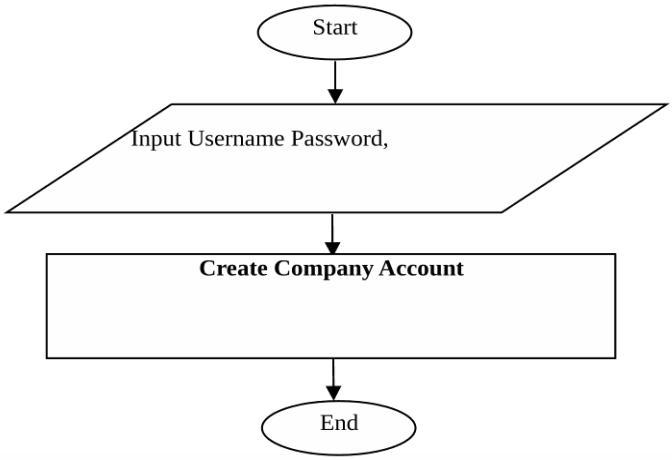


Figure 24: Flowchart Diagram of "Upload New Company" Design

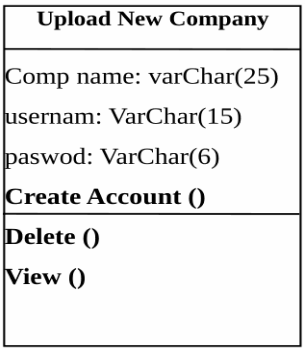


Figure 25: The Class Diagram of Upload New Company

(c) **Bus Booking Input Form:** This input form is used to capture customers' data such as Company Customers' Name, Class of bus, bus Route, Amount, BusNo., SeatNo., Take off time, Year: Day, Time Surname , Other name, Phone number, E-mail Address, Card No. Expiry Date, Card Pin. After the feeling of this form and necessary payment the process is continued by clicking complete your booking or the process is discontinued by choosing cancel

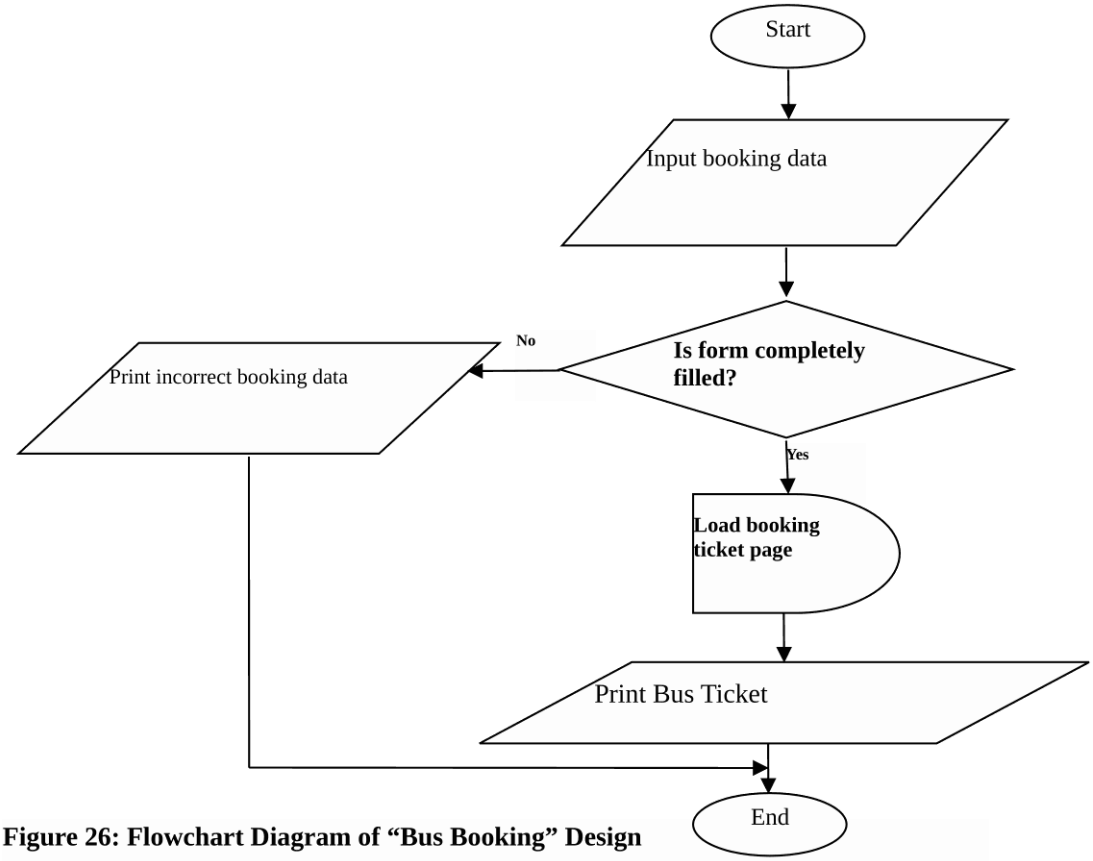


Figure 26: Flowchart Diagram of "Bus Booking" Design

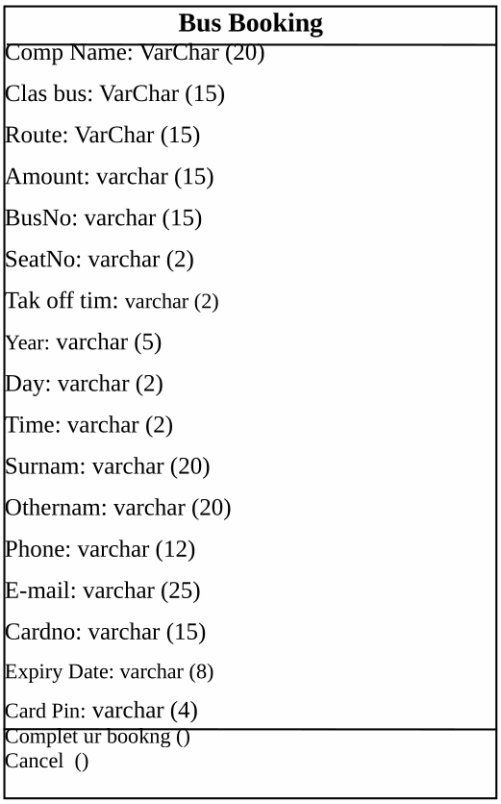


Figure 27: Class Diagram of the Bus Booking Form

(D) Courier Service: The Courier service module is dedicated for customers/visitor who wishes to transport goods from place to place in a more secured manner. The courier service platform is launched when a user selects the main menu; the courier service button will be located at the fourth position from the left. The form design is as shown below:

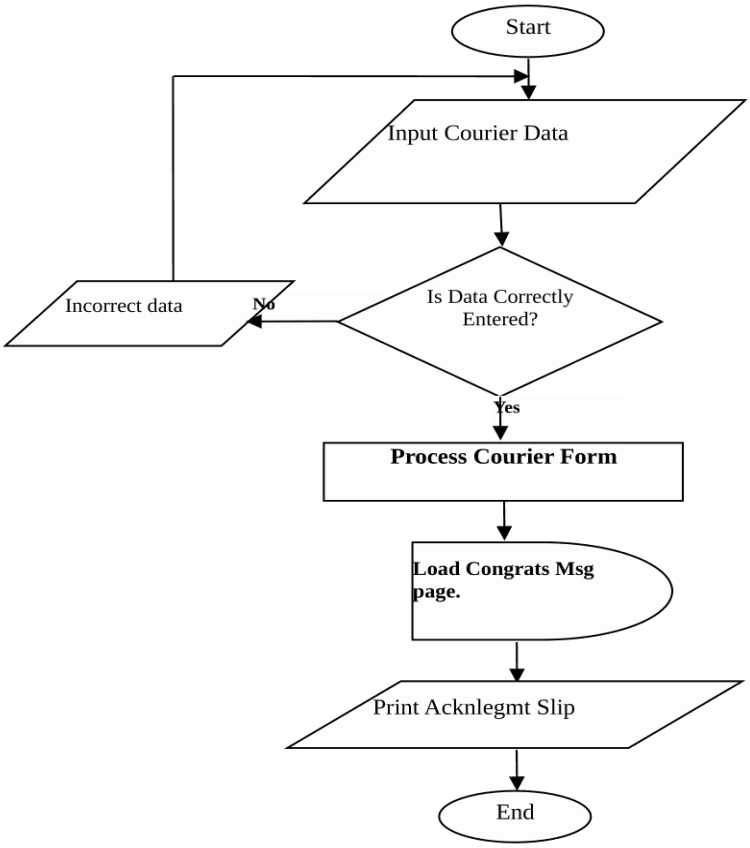


Figure 28: Flowchart Diagram of "Courier Service" Design

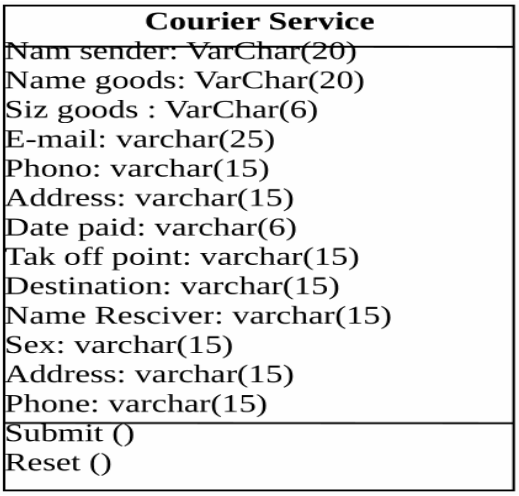


Figure 29: Class Diagram of the Courier Form

(E) Job Recruitment/Career: This module is used to advertise for job recruitment for the various companies if the need be. The recruitment form is displayed when the user is on the home page and clicks **Job/Career button** at the main menu. The form is loaded and prompting the user to feel his/her personal data for on-wards processing.

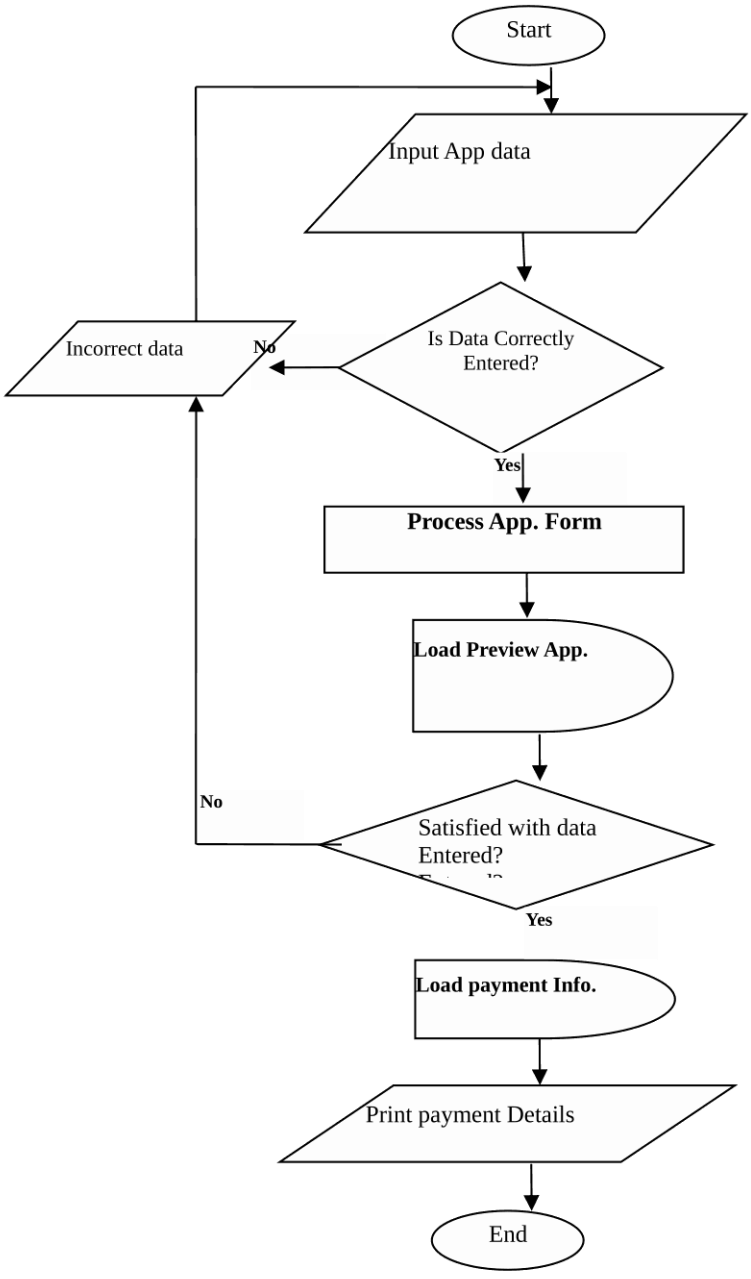


Figure 30: Flowchart Diagram of "Job/ Career" Design

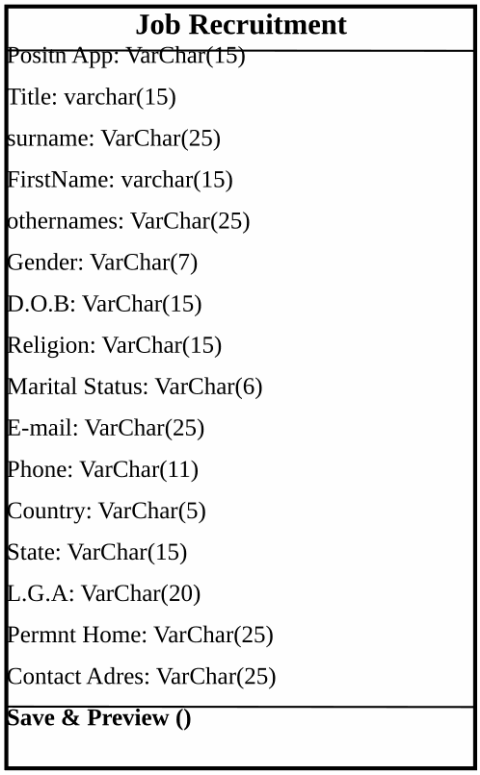


Figure 31: Class Diagram of the Job/Recruitment Form

4.9.3 Output Form Design

During the electronic booking exercise as established by the Integrated Web-Based Transport System, the following outputs would be achieved with the system: Registered Company Account, Bus Ticket, Courier Congrats Message, Courier Acknowledgment Slip, Application Preview, Application Payment Information, Contact Success Message and Bank Details as shown below:

(A) Bus Booking Ticket Generation Design:

The system user or customer of a particular company; after feeling the booking form proceeds to click on **"Complete Your Booking".** Upon clicking this button, the system generate the booking ticket which contains the bookers' Unique ID number, Seat number, firstname, lastname, phonenumber, route, amount, take off time and travel date. Thereafter, requires the user to either print the ticket or save it for later retrieval.

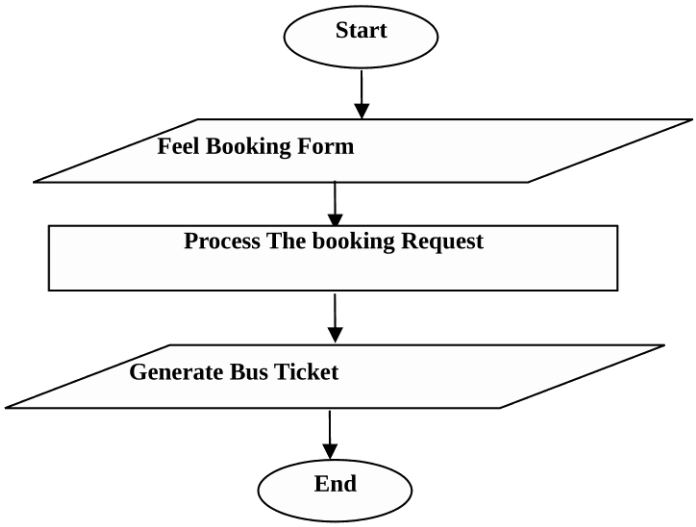


Figure 32: Flowchart Diagram of "Bus Ticket Generation" Design

Bus Booking
Unique ID. Number: VarChar (10)
SeatNo: varchar (2)
First Name: VarChar (15)
LastName: VarChar (15)
Phone: varchar (12)
Route: VarChar (15)
Amount: varchar (15)
Take off Time: varchar (2)
Travel Date: VarChar (15)
Print ()

Figure 33: Class Diagram of the "Generate Ticket" Form

(B) Courier Acknowledgement Slip

The IWTS has Courier Service on the main menu as one of the modules. Any customer wishing to apply for courier service selects this menu and feels the required data; he further submits the form, consequently, the system displays a congratulatory message page; informing him that **"Your goods has been sent please print your acknowledgement slip for the courier service".** The user thereafter clicks the button to print the slip and the system rather outputs payment acknowledgement form telling him that his payment has been accepted and that he should **"kindly print the acknowledgement slip and come with it to pack for validation check"** Finally, the button to be pressed to print the slip will be presented. The slip when

printed contains some items such as full names, name of goods, size of goods, e-mail, phone number, address, date paid, etc

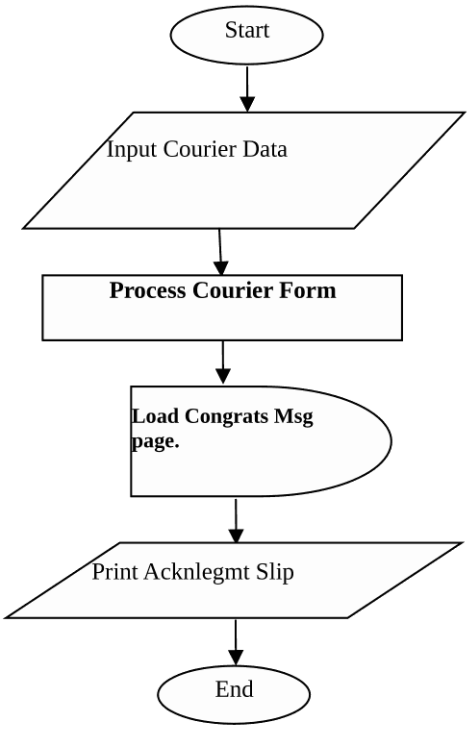


Figure 34: Flowchart Diagram of "Generate Courier Acknowledgement" Design

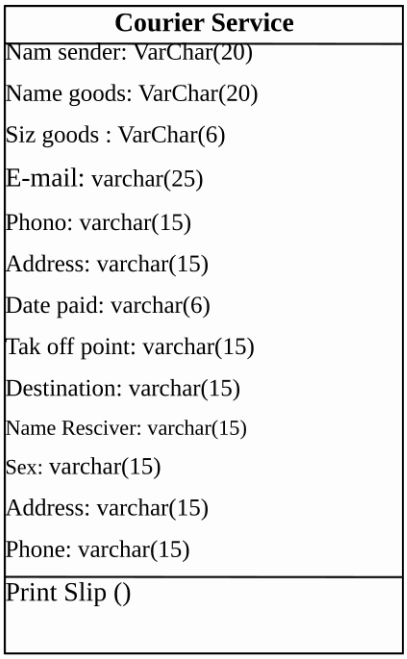


Figure 35: Class Diagram of Generate Courier Acknowledgement Design

This aspect specifies the name given to the database used to store data and shows pertinent parameters that describe the structure of data components in the system. At this point, the program modules and the input/output formats are being specified.

Being a large database, the researcher used index in stepping the database table at each significant level (Bus Booking, Courier Service, Recruitment and Company). Also triggers were used to maintain a copy of each applicant/user from any of the databases (TCDB, or BDB) with the IWTMS.

4.10.1 Database Specification:

In order to achieve effectiveness, efficiency and consistency in data management, this work employed the Structured Query Language (SQL) Server. The database as used in this system is named "phpMyAdmin" for ease of referencing. Using this Relational Database Management System (RDBMS) to ease the programming aspect of the project and its primary records form.

In the database specification the relational database form makes use of the tables to represent the records as well as show the relationship between the records and tables as the tables stands for the organized set of records. Some of the database tables and its data specifications as used in designing this IWTMS are as shown below;

4.11 Program Module Specification

This is required in the course of software upgrade or update in future. The different modules that control this system are; Administrator (create admin), Company's Account module , Bus Booking Application Form, Courier Service, Staff Recruitment, Bus Ticket, About Us, Contact Us and Bank Details module. Each of these modules is driven by set of codes. Below is the specification identifying the various modules and each of these modules have many sub-modules attached to it.

Table 1: Program module Specification

Name of Module	Specification
Admin Home	php Session start (); <Title>Home Page</Title> DOCTYPE html PUBLIC ChkStatus.php Upd1.php ChgCode.php Slogin.php
Bus Booking Application	<Title>Booking Platform</Title> Submit
Freight Transport Booking	<Title> Freight Transport Booking </Title> Submit
Personnel Management Services	<Title>Offline Personnel Management System </Title> Submit

Table 1.

4.11.1 Input and Output Format

The credibility given to computer in precision is its ability to take in and reproduce exactly what it takes in (i.e. the concept of Garbage-in-Garbage-out (GIGO)). The input format specifies how data are organized as they arrive the system to make them more meaningful to end users of the system. This system discuses various levels of inputs to include staff log in, create administrator, register company, upload new company, generate bus ticket and print traveling ticket, etc. A typical input/output specification of the system is as shown below.

Table 2: Input and output formats

Input	Specification	Output
Phone	phone	08053611795
Surname	Surname	Igboke
Othernames	othernames	John Ituma
Email	email	princejey_4krist@yahoo.com
Sex	Sex	Male
CompanyName	CompanyName	Peace Mass Transit Ltd.
Class of Bus	Class of Bus	Hummer
Route	Route	Abakaliki-Enugu
Amount	Amount	500
Month	Month	January
Year	Year	2014

Day	Day	2nd

Table 2.

4.11.2 Data Dictionary

Table 3: Data Dictionary

Data Field Name	Meaning/Description
Phone	Enter the phone number of user which serves as the user's key access to the WTMS. It serves the as SSN in the developed world.
Surname	This is where the system accepts the users surname as input to the System
Othernames	Enters the other names of user into the system
Sex	The sex of the user is entered into the WTMS
Email	accepts and holds email address of users
TravelDate	holds date of embarked on a journey
IdNo	this holds the identity card number of any type of Id card used by the customer in the course of applying for a travel ticket
Bookstatus	this holds the status of a user whether booked or not

Table 3.

4.12 SYSTEM IMPLEMENTATION

Having concluded designs and necessary specifications, the next step is to create the event that will drive the functionality so designed. Kalcharam (1998) states that implementation process runs from the point where the system design is completed and is ready to be used.

The IWTMS is designed with PHP and HTML programming language using my SQL Server-2005 architecture. WTMS is hosted online and once this is done, all FORMS, MODULES and FUNCTIONS that make up the system are activated ready for use. The application is window based, menu driven and highly interactive.

4.12.1 Implementation Method

There are several implementation methods to include: pilot, phase, parallel, etc., used for implementing systems developed. The method adopted will depend on so many factors beginning from the structural development to social and economic factors. However, this

system makes use of phase implementation method because of its ability to implement several units at a time. Phase implementation is cost effective as it takes in minimal cost for maximum output.

4.12.2 USER INTERFACE IMPLEMENTATION

The system is simplified and interactive, making it easy for users to make use of the system with or without any assistance.

4.12.3 Main Menu Implementation Interface

The user of this system loads the website (http://www:transport.com) to interface with the first window called main menu. This window enables any user/visitor of the system to choose from the list of menus which displays different options of his/her choice; after which, he selects an option, that enables him to make use of the application to run a certain task as may have been set up by the administrator.



Figure 36: IWTS "Main Menu Interface"

4.12.4 LOGIN WINDOW IMPLEMENTATION

Users login into the website (http://www.iwtms.com) to interface with the first window (login window). The success of any user will be the determinant on whether the user has what it takes

to access the IWTS or not. In this login interface, there are two main administrators, the software and company administrators

(a) System Login Design: The log is being a web-based application logs in users to the interface as shown in figure 36 below from which a user of the system can log in as prospective software or company administrator.

The software administrator registers and logs in each company that wishes to operate through the system and further create account for the company admin for regular updating of the respective company's information to the system.

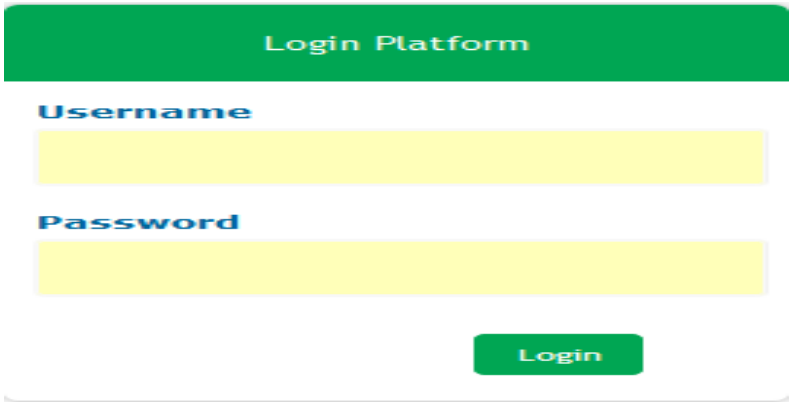


Figure 37: Developer/Main Admin Login Implementation Interface

The software developer or the main administrator is the owner of the website, who has the utmost controls over the system. He gives access to individual transport companies to get registered into the website for transacting business with their respective customers and the general public. He schedules the registration exercise, and registers different companies and their administrators, and generally, manages the IWTMS website. The administrator could do the following;

- Change Password: the Main administrator would change and customize companies' admin password to ensure adequate security.

- The IWTS site owner/Manager: the Main administrator could create another admin user account allowing more than one administrator to the system.
- Generate companies' Registration list: after registration has been completed as initiated by the administrator, the next is to generate company's registration list which is only possible with the main admin login.
- De-activation of Company's Account: The main Admin is authorized to de-activate any company that fails to comply with the IWTMS Company's terms of agreement.
- Record updating: The min Admin is obligated to updating of any transport company that is registered with the IWTMS

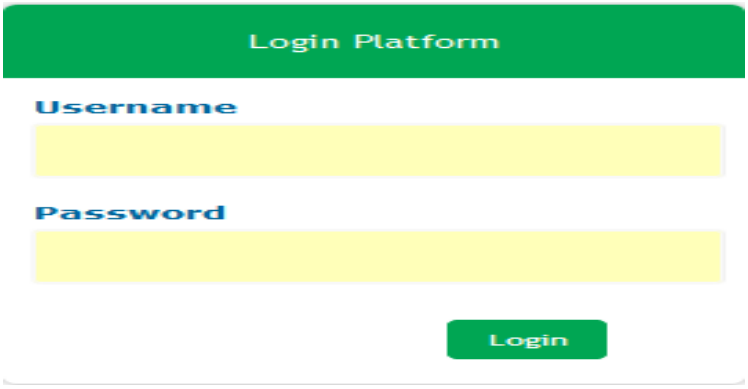


Figure 38: Admin Login Implementation Interface

The administrator is an authorized IWTS staff who has ultimate control of the system. He schedules the booking exercise, registers another administrator, creates booking chances, and displays price list and route lists of various trips for a particular company. Generally, the admin performs site management services to a specific user, registered to his company. With a click, the administrators could do the following;

- Manage user: the company administrator could create another user account allowing different company users to the system.
- Generate Users' Application list: After registration has been completed as initiated by the administrator, the next is to generate users' application list which is only possible after booking is made.

- De-activation of User's Account: The company admin is authorized to de-activate any user who fails to comply with the IWTS's terms of agreement.
- Record updating: The admin is obligated to update any customer/users who is registered with the IWTMS
- Generate Customers' list: after registration has been completed as initiated by the administrator, the next is to generate customers' list.
- Print travel tickets: the administrator can generate and print company customers' bus ticket and then specify the bounds.

4.12.5 INPUT FORM IMPLEMENTATION:

The IWTS creates input forms such as Bus Booking, Courier Service, Upload New Company, Company Admin Setup, Job/Courier; other inputs forms such as Validation Check, Contact Us, About Us and Bank Details which constitute the major input forms.

(b) Courier Login Input Implementation

This login interface permits the company admin officer to access the courier service application form after supplying his/her username and password.

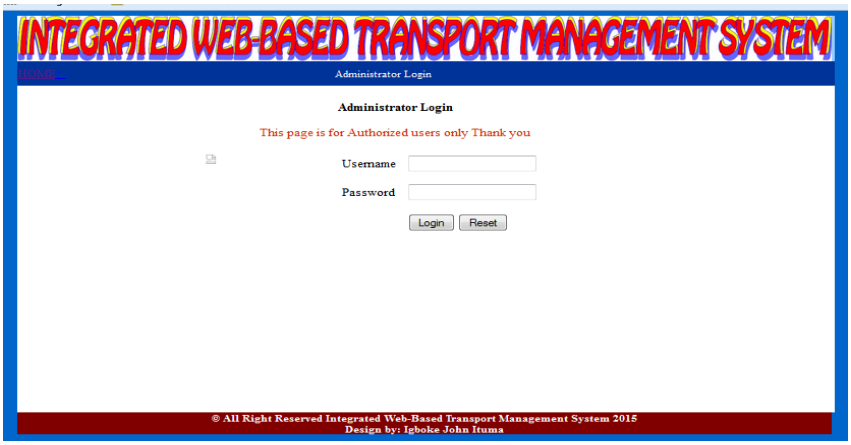


Figure 39: Courier Service Login Interface

(c) Bus Booking Implementation: For any user to implement certain process he/she must use one input form or the other, the bus booking form is regularly used by the company

customers to enter request/personal data in order to create bus ticket. The ticket created after feeling the booking is used by the customer to board bus on a designated date of the journey.

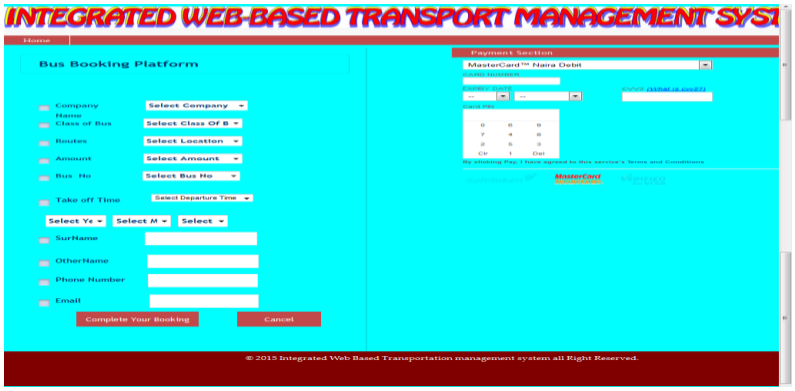


Figure 40: Bus Booking Interface

(d) Courier Service Implementation:

The Courier Service Form is used by any customer who wishes to send goods or parcel from one place to another. The customer takes his item to the company for courier booking and meets the company administrator for computerization. The admin thereby captures the sender and the receiver's personal data; which enables the company to send such it, having tracked every detail about the goods, sender and the receiver for security purpose. Another page with a congratulatory message is displayed telling you that your goods have been sent and that you should print acknowledgment slip for the courier services. After this a "Validation Check" page comes up requesting you to enter your full names to validate you details.

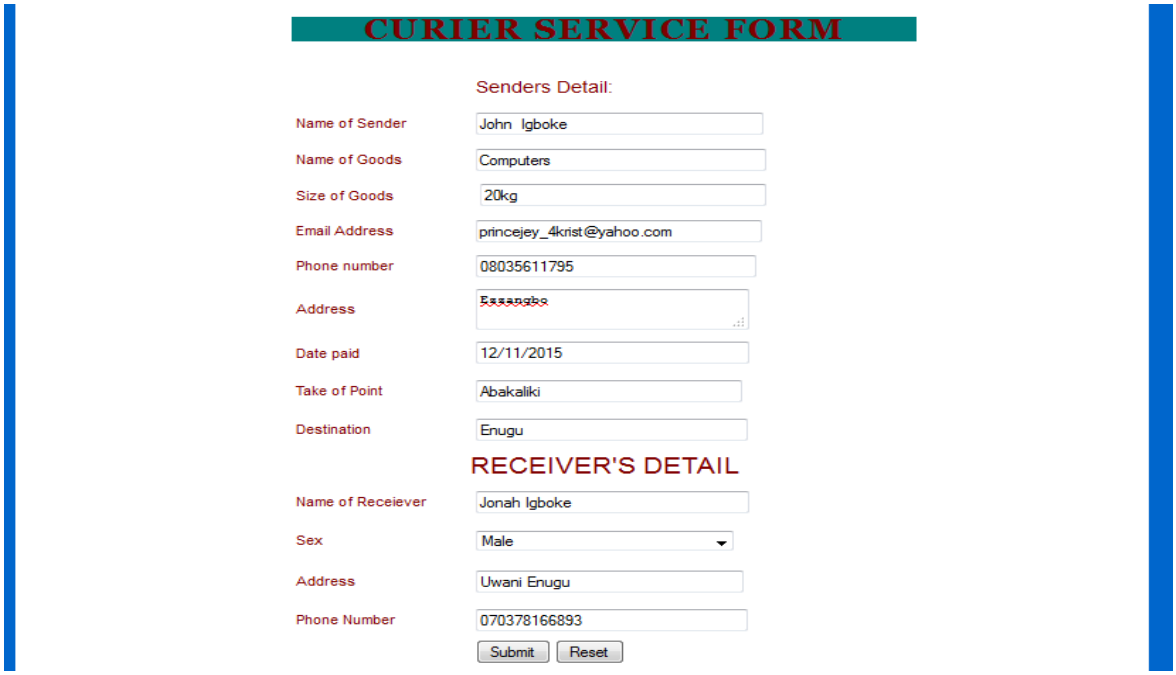


Figure 41: Courier Service Application Interface

(e) Job/Career Recruitment Implementation

The user of the IWTS can as well apply for job recruitment if such advert is placed on the site by any company. The visitor does this by selecting Job/Career at the main menu on the home page, which takes him to another page prompting him to click “Start Application”. This button when pressed displays application form where his bio-data every details about the job is felled and submitted for further processing; after feeling the form you save and preview, corrections can be made after previewing the form. The user can then go further to print the payment acknowledgement slip indicating the depositor’s name, account number, account name amount paid etc

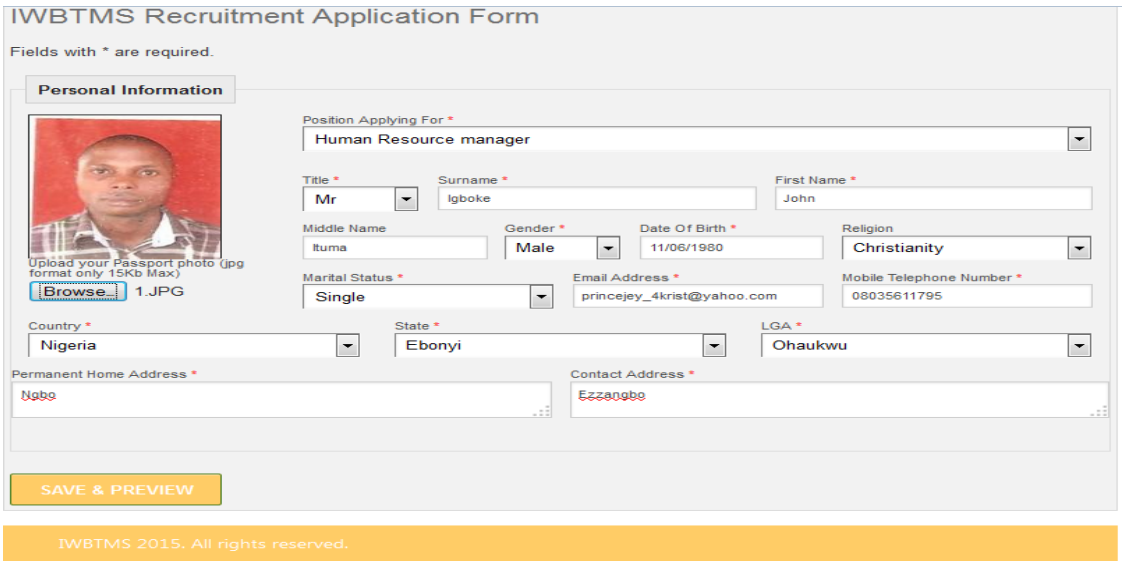


Figure 42: Job Recruitment Interface

(f) Company Account Creation Implementation

The company account creation input form is displayed when the software admin logs into the system and selects "Upload New Company" icon. This platform enables him to create company administrator's account whose duty is to set up the online transaction system for the company's customers and visitors. The platform requests for company's name, admin's username and password and finally create account command button. These operations when completed will allow the IWTS to create accounts for different companies.

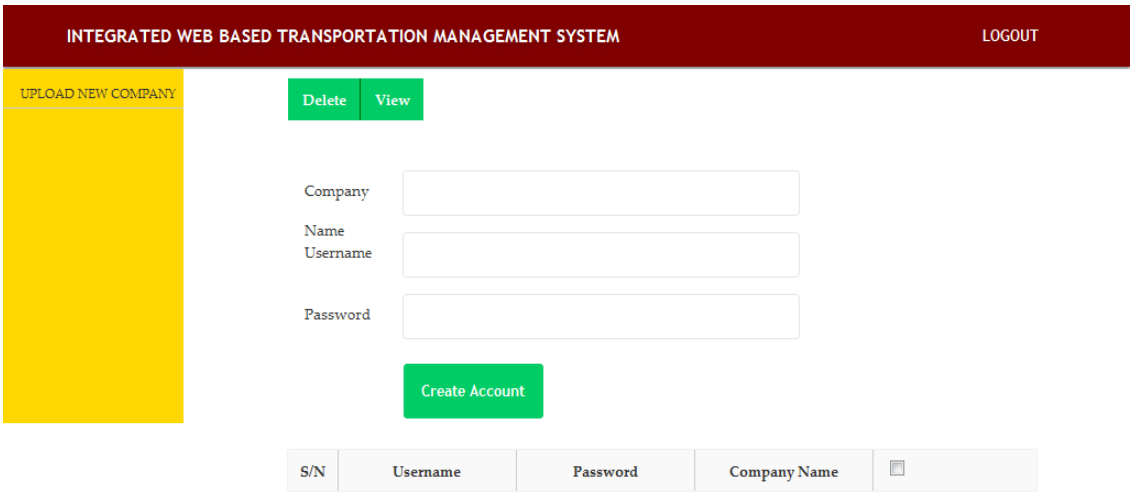


Figure 43: Company Account Creation Interface

(g) Company System Setup Implementation: The company system setup form comes up after the company account creation process is run. The company admin is thereafter obligated to set up his company system for the company's customers/visitors to view at the front-end of the system. The system allows the admin to the bus route, amount and class of bus for each trip for a particular transport company.

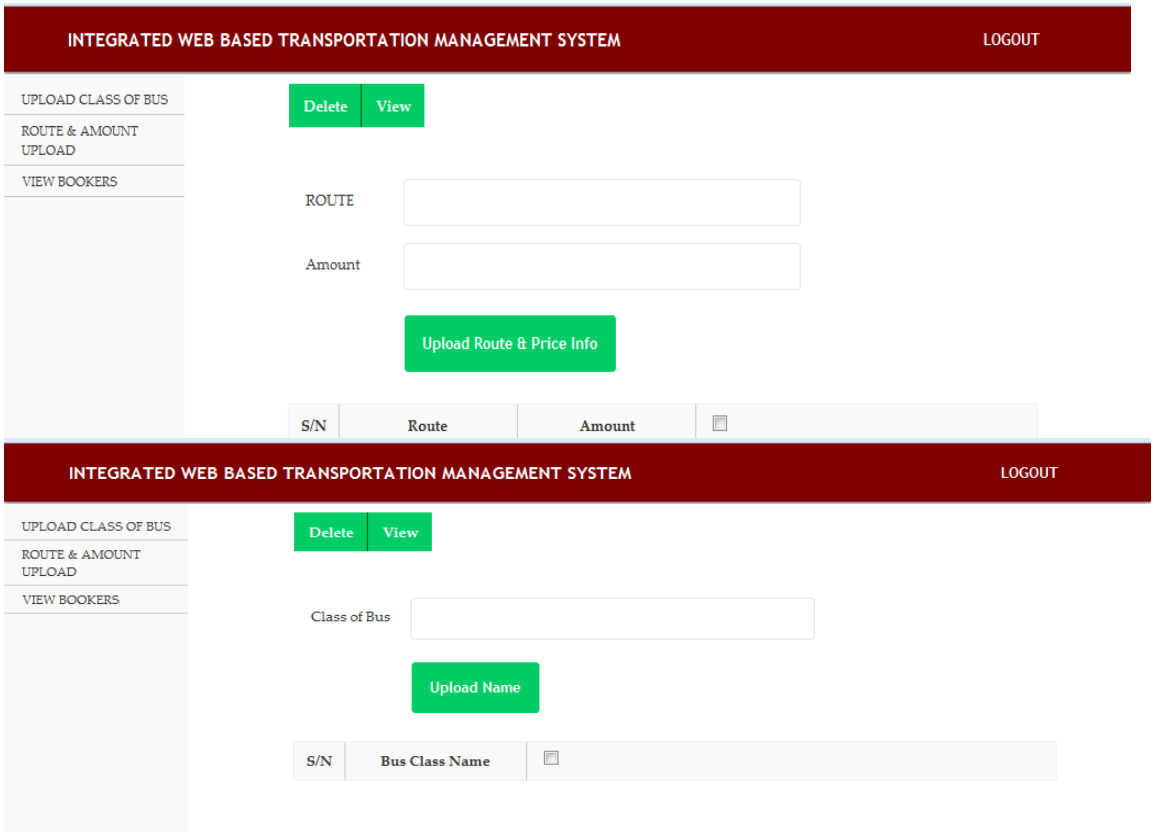


Figure 44: Company System Setup Interface

(h) Contact the Company Implementation

The input from below is used by the company customers to contact the company; by sending mails to them. The parameters needed to supply includes: customer's name, Subject, e-mail address and the message itself.



Figure 45: Contact Company Interface

4.12.6 OUTPUT FORM IMPLEMENTATION

The output forms for running various processes as integrated in the IWTS are listed as below: Registered Company Account, Bus ticket, Courier Congrats Message, Shipping Acknowledgement Slip, Application Preview, Application Payment Information, Contact Success Message and Bank Details which constitute the major output forms.

(a) Registered Company Output Implementation

The registered company form displayed below is found when the software admin wishes to view the list of registered companies; in such case the list of company registered within a given period of time will be displayed in the order below

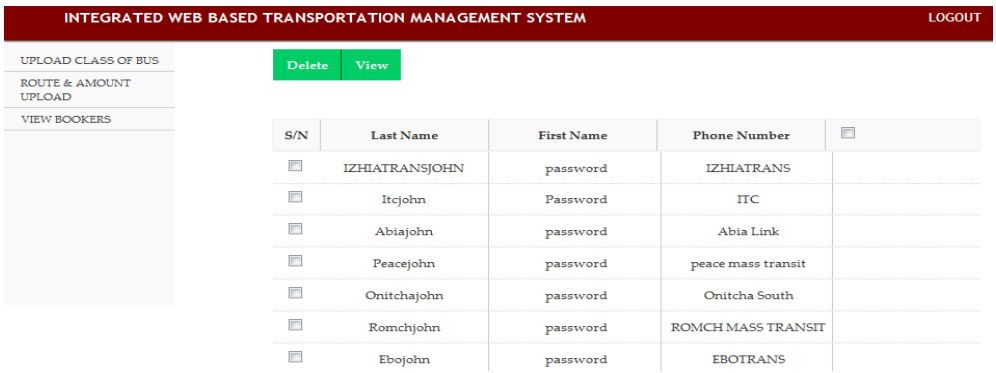


Figure 46: List of Company Interface

(b) Bus Ticket Output Implementation

The Bus ticket below is obtained after feeling and submitting the booking request form below. The company customer when obtain this ticket uses it to board bus in the particular company of his choice.

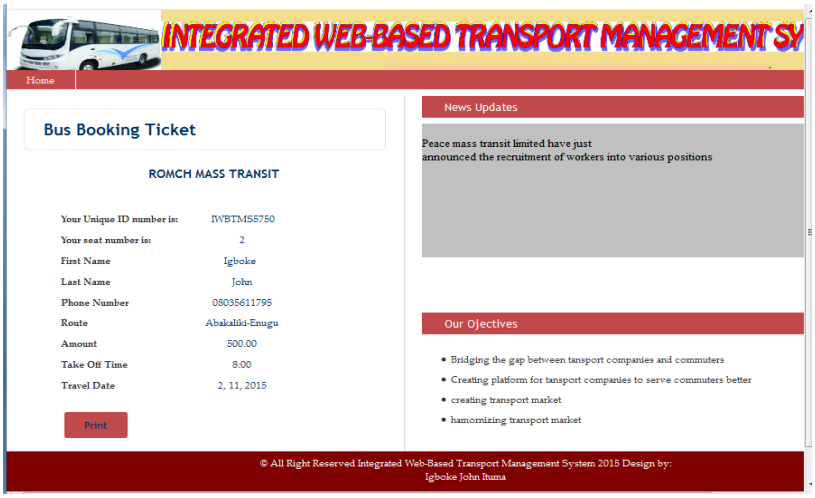


Figure 47: Bus Ticket Interface

(c) Courier Congrats Output Implementation

This output form is seen after the customer requests for the service which is processed by the company admin. This message comes up to prove that the request is successful, but further requests that the user should enter his full name in order to validate for the true owner of the goods.



Figure 48: Congrats/ Validation Check Interface

(d) Courier Acknowledgement Output Interface

Here is the courier output interface which is printed by the company admin to the receiver in attempt to claim the item sent to him by the sender



Figure 49: Courier Acknowledgement Slip

(e) Job/Career Recruitment Output Implementation

The job recruitment interface is obtained after applying for job recruitment. This displays the applicants' personal data as entered in the apps form; the output presents a unique I.D number which is used to identify each applicant of the system. The processing could be preceded by clicking the 'proceed' command button below the form. The outcome of the process showcases another form below known as Recruitment Payment Info. Output, after this output is displayed and "prints Payment" button is clicked the user then prints the Recruitment Payment Details to come with on the day of interview; which will be displayed by the net.

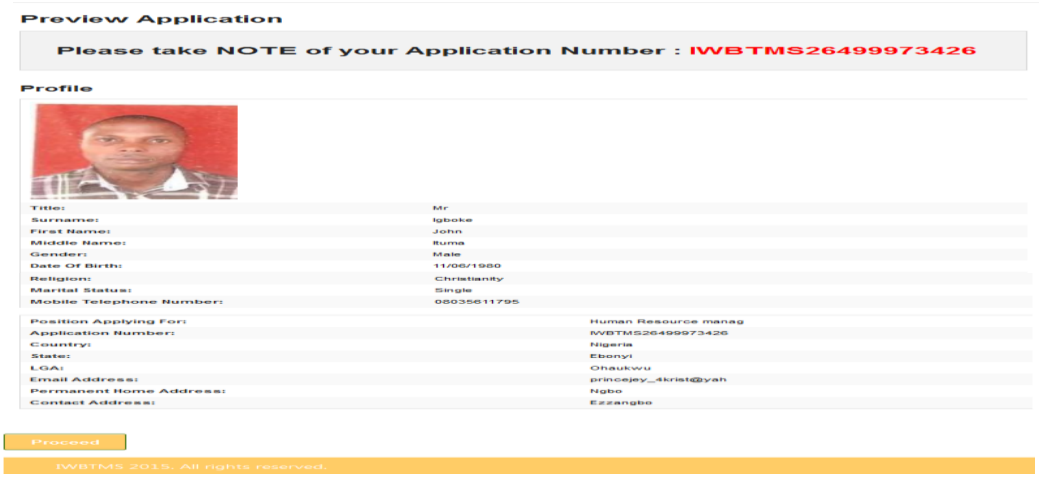


Figure 50: Job Recruitment Output Interface

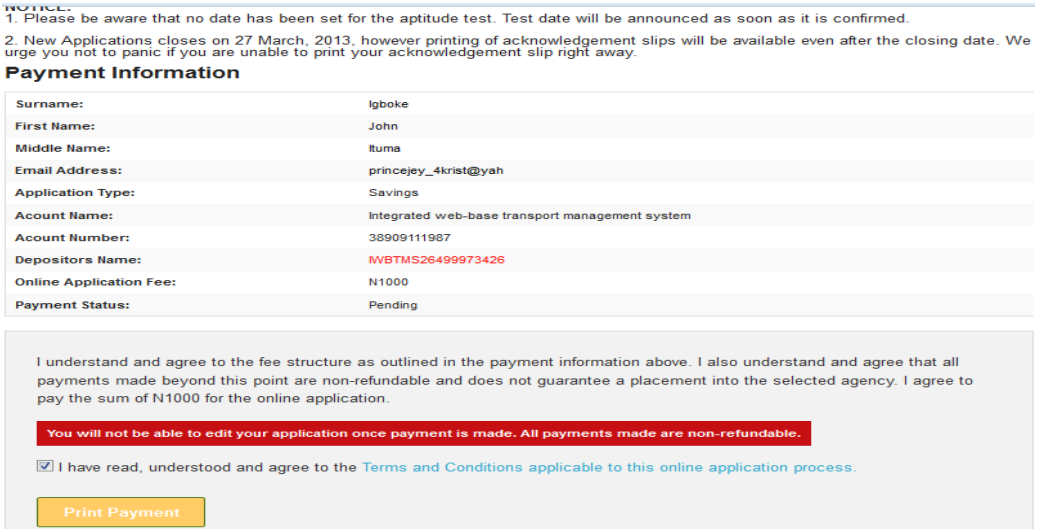


Figure 51: Recruitment Payment Info. Output

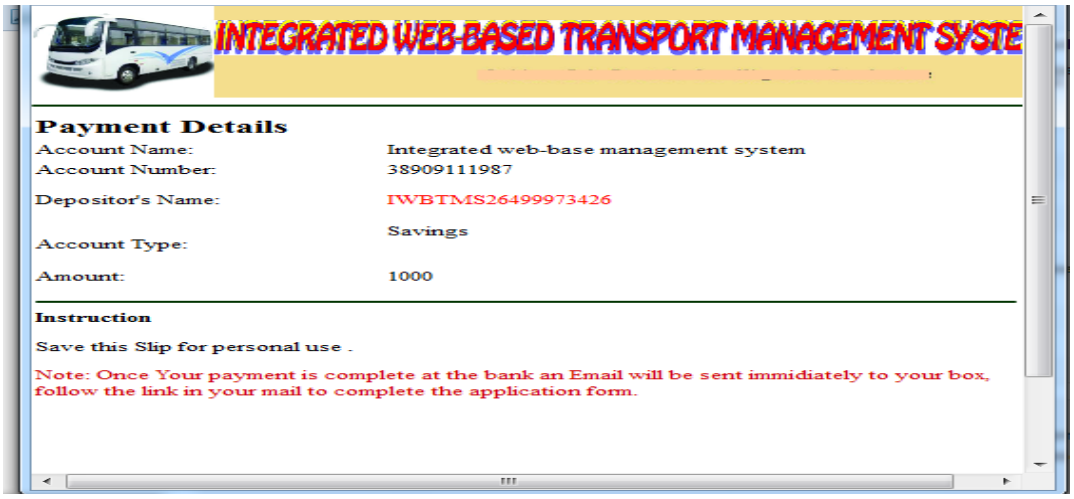


Figure 52: Recruitment Payment Details

(f) Recruitment Application Database Output Implementation

The database below showcases the list of applicants that applied for the a recruitment exercise over a certain period of time

ID	Pin	Position	Picture	Title	Surname	Firstname	Middlename	Gender	Date_Of_Birth	Religion	Marital_Status	Country	State	LGA
24	IWBTMS30810532681	Inter-State Driver I	image/IWBTMS30810532681.jpeg	Mr	Idenyi	Chika	Nkem	Male	09/14/2010	Christianity	Married	Nigeria	Bayelsa	Kolokuma/Opo
25	IWBTMS30693294143			--				--		--	--	Nigeria		
26	IWBTMS26499973426	Human Resource manag	image/IWBTMS26499973426.jpeg	Mr	Igboke	John	Ituma	Male	11/06/1980	Christianity	Single	Nigeria	Ebonyi	Ohaukwu
21	IWBTMS27406593489	Human Resource manag		Mr	Igboke	John	A	Male	09/18/2015	Christianity	Single	Nigeria	Ebonyi	Ohaukwu
22	IWBTMS34860432650	Curier Officer<		Mr	Idenyi	James	ogeh	Male	18/02/1980	Christianity	Single	Nigeria	Ebonyi	Ohaukwu
23	IWBTMS32903783643	Park Cleane	image/IWBTMS32903783643.jpeg	Mr	Igboke	Chika	Nkem	Male	08/31/2015	Christianity	Single	Nigeria	Ebonyi	Ohaukwu
19	IWBTMS23436373106		image/IWBTMS23436373106.jpeg	Miss	china	okoro	mercy	--	09/07/2015		--	Nigeria	Bayelsa	Ekeremor
20	IWBTMS40210782661	ASP II	image/IWBTMS40210782661.jpeg	Mr	Igboke	John	A	Male	09/18/1996	--	Single	Nigeria	Ebonyi	Ishielu

Table 4: Recruitment Database Interface

4.13 CHOICE OF PROGRAMMING LANGUAGE

In order to ensure proper alignment for this web-based application, we used PHP and HTML framework at the front end due to their object oriented nature and coherency and in respect of the fact that PHP and HTML support event-driven concept. The platform for the programming languages used was the Dream Weaver which provides integration of internet programming languages as well as enabling environment for different programming languages to be used in a singular application. More so, PHP and HTML offer:

1. Creation of graphical/user-friendly interface as a window based system with multiple links which suit web based applications.
2. Support for web based database applications
3. Versatility as they can serve both user/client sides making the application so designed to have good platform to run efficiently.

4. Interactivity which is one of the features of PHP keeps users of the IWTS on a continuous user friendly interface thereby giving the users less burden.
5. Flexibility in running on multiple platforms and operating systems

My SQL Server-2005 database architecture is used at the back end for efficient data capture, storage and retrieval. It is a Relational Data Base Management system (RDBMS) used in primary data model for commercial and data processing application.

4.14 Security Features of the IWTS Database

IWTS has been built around a large body of database that grows as time counts. Also, transportation management system is a key component in any developed and developing country. As such, the users would go any length to ensure that they manipulate the system, and where it becomes impossible, they would in turn sort every avenue to penetrate the database as to achieve their dubious intentions. It becomes therefore necessary that a sensitive database of this kind should be adequately protected to grant confidence in its applications.

The following are the security features of this system,

(a): The database software (My-SQL-2005) has its security feature such as encryption, authentication, security policies, integrity checking, and access restriction on tables which are inherent to the database developed in this work and serve as a security to this system.

(b): This work has been designed with strong control on access to the database by all users. Transporters and administrators can only access forms through which they can submit their data and/or query the database to generate report as in the case of administrator; they do not have the access to manipulate the database and as such, are restricted to total access to the database. This is possible as the c-panel used in hosting the database is having network security provided by the service provider, meaning that, for an access to be granted to the database requesting editing, formatting, or any form of adjustment, the services of the internet service provider hosting the IWTS as well as permission from the software administrators of the

system would be needed. It therefore becomes difficult for an entity to think of manipulating the database.

(c): The system is also timed as the visitors use it periodically, and once the time is over for a given user, the web site is shut till a time when such need arises. This also provides security to the database.

(d): There is a module that monitors and reports any illegal attempt to gain access to the database to the appropriate unit as would be required by IWTS when such a system is set operational as one of the security features.

(e): The system also has two paramount authentication measures which it uses to check who is using the system and guarantee the elimination of double/multiple application;

(f): The administrator who has a more control on the system is equally adequately authenticated to ensure he is the right person before allowed access as administrator. This is done with the use of secured username and password.

The security features used in the IWTS as discussed is in line with the work of the following; Murray (2010) opines that, database software should be design to provide control, protect right of entry to the contents of a database as well as preserve the integrity, consistency, and overall quality of the data. He further states database should be design to;

i. Ensure with the aim of authentic users perform the given activities at given times.
ii. Ensure physical safety measures of the system
iii. Ensure network security and
iv. Ensure efficient encryption and authentication of database

Cyan, Lane, and Polk (2005) summarizes database security to include;

a. Data encryption
b. Authentication method
c. Authorization

d. Access restriction on tables, view, synonyms, or rows.

e. Security polices

4.15 General Resources Requirement for the System: This explains the core of software and hardware components requirements and specification used in developing the system. The requirements outlined here are the minimum for actualizing this system.

4.15.1 Software Requirement:

The minimum software required for this system is as follows;

a. The front end/Graphic User Interface (GUI) tool is PHP and HTML with Dream Weaver as a background platform. Each component is treated as an object and runs on net, therefore, for proper integration; net programming languages such as PHP and HTML were used to build an interactive interface.

b. The database model (RDBMS)/Back end is MySQL Server-2005.

c. The operating System is Windows Environment (Vista, Win7, Win8,etc)

4.15.2 Hardware Requirement

The minimum hardware requirement is as follows;

a. INTEL PIV 3GHZ (100 FSP) MMX or higher

b. 2GB RAM with 500GB Hard Disk free space

c. Flat Screen Monitor

d. USB keyboard and Mouse

e. Fully multimedia and networked systems

CHAPTER FIVE
SYSTEM TESTING, EVALUATION AND INTEGRATION

5.1 SYSTEM TESTING

The new system to become operational has to meet the design specification objectives. This is achieved with the use of life data to run the system so developed to validate its accuracy and achievement of stated objectives. In the course of system testing, valid and invalid data are supplied purposely in order to validate the system designed. Doing this demands setting out test plan and test data from the system input data specifications.

5.1.1 TEST PLAN

Using selected input data of the system to carry out software testing is a sure way of verifying for the accuracy and reliability of the system output result. IWTMS is tested at various module levels and the entire system validated at the implementation stage. The test plan as discussed is the Top-Down design methodology and it is suitable in this case as it avails us with satisfaction at each module where correction was required, as a result, error(s) are not carried from one module to the other.

5.1.2 TEST DATA

Live data gathered from transporters were used to test the system for functionality using relevant input data for a given stage. To ascertain efficiency, both correct and incorrect data were used for the testing and it was obvious that the system while running to produce result with the correct data was able also to come up with an error message when wrong input data was entered.

In the course of trying a prolonged access without success, the system terminates the user and sends “page timeout” message issued which is a good security feature of the system.

Transporters'/Customers' Booked List

book_id	com_id	bus_amnt	seatno	takeofftime	yr	mnths	dys	fn	ln	phone	email	idno
33	9	400.00	8	7:00	2015	02	17	Egba	James	0803522894	odi@yahoo.com	323470
34	9	400.00	13	16:00	2012	10	17	Jane	Ibe	07056334964	odi@yahoo.com	140720
35	10	400.00	13	16:00	2012	10	17	Jane	Ibe	07056334964	odi@yahoo.com	101930
36	10	400.00	13	16:00	2012	10	17	Jane	Ibe	07056334964	odi@yahoo.com	210460
37	10	10,000.00	11	8:00	2015	11	28	Igboke	johnson	07035611795	prince@yahoo.com	99110
38	12	500.00	13	3:00	2015	10	28	johnson	oke	08034611795	jaco@yahoo.com	33460
39	10	10,000.00	14	8:00	2015	08	8	Igboke	Faith	09036511795	faith@yahoo.com	60090
40	12	400.00	15	10:00	2015	08	8	Igwe	Faith	06093567782	faith@yahoo.com	2870
41	6	500.00	2	8:00	2015	11	1	Igboke	John	08035611795	princejey_4krist@yahoo.com	295890
42	6	500.00	2	8:00	2015	11	2	Igboke	John	08035611795	princejey_4krist@yahoo.com	5750

Table 5: List of booked Customers for Online Generation of Bus Ticket

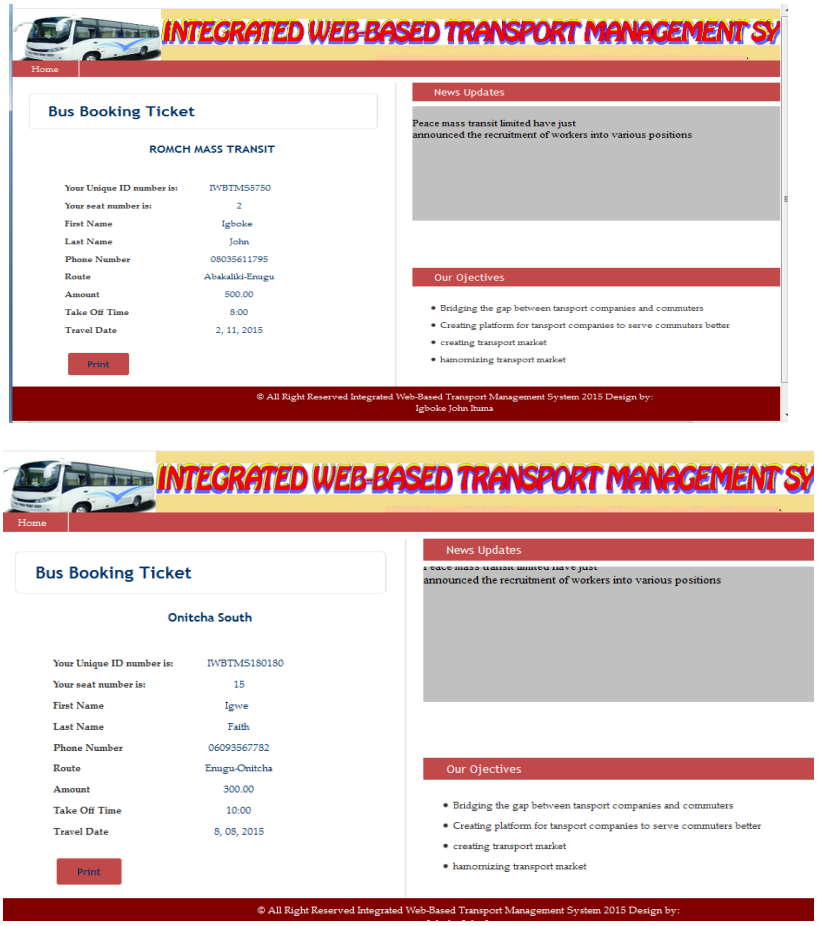


Figure 53: Output of Bus booked Customers

Also, to ascertain efficiency, a booked transporter follow the same procedure using different phone number as to register, but the system could detect that he was already booked and denied same, another booking application. As such, both correct and incorrect data were used for the testing and it was obvious that the system while running to produce result with the correct data was able also to come up with an error message when wrong input data was entered.

In the course of trying a prolong access without success, the system terminates the user and sends “page timeout” message issued which is a good security feature of the system.

5.1.3 TEST RESULT

In the cause of testing, results generated were dully examined and compared with operational specifications to ensure that they meet specifications as contained in the objective specifications. This was done in units till the whole system was tested and results produced accordingly. The expected result was to generate bus ticket automatically without having a face to face contact with the transport company, and then create the customer booked list and bus ticket. Also, it is expected that there should be no double or multiple booking of customers. From **FIGURE……..** Unit, customer whose data found is the generated a bus ticket as shown in the FIGURED**…….BELOW**

book_id	com_id	bus_amnt	seatno	takeofftime	yr	mnths	dys	fn	ln	phone	email	idno
33	9	400.00	8	7:00	2015	02	17	Egba	James	0803522894	odi@yahoo.com	323470
34	9	400.00	13	16:00	2012	10	17	Jane	Ibe	07056334964	odi@yahoo.com	140720
35	10	400.00	13	16:00	2012	10	17	Jane	Ibe	07056334964	odi@yahoo.com	101930
36	10	400.00	13	16:00	2012	10	17	Jane	Ibe	07056334964	odi@yahoo.com	210460
37	10	10,000.00	11	8:00	2015	11	28	Igboke	johnson	07035611795	prince@yahoo.com	99110
38	12	500.00	13	3:00	2015	10	28	johnson	oke	08034611795	jaco@yahoo.com	33460
39	10	10,000.00	14	8:00	2015	08	8	Igboke	Faith	09036511795	faith@yahoo.com	60090
40	12	400.00	15	10:00	2015	08	8	Igwe	Faith	06093567782	faith@yahoo.com	2870
41	6	500.00	2	8:00	2015	11	1	Igboke	John	08035611795	princejey_4krist@yahoo.com	295890
42	6	500.00	2	8:00	2015	11	2	Igboke	John	08035611795	princejey_4krist@yahoo.com	5750

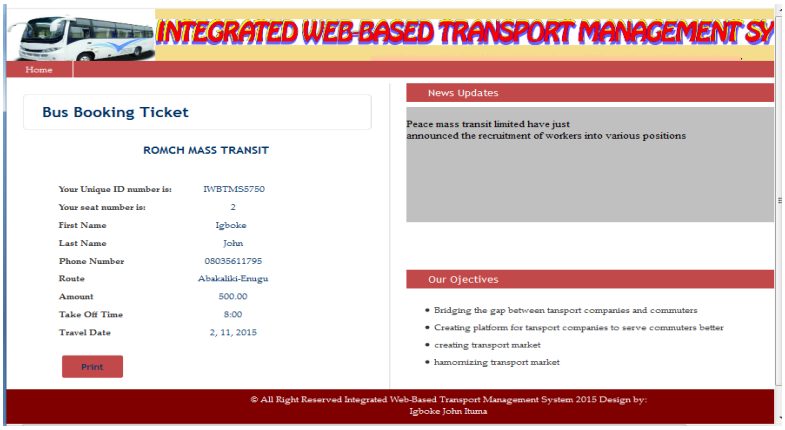


Figure54: List of Booked Customers for Online Generation of Bus Ticket

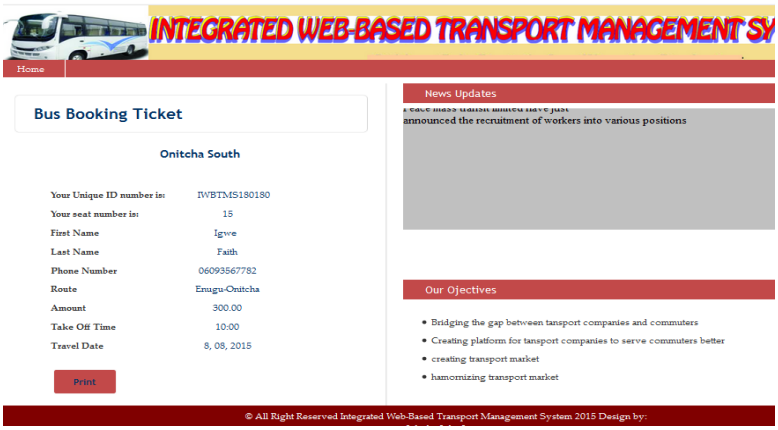


Figure 55: Output of Bus booked Customers

5.2 SYSTEM INTEGRATION

Having completed the various subsystems development and tested for functionality, they were integrated to form the whole system. The modules, functions and subsystems were linked together accordingly from which testing was also done to ensure error free system. During integration, incremental approach was used to achieve the integration which was aimed at uncovering errors associated with interfacing.

IWTS modules and subsystems have been integrated, which authenticates the functional effectiveness and efficiency of the entire system. Every aspect of the system is therefore free to communicate data signals as appropriate data.

5.2.1 Change over Procedure

The Change over Procedure is concerned with the transferring operation from the old system to the new system. The choice approach depends on the user, data involved and the nature of the system. Approaches such as parallel, Pilot, direct and phase change over procedures abound,

The IWTS employed parallel approach where the old method is run side by side with the new method till a time whereby, the entire old system can be adequately replaced. This approach is expensive, but it is good for the IWTS in the mean time since the entire system is technologically disadvantaged especially in the area of ICT and its awareness. With this, the old system will be phased out gradually till such a time that it would be completely off.

5.3 PERFORMANCE EVALUATION

There was keen inspection and close examination of the testing processes to ascertain the ability of the system at various implementation phases in performing the expected function. It is used to determine system throughputs in terms of input/output requirements. To this end, our systems application uptime is such that it runs fast in carrying out a given operation. High storage capabilities offered in the database ensure that both input and output data are kept intact and secured from unauthorized access.

CHAPTER SIX

SUMMARY AND CONCLUSION

6.1 SUMMARY OF ACHIEVEMENTS

Web-Based Transport Management System (IWTMS) was conceived with the burning desire of overhauling the transport management systems of developing countries toward maintaining standard in our transport system. Also with the recent trends, things are done with more acceptable systems that have proven beyond doubt, their potentials in almost every aspect of human endeavour that is the computer technology driven by Information and Communication Technology (ICT).

This study investigated the exiting bus booking system and some other services rendered by different transport companies system as implemented in the developing countries, taking Nigeria as a case study, isolated weaknesses associated with the existing system and has been able to come up with a reliable transport system that is web-based, which was tested and confirmed to be functional.

Bus/ticket Booking System (BBS), Courier Transport System (CTS), and Job/Recruitment Application System (JAS) were developed to fully implement the system. Although, CTS was not completely implemented due to the high cost and time constraints involved for the implementation

The researcher makes use of PHP and HTML as programming language for the development of this system with Dream Weaver as executable platform. MySQL Server-2005 was used in structuring the database which was executed online contrary to the stand alone computerized transport management system as the case has been.

This system implementation is the current trend needed in transport system which has the potentials of transforming the Africa transport system for good as most of the misnomers associated with transport systems stand corrected. The system being web-based and working with the bank; can encourage urgent ticket reservation of citizens who are in need of embarking on a journey , it is able to eliminate multiple/double booking of transporters since each customer has identification number and can never be allowed with more than one, cost has been dropped drastically as most of the paper work, ad-hoc staff, training, etc. are reduced to web-based both in storage and operations, the system is also able to eliminate the burden on passengers to queue up for hours or days waiting for booking since booking is automatic. The system should therefore be adopted for the desired pragmatic change in our transport management systems.

6.2 PROBLEMS ENCOUNTERED

The system so developed was achieved successfully. Though there were some problems encountered which include;

- Data Gathering: the scope of this research was wide and this made it difficult to have information readily available as expected. Some information needed was classified official and was difficult for same to be given out leading to so much consultation from office to office according to hierarchy.
- **Choice of Primary Key:** being a secure system which is supposed to check for status of a prospective user before applying same in a country like ours, where Social Security Number (SSN) is absent, it wasn't really easy to have come up with a combination of methods that could serve as Unique ID Number in order to have an authentic system as this.
- **Simulation**: the IWTS was supposed to automatically link up with the bank databases for its input data, but due to the huge amount of time and money required to accomplish

this, hence it is an academic research work, a simulation of the bank databases was used to provide input data.

- **Capital:** though an academic research work, it was a huge capital project which really stressed the researcher financially
- **Time Slack in Delivery**: The system interacts with users, using their phone numbers and/or email addresses, and different mobile service providers have different time slacks between when a message is sent and when the message is received (like Glo takes about ten minutes, MTN takes about three minutes, Airtel takes about five minutes etc.).

Above all, the joy was that irrespective of the obstacles, the work was a success.

6.3 SOLUTIONS ADOPTED

The following were solution adopted in order to address the afore listed problems;

1. The researchers took much time to persevere, as to enable them come out with meaningful information. While for the classical information, the researchers persevered by showing so much proofs that the information was needed for research purposes only which after much consultation, we were attended to.
2. For choice of primary key for a developing country like Nigeria where there is no national database of citizens like in Europe where social security number is used, we therefore made use of unique ID number which is created for every user for easy identification.
3. For the purpose of demonstration hence the full integration of the customers' bank database was not feasible due to so many factors; a simulated bank database was used.
4. For capital, the researchers work within the strength of the available capital, but ensure that the key components of the system were achieved.

5. The slack in message delivery was not too much a problem, though; the researchers have suggested that the GSM service providers should improve in their service delivery.

6.4 CONCLUSION

This system has been able to achieve successfully the development and implementation of Bus/ticket Booking System, Courier Transport System, and Job/Recruitment System, which constitute part of the IWTMS. It has as well been able to take care of all the anomalies associated with transport management systems as has been in practice by transport companies in Nigeria.

IWTMS may be seen as a threat to some transporters who would want to avail themselves with the weakness of the existing transport management system to their selfish advantages. Notwithstanding, let's look at the collective interest of the entire nation and allow such a system that has the potentials of repositioning our transport process stands as a nation for good management. Flexibility, efficiency, economy, etc with the IWTS is very high, as such; it should be encouraged to be adopted.

6.5 RECOMMENDATIONS

We must not continue to accept backwardness, let's arise and put an end to little things that matter by employing world standards in doing things. If standard must be met, then it calls for a new look into our transport process, which this work attempts to address. In a time like this that a concept has been set rolling in the seeming trend, it's worthwhile to recommend thus;

- This system should be implemented fully in the transportation system for bus/ticket reservations in Nigeria.
- IT facilities especially GSM, 3G and 4G technology should be extended to cover all remote areas.

- Nigeria Communication Commission (NCC) should monitor and ensure that GSM service Providers are able to improve on service delivery.
- Transport companies should ensure that trusted personnel only are allowed access to log in as admin.
- Social Security Number (SSN) should be given to citizens to ease authenticity and easy identification of transport fraudsters.

6.6 CONTRIBUTION TO KNOWLEDGE

The contribution to knowledge in this research work is the integration of Transporters' Bank Database (TBDB), Courier Transport Database System (CTDS) and Bus Booking Database System (BDS). Also, the use of integrated database is for the validation of transporters' credit wordiness before processing Booking request.

REFERENCES

Mondell, S., L., (1989). *Computers and Information Processing (5th Ed).* New York, West Publishing Company

Nwachukwu, E. O., (1996). *Introduction to Artificial Intelligence*. University of Port Harcourt: Unpublished Lecture note.

Agana, M. A, (2011). *An Instruction Delivery System for the Teaching of Mathematics*.

Unpublished M.Sc. Dissertation presented to Department of Computer Science, Faculty of Physical Sciences, Ebonyi State University, Abakaliki.

Amosa B. M. C., (2001). *Internet Connectivity; Problem and Findings*. Case study for developing countries, COAN conference series, and vol. 9, Nigeria.

Bassey, I. E., (2009). *An Expert System for troubleshooting Automobile Engine Faults.* Unpublished M.Sc. Dissertation presented to Department of Computer Science, Faculty of Physical Sciences, Ebonyi State University, Abakaliki

Mbam, B. C. E., (2002). *Information Technology and Management System.* Enugu: Our Saviour Press LTD.

Robert, C. M., (2012). *New York Review of Books.* Britannica Online Encyclopedia. http://www.britannica.com/../democracy

Inyima H .C Okezie C C., (2005), *1CT Assisted Industrial Information flow Model Towards Accelerated Technology Development*. The Journal Information, Communication and Computing Technology (JICCOTI'CIl) VOL1, PP5

Jean-paul Rodrigue, Dr. Brian slack and Dr. Claude Comtois (2010) , *A Diversity of modes of Transportation,* http"www.people.hofstra.edu/geotrans/eng/ch3en/perfcompfrt.html a web page downloaded on 06/06/2014.

Robert L. Bertini, Ph.D,P E(2012), *American Trucking Association foundation* http:www.benefit costists.dot.gov.

Wesel, R. (2008). *Cargo-tracking system combines RFID. Sensors, GSM and satellite.* htt://www.refidjournal.com/article/view/3870 a web page retrieved from RFID journal on 25/05/2014.

Koppanyi, Z.P, Lovas, T.A (2012), *International Achievers of the photogrammeting, Remote sensing and information sciences*, volume xxxix-B2, http://www.springerlink.com/content/1068-96051 a web page retrieved on 06/03/2014

Fremont, G. Grazzini, S. Sasses, A (2010*), the safe trip project improving Road safety for passenger vehicles using 2-way satellite communication*. http://www.springerlink.com/content/1068-960 A web page retrieved on 06/03/2014

R. Nee E A (1999). *New High-Rate Wireless LAN, EEE communications magazine* vol. 37,82-88.

ETSI, H A, (1999*) Global system for mobile communication* http://www..ieeexplore.ieee.org/xpl/mostResentissue.jsp?pinumber=7998-A web page retrieved on 06/03/2009

Robert L. Bertini, Ph.D P.E(2012) *Benefits of intelligent transportation system* http:www. Benefitcost.its.got.gov.

Nwakpa Mathew .N, (2011) *Design and implementation of computer Network for Transport services*. Unpublished M.Sc dissertation presented to department of computer science. Physical Science. Ebonyi State University, Abakaliki.

Padmanabhan, P.B. (2000) *Enhancement to the RADar user location and Tracking system* http://www.Hp.research. Microsoft.com/pub/tr/tr-2000-12.pdf A web page retrieved on 08/04/2014.

Ezeora E U and Mbam B C E., (2006). *Internet Services in Nigeria: the Journey so far:*The journal of information communication and computing Technology (JICCOTICII) VOL.3.IT30-32

Brightman Richard W and Dimsdte .Jeffrey M., (1986). *Using Computer In An Information Age.* Delmar publisher's inc. USA.

Kevin O. Capaciete, (February 26, 2012): *Web-Based Bus Reservation and Ticketing System*: published by: Naga City, Philippines (2010).

Whitten J.I Bentey L D Dittman K C., (2005) 5th Edition, *System Analysis and design Method.* Irwin/McGraw-HUl pushers. New York. Profiles Magazine 1992 page 43. Selected Topic on Computers by Allied Ventures System limited.

Ezeora E U., Mbam B C E., (2006). *Internet Services in Nigeria: the Journey so far:* The journal of information communication and computing Technology (JICCOTICII) VOL.3.IT30-32

Brightman Richard W., Dimsdte .Jeffrey M., (1986). *Using Computer In An Information Age*. Delmar publisher's inc. USA.

Brij Mohan Dammani, (2010). *Bus Reservation System* @ http://www.techbrij.com

Usaid | Deliver Project (October 2010),.Transport Management A Self-Learning Guide for Local Transport Managers of Public Health Services: Published by U.S. Agency for International Development (2010).

Kevin O. Capaciete, (February 26, 2012): *Web-Based Bus Reservation and Ticketing System*: published by: Naga City, Philippines (2010).

International Journal of scientific knowledge (May, 2013, Vol 3 No 1). *Design and Developing online Iraqi Bus Reservation System by Using Unified Modeling Language* @ http://www.ijsk.org.

APPENDIX A: SAMPLED CODE

```
<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Transitional//EN"
"http://www.w3.org/TR/xhtml1/DTD/xhtml1-transitional.dtd">
<html xmlns="http://www.w3.org/1999/xhtml">
<!-- DW6 -->
<head>
<!-- Copyright 2005 Macromedia, Inc. All rights reserved. -->
<title>Integrated Web-Base Mgt System</title>
<meta http-equiv="Content-Type" content="text/html; charset=utf-8" />
<link rel="stylesheet" href="mm_restaurant1.css" type="text/css" />
<style type="text/css">
<!--
.style1 {color: #FFFFFF}
.style3 {
        color: #000000;
        font-size: 14px;
}
.style4 {
        font-size: 14px;
        color: #FFFFFF;
}
#apDiv1 {
        position:absolute;
        width:220px;
        height:269px;
        z-index:1;
        left: 809px;
        top: 145px;
}
.style8 {color: #CC3300; font-size: 14px; }
#apDiv1 marquee .style3 {
        color: #800000;
}
#apDiv1 marquee .style3 .style4 strong {
        color: #800000;
}
#apDiv1 marquee .style3 .style4 {
        color: #800000;
}
#padding .style8 {
        color: #800000;
}
#padding .style8 {
        color: #800000;
}
#padding .style8 .style31 {
        color: #800000;
}
#apDiv2 {
        position:absolute;
        width:388px;
        height:43px;
        z-index:2;
        left: 517px;
        top: 61px;
}
.style10 {
        color: #800000;
}
-->
</style>
```

```
<!-- Start WOWSlider.com HEAD section -->
        <link   rel="stylesheet"   type="text/css"   href="engine1/style.css"
media="screen" />
        <style type="text/css">a#vlb{display:none}</style>
<script type="text/javascript" src="engine1/jquery.js"></script>
<!-- End WOWSlider.com HEAD section -->


<!-- Start WOWSlider.com HEAD section -->
        <link   rel="stylesheet"   type="text/css"   href="engine2/style.css"
media="screen" />
        <style type="text/css">a#vlb{display:none}</style>
<script type="text/javascript" src="engine2/jquery.js"></script>
<!-- End WOWSlider.com HEAD section -->


<!-- Start WOWSlider.com HEAD section -->
        <link   rel="stylesheet"   type="text/css"   href="engine3/style.css"
media="screen" />
        <style type="text/css">a#vlb{display:none}</style>
<script type="text/javascript" src="engine3/jquery.js"></script>
<!-- End WOWSlider.com HEAD section -->


<!-- Start WOWSlider.com HEAD section -->
        <link   rel="stylesheet"   type="text/css"   href="engine4/style.css"
media="screen" />
        <style type="text/css">
        a#vlb{display:none}a:link {
        color: #FFFFFF;
}
a:visited {
        color: #FFFFFF;
}
a:hover {
        color: #7E0000;
}
a:active {
        color: #FFFFFF;
}
.style16 {font-size: 16px}
    .style17 {font-size: 14px}
    .style18 {font-size: 14px; color: #800000; }
    .style14 {font-size: 24px}
    .auto-style1 {
                color: #CC3300;
                line-height: 18px;
                font-style: normal;
                font-variant: normal;
                font-weight: normal;
                font-size: 12px;
                font-family: "times new roman";
                text-align: center;
        }
    </style>
<script type="text/javascript" src="engine4/jquery.js"></script>
<!-- End WOWSlider.com HEAD section -->
<script type="text/javascript">
function nchk()
{
```

```
if((document.form1.textfield.value!="Admin")                                    ||
(document.form1.textfield2.value!="Password"))
{
alert("Please either username or  password \n is invalid please try again")
}

else            if((document.form1.textfield.value=="Admin")            &&
(document.form1.textfield2.value=="Password"))
{
alert("Welcome Admin")
window.open("update.html")
}
}
</script>

<!-- Start WOWSlider.com HEAD section -->
       <link  rel="stylesheet"  type="text/css"  href="engine2//style.css"
media="screen" />
       <script type="text/javascript" src="engine2//jquery.js"></script>
<!-- End WOWSlider.com HEAD section -->


<!-- Start WOWSlider.com HEAD section -->
       <link  rel="stylesheet"  type="text/css"  href="engine5//style.css"
media="screen" />
       <script type="text/javascript" src="engine5//jquery.js"></script>
<!-- End WOWSlider.com HEAD section -->


<!-- Start WOWSlider.com HEAD section -->
       <link  rel="stylesheet"  type="text/css"  href="engine6//style.css"
media="screen" />
       <script type="text/javascript" src="engine6//jquery.js"></script>
<!-- End WOWSlider.com HEAD section -->

</head>
<body bgcolor="teal">
<table    width="960px"    align="center"    border="0"    cellspacing="0"
cellpadding="0">
       <tr bgcolor="#99ccff">
              <td colspan="3" class="logo" nowrap="nowrap" style="height:
11px">
              <img       height="67"       src="images/trans%20logo.jpg"
width="1000px" /></td>
         </tr>

       <tr bgcolor="#003399">
              <td height="36" colspan="3" id="navigation" nowrap="nowrap"
class="navText"><span  class="style1"><a  href="index.html">HOME</a>  |  <a
href="About.html">
              About US </a> |  <a href="Contact us.html">|</a>Bus
              <a  href="trans/index1.php">Booking  </a><a  href="Available
facilities.html"> </a>||
              <a href="Curier.html">Curier
              Services</a> || <a href="job/index.html">JOB/CAREER </a>||<a
href="Contact us.html"> CONTACT US || </a><a href="Bank details.html">BANK
DETAILS</a> 
              ||</span>  <a
href="trans/recruit/index.php">Admin login</a></td>
          </tr>

       <tr bgcolor="#ffffff">
```

```
                <td   width="200"   class="auto-style1"   id="padding"><span
class="style8">


<!-- Start WOWSlider.com BODY section id=wowslider-container6 -->
        <div id="wowslider-container6">
        <div class="ws_images"><ul>
<li><img  src="data6/images/director.jpg"  alt="DIRECTOR"  title="DIRECTOR"
id="wows6_0"/></li>
<li><img src="data6/images/aritos1.jpg" alt="" title="" id="wows6_1"/>AUTO
STAR</li>
<li><img       src="data6/images/images 110.jpg"       alt=""       title=""
id="wows6_2"/>PEACE MASS</li>
<li><img       src="data6/images/images 111.jpg"       alt=""       title=""
id="wows6_3"/>IFESINACHI</li>
<li><img       src="data6/images/images 033.jpg"       alt=""       title=""
id="wows6_4"/>ROMCHI</li>
<li><img       src="data6/images/images 048.jpg"       alt=""       title=""
id="wows6_5"/>EKENEDILICHUKWU</li>
<li><img       src="data6/images/images 008.jpg"       alt=""       title=""
id="wows6_6"/>AKTC</li>
<li><img       src="data6/images/images 009.jpg"       alt=""       title=""
id="wows6_7"/>COAL CITY</li>
<li><img       src="data6/images/images 015.jpg"       alt=""       title=""
id="wows6_8"/>ONITCHA SOUTH</li>
<li><img       src="data6/images/images 032.jpg"       alt=""       title=""
id="wows6_9"/>EBOTRANS</li>
</ul></div>
<span  class="wsl"><a  href="http://wowslider.com">jquery  slideshow</a>  by
WOWSlider.com v5.3</span>
        <a href="#" class="ws_frame"></a>
        <div class="ws_shadow"></div>
        </div>
        <script                                          type="text/javascript"
src="engine6//wowslider.js"></script>
        <script type="text/javascript" src="engine6//script.js"></script>
<!-- End WOWSlider.com BODY section -->

<marquee direction ="up">An
                online booking system for Transportation is an internet-base
system that allows
                one to book for services online. The Transportation business
or
                Companies are not left behind in the recent development of
the impact
                of internet technology<br/><b>This application is design by
Igboke John Ituma </b></marquee></span><span class="style3"> </span><br />
                </td>
                                </tr>
        </table>

        </p>
                </td>
                <td valign="top" style="width: 589px">
                <table    border="0"    cellspacing="0"    cellpadding="0"
style="width: 485px; height: 391px">
                <tr>


<td class="pageHeader" style="width: 402px">
```

```
                <h5  align="center"  class="style10"  style="height:  26px;
width: 377px">WELCOME MESSAGE</h5></td>
                </tr>

                <tr>
                <td height="347" valign="top" class="bodyText" style="width:
402px">
                <p class="style17" style="width: 471px">The world today is
technically changing very fast,  everyday. Internet technology is one of
such technologies invented for years  now, since the advent of internet
technology especially the World Wide Web,  which supports several services
in public/private enterprises, has helped  business transaction to operate
online.<br />
                  Online  booking  system  is  used  to  store  and  retrieve
information about business product, business services and it facility. Also,
it  creates a platform for transaction activities.
                An online booking system for Transportation is an internet-
base system that
                allows one to book for services online. The Transportation
business or
                Companies are not left behind in the recent development of
the impact of internet technology.
                </p>
                                        </td>
                </tr>
        </table>
                </td>
  </tr>

        <tr bgcolor="#ffffff">
        <td colspan="6"><img src="mm spacer.gif" alt="" width="1" height="1"
border="0" /></td>
        </tr>

        <tr bgcolor="maroon">
        <td  colspan="6"  style="height:  46px"><div  align="center"><span
class="style4"><strong><h3  align="center">&copy;  All  Right  Reserved
Integrated Web-Based Transport Management System 2015 <br/>Design by: Igboke
John                                    Ituma</h3></strong></span><strong><span
class="style4"></span></strong></div></td>
        </tr>

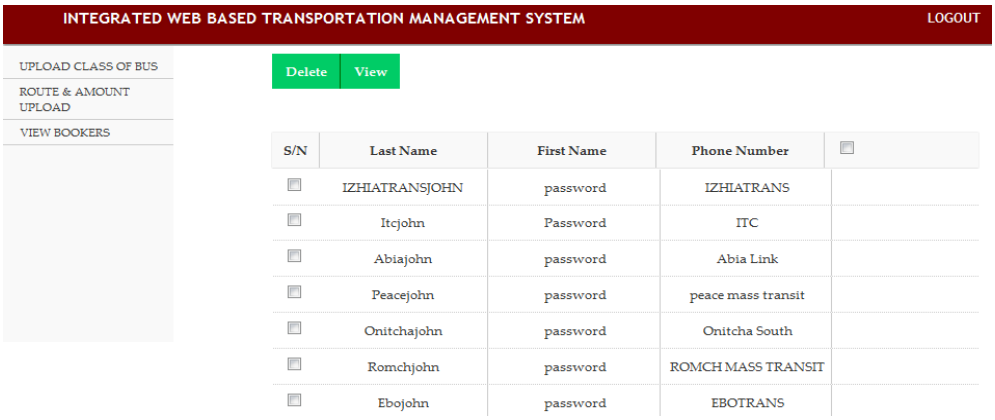

        <tr bgcolor="#003399">
        <td colspan="6"><img src="mm spacer.gif" alt="" width="1" height="1"
border="0" /></td>
        </tr>

        <tr>
        <td colspan="6"><img src="mm spacer.gif" alt="" width="1" height="2"
border="0" /></td>
        </tr>

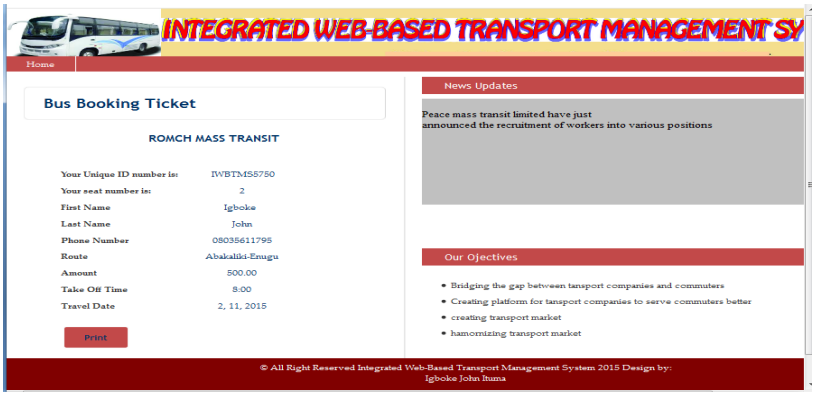
        <tr bgcolor="#003399">
        <td colspan="6"><img src="mm spacer.gif" alt="" width="1" height="1"
border="0" /></td>
        </tr>


        </table>
</body>
</html>
```

APPENDIX B: SAMPLE OUTPUT



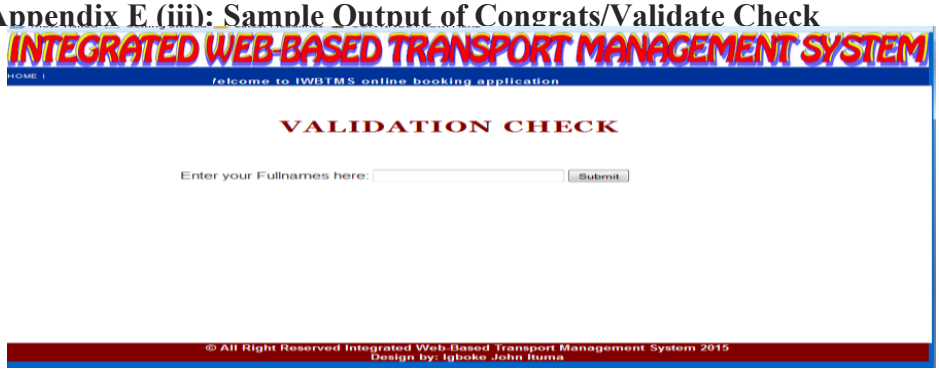
Appendix C (i): Sample Output of List of Company



Appendix D (ii): Sample Output of Bus Ticket



Appendix E (iii): Sample Output of Congrats/Validate Check



PRINT ACKNOWLEDGEMENT SLIP

Your payment has been accepted please kindly print this acknowledgment slip and come with it to the park for validation.

CLICK HERE TO PRINT THIS SLIP

Fullnames: _____ Odiase efosa
Name of Goods:_____ 1020304050607
Size of Goods: _____First Bank
Email address:_____ azemobordaniel@yahoo.com
Phone number:_____ 08055065547
Address: _____17, Aloh Street, Off Kpirikpiri Abakaliki, Ebonyi
Date paid:_____ 1/10/2013
Take off Point: _____5/10/2013
Destination:_____6/10/2013
Name of Receiver:_____ #15000
Sex: _____Male
Address:_____ Programmer and Web designer
Receiver Phone Number: _____Executive room

Appendix F (iv): Sample Output of Courier Acknowledgement Slip

Appendix G (v): Sample Output of Job Recruitment

Preview Application

Please take NOTE of your Application Number : IWBTMS26499973426

Profile



Title:	Mr
Surname:	Igboke
First Name:	John
Middle Name:	Ituma
Gender:	Male
Date Of Birth:	11/06/1980
Religion:	Christianity
Marital Status:	Single
Mobile Telephone Number:	08035611795

Position Applying For:	Human Resource manag
Application Number:	IWBTMS26499973426
Country:	Nigeria
State:	Ebonyi
LGA:	Ohaukwu
Email Address:	princejoy_4krist@yah
Permanent Home Address:	Ngbo
Contact Address:	Ezzangbo

Proceed

IWBTMS 2015. All rights reserved.

Appendix H (vi): Sample Output of Recruitment Payment Infor

NOTICE:
1. Please be aware that no date has been set for the aptitude test. Test date will be announced as soon as it is confirmed.

2. New Applications closes on 27 March, 2013, however printing of acknowledgement slips will be available even after the closing date. We urge you not to panic if you are unable to print your acknowledgement slip right away.

Payment Information

Surname:	Igboke
First Name:	John
Middle Name:	Ituma
Email Address:	princejey_4krist@yah
Application Type:	Savings
Acount Name:	Integrated web-base transport management system
Acount Number:	38909111987
Depositors Name:	IWBTMS26499973426
Online Application Fee:	N1000
Payment Status:	Pending

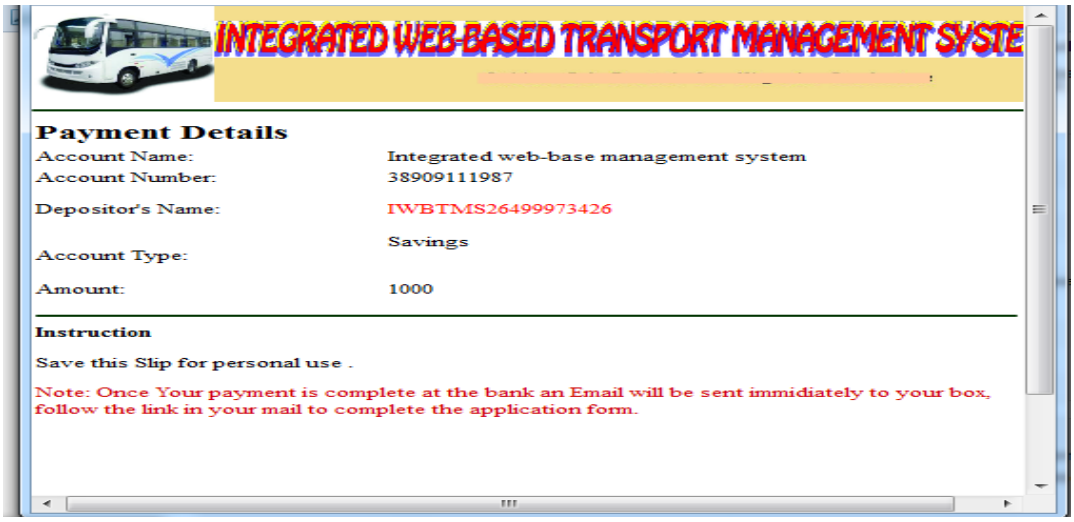
I understand and agree to the fee structure as outlined in the payment information above. I also understand and agree that all payments made beyond this point are non-refundable and does not guarantee a placement into the selected agency. I agree to pay the sum of N1000 for the online application.

You will not be able to edit your application once payment is made. All payments made are non-refundable.

☑ I have read, understood and agree to the Terms and Conditions applicable to this online application process.

Print Payment

Appendix I (vii): Sample Output of Recruitment Payment



Appendix K (x): Sample Output Bus Booking Database

book_id	com_id	bus_amnt	seatno	takeofftime	yr	mnths	dys	fn	ln	phone	email	idno
33	9	400.00	8	7:00	2015	02	17	Egba	James	0803522894	odi@yahoo.com	323470
34	9	400.00	13	16:00	2012	10	17	Jane	Ibe	07056334964	odi@yahoo.com	140720
35	10	400.00	13	16:00	2012	10	17	Jane	Ibe	07056334964	odi@yahoo.com	101930
36	10	400.00	13	16:00	2012	10	17	Jane	Ibe	07056334964	odi@yahoo.com	210460
37	10	10,000.00	11	8:00	2015	11	28	Igboke	johnson	07035611795	prince@yahoo.com	99110
38	12	500.00	13	3:00	2015	10	28	johnson	oke	08034611795	jaco@yahoo.com	33460
39	10	10,000.00	14	8:00	2015	08	8	Igboke	Faith	09036511795	faith@yahoo.com	60090
40	12	400.00	15	10:00	2015	08	8	Igwe	Faith	08093567782	faith@yahoo.com	2870
41	6	500.00	2	8:00	2015	11	1	Igboke	John	08035611795	princejey_4krist@yahoo.com	295890
42	6	500.00	2	8:00	2015	11	2	Igboke	John	08035611795	princejey_4krist@yahoo.com	5750