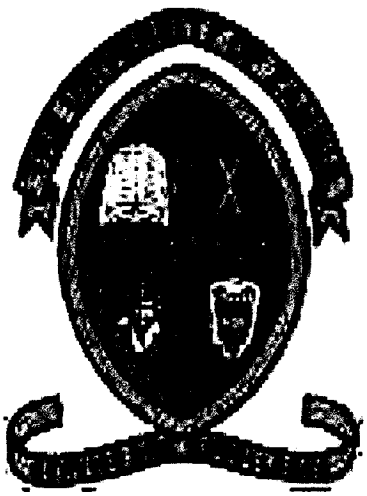
THE UNIVERSITY OF ZAMBIA

SCHOOL OF NATURAL SCIENCES

DEPARTMENT OF COMPUTER STUDIES



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The Zambian web-based Vehicle Trade and Inventory Management System (ZVTIMS).

A project report thesis submitted in partial fulfilment of the Bachelor of Science in computer science of the University of Zambia.

September, 2013.

By

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Declaration

I Mulomba Wilson Choongo do hereby declare that this project Thesis is original and has not been published and/or submitted for any other degree award to any other University before.

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Signed:..... Date:.....23/09/2013.....

ACKNOWLEDGEMENT

I would like to acknowledge the following people without whose help; this work would never have come to completion.

Most valuable is the contribution of my supervisor Mrs. Leena Kumar for her time, patience and above all her technical guidance throughout the study.

I highly acknowledge my God for giving me good health and having blessed me with the opportunity to take this study. My deepest gratitude goes to my late mother Mrs. Mary Chibeka Choongo for her support both emotional and spiritual plus the care she has given me. May her soul rest in internal peace. Special thanks to my late father Mr. Edison Choongo for making the road and mentoring me. Thanks to my brother and sisters for their encouragements and my girlfriend Rosemary Chirwa for her love and support.

Lastly, I am grateful to Dr. Jackson Phiri , Mr. Nyerinda Mayumbo and Dr. John Regan for their cooperation and information sharing that added value to the success of the this project.

Abstract

The purpose of this project is to come up with a platform where buyers are able to meet sellers and trade specifically in vehicles both commercial and domestic. This will be in a form of a web-based management information system.

This will be a website where people can buy and sell things like bikes, cars and commercial vehicles. An efficient search facility will be provided to visitors to find things of their interest quickly. There will be a content management system (CMS) designed for the administrator(s) of the website. This will ease on the work of administrators on maintaining the site content. The system will further more create a timely access to potential sales of vehicles, creating marketing strategies for vehicles sales and provide an advertising platform for vehicles.

The vehicle trade and inventory management information system to be developed in this project will offer functionalities to quick access to buyers from various parts of the country in Zambia .It will enable monitoring of the results and performance of the buying and selling activity in the country .This information can then be used to control trade in the country so that relevant and measurable objectives can be checked by necessary authorities.

ACRONYMS

WWW	World Wide Web
CMS	Content Management System
ZVTIMS	Zambian Vehicle Trade and Inventory Management System
LAN	LOCAL AREA NETWORK
HTTP	Hypertext Transfer Protocol
FTP	File Transfer Protocol
UML	Unified Modelling Language
VIN	Vehicle Identification Number
OEM	Original Equipment Manufacturer
HTML	Hyper Text Markup Language
UPC	Universal Product Code

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CHAPTER ONE

1.1 INTRODUCTION

The business transactions between buyers and sellers are a property of the electronic commerce (E-commerce). It is the most notable business use of the World Wide Web (www).The fundamental goal of an E-commerce site is to sell products and services online-commerce is the exchange of goods and services by means of the Internet or other computer networks. E-commerce follows the same basic principles as traditional commerce, that is buyers and sellers come together to exchange goods for money. But rather than conducting business in the traditional way in stores and other "brick and mortar" buildings or through mail order catalogues and telephone operators in e-commerce buyers and sellers transact business over networked computers[26].

According to Redmond [9] E-commerce offers buyers convenience. They can visit the World Wide Web sites of multiple vendors 24 hours a day and seven days a week to compare prices and make purchases, without having to leave their homes or offices. In some cases, consumers can immediately obtain a product or service, such as an electronic book, a music file, or computer software, by downloading it over the Internet.

For sellers, e-commerce offers a way to cut costs and expand their markets. They do not need to build, staff, or maintain a store or print and distribute mail order catalogs. Automated order tracking and billing systems cut additional labor costs, and if the product or service can be downloaded, e-commerce firms have no distribution costs. Because they sell over the global Internet, sellers have the potential to market their products or services globally and are not limited by the physical location of a place. Internet technologies also permit sellers to track the interests and preferences of their customers with the customer's permission and then use this information to build an ongoing relationship with the customer by customizing products and services to meet the customer's needs [9].

1.2 MOTIVATION AND SIGNIFICANCE OF THE THESIS

1.2.1 MOTIVATION

In Zambia, selling and buying of local automobiles like bikes, cars and commercial vehicles have being done mostly by advertisements in the newspapers. For instance the SANGWAPO column of the "The post" newspaper advertises sales of automobiles. This has inherent disadvantages in that it does not provide the reader or potential buyer with the appropriate needs or specification of the vehicles(s) and services. It further has a slow communication response lag between the buyer and the seller and in the world of business; time is of great value and importance. On the other hand it negatively affects profitability due inadequate business plans and excessive spending on advertising and marketing to attract customers to the newspapers columns. On the brighter side the internet covers a large clientele base and its expanding rapidly. This may subsequently attract more profitability based on the following research findings:

- Online consumer sales expanded by more than 23% in 2005 to an estimated $142–$172 billion[17].
- On an average day, 70 million people go online. Around 140 million send e-mail, 8 million have created a blog, 4 million share music on peer-to-peer networks, and 3 million use the Internet to rate a person, product, or service [10].
- The number of people who have purchased something online expanded to about 110 million, with additional millions shopping (gathering information) but not purchasing [10].
- Use of the Internet for business-to-business commerce expanded about 30% in 2005 to more than $1.5 trillion[2].

  The Internet technology base gained greater depth and power, as more than 42 million households had broadband cable or DSL access to the Internet in 2005—which is about 38% of all households [17].

Consequently technology continues to grow thus, providing users with fast and reliable connections .This is highlighted in the following technological trends.

- Wireless Internet connections (Wi-Fi, Wi-Max, and 3G telephone) grow rapidly.
- The Internet broadband foundation has become stronger in households and businesses.

- Bandwidth prices have fallen as telecommunications companies re-capitalize their debts.
- RSS (Really Simple Syndication) have grown to become a major new form of user-controlled information. [14].

Computing and networking component prices have continued to fall dramatically. This is as a result of the technological advancements that have continued to revolve.

In light of these research findings and the problems that are faced in Zambia as earlier described, I found motivation to undertake this project.

1.2.2 SIGNIFICANCE

The significance of this project is the promise that it will bring about some fundamental, unprecedented shifts in commerce and trade in relation to vehicles. These shifts will appear in the large reduction in information asymmetry among all market participants (buyers and sellers). Information asymmetry is any disparity in the relevant market information among parties in a transaction. In Zambia, sellers of vehicles are able to prevent buyers from learning about their original costs, price discrimination strategies, and profits from sales. This becomes more difficult with web-based Zambian Vehicle and Trade Management System, and the entire marketplace potentially becomes highly price competitive. This also presents the possibility that sellers might collude on prices rather than compete and drive overall average prices up. This strategy works well especially when there are just a few suppliers [22]. It will further create a convenient platform that is time particular where sellers and buyers can meet and transact. Additionally it will cut down on the cost of advertising as it will be integrated seamless in the system.

1.3 SCOPE

The scope of the Zambian Vehicle Trade and Inventory Management system will be a full functional software system that is going to the handle the following in its scope. Online sales of new cars is heavily regulated and mostly forbidden. Therefore in this project the sales will concentrate on used vehicles in Zambia.

- A website that is a platform where people can buy and sell things like bikes, cars and commercial vehicles.
- An efficient search facility that will enable visitors to the website to find things of their interest fast and easily.

- A content management system (CMS) designed for the administrator(s) of the website in order for them to manage content of the web site with ease and having not to worry about the underlying HTML.
- The system will be geographically limited to Zambia.

1.4 PROBLEM STATEMENT

The Zambian selling and buying of local automobiles like bikes, cars and commercial vehicles has being done mostly by advertisements in the newspapers, on brochures and fliers. For instance the "SANGWAPO" column of the "The post newspaper" advertises sales of automobiles. This has inherent disadvantages in that it does not provide the reader or potential buyer with the appropriate needs or specification of the Vehicles(s) and services they want. It further has a slow communication response between the buyer and the seller as time waits for no man in the world of business; time is therefore, of great value in this sector. Access to newspapers to remote places in Zambia is also a problem thus an alternative and cheaper way is through the internet. Therefore the internet becomes a handy way to conduct business. The newspapers have a negative impact on the profitability as the customer clientele is lesser as compared to the online presence of the customers.

1.5 AIMS AND OBJECTIVES

1.5.1 AIMS

The aims of the vehicle trade and inventory system are to provide a central vehicle repository of information used to define vehicles and relate the vehicle to its owner, location and relative importance. This information will provide personnel with data needed to support their job functions. The aims of the vehicle trade and inventory system are:

- To provide an online platform where buyers and sellers of vehicles can meet and transact.
- Provide financial services that will allow the budgeting for vehicle procurement, depreciate vehicle over time, and prepare complete tax documents using the necessary information as deemed fit.
- Provide a platform that will ease contract and enterprise agreements and negotiate vendor discounts with Contracts management.
- It will provide technical personnel the ability to resolve problems more quickly with the information contained within a location and hence facilitate support or maintenance activities associated on the vehicle(s).

- The vehicle trade and inventory system will provide integration with the everyday functions performed by personnel associated with entering and maintaining vehicles information. The system will reduce the effort devoted to vehicle management trade, while supplying many personnel with the information they need to perform their functional responsibilities in order for transactions to occur.
- The system will provide a central vehicle repository that covers the entire Zambia, rather than having separate vehicle repository for mainframe, network and distributed environments. Having this will ultimately simplify accounting and vehicle management, while allowing for the implementation of enterprise-wide vehicle management standards and procedures.

1.5.2 OBJECTIVES

The objectives of the Zambian Vehicle Trade and Inventory Management are to manage the physical and logical properties of information system resources and their relationship, while ensuring that service level commitments are achieved. These objectives include:

- Ensure efficient and timely identification of vital vehicle(s).
- Assist in managing the enterprise-wide inventory.
- Provide a common repository for vehicle(s).
- Plan and control the proliferation of vehicles across Zambia.
- To allow people to buy and sell vehicles and allow people to find things of their interest quickly.
- To identify and track all data processing in an inventory system repository.
- To define the process by which vehicles are identified and maintained in the vehicle trade and inventory system.
- To provide a full range of reports that will satisfy informational requirements in the Zambia.
- To provide an exact specifications on the available vehicles and a competitive price
- To provide training to personnel responsible for supporting the inventory management system.

1.6 ORGANIZATION OF THE THESIS

This project thesis is organized in the following order. Chapter one gives a general introduction to the subject under study. It further describes the motivation and significance of the thesis. It gives the scope of the project and outlines the aims and objectives of the thesis. In chapter two we dive in the subject area and explore the literature review and related works. Chapter three describes in details the methodology used to undertake the project. It discusses the system requirements, design and lastly the implementation. In chapter four we narrow in the developed system and perform the system testing and the results of the testing are discussed in this chapter. Finally in chapter five of the project thesis we conclude it and give an overall discussion of the topic under study and we further give the future works of the Zambian Vehicle Trade and Inventory Management system.

1.7 SUMMARY

The Vehicle Trade and Inventory Management system will solve the problems stated in the problem statement in Zambia and thus foster development in the business sector. It will provide to the buyers (visitors to the website) an efficient search facility that will be providing to visitors the capacity to find things of their interest. It will also bridge the seller and buyer time space as mentioned as time space will be fast because time is of great importance to business. It will provide a platform where buyers and sellers can meet and perform business transaction using an online way.

CHAPTER TWO

2.1 INTRODUCTION

Inventory management software is a computer-based system for tracking inventory levels, orders, sales and deliveries, [27]. It can also be used in the manufacturing industry to create a work order, bill of materials and other product-related documents. Companies use inventory management software to avoid product overstock and outages. It is a tool for organizing inventory data that before was generally stored in hard-copy form or in spread sheets.

In Zambia selling and buying of products such as bikes, cars and commercial vehicles has been done using advertisement in the newspapers. For instance the SANGWAPO column of the "The post newspaper" has inherent disadvantages in that it does not provide the reader of the potential buyer with the appropriate needs or specifications of the product(s). It further has slow communication response between the buyer and the seller and in the business world time is of great value and importance. This system (newspaper) provides a tedious way of searching of what the buyer and the particular specification of the wanted product(s) are close to impossible to find.

The vehicle and inventory management system will solve these problems in Zambia. It will provide to the buyer (visitors to the website) an efficient search facility that will be providing to visitors the capacity to find things of their interest. This chapter deals with the underlying technology and knowledge under which this project is based.

2.2 LITERITURE REVIEW AND RELATED WORKS

Inventory control goes back further than writing; there were simpler inscriptions in Egyptian and Babylonian warehouses and granaries, with pictures that represented the inventory owner and numbers representing amounts in stock and taxes due.

The labels of Abydos and the granary cuneiforms of Babylon were primal versions of the humble SKU, which then inspired the development of methods of tracking and inventory information disbursement. The progression of inventory records shows a drive for greater and greater durability, accuracy, and level of convenience. The desire for reliable, accurate and fast inventory accounting has led to the development of inventory accounting software; a

mechanized version of the ancient record-keeping scribe who once scratched IDs into bits of bone to assist with a task human memory was unable to handle [13].

Barcode scanners went to field use in 1974. By the 1980s, the first inventory control computer programs that could run on a PC were starting to see use. The Universal Product Code (UPC) was adopted by the grocery industry in April 1973 as the standard barcode for all grocers, though it was not introduced at retailing locations until 1974. This helped drive down costs for inventory management because retailers in the United States and Canada didn't have to purchase multiple barcode readers to scan competing barcodes. There was now one primary barcode for grocers and other retailers to buy one type of reader for [4].

In the early 1980s, personal computers debuted and started becoming popular. This further pushed down the cost of barcodes and readers. It also allowed the first version of inventory management software to be put into place. One of the biggest hurdles in selling readers and barcodes to retailers was the fact that they didn't have a place to store the information they scanned. As computers became more common and affordable, this hurdle was overcome. Once barcodes and inventory management programs started spreading through grocery stores, inventory management by hand became less practical. Writing inventory data by hand on paper was replaced by scanning products and inputting information into a computer by hand, starting in the early 2000s. The inventory management software progressed to the point where business people no longer needed to input data by hand but could instantly update their database with barcode readers [23].

Inventory management is one of the basic problems in almost every company. Before computer age and integration, paper tables and paperwork solutions were being used as inventory management tools. These were very far from being a solution; it took so much time, and even needed employees just for this section of the organization. There wasn't any efficient solution available in the many companies during those days. Every process was based on paperwork and this resulted in high human fault rate, difficulties in the process and the tracing of the inventory losses and there wasn't any efficient logging system. After the computer age, every process started to be integrated into the electronic environment. And now we have qualified technology to implement new solutions to these problems. Software based systems bring the advantages of having the most efficient control with less effort and employees.

Inventory management provides:

- Up-to-date information about data processing resources through the creation and archiving of records in a centralized repository.
- Financial records specific to a single component, or groups of components.
- Service records for all components in the inventory.
- Data used to support configuration diagrams of the hardware and software components contained within specific locations, or the entire data processing environment. Inventory management software is made up of several key components, all working together to create a cohesive inventory for many organisations'system.These features include:

Order management

Should inventory reach a certain threshold, a company's inventory management system can be programmed to tell managers to reorder that product. This helps companies avoid running out of products or tying up too much capital in inventory.

Asset tracking

When a product is in a warehouse or store, it can be tracked via its barcode and /or other tracking criteria such as serial number, lot number or revision number. Nowadays, inventory management software often utilizes barcode, radio frequency identification (RFID), and/or wireless tracing technology.

Service management

Companies that are primarily service-oriented rather than product-oriented can use inventory management software to track the cost of the materials they use to provide services, such as cleaning supplies. This way, they can attach prices to their services that reflect the total cost of performing them.

Product identification

Barcodes are often the means where by data on products and orders are inputted into memory management software. A barcode reader is used to read barcodes and look up information on the products they represent. Radio-frequency identification (RFID) tags and wireless methods of product identification are also growing in popularity.

RELATED WORKS

Key Trend: Rise of Online Classifieds

In the online world, there has been a strong growth of lead generation channels for automotive sales. In the 80s and 90s, automotive classifieds were primarily based in print. However, since the mid 90s, online classifieds have replaced print as the main channel for advertising used cars. AutoTrader – a leading auto classified site – has shown strong sales growth and now has over a billion dollars in annual revenue.

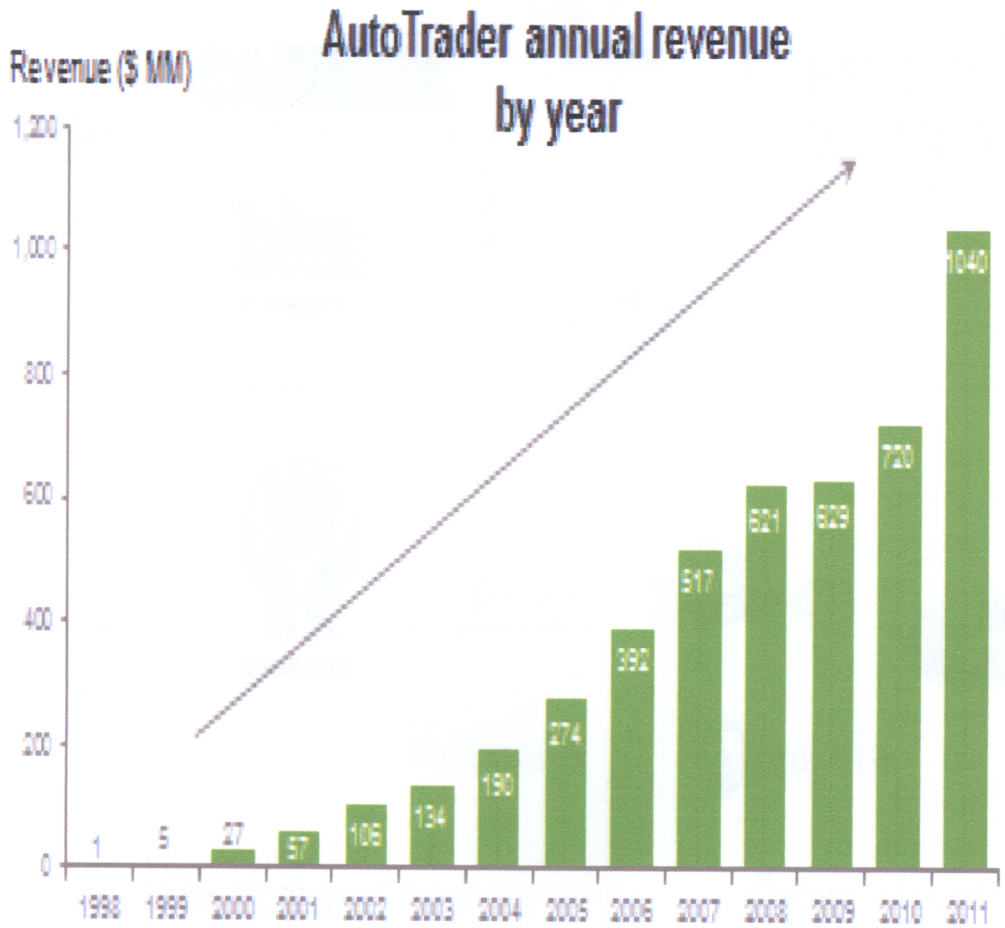

Figure 2.1: Growth sales (source CNW Marketing Research).

Key Trend: Emergence of Online Retail Channel

In recent years, there have been small but growing examples of online retail channels for used cars. The most prominent among them is eBay Motors. Since being launched as a separate vertical by eBay in 2000, eBay motors has grown rapidly and now has ~$8 Billion in transactions occurring each year. Many of these sales are sight-unseen sales, where the buyer pays for the car based on information available just online or over the phone.

Figure 2.2: Physical and Online Channels (source automotive news).

A similar emergence was seen in the mid 90s for lead-generation when online classifieds like AutoTrader rose to replace physical lead sources like Credit Unions and Newspapers as the primary lead generation channels. Certain retailers such as Texas Direct Auto in the US and Car Shop in the UK believe in the potential for online retailing and have harnessed eBay Motors (and, in the case of CarShop, developed a standalone e-commerce platform) to sell cars. With models such as these, the word of online auto retailers is starting to become larger, though it is still much smaller than the volume sold by traditional dealerships such as CarMax.

Recently starting from the year 2005 there has being increase in vehicle trade management software offering different functionalities. For example the Dominion's Dealer Specialties provides auto dealers nationwide in America with a comprehensive suite of inventory management solutions, websites, Internet marketing tools and enhanced vehicle listings distributed online. Dominion is based in America. As the largest and most experienced business in the market, car dealers can choose from full-service data collection to industry leading in-house products to manage inventory, giving them the best value for their changing needs.

VIN Decoding

A Vehicle Identification Number (VIN) has the ability to communicate a complete vehicle story. From a VIN, you can determine not only a vehicle's year, make and model, but also detailed features including trim, style, vehicle type, engine code and more. Dealer Specialities offers industry –leading VIN decoding services with exceptional data accuracy and quality integrated in inventory manager.

Through Dominion's partnership with Data One Software, they utilize one of the largest and most comprehensive automotive databases in the nation. Data One Software provides historical and new vehicle data for vehicles since 1981 .It is extremely important that vehicle descriptions align and adhere to OEM (original Equipment Manufacturer) marketing standards. Data One Software remains at the forefront in the industry for data accuracy quality and timeliness [8].

The power VIN decoding services with Dealer Specialties' Inventory Manager makes entering a VIN into the inventory software quick and easy.VIN Decoding Categories

- Basic vehicle characteristics

- Green data , safety data and ratings
- Service data including OEM services schedules
- Vehicle comparison data
- Vehicle pricing and incentives
- Vehicle awards and accolades
- Vehicle reviews and weekly automotive columns

Data Distribution Network

Dominion has a robust and comprehensive dealer Inventory Management System that automatically and seamlessly distributes inventory to eBay, Craigslist, Cars.com, Facebook, Twitter, AutoTrade.com, GetAuto.com and more.

- Seamless and automatic distribution.
- Free and subscription-based partners.
- Includes 600+ data partners.
- Has no additional cost.

Another example of the related work is the www.ukzedtrade.com website which was found in 2011. They provide searching facilities for a car or commercial vehicle, through their trusted contacts and buyers are able to look for the vehicle and find them quickly and efficiently at the lowest price possible.

Last year in 2012 the ukzed company sold over 40 cars and Trucks. Through the years they have acquired a strong pofolio of sold cars as can see be in the Sold Vehicle Section on the ukzed website, and most importantly a lot of repeat business. The reason they are different from other dealerships is that they source their vehicles rather than stocking, simply because they do not want customers to be limited to what we have in stock. Instead they can literally find the best car for customers from thousands of potential options. On top of it they also provide spare parts direct from the UK.

2.3 VEHICLE TRADE AND COMMERCE

E-commerce, as defined by *businessdictionary.com,* is "Business conducted through the use of computers, telephones, fax machines, barcode readers, credit cards, automated teller machines (ATM) or other electronic appliances (whether or not using the internet) without

the exchange of paper-based documents. It includes activities such as procurement, order entry, transaction processing, payment, authentication and non-repudiation, inventory control, order fulfilment, and customer support. When a buyer pays with a bank card swiped through a magnetic-stripe-reader, he or she is participating in e-commerce".

2.4 TYPES OF E-COMMERCE

A variety of businesses are conducted online, including retail businesses that sell products to consumers, service providers that sell services to consumers, auctioneers that create a marketplace for products and services, and business-to-business commerce. Retail transactions make up the largest part of e-commerce. Consumers can find computers, automobiles, clothing, books, music, airline and event tickets, food, and just about anything else for sale on the Internet

2.5 FEATURES OF E-COMMERCE

2.5.1 UBIQUITY

In traditional commerce, a marketplace is a physical place you visit in order to transact. For example, television and radio typically motivate the consumer to go someplace to make a purchase. E-commerce, in contrast, is characterized by its ubiquity meaning that it is available just about everywhere, at all times. It liberates the market from being restricted to a physical space and makes it possible to shop from your desktop, at home, at work, or even from your car, using mobile commerce. The result is called a market space as stated by Cristian Darie[23] which is market extended beyond traditional boundaries and removed from a temporal and geographic location. From a consumer point of view, ubiquity reduces transaction costs which are the costs of participating in a market. To transact, it is no longer necessary that you spend time and money travelling to a market. According to Dawson [12], at a broader level, the ubiquity of e-commerce lowers the cognitive energy required to transact in a market space. Cognitive energy refers to the mental effort required to complete a task. Humans generally seek to reduce cognitive energy outlays. When given a choice, humans will choose the path requiring the least effort—the most convenient path [15].

2.5.2 GLOBAL REACH

E-commerce technology permits commercial transactions to cross cultural and national boundaries far more conveniently and cost-effectively than is true in traditional commerce. As a result, the potential market size for e-commerce merchants is roughly equal to the size of the world's online population (over 1 billion in 2005, and growing rapidly, according to the Computer Industry Almanac) [26]. The total number of users or customers an e-commerce business can obtain is a measure of its reach [9]. In contrast, most traditional commerce is local or regional and it involves local merchants or national merchants with local outlets. Television and radio stations, and newspapers, for instance, are primarily local and regional institutions with limited but powerful national networks that can attract a national audience. In contrast to e-commerce technology, these older commerce technologies do not easily cross national boundaries to a global audience.

2.5.3 UNIVERSAL STANDARDS

One strikingly unusual feature of e-commerce technologies is that the technical standards of the Internet, and therefore the technical standards for conducting e-commerce, are universal standards meaning they are shared by all nations around the world. In contrast, most traditional commerce technologies differ from one nation to the next. For instance, television and radio standards differ around the world, as does cell telephone technology. The universal technical standards of the Internet and e-commerce greatly lower market entry costs which are the cost merchants must pay just to bring their goods to market. At the same time, for consumers, universal standards reduce search costs which are the efforts required to find suitable products. And by creating a single, one-world market space, where prices and product descriptions can be inexpensively displayed for all to see, price discovery becomes simpler, faster, and more accurate [7]. And users of the Internet, both businesses and individuals, experience network externalities; these are benefits that arise because everyone uses the same technology. With e-commerce technologies, it is possible for the first time in history to easily find many of the suppliers, prices, and delivery terms of a specific product anywhere in the world, and to view them in a coherent, comparative environment. Although this is not necessarily realistic today for all or many products, it is a potential that will be exploited in the future.

2.5.4 RICHNESS

Information richness refers to the complexity and content of a message [26]. Traditional markets, national sales forces, and small retail stores have great richness: they are able to provide personal, face-to-face service using aural and visual cues when making a sale. The richness of traditional markets makes them a powerful selling or commercial environment. Prior to the development of the Web, there was a trade-off between richness and reach: the larger the audience reached the less rich the message.

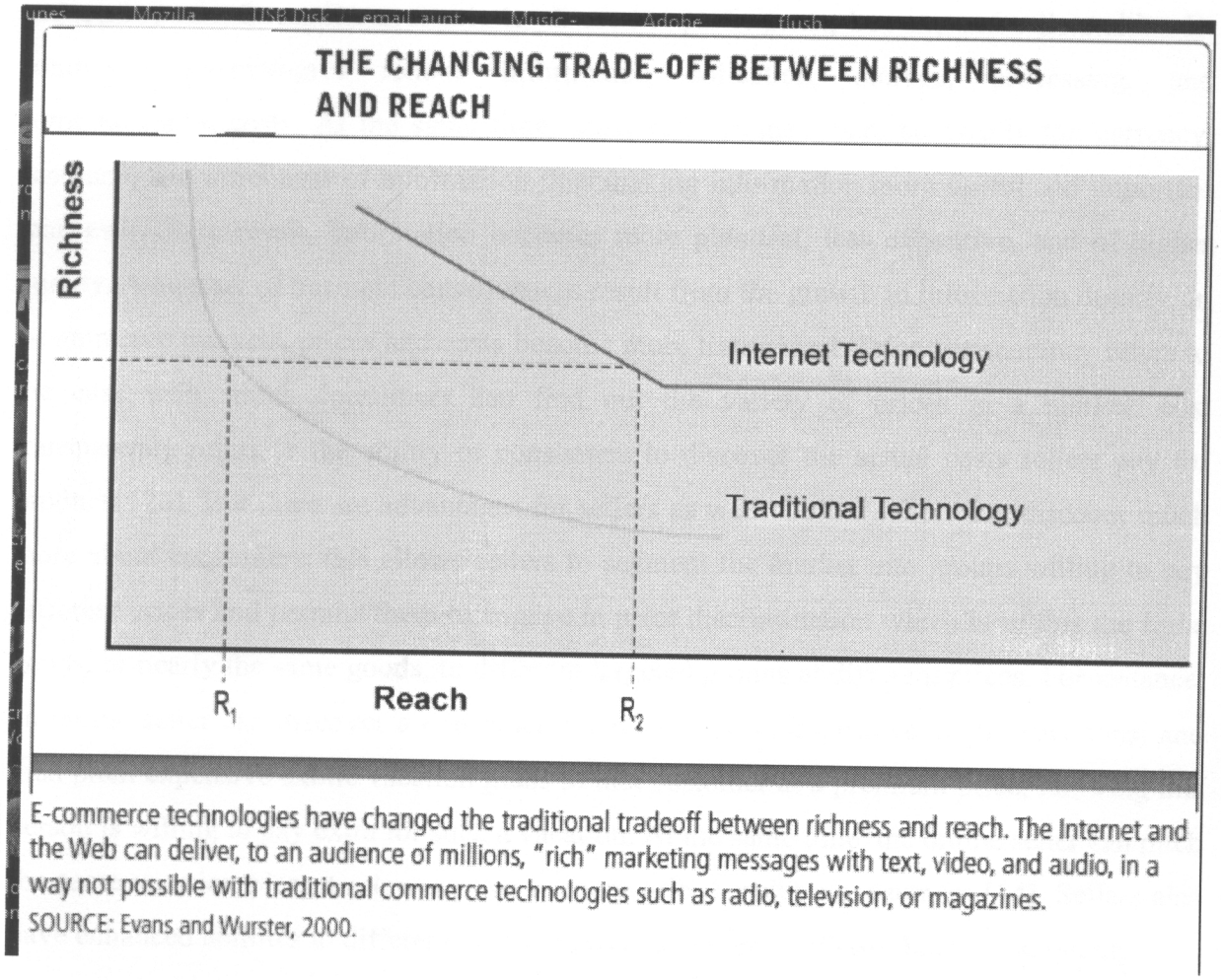

Figure 2.3: Richness vs Reach

In contrast, all of these activities are possible on an e-commerce Web site. Interactivity allow an online merchant to engage a consumer in ways similar to a face-to-face experience, but on a much more massive, global scale.

2.5.5 INTERACTIVITY

Unlike any of the commercial technologies of the 21st century, with the possible exception of the telephone, e-commerce technologies allow for interactivity, meaning they enable two-way communication between the buyer and seller. Television, for instance, cannot ask viewers any questions or enter into conversations

2.5.6 INFORMATION DENSITY

The Internet and the Web vastly increases information density defined as the total amount and quality of information available to all market participants, buyers, and sellers alike. E-commerce technologies reduce information collection, storage, processing, and communication costs. At the same time, these technologies increase greatly the currency, accuracy, and timeliness of information thus making information more useful and important than ever. As a result, information becomes more plentiful, less expensive, and of higher quality. A number of business consequences result from the growth in information density. In e-commerce markets, prices and costs become more transparent. Price transparency refers to the ease with which consumers can find out the variety of prices in a market; cost transparency refers to the ability of consumers to discover the actual costs sellers pay for products [26]. But there are advantages for sellers as well. Online sellers can discover much more about consumers; this allows sellers to segment the market into groups willing to pay different prices and permits them to engage in price discrimination which is selling the same goods, or nearly the same goods, to different targeted groups at different prices. For instance, an online seller can discover a consumer's avid interest in expensive exotic vacations, and then pitch expensive exotic vacation plans to that customer at a premium price, knowing this person is willing to pay extra for such a vacation. At the same time, the online seller can pitch the same vacation plan at a lower price to more price-sensitive consumers [14]. Sellers also have enhanced abilities to differentiate their products in terms of cost, brand, and quality.

2.5.7 PERSONALIZATION AND CUSTOMIZATION

E-commerce technologies permit personalization: sellers can target their marketing messages to specific individuals by adjusting the message to a person's name, interests, and past purchases. The technology also permits customization, which is changing the delivered product or service based on a user's preferences or prior behaviour. Given the interactive nature of e-commerce technology, much information about the consumer can be gathered in the marketplace at the moment of purchase. With the increase in information density, a great

deal of information about the consumer's past purchases and behaviors can be stored and used by online merchants. The result is a level of personalization and customization unthinkable with existing commerce technologies. For instance, you may be able to shape what you see on television by selecting a channel, but you cannot change the contents of the channel you have chosen. In contrast, the online version of the Wall Street Journal allows you to select the type of news stories you want to see first, and gives you the opportunity to be alerted when certain events happen.

2.6 SUMMARY

In Zambia there is no vehicle trade and inventory software system that works like Dominion. Therefore, in this project am going to develop a vehicle trade and inventory software system to use in Zambia, which is going to enhance productivity and performance of vehicle buying and selling and reducing the time factor that is involved in the transactions. It is going to utilize e-commerce capabilities mentioned above. Why study e-commerce? The answer is simply that e-commerce technologies and the digital markets that result do promise to bring about some fundamental, unprecedented shifts in commerce. One of these shifts, for example, appears to be a large reduction in information asymmetry among all market participants (buyers and sellers). In the past, merchants and manufacturers were able to prevent consumers from learning about their costs, price discrimination strategies, and profits from sales. This becomes more difficult with e-commerce, and the entire marketplace potentially becomes highly price competitive. In addition, the unique dimensions of e-commerce technologies listed in Figure 2.1 also suggest many new possibilities for marketing and selling. A powerful set of interactive, personalized, and rich messages are available for delivery to segmented, targeted audiences. E-commerce technologies make it possible for sellers to know much more about consumers and to be able to use this information more effectively than was ever true in the past. Potentially, online sellers could use this new information to develop new information asymmetries, enhance their ability to brand products, charge premium prices for high-quality service, and segment the market into an endless number of subgroups, each receiving a different price. To complicate matters further, these same technologies make it possible for sellers to know more about other sellers than was ever true in the past. This presents the possibility that sellers might collude on prices rather than compete and drive overall average prices up. This strategy works especially well when there are just a few suppliers [26].

CHAPTER THREE

3.1 INTRODUCTION

In this chapter we discuss the approach used to achieve the objectives of the project and ultimately the aims of the project. The techniques used to achieve the user requirements and the technologies used in the designing of the system.

3.2 SYSTEM REQUIREMENTS

3.2.1 FACT FINDING TECHNIQUES

The techniques used to come up with system requirements involved reading the available literature in form of reports, brochures-commerce books and journals. However little information was available as regards to information processing. Most of the available literature was purely demographic.

In order to come up with the system requirements that are specific to the Zambian set up , The Zambian Vehicle Trade and Management system project included references from the news papers for example the one given in the first chapter that is "the post news paper". Furthermore oral interviews were conducted on vehicle dealers around Lusaka. Then a random sample of potential buyers was taken into study and also oral interviewed as a way of coming up with the system requirements. However the was a problem with this approach as most of the vehicle dealers are not so conversant with online operation and thus basic tutorial was given to them in order to spearhead the project . This resulted in unforeseen time loss in the collection of the system requirements at this stage. Nevertheless the following system requirements were captured in the process.

3.2.2 REQUIREMENTS

The requirements of the Web-based Zambian Vehicle Trade and Inventory management information system are to develop:

- A web based front end for entering vehicle details including the name, price, date, make and other related information to the vehicles.
- A web based front end for searching the information relating to a given vehicle or a given vehicle group and price;
- A facility to still enter content and maintain content using a user friendly content management system that will be implemented when logged in as administrator.

- A facility to produce summary information of vehicles and sold vehicles particulars and any other related activities
- A blog section where sellers and buyers can communicate and finalize business transactions appropriately.

3.2.3 FUNCTIONAL REQUIREMENTS

In this project the aim at developing a system which should improve the trade specifically vehicle trade conducted in Zambia has mentioned in the problem statement in chapter one, this improvements on the current and added lot of functionalities and therefore the Major target or goal here is:

- To develop a vehicle trade database that can support the following tables: comments, pages, posts, products, subjects, transactions and users.
- To develop a client interface that allows privileged users to carry out tasks such as inserting or modifying and deleting data in the database;
- To develop a searching functionality in order to allow normal and privileged users to search the details of a given vehicle, price group.
- To fully integrate the Web-based Zambia Vehicle Trade and management information and Inventory system to the World-Wide-Web and hence allow access from any Internet networked terminal and Web browser around the world;
- To develop a functionality that produces summary information of required data to enhance decision making;
- To embed security features in the Web DBMS to provide privacy, integrity;
- To allow privileged users to maintain the Web-based Zambian Vehicle Trade and Inventory management information system by adding/deleting particulars, backing-up or resetting the database and extract online summary in the form of histograms for each vehicle sold and lists of free-format comments. Thus a graphical reporting tool should be provided for analyzing the data.
- And finally the system should be flexible enough to store data for several years and also be able provide sufficient **User** and **Administration** Guides and providing ease of management.

3.2.4 NON FUNCTIONAL REQUIREMENTS

The system must be developed to suit the particular needs of a user-friendly environment. This means that the system must accommodate a clearly understandable user interface. A fast response time in obtaining and providing information to the system may also prove to be a significant advantage. In addition to these requirements, the system should also embrace the following requirements:-

Security: Each user that administers the systems or posts is required to log in. The system should log staff that has been assigned user names and passwords. The system should be designed to make it impossible for anybody to log in without a valid username and password. Data encryption should be employed to keep the user login name and password secret.

- Reliability: The system should have little or no downtime and be able to handle multiple concurrent users.
- Ease of Use: The general and administrative views should be easy to use and intuitive.
- Performance: The system should have a quick response time. For the purpose of this research project, this would be defined as less than 10 seconds.
- System and Browser compatibility Testing: The system should be accessible on the following browsers - Microsoft Internet Explorer 7.5+, Netscape Navigator, Safari and Firefox Mozilla.
- System requirements: The Zambia Vehicle Trade and Inventory System will run on a Windows server. This system would be designed to run on a minimum hardware configuration of 500MHz x86 machines.

Server Software:

- Operating System: Windows 2000, Windows XP and Windows 8
- PHP version: PHP 4.5+
- Web Server: Apache Web Server. 2.0+
- Database: MySQL 4.01+

Client Software:

- JavaScript
- Css
- Html
- Microsoft Internet Explorer 7.5+, Netscape Navigator, Safari and Firefox Mozilla.

3.3 SYSTEM DESIGN

3.3.1 ACCESS LEVEL

In order to take closer look into what the Zambia Vehicle Trade and Inventory should do and how, it was necessary to decompose the system's functionalities based on the user type and levels of access. The three main user groups and access levels are:

- Global User Group (normal access level)
- The Staff User Group (privileged access level)
- The blog post User (privileged access level)

Therefore, the requirements could be efficiently analyzed depending on the user group and the functionalities they should be allowed to perform.

3.3.2 MAIN SYSTEM PAGE (INDEX PAGE ON THE WEBSITE)

It is required for the system to provide a Main Page where any Global user (any user within and outside the Zambian Vehicle Trade and Inventory) will be able to access. The main functionality of this page will be to allow any user to search the database by using information such as price group and the vehicle brand. The search capabilities of the main page might not be limited to the exact vehicle brand, but may for example provide the means for displaying any information that might be relevant but not confidential. The Main Page should also include a Login facility for any privileged or normal user to be able to have access to more advanced functionalities of the System. The global users are going to be able to select vehicles of their interest from the site, state their quantities. The system will further then process the details and give them the total price due. Then they can get in touch with the seller by means of the blog section which the system provides.

3.3.3 THE STAFF USER GROUP

When a Staff user has successfully logged into the system via the Main Page Login facility, it will be necessary for the system to display a specific menu with all available option that can be carried out. Therefore by taking into account the system requirements, it will be necessary to include options such as Manage Inventory, Manage Website content, Add staff user and Delete staff User. A Logout option will also be appropriate for the Zambian Vehicle Trade and Inventory user to be able to logout when desired.

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SCHOOL OF NATURAL SCIENCES

DEPARTMENT OF COMPUTER STUDIES

CST 4000 – PROJECT

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The Zambian web-based Vehicle Trade and Inventory Management System (ZVTIMS).

A project report thesis submitted in partial fulfilment of the Bachelor of Science in computer science of the University of Zambia.

September, 2013.

By

MULOMBA WILSON CHOONGO

SUPERVISOR : MRS. LEENA KUMAR

Declaration

I Mulomba Wilson Choongo do hereby declare that this project Thesis is original and has not been published and/or submitted for any other degree award to any other University before.

Signed: ..... Date:.....

Mulomba W. Choongo

Supervisor: Mrs. Leena Kumar

Signed:..... Date:.....23/09/2013.....

ACKNOWLEDGEMENT

I would like to acknowledge the following people without whose help; this work would never have come to completion.

Most valuable is the contribution of my supervisor Mrs. Leena Kumar for her time, patience and above all her technical guidance throughout the study.

I highly acknowledge my God for giving me good health and having blessed me with the opportunity to take this study. My deepest gratitude goes to my late mother Mrs. Mary Chibeka Choongo for her support both emotional and spiritual plus the care she has given me. May her soul rest in internal peace. Special thanks to my late father Mr. Edison Choongo for making the road and mentoring me. Thanks to my brother and sisters for their encouragements and my girlfriend Rosemary Chirwa for her love and support.

Lastly, I am grateful to Dr. Jackson Phiri , Mr. Nyerinda Mayumbo and Dr. John Regan for their cooperation and information sharing that added value to the success of the this project.

Abstract

The purpose of this project is to come up with a platform where buyers are able to meet sellers and trade specifically in vehicles both commercial and domestic. This will be in a form of a web-based management information system.

This will be a website where people can buy and sell things like bikes, cars and commercial vehicles. An efficient search facility will be provided to visitors to find things of their interest quickly. There will be a content management system (CMS) designed for the administrator(s) of the website. This will ease on the work of administrators on maintaining the site content. The system will further more create a timely access to potential sales of vehicles, creating marketing strategies for vehicles sales and provide an advertising platform for vehicles.

The vehicle trade and inventory management information system to be developed in this project will offer functionalities to quick access to buyers from various parts of the country in Zambia .It will enable monitoring of the results and performance of the buying and selling activity in the country .This information can then be used to control trade in the country so that relevant and measurable objectives can be checked by necessary authorities.

ACRONYMS

WWW	World Wide Web
CMS	Content Management System
ZVTIMS	Zambian Vehicle Trade and Inventory Management System
LAN	LOCAL AREA NETWORK
HTTP	Hypertext Transfer Protocol
FTP	File Transfer Protocol
UML	Unified Modelling Language
VIN	Vehicle Identification Number
OEM	Original Equipment Manufacturer
HTML	Hyper Text Markup Language
UPC	Universal Product Code

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CHAPTER ONE

1.1 INTRODUCTION

The business transactions between buyers and sellers are a property of the electronic commerce (E-commerce). It is the most notable business use of the World Wide Web (www).The fundamental goal of an E-commerce site is to sell products and services online-commerce is the exchange of goods and services by means of the Internet or other computer networks. E-commerce follows the same basic principles as traditional commerce, that is buyers and sellers come together to exchange goods for money. But rather than conducting business in the traditional way in stores and other "brick and mortar" buildings or through mail order catalogues and telephone operators in e-commerce buyers and sellers transact business over networked computers[26].

According to Redmond [9] E-commerce offers buyers convenience. They can visit the World Wide Web sites of multiple vendors 24 hours a day and seven days a week to compare prices and make purchases, without having to leave their homes or offices. In some cases, consumers can immediately obtain a product or service, such as an electronic book, a music file, or computer software, by downloading it over the Internet.

For sellers, e-commerce offers a way to cut costs and expand their markets. They do not need to build, staff, or maintain a store or print and distribute mail order catalogs. Automated order tracking and billing systems cut additional labor costs, and if the product or service can be downloaded, e-commerce firms have no distribution costs. Because they sell over the global Internet, sellers have the potential to market their products or services globally and are not limited by the physical location of a place. Internet technologies also permit sellers to track the interests and preferences of their customers with the customer's permission and then use this information to build an ongoing relationship with the customer by customizing products and services to meet the customer's needs [9].

1.2 MOTIVATION AND SIGNIFICANCE OF THE THESIS

1.2.1 MOTIVATION

In Zambia, selling and buying of local automobiles like bikes, cars and commercial vehicles have being done mostly by advertisements in the newspapers. For instance the SANGWAPO column of the "The post" newspaper advertises sales of automobiles. This has inherent disadvantages in that it does not provide the reader or potential buyer with the appropriate needs or specification of the vehicles(s) and services. It further has a slow communication response lag between the buyer and the seller and in the world of business; time is of great value and importance. On the other hand it negatively affects profitability due inadequate business plans and excessive spending on advertising and marketing to attract customers to the newspapers columns. On the brighter side the internet covers a large clientele base and its expanding rapidly. This may subsequently attract more profitability based on the following research findings:

- Online consumer sales expanded by more than 23% in 2005 to an estimated $142–$172 billion[17].
- On an average day, 70 million people go online. Around 140 million send e-mail, 8 million have created a blog, 4 million share music on peer-to-peer networks, and 3 million use the Internet to rate a person, product, or service [10].
- The number of people who have purchased something online expanded to about 110 million, with additional millions shopping (gathering information) but not purchasing [10].
- Use of the Internet for business-to-business commerce expanded about 30% in 2005 to more than $1.5 trillion[2].

  The Internet technology base gained greater depth and power, as more than 42 million households had broadband cable or DSL access to the Internet in 2005—which is about 38% of all households [17].

Consequently technology continues to grow thus, providing users with fast and reliable connections .This is highlighted in the following technological trends.

- Wireless Internet connections (Wi-Fi, Wi-Max, and 3G telephone) grow rapidly.
- The Internet broadband foundation has become stronger in households and businesses.

- Bandwidth prices have fallen as telecommunications companies re-capitalize their debts.
- RSS (Really Simple Syndication) have grown to become a major new form of user-controlled information. [14].

Computing and networking component prices have continued to fall dramatically. This is as a result of the technological advancements that have continued to revolve.

In light of these research findings and the problems that are faced in Zambia as earlier described, I found motivation to undertake this project.

1.2.2 SIGNIFICANCE

The significance of this project is the promise that it will bring about some fundamental, unprecedented shifts in commerce and trade in relation to vehicles. These shifts will appear in the large reduction in information asymmetry among all market participants (buyers and sellers). Information asymmetry is any disparity in the relevant market information among parties in a transaction. In Zambia, sellers of vehicles are able to prevent buyers from learning about their original costs, price discrimination strategies, and profits from sales. This becomes more difficult with web-based Zambian Vehicle and Trade Management System, and the entire marketplace potentially becomes highly price competitive. This also presents the possibility that sellers might collude on prices rather than compete and drive overall average prices up. This strategy works well especially when there are just a few suppliers [22]. It will further create a convenient platform that is time particular where sellers and buyers can meet and transact. Additionally it will cut down on the cost of advertising as it will be integrated seamless in the system.

1.3 SCOPE

The scope of the Zambian Vehicle Trade and Inventory Management system will be a full functional software system that is going to the handle the following in its scope. Online sales of new cars is heavily regulated and mostly forbidden. Therefore in this project the sales will concentrate on used vehicles in Zambia.

- A website that is a platform where people can buy and sell things like bikes, cars and commercial vehicles.
- An efficient search facility that will enable visitors to the website to find things of their interest fast and easily.

- A content management system (CMS) designed for the administrator(s) of the website in order for them to manage content of the web site with ease and having not to worry about the underlying HTML.
- The system will be geographically limited to Zambia.

1.4 PROBLEM STATEMENT

The Zambian selling and buying of local automobiles like bikes, cars and commercial vehicles has being done mostly by advertisements in the newspapers, on brochures and fliers. For instance the "SANGWAPO" column of the "The post newspaper" advertises sales of automobiles. This has inherent disadvantages in that it does not provide the reader or potential buyer with the appropriate needs or specification of the Vehicles(s) and services they want. It further has a slow communication response between the buyer and the seller as time waits for no man in the world of business; time is therefore, of great value in this sector. Access to newspapers to remote places in Zambia is also a problem thus an alternative and cheaper way is through the internet. Therefore the internet becomes a handy way to conduct business. The newspapers have a negative impact on the profitability as the customer clientele is lesser as compared to the online presence of the customers.

1.5 AIMS AND OBJECTIVES

1.5.1 AIMS

The aims of the vehicle trade and inventory system are to provide a central vehicle repository of information used to define vehicles and relate the vehicle to its owner, location and relative importance. This information will provide personnel with data needed to support their job functions. The aims of the vehicle trade and inventory system are:

- To provide an online platform where buyers and sellers of vehicles can meet and transact.
- Provide financial services that will allow the budgeting for vehicle procurement, depreciate vehicle over time, and prepare complete tax documents using the necessary information as deemed fit.
- Provide a platform that will ease contract and enterprise agreements and negotiate vendor discounts with Contracts management.
- It will provide technical personnel the ability to resolve problems more quickly with the information contained within a location and hence facilitate support or maintenance activities associated on the vehicle(s).

- The vehicle trade and inventory system will provide integration with the everyday functions performed by personnel associated with entering and maintaining vehicles information. The system will reduce the effort devoted to vehicle management trade, while supplying many personnel with the information they need to perform their functional responsibilities in order for transactions to occur.
- The system will provide a central vehicle repository that covers the entire Zambia, rather than having separate vehicle repository for mainframe, network and distributed environments. Having this will ultimately simplify accounting and vehicle management, while allowing for the implementation of enterprise-wide vehicle management standards and procedures.

1.5.2 OBJECTIVES

The objectives of the Zambian Vehicle Trade and Inventory Management are to manage the physical and logical properties of information system resources and their relationship, while ensuring that service level commitments are achieved. These objectives include:

- Ensure efficient and timely identification of vital vehicle(s).
- Assist in managing the enterprise-wide inventory.
- Provide a common repository for vehicle(s).
- Plan and control the proliferation of vehicles across Zambia.
- To allow people to buy and sell vehicles and allow people to find things of their interest quickly.
- To identify and track all data processing in an inventory system repository.
- To define the process by which vehicles are identified and maintained in the vehicle trade and inventory system.
- To provide a full range of reports that will satisfy informational requirements in the Zambia.
- To provide an exact specifications on the available vehicles and a competitive price
- To provide training to personnel responsible for supporting the inventory management system.

1.6 ORGANIZATION OF THE THESIS

This project thesis is organized in the following order. Chapter one gives a general introduction to the subject under study. It further describes the motivation and significance of the thesis. It gives the scope of the project and outlines the aims and objectives of the thesis. In chapter two we dive in the subject area and explore the literature review and related works. Chapter three describes in details the methodology used to undertake the project. It discusses the system requirements, design and lastly the implementation. In chapter four we narrow in the developed system and perform the system testing and the results of the testing are discussed in this chapter. Finally in chapter five of the project thesis we conclude it and give an overall discussion of the topic under study and we further give the future works of the Zambian Vehicle Trade and Inventory Management system.

1.7 SUMMARY

The Vehicle Trade and Inventory Management system will solve the problems stated in the problem statement in Zambia and thus foster development in the business sector. It will provide to the buyers (visitors to the website) an efficient search facility that will be providing to visitors the capacity to find things of their interest. It will also bridge the seller and buyer time space as mentioned as time space will be fast because time is of great importance to business. It will provide a platform where buyers and sellers can meet and perform business transaction using an online way.

CHAPTER TWO

2.1 INTRODUCTION

Inventory management software is a computer-based system for tracking inventory levels, orders, sales and deliveries, [27]. It can also be used in the manufacturing industry to create a work order, bill of materials and other product-related documents. Companies use inventory management software to avoid product overstock and outages. It is a tool for organizing inventory data that before was generally stored in hard-copy form or in spread sheets.

In Zambia selling and buying of products such as bikes, cars and commercial vehicles has been done using advertisement in the newspapers. For instance the SANGWAPO column of the "The post newspaper" has inherent disadvantages in that it does not provide the reader of the potential buyer with the appropriate needs or specifications of the product(s). It further has slow communication response between the buyer and the seller and in the business world time is of great value and importance. This system (newspaper) provides a tedious way of searching of what the buyer and the particular specification of the wanted product(s) are close to impossible to find.

The vehicle and inventory management system will solve these problems in Zambia. It will provide to the buyer (visitors to the website) an efficient search facility that will be providing to visitors the capacity to find things of their interest. This chapter deals with the underlying technology and knowledge under which this project is based.

2.2 LITERITURE REVIEW AND RELATED WORKS

Inventory control goes back further than writing; there were simpler inscriptions in Egyptian and Babylonian warehouses and granaries, with pictures that represented the inventory owner and numbers representing amounts in stock and taxes due.

The labels of Abydos and the granary cuneiforms of Babylon were primal versions of the humble SKU, which then inspired the development of methods of tracking and inventory information disbursement. The progression of inventory records shows a drive for greater and greater durability, accuracy, and level of convenience. The desire for reliable, accurate and fast inventory accounting has led to the development of inventory accounting software; a

mechanized version of the ancient record-keeping scribe who once scratched IDs into bits of bone to assist with a task human memory was unable to handle [13].

Barcode scanners went to field use in 1974. By the 1980s, the first inventory control computer programs that could run on a PC were starting to see use. The Universal Product Code (UPC) was adopted by the grocery industry in April 1973 as the standard barcode for all grocers, though it was not introduced at retailing locations until 1974. This helped drive down costs for inventory management because retailers in the United States and Canada didn't have to purchase multiple barcode readers to scan competing barcodes. There was now one primary barcode for grocers and other retailers to buy one type of reader for [4].

In the early 1980s, personal computers debuted and started becoming popular. This further pushed down the cost of barcodes and readers. It also allowed the first version of inventory management software to be put into place. One of the biggest hurdles in selling readers and barcodes to retailers was the fact that they didn't have a place to store the information they scanned. As computers became more common and affordable, this hurdle was overcome. Once barcodes and inventory management programs started spreading through grocery stores, inventory management by hand became less practical. Writing inventory data by hand on paper was replaced by scanning products and inputting information into a computer by hand, starting in the early 2000s. The inventory management software progressed to the point where business people no longer needed to input data by hand but could instantly update their database with barcode readers [23].

Inventory management is one of the basic problems in almost every company. Before computer age and integration, paper tables and paperwork solutions were being used as inventory management tools. These were very far from being a solution; it took so much time, and even needed employees just for this section of the organization. There wasn't any efficient solution available in the many companies during those days. Every process was based on paperwork and this resulted in high human fault rate, difficulties in the process and the tracing of the inventory losses and there wasn't any efficient logging system. After the computer age, every process started to be integrated into the electronic environment. And now we have qualified technology to implement new solutions to these problems. Software based systems bring the advantages of having the most efficient control with less effort and employees.

Inventory management provides:

- Up-to-date information about data processing resources through the creation and archiving of records in a centralized repository.
- Financial records specific to a single component, or groups of components.
- Service records for all components in the inventory.
- Data used to support configuration diagrams of the hardware and software components contained within specific locations, or the entire data processing environment. Inventory management software is made up of several key components, all working together to create a cohesive inventory for many organisations'system.These features include:

Order management

Should inventory reach a certain threshold, a company's inventory management system can be programmed to tell managers to reorder that product. This helps companies avoid running out of products or tying up too much capital in inventory.

Asset tracking

When a product is in a warehouse or store, it can be tracked via its barcode and /or other tracking criteria such as serial number, lot number or revision number. Nowadays, inventory management software often utilizes barcode, radio frequency identification (RFID), and/or wireless tracing technology.

Service management

Companies that are primarily service-oriented rather than product-oriented can use inventory management software to track the cost of the materials they use to provide services, such as cleaning supplies. This way, they can attach prices to their services that reflect the total cost of performing them.

Product identification

Barcodes are often the means where by data on products and orders are inputted into memory management software. A barcode reader is used to read barcodes and look up information on the products they represent. Radio-frequency identification (RFID) tags and wireless methods of product identification are also growing in popularity.

RELATED WORKS

Key Trend: Rise of Online Classifieds

In the online world, there has been a strong growth of lead generation channels for automotive sales. In the 80s and 90s, automotive classifieds were primarily based in print. However, since the mid 90s, online classifieds have replaced print as the main channel for advertising used cars. AutoTrader – a leading auto classified site – has shown strong sales growth and now has over a billion dollars in annual revenue.

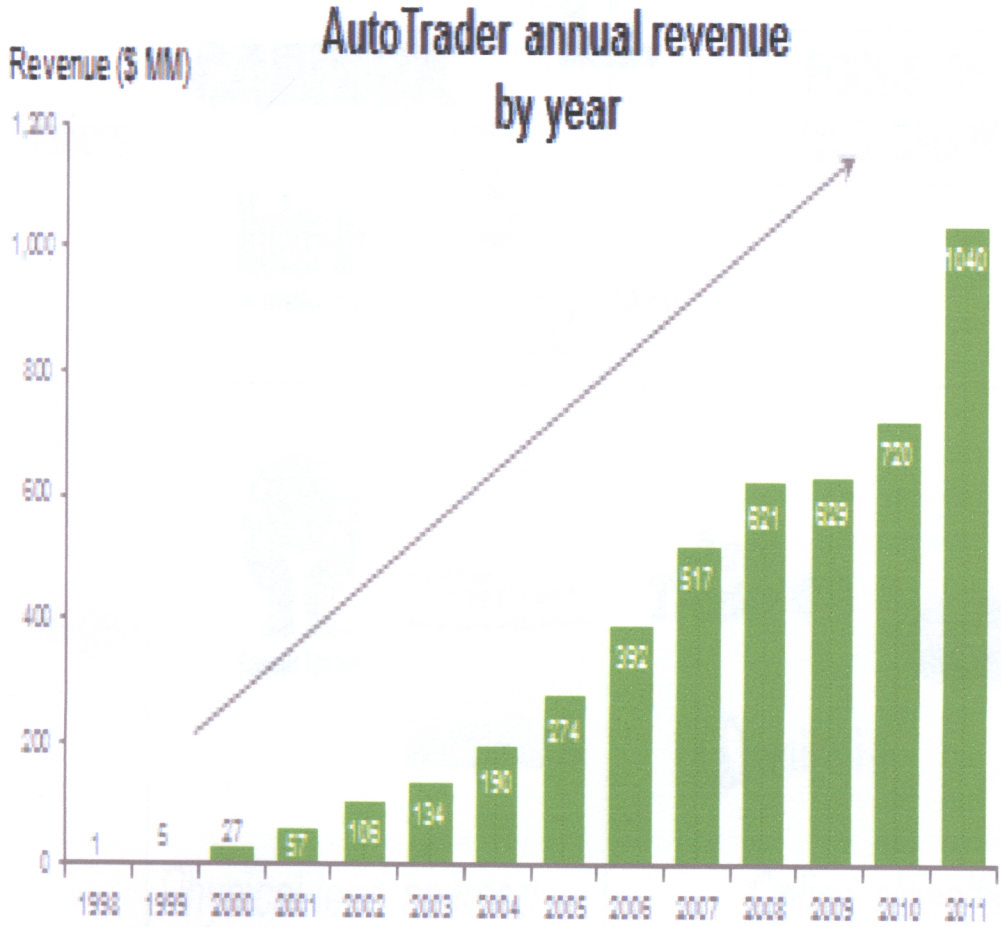


Figure 2.1: Growth sales (source CNW Marketing Research).

Key Trend: Emergence of Online Retail Channel

In recent years, there have been small but growing examples of online retail channels for used cars. The most prominent among them is eBay Motors. Since being launched as a separate vertical by eBay in 2000, eBay motors has grown rapidly and now has ~$8 Billion in transactions occurring each year. Many of these sales are sight-unseen sales, where the buyer pays for the car based on information available just online or over the phone.

Figure 2.2: Physical and Online Channels (source automotive news).

A similar emergence was seen in the mid 90s for lead-generation when online classifieds like AutoTrader rose to replace physical lead sources like Credit Unions and Newspapers as the primary lead generation channels. Certain retailers such as Texas Direct Auto in the US and Car Shop in the UK believe in the potential for online retailing and have harnessed eBay Motors (and, in the case of CarShop, developed a standalone e-commerce platform) to sell cars. With models such as these, the word of online auto retailers is starting to become larger, though it is still much smaller than the volume sold by traditional dealerships such as CarMax.

Recently starting from the year 2005 there has being increase in vehicle trade management software offering different functionalities. For example the Dominion's Dealer Specialties provides auto dealers nationwide in America with a comprehensive suite of inventory management solutions, websites, Internet marketing tools and enhanced vehicle listings distributed online. Dominion is based in America. As the largest and most experienced business in the market, car dealers can choose from full-service data collection to industry leading in-house products to manage inventory, giving them the best value for their changing needs.

VIN Decoding

A Vehicle Identification Number (VIN) has the ability to communicate a complete vehicle story. From a VIN, you can determine not only a vehicle's year, make and model, but also detailed features including trim, style, vehicle type, engine code and more. Dealer Specialities offers industry –leading VIN decoding services with exceptional data accuracy and quality integrated in inventory manager.

Through Dominion's partnership with Data One Software, they utilize one of the largest and most comprehensive automotive databases in the nation. Data One Software provides historical and new vehicle data for vehicles since 1981 .It is extremely important that vehicle descriptions align and adhere to OEM (original Equipment Manufacturer) marketing standards. Data One Software remains at the forefront in the industry for data accuracy quality and timeliness [8].

The power VIN decoding services with Dealer Specialties' Inventory Manager makes entering a VIN into the inventory software quick and easy.VIN Decoding Categories

- Basic vehicle characteristics

- Green data , safety data and ratings
- Service data including OEM services schedules
- Vehicle comparison data
- Vehicle pricing and incentives
- Vehicle awards and accolades
- Vehicle reviews and weekly automotive columns

Data Distribution Network

Dominion has a robust and comprehensive dealer Inventory Management System that automatically and seamlessly distributes inventory to eBay, Craigslist, Cars.com, Facebook, Twitter, AutoTrade.com, GetAuto.com and more.

- Seamless and automatic distribution.
- Free and subscription-based partners.
- Includes 600+ data partners.
- Has no additional cost.

Another example of the related work is the www.ukzedtrade.com website which was found in 2011. They provide searching facilities for a car or commercial vehicle, through their trusted contacts and buyers are able to look for the vehicle and find them quickly and efficiently at the lowest price possible.

Last year in 2012 the ukzed company sold over 40 cars and Trucks. Through the years they have acquired a strong pofolio of sold cars as can see be in the Sold Vehicle Section on the ukzed website, and most importantly a lot of repeat business. The reason they are different from other dealerships is that they source their vehicles rather than stocking, simply because they do not want customers to be limited to what we have in stock. Instead they can literally find the best car for customers from thousands of potential options. On top of it they also provide spare parts direct from the UK.

2.3 VEHICLE TRADE AND COMMERCE

E-commerce, as defined by *businessdictionary.com,* is "Business conducted through the use of computers, telephones, fax machines, barcode readers, credit cards, automated teller machines (ATM) or other electronic appliances (whether or not using the internet) without

the exchange of paper-based documents. It includes activities such as procurement, order entry, transaction processing, payment, authentication and non-repudiation, inventory control, order fulfilment, and customer support. When a buyer pays with a bank card swiped through a magnetic-stripe-reader, he or she is participating in e-commerce".

2.4 TYPES OF E-COMMERCE

A variety of businesses are conducted online, including retail businesses that sell products to consumers, service providers that sell services to consumers, auctioneers that create a marketplace for products and services, and business-to-business commerce. Retail transactions make up the largest part of e-commerce. Consumers can find computers, automobiles, clothing, books, music, airline and event tickets, food, and just about anything else for sale on the Internet

2.5 FEATURES OF E-COMMERCE

2.5.1 UBIQUITY

In traditional commerce, a marketplace is a physical place you visit in order to transact. For example, television and radio typically motivate the consumer to go someplace to make a purchase. E-commerce, in contrast, is characterized by its ubiquity meaning that it is available just about everywhere, at all times. It liberates the market from being restricted to a physical space and makes it possible to shop from your desktop, at home, at work, or even from your car, using mobile commerce. The result is called a market space as stated by Cristian Darie[23] which is market extended beyond traditional boundaries and removed from a temporal and geographic location. From a consumer point of view, ubiquity reduces transaction costs which are the costs of participating in a market. To transact, it is no longer necessary that you spend time and money travelling to a market. According to Dawson [12], at a broader level, the ubiquity of e-commerce lowers the cognitive energy required to transact in a market space. Cognitive energy refers to the mental effort required to complete a task. Humans generally seek to reduce cognitive energy outlays. When given a choice, humans will choose the path requiring the least effort—the most convenient path [15].

2.5.2 GLOBAL REACH

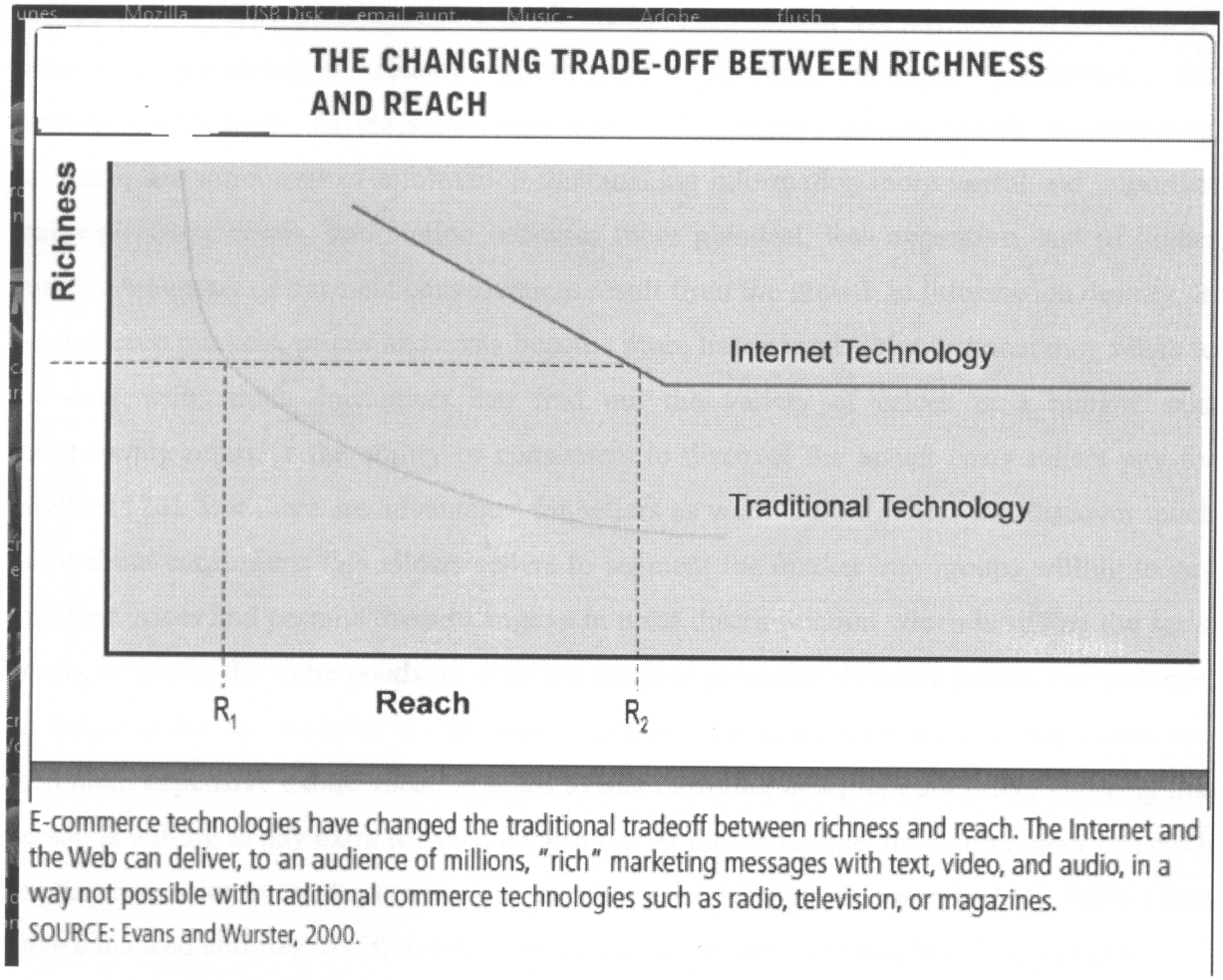
E-commerce technology permits commercial transactions to cross cultural and national boundaries far more conveniently and cost-effectively than is true in traditional commerce. As a result, the potential market size for e-commerce merchants is roughly equal to the size of the world's online population (over 1 billion in 2005, and growing rapidly, according to the Computer Industry Almanac) [26]. The total number of users or customers an e-commerce business can obtain is a measure of its reach [9]. In contrast, most traditional commerce is local or regional and it involves local merchants or national merchants with local outlets. Television and radio stations, and newspapers, for instance, are primarily local and regional institutions with limited but powerful national networks that can attract a national audience. In contrast to e-commerce technology, these older commerce technologies do not easily cross national boundaries to a global audience.

2.5.3 UNIVERSAL STANDARDS

One strikingly unusual feature of e-commerce technologies is that the technical standards of the Internet, and therefore the technical standards for conducting e-commerce, are universal standards meaning they are shared by all nations around the world. In contrast, most traditional commerce technologies differ from one nation to the next. For instance, television and radio standards differ around the world, as does cell telephone technology. The universal technical standards of the Internet and e-commerce greatly lower market entry costs which are the cost merchants must pay just to bring their goods to market. At the same time, for consumers, universal standards reduce search costs which are the efforts required to find suitable products. And by creating a single, one-world market space, where prices and product descriptions can be inexpensively displayed for all to see, price discovery becomes simpler, faster, and more accurate [7]. And users of the Internet, both businesses and individuals, experience network externalities; these are benefits that arise because everyone uses the same technology. With e-commerce technologies, it is possible for the first time in history to easily find many of the suppliers, prices, and delivery terms of a specific product anywhere in the world, and to view them in a coherent, comparative environment. Although this is not necessarily realistic today for all or many products, it is a potential that will be exploited in the future.

2.5.4 RICHNESS

Information richness refers to the complexity and content of a message [26]. Traditional markets, national sales forces, and small retail stores have great richness: they are able to provide personal, face-to-face service using aural and visual cues when making a sale. The richness of traditional markets makes them a powerful selling or commercial environment. Prior to the development of the Web, there was a trade-off between richness and reach: the larger the audience reached the less rich the message.



E-commerce technologies have changed the traditional tradeoff between richness and reach. The Internet and the Web can deliver, to an audience of millions, "rich" marketing messages with text, video, and audio, in a way not possible with traditional commerce technologies such as radio, television, or magazines.
SOURCE: Evans and Wurster, 2000.

Figure 2.3: Richness vs Reach

In contrast, all of these activities are possible on an e-commerce Web site. Interactivity allow an online merchant to engage a consumer in ways similar to a face-to-face experience, but on a much more massive, global scale.

2.5.5 INTERACTIVITY

Unlike any of the commercial technologies of the 21st century, with the possible exception of the telephone, e-commerce technologies allow for interactivity, meaning they enable two-way communication between the buyer and seller. Television, for instance, cannot ask viewers any questions or enter into conversations

2.5.6 INFORMATION DENSITY

The Internet and the Web vastly increases information density defined as the total amount and quality of information available to all market participants, buyers, and sellers alike. E-commerce technologies reduce information collection, storage, processing, and communication costs. At the same time, these technologies increase greatly the currency, accuracy, and timeliness of information thus making information more useful and important than ever. As a result, information becomes more plentiful, less expensive, and of higher quality. A number of business consequences result from the growth in information density. In e-commerce markets, prices and costs become more transparent. Price transparency refers to the ease with which consumers can find out the variety of prices in a market; cost transparency refers to the ability of consumers to discover the actual costs sellers pay for products [26]. But there are advantages for sellers as well. Online sellers can discover much more about consumers; this allows sellers to segment the market into groups willing to pay different prices and permits them to engage in price discrimination which is selling the same goods, or nearly the same goods, to different targeted groups at different prices. For instance, an online seller can discover a consumer's avid interest in expensive exotic vacations, and then pitch expensive exotic vacation plans to that customer at a premium price, knowing this person is willing to pay extra for such a vacation. At the same time, the online seller can pitch the same vacation plan at a lower price to more price-sensitive consumers [14]. Sellers also have enhanced abilities to differentiate their products in terms of cost, brand, and quality.

2.5.7 PERSONALIZATION AND CUSTOMIZATION

E-commerce technologies permit personalization: sellers can target their marketing messages to specific individuals by adjusting the message to a person's name, interests, and past purchases. The technology also permits customization, which is changing the delivered product or service based on a user's preferences or prior behaviour. Given the interactive nature of e-commerce technology, much information about the consumer can be gathered in the marketplace at the moment of purchase. With the increase in information density, a great

deal of information about the consumer's past purchases and behaviors can be stored and used by online merchants. The result is a level of personalization and customization unthinkable with existing commerce technologies. For instance, you may be able to shape what you see on television by selecting a channel, but you cannot change the contents of the channel you have chosen. In contrast, the online version of the Wall Street Journal allows you to select the type of news stories you want to see first, and gives you the opportunity to be alerted when certain events happen.

2.6 SUMMARY

In Zambia there is no vehicle trade and inventory software system that works like Dominion. Therefore, in this project am going to develop a vehicle trade and inventory software system to use in Zambia, which is going to enhance productivity and performance of vehicle buying and selling and reducing the time factor that is involved in the transactions. It is going to utilize e-commerce capabilities mentioned above. Why study e-commerce? The answer is simply that e-commerce technologies and the digital markets that result do promise to bring about some fundamental, unprecedented shifts in commerce. One of these shifts, for example, appears to be a large reduction in information asymmetry among all market participants (buyers and sellers). In the past, merchants and manufacturers were able to prevent consumers from learning about their costs, price discrimination strategies, and profits from sales. This becomes more difficult with e-commerce, and the entire marketplace potentially becomes highly price competitive. In addition, the unique dimensions of e-commerce technologies listed in Figure 2.1 also suggest many new possibilities for marketing and selling. A powerful set of interactive, personalized, and rich messages are available for delivery to segmented, targeted audiences. E-commerce technologies make it possible for sellers to know much more about consumers and to be able to use this information more effectively than was ever true in the past. Potentially, online sellers could use this new information to develop new information asymmetries, enhance their ability to brand products, charge premium prices for high-quality service, and segment the market into an endless number of subgroups, each receiving a different price. To complicate matters further, these same technologies make it possible for sellers to know more about other sellers than was ever true in the past. This presents the possibility that sellers might collude on prices rather than compete and drive overall average prices up. This strategy works especially well when there are just a few suppliers [26].

CHAPTER THREE

3.1 INTRODUCTION

In this chapter we discuss the approach used to achieve the objectives of the project and ultimately the aims of the project. The techniques used to achieve the user requirements and the technologies used in the designing of the system.

3.2 SYSTEM REQUIREMENTS

3.2.1 FACT FINDING TECHNIQUES

The techniques used to come up with system requirements involved reading the available literature in form of reports, brochures-commerce books and journals. However little information was available as regards to information processing. Most of the available literature was purely demographic.

In order to come up with the system requirements that are specific to the Zambian set up , The Zambian Vehicle Trade and Management system project included references from the news papers for example the one given in the first chapter that is "the post news paper". Furthermore oral interviews were conducted on vehicle dealers around Lusaka. Then a random sample of potential buyers was taken into study and also oral interviewed as a way of coming up with the system requirements. However the was a problem with this approach as most of the vehicle dealers are not so conversant with online operation and thus basic tutorial was given to them in order to spearhead the project . This resulted in unforeseen time loss in the collection of the system requirements at this stage. Nevertheless the following system requirements were captured in the process.

3.2.2 REQUIREMENTS

The requirements of the Web-based Zambian Vehicle Trade and Inventory management information system are to develop:

- A web based front end for entering vehicle details including the name, price, date, make and other related information to the vehicles.
- A web based front end for searching the information relating to a given vehicle or a given vehicle group and price;
- A facility to still enter content and maintain content using a user friendly content management system that will be implemented when logged in as administrator.

- A facility to produce summary information of vehicles and sold vehicles particulars and any other related activities
- A blog section where sellers and buyers can communicate and finalize business transactions appropriately.

3.2.3 FUNCTIONAL REQUIREMENTS

In this project the aim at developing a system which should improve the trade specifically vehicle trade conducted in Zambia has mentioned in the problem statement in chapter one, this improvements on the current and added lot of functionalities and therefore the Major target or goal here is:

- To develop a vehicle trade database that can support the following tables: comments, pages, posts, products, subjects, transactions and users.
- To develop a client interface that allows privileged users to carry out tasks such as inserting or modifying and deleting data in the database;
- To develop a searching functionality in order to allow normal and privileged users to search the details of a given vehicle, price group.
- To fully integrate the Web-based Zambia Vehicle Trade and management information and Inventory system to the World-Wide-Web and hence allow access from any Internet networked terminal and Web browser around the world;
- To develop a functionality that produces summary information of required data to enhance decision making;
- To embed security features in the Web DBMS to provide privacy, integrity;
- To allow privileged users to maintain the Web-based Zambian Vehicle Trade and Inventory management information system by adding/deleting particulars, backing-up or resetting the database and extract online summary in the form of histograms for each vehicle sold and lists of free-format comments. Thus a graphical reporting tool should be provided for analyzing the data.
- And finally the system should be flexible enough to store data for several years and also be able provide sufficient **User** and **Administration** Guides and providing ease of management.

3.2.4 NON FUNCTIONAL REQUIREMENTS

The system must be developed to suit the particular needs of a user-friendly environment. This means that the system must accommodate a clearly understandable user interface. A fast response time in obtaining and providing information to the system may also prove to be a significant advantage. In addition to these requirements, the system should also embrace the following requirements:-

Security: Each user that administers the systems or posts is required to log in. The system should log staff that has been assigned user names and passwords. The system should be designed to make it impossible for anybody to log in without a valid username and password. Data encryption should be employed to keep the user login name and password secret.

- Reliability: The system should have little or no downtime and be able to handle multiple concurrent users.
- Ease of Use: The general and administrative views should be easy to use and intuitive.
- Performance: The system should have a quick response time. For the purpose of this research project, this would be defined as less than 10 seconds.
- System and Browser compatibility Testing: The system should be accessible on the following browsers - Microsoft Internet Explorer 7.5+, Netscape Navigator, Safari and Firefox Mozilla.
- System requirements: The Zambia Vehicle Trade and Inventory System will run on a Windows server. This system would be designed to run on a minimum hardware configuration of 500MHz x86 machines.

Server Software:

- Operating System: Windows 2000, Windows XP and Windows 8
- PHP version: PHP 4.5+
- Web Server: Apache Web Server. 2.0+
- Database: MySQL 4.01+

Client Software:

- JavaScript
- Css
- Html
- Microsoft Internet Explorer 7.5+, Netscape Navigator, Safari and Firefox Mozilla.

3.3 SYSTEM DESIGN

3.3.1 ACCESS LEVEL

In order to take closer look into what the Zambia Vehicle Trade and Inventory should do and how, it was necessary to decompose the system's functionalities based on the user type and levels of access. The three main user groups and access levels are:

- Global User Group (normal access level)
- The Staff User Group (privileged access level)
- The blog post User (privileged access level)

Therefore, the requirements could be efficiently analyzed depending on the user group and the functionalities they should be allowed to perform.

3.3.2 MAIN SYSTEM PAGE (INDEX PAGE ON THE WEBSITE)

It is required for the system to provide a Main Page where any Global user (any user within and outside the Zambian Vehicle Trade and Inventory) will be able to access. The main functionality of this page will be to allow any user to search the database by using information such as price group and the vehicle brand. The search capabilities of the main page might not be limited to the exact vehicle brand, but may for example provide the means for displaying any information that might be relevant but not confidential. The Main Page should also include a Login facility for any privileged or normal user to be able to have access to more advanced functionalities of the System. The global users are going to be able to select vehicles of their interest from the site, state their quantities. The system will further then process the details and give them the total price due. Then they can get in touch with the seller by means of the blog section which the system provides.

3.3.3 THE STAFF USER GROUP

When a Staff user has successfully logged into the system via the Main Page Login facility, it will be necessary for the system to display a specific menu with all available option that can be carried out. Therefore by taking into account the system requirements, it will be necessary to include options such as Manage Inventory, Manage Website content, Add staff user and Delete staff User. A Logout option will also be appropriate for the Zambian Vehicle Trade and Inventory user to be able to logout when desired.

3.3.4 ENTERING AND EDITING VEHICLE DETAILS (MANAGING INVENTORY)

For a staff user to be able to edit and enter into the system's database it will be essential to take into account that the vehicle trade and inventory system will be integrated to database. Therefore, it will be essential for the system to provide to the user the exact fields as database does for any particular type of details. In addition, when a particular of a given vehicle has successfully been submitted or edited into the database it will be essential for the system to display the appropriate message or immediately show that it is in the database.

3.3.5 MANAGE WEBSITE CONTENT

For a staff user to be able to manage the content of the website. A content management option will be provided and is going to include the following functionality. The staff user can add, update and delete subjects that are on the navigational panel. Further adding, updating and deleting pages which will be displayed on the main page when selected. Finally the staff user will be provided with the functionality to add staff users and delete staff users. The staff users will have a username and a password to access this privileged mode.

3.3.6 BLOG POST USER

The blog post user will be a seller who's had his/her vehicle entered in the system by the Staff user. Then he/she can blog as a method to reach prospective customers for that particular vehicle they are selling. Customers can then leave comments on the seller's blog and arrange for further transactions. These sellers will have a username and a password.

3.3.7 USE CASE STRUCTURE DIAGRAMS

For the development of a more consistent and effective system, it was essential to firstly identify which information should be included accomplish this, it was first of great significance to group all the relevant tasks (system functionalities) depending on the users.
The way the systems tasks could be efficiently identified was by using a special technique called UML (Unified Modeling Language) use case diagrams.

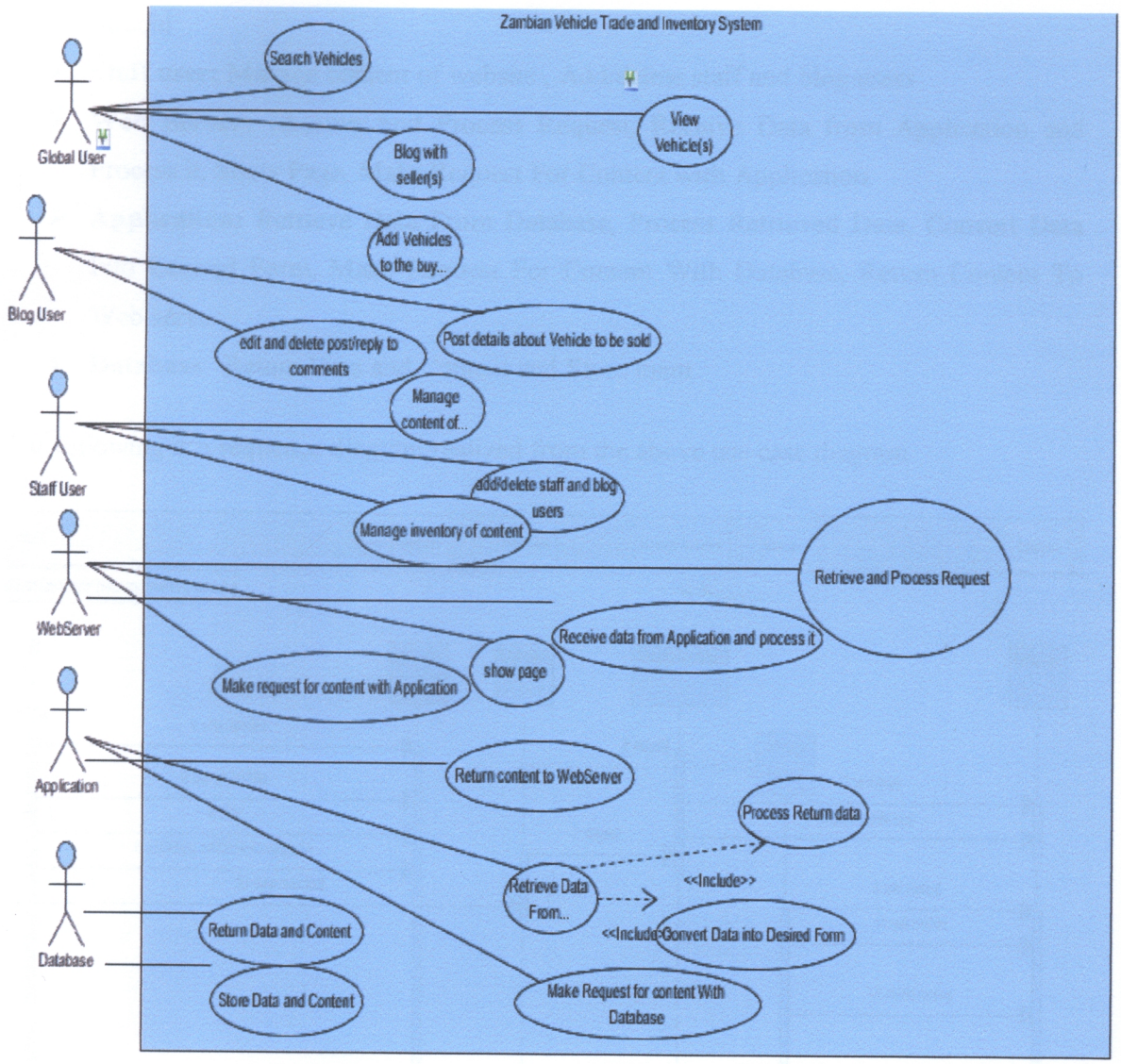


Figure 3.1: (UML Use case Diagram of the Zambian Vehicle Trade and Inventory System)

Actors: Global user, Blog user, Staff user, Web Server, Application and Database. The corresponding are use cases for these actors are:

- **Global user:** Search vehicle(s), Blog with sellers, view vehicle(s), Add/delete vehicles to the buy table (It counts the total quantity of vehicle(s) to be transacted and calculates the total price).

- **Blog user:** edit and delete posts/reply to comments, Post details about Vehicle(s) to be sold.
- **Staff user:** Manage content of website , Add/delete staff and blog users
- **Web Server:** Receive And Process Request, Receive Data from Application and Process it, Show Page, Make Request For Content with Application.
- **Application:** Retrieve Data From Database, Process Retrieved Data, Convert Data Into Desired Form, Make Request For Content With Database, Return Content To Web server.
- **Database**: Return Data and Content and Store them.

The following is a sequence diagram realized from the above use case diagram

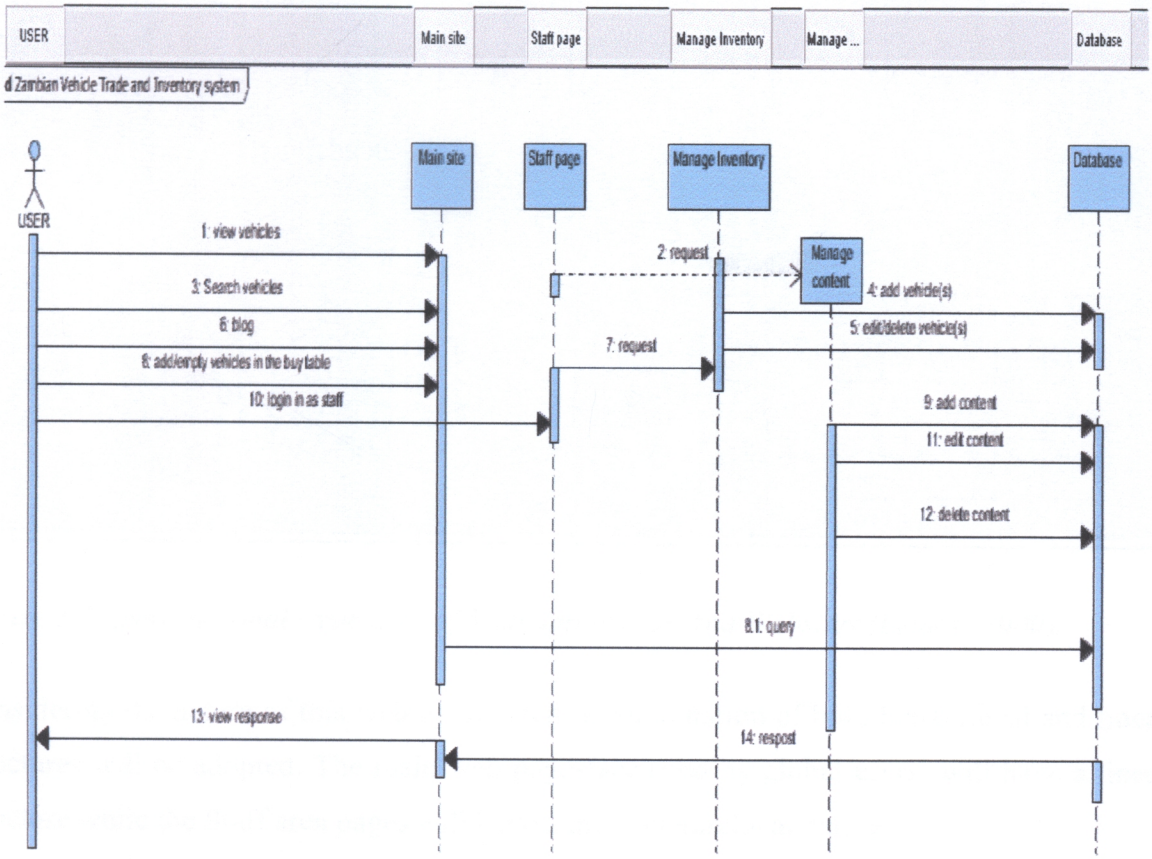


Figure 3.2:Sequence diagram of the Zambian Vehicle Trade and Inventory System.

3.3.8 ARCHITECTURAL DESIGN

Web applications fall into four main structures. They can be linear, grid, hierarchical, or networked (fig 3.3). In practice most web sites are a combination of some of these structures.

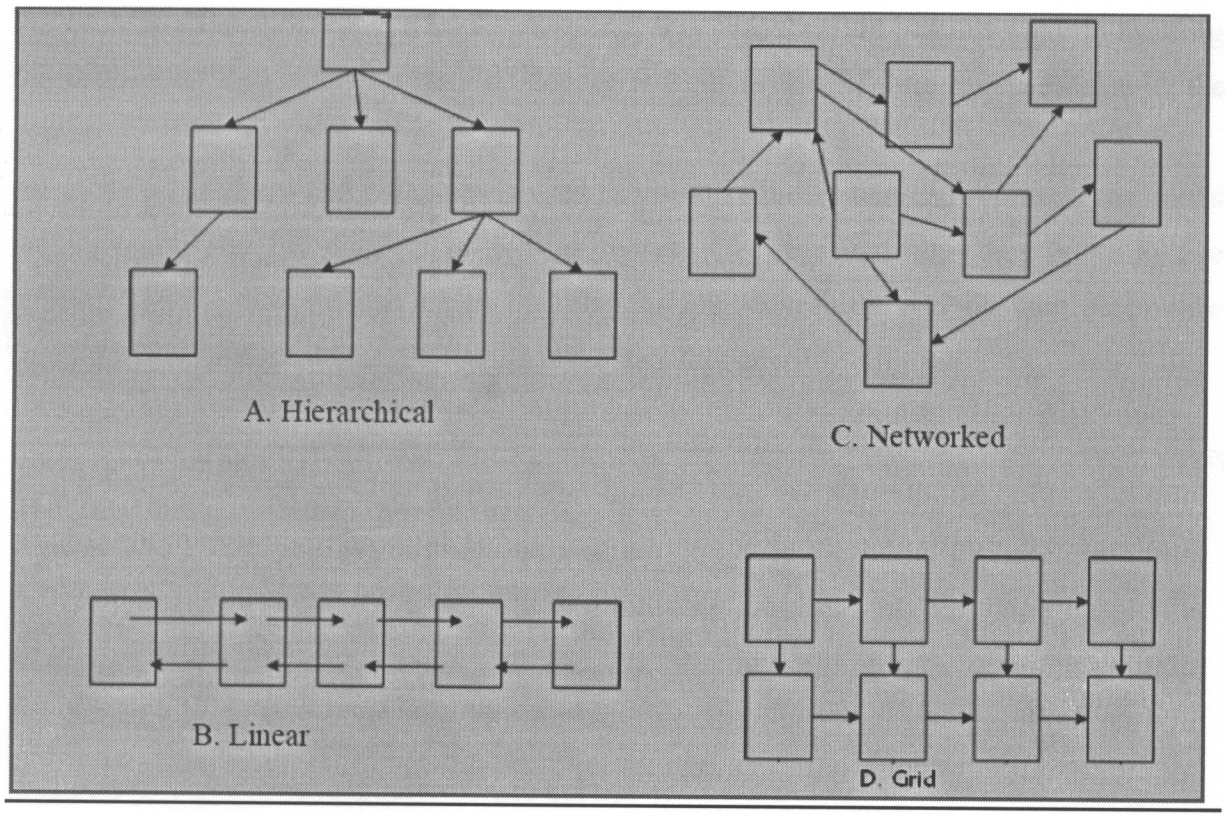


Figure 3.3: .Navigational structures of Web application and Websites (Lemay, 2000).

Considering the nature of this web application, a combination of both hierarchical and linear structures will be adopted. The main web pages(accessed by global users) will have a linear structure while the Staff area pages will have a more hierarchical nature.

3.3.9 DATABASE DESIGN

Database design involves the production of a model of the data to be stored in the database. A data model is a diagram of the database design that documents and communicates how the database is structured. The database design methodology followed in this project is that suggested by Connolly [16]. Connolly presents quite a detailed guide to designing databases, but not all of those steps may apply here, as this project is not too complex.

The design process is divided into three main stages. These include the conceptual, logical and physical database design. The purpose of the conceptual database design is to decompose the design into more manageable tasks, by examining user views of the system. That is, local conceptual data models are created that are a complete and accurate representation of the system as seen by different users. Each local conceptual data model is made up of entity types, relationship types, attributes and their domains, primary keys and integrity constraints. For each user view identified a local conceptual data model would be built. [16]. In building the conceptual data model, a data dictionary is built to identify the major entities in the system.

An entity relationship (ER) diagram is used to visualize the system and represent the user's requirements. The ER diagram is used to represent entities and how they relate to one another. The ER diagram also shows the relationships between the entities, their occurrence (multiplicities) and attributes. Following is the data dictionary.

DATA DICTIONARY	
ENTITY NAME	ENTITY DESCRIPTION
pages	pages to be displayed on site
posts	posts posted by sellers
products	vehicles to be stored in the system
subjects	subjects in the navigational area
transactions	transactions to be stored
users	staff users of the system
bloggers	visitors/customers to the site
comments	The commets left by visitors/customer to the site

Table 3.1. The Data dictionary of the ZVTIMS.

The following are the entities to be stored in the database and their relationship

Entity name	Attributes	Description	Data Type	Size	Nulls	Multi-valued
comments	-id(PK)	Comments identification number	int	11	No	No
	-name	Name of commenter	varchar	255	No	No
	-website	Website of commenter	varchar	255	No	No
	-content	Content comment of the visitor/customer	Text		No	No
	-post_id(FK)	Post id of the seller	int	11	No	No
	-date		int	11	No	No
users	-id(PK)	User's identification number	int	11	No	No
	-username	Staff's user name	varchar	255	No	No
	hashed_password	Password of staff	varchar	40	No	No
products	-id	Product's	int	11	No	No

		identification Number				
	-vehicle_name	Name of vehicle	varchar	255	No	No
	-price	Price of vehicle	varchar	16	No	No
	-details	Details of the vehicle sold	text		No	No
	-category	Make of vehicle Sold	varchar	16	No	No
	-subcategory	Type of vehicle	varchar	255	No	No
	-date_added	The vehicle's added date in the system	date		No	No
pages	-id(PK)	The page's identification number	int	11	No	No
	-subject_id(FK)	The subject's identification number that relates to the page	int	11	No	No
	-menu_name	The menu_name of the page	varchar	30	No	No
	-position	The position of the page on the navigation	int	11	No	No

	visible	The visibility of the page on the site	tinyint	1	No	No
	content	The main content of the site	text		No	No
posts	id(PK)	The post's identification number	int	11	No	No
	title	The title of the post	varchar	255	No	No
	body	The content of the post to be displayed	text			
	num_comments	The number of comments posted for that post	int	11	No	No
	date	Date added in system	int	11	No	No
subjects	-id (PK)	Subject's identification number	int	11	No	No
	-menu_name	The menu_name of the subject in the navigation on main site	varchar	30	No	No
	-position	The position of the subjects on the navigation site.	int	3	No	No

	-visible	The visibility of the subjects on the main site	tinyint	1	No	No

Table 3.2 :Entities stored in the database.

Logical Design

The process of logical database design constructs a model of the information used in an enterprise based on a specific data model, such as the relational model, but independent of a particular DBMS and other physical considerations [16]. The logical database design consists of an ER(Entity Relationship) diagram, a relational schema, and any supporting documentation for them. In the logical data model, all attributes of entities are primitive.

Producing a logical data model involves normalization. The aim of normalization is to eradicate certain undesirable characteristics from a database design. It removes data redundancy and thus prevents update anomalies. Normalization helps increase the clarity of the data model.

Integrity constraints are imposed in order to protect the database from becoming inconsistent. There are five types of integrity constraints which include the required data, attribute domain constraints, entity integrity, referential integrity and enterprise constraints. The resulting relations are validated using normalization. For this project, producing relations in third normal form (3NF) will be used and will do it.

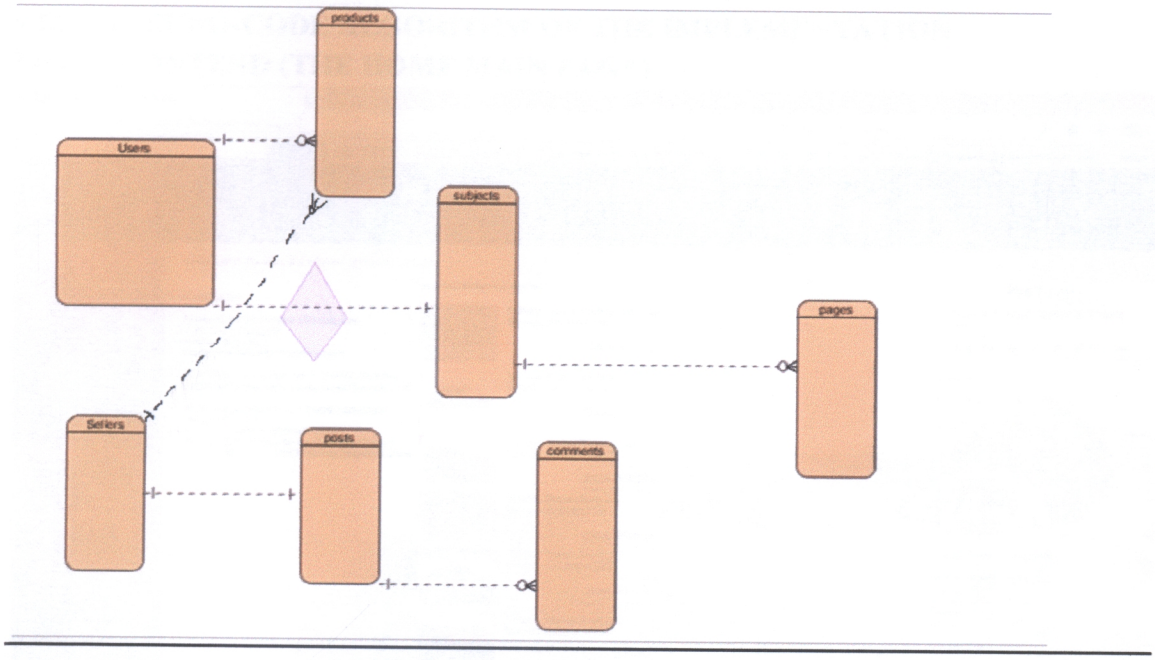


Figure 3.4: ER-diagram of the Zambia Vehicle Trade and Inventory System.

Physical Database Design

Physical database design translates the logical data model into a set of SQL statements that define the database for a particular database system. In other words, it is the process of producing a description of the implementation of the database on secondary storage. It describes the base relations and the storage structures and access methods used to access the data effectively, along with associated integrity constraints and security measures. The target DBMS in this case is MySQL.

The following translations occur:

1. Entities become tables in MySQL.
2. Attributes become columns in the MySQL database.
3. Relationships between entities are modeled as foreign keys.

3.4 SYSTEM IMPLEMENTATION

The word implementation means to carry out or fulfill something that is to put something into effect or action. In this section we are going to demonstrate the implementation of the Zambian Vehicle and Trade Inventory Management system. The implementation is going to counter check its validity and reliability against its proposed solution.

3.4.0 PSEUDO-CODE ALGORITHM OF THE IMPLEMENTATION

3.4.1 FRONTEND (THE HOME MAIN PAGE)

Figure 3.5: The main website home page

From the main page (index page)

If User selects link <View_vehicle > goto product.php && gets(vehicle_id);

Figure 3.6: Showing page product.php

If vehicle_id isset

get (vehicle_name , price ,date_added , details , category , subcategory); //using a database //query to get them

echo //displays the following variables

string vehicle_name,

int price,

date date_added,

text details,

string category,

string subcategory;

If User selects link < View Full image > goto (vehicle_id.jpg)// Which is a Full image of the // vehicle stored on the the server.

Figure 3.7: Stored image of the vehicle on the server

If User selects link < Add to Buy > goto buy.php && get(vehicle_id)

If vehicle_id isset

Push selected vehicle into SESSION ARRAY(buy_array);

Increment quantity by 1 in SESSION ARRAY;

SET $unit_price = $vehicle_price;

SET $total_price = $unit_price * quantity;

SET $table_price = $total_price + $table_price;

If User select link <click here to empty vehicles in the table> goto buy.php && get (empty_ buy)

Unset (SESSION ARRAY ['buy_array.php']);//delete what is stored in the session array

echo <table>

Vehicle	Vehicle Description	Unit Price	Quantity	Total_Price
$vehicle_name	$vehicle_details	$price	$quantity	$total_price

echo </table>

echo $table_total;

else

echo "There are no Vehicles in the System";

END;

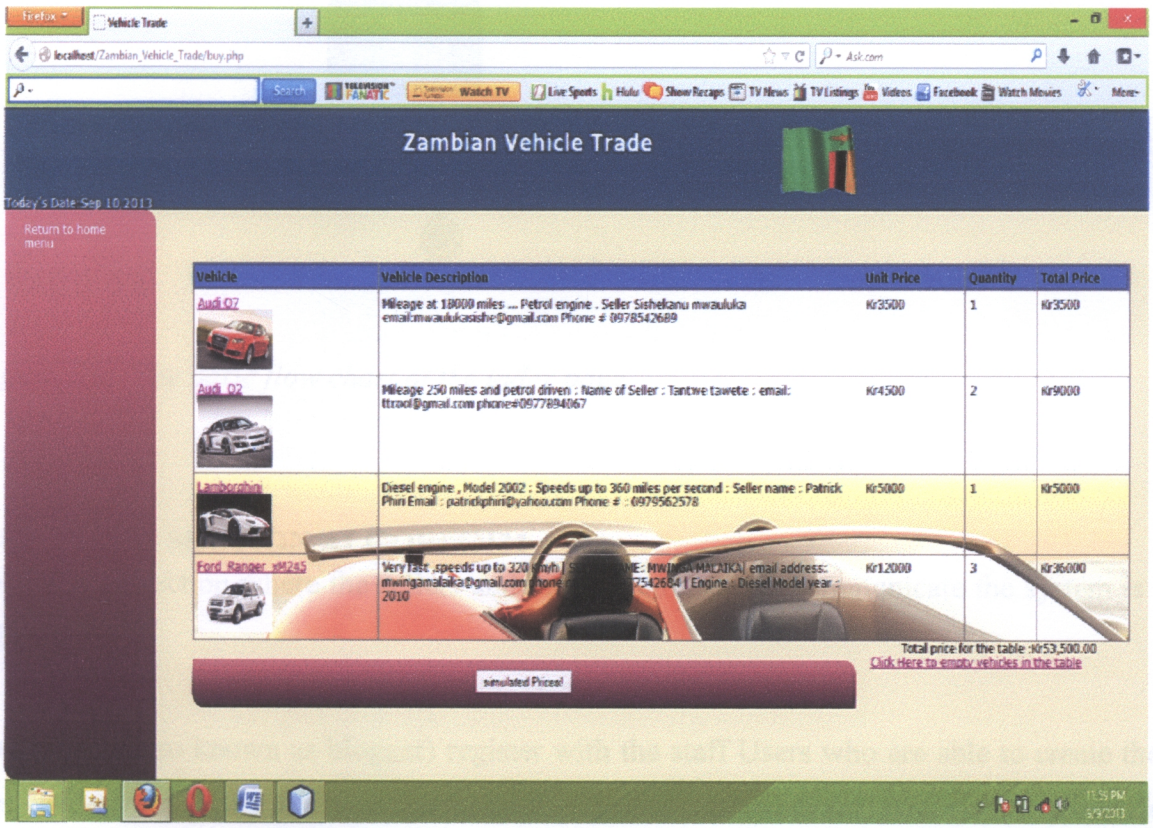


Figure 3.8:Price simulation of vehicles

The following flow chart diagram depicts the above pseudo-code

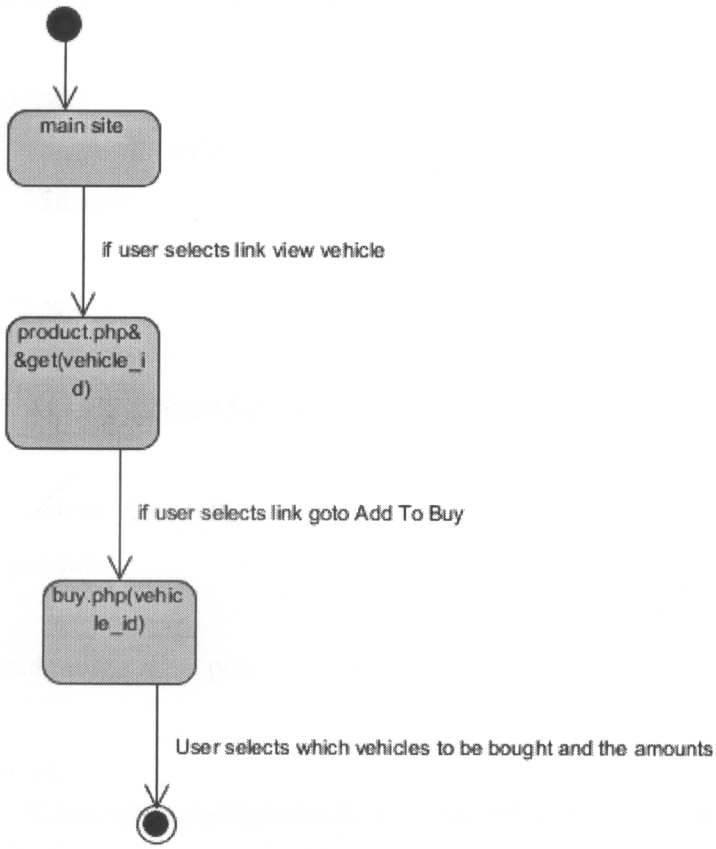


Figure 3.9: The basic flow chart of the index page

3.4.2 BLOG SECTION ALGORITHM

For the blog section where the sellers and buyers can actually communicate the system is as follows.

The sellers (also known as blogger) register with the staff Users who are able to create their user name and password. This can later be used to login as seller and Post what vehicles they are selling and the method to reach them and any other relevant information that the customers need to know. Transaction can then be started.

The following illustrates pseudo-code algorithm of the blog section

If User selects link <+ New post> goto post_add.php

Check

If (!(blog_user == $user))

Echo "Not registered seller , contact administrator";

Else

//Prompt seller to enter

Name of seller:……//$seller

Details:……//$details

If User selects button <post>

//THEN run database query

INSERT INTO posts VALUES ($name,$user);

Echo "Entry posted";

Display options(Edit , Delete , View all);

END //end of seller algorithm

If User selects link <read more> goto post_view.php

Display (post);

//Prompt User to comment

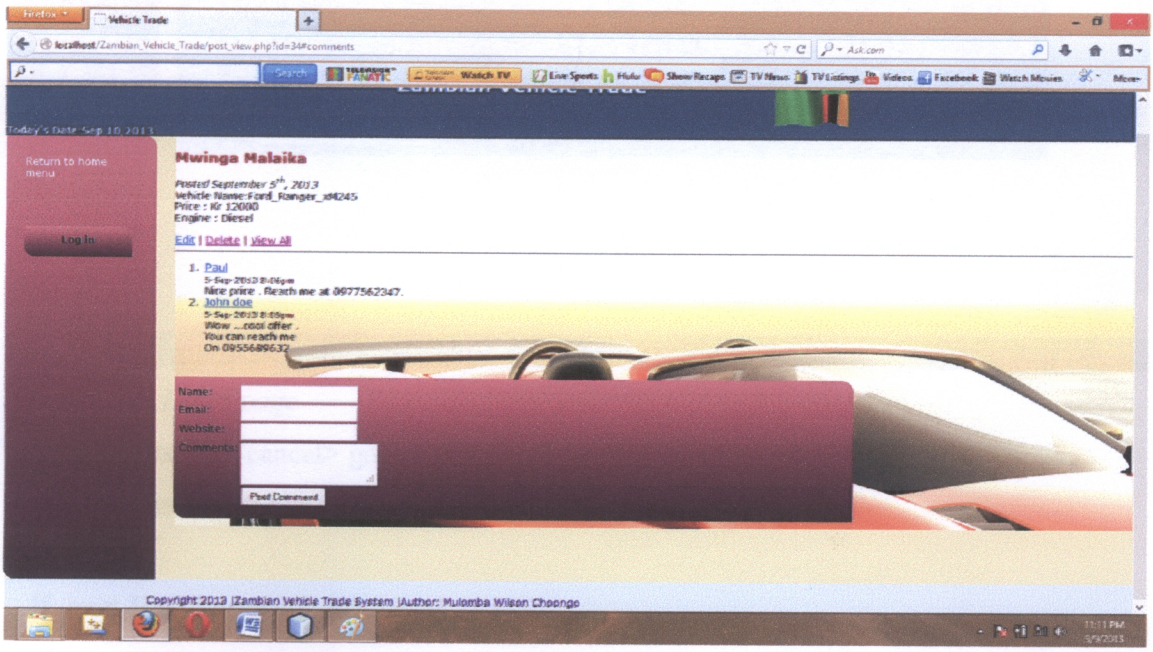


Figure 3.10: Post comment page

If user selects link <Post comment> //Run database query to add the comment to the post

//This engages the viewer and seller into a transaction

END //end of the visitor /buyer blog section algorithm

Finally on the main page a search panel will be provided that is going assist customers to find the vehicles of interest quickly and efficiently.

3.4.3 BACKEND IMPLEMENTATION (PSEUDO-CODE ALGORITHM)

The Backend of the system is shown by the following pseudo-code that illustrates its working and algorithms which are implemented.

If User selects link<log in as staff> goto login.php

//Prompt User to Enter

User Name:……//$username

Password:……..//$password

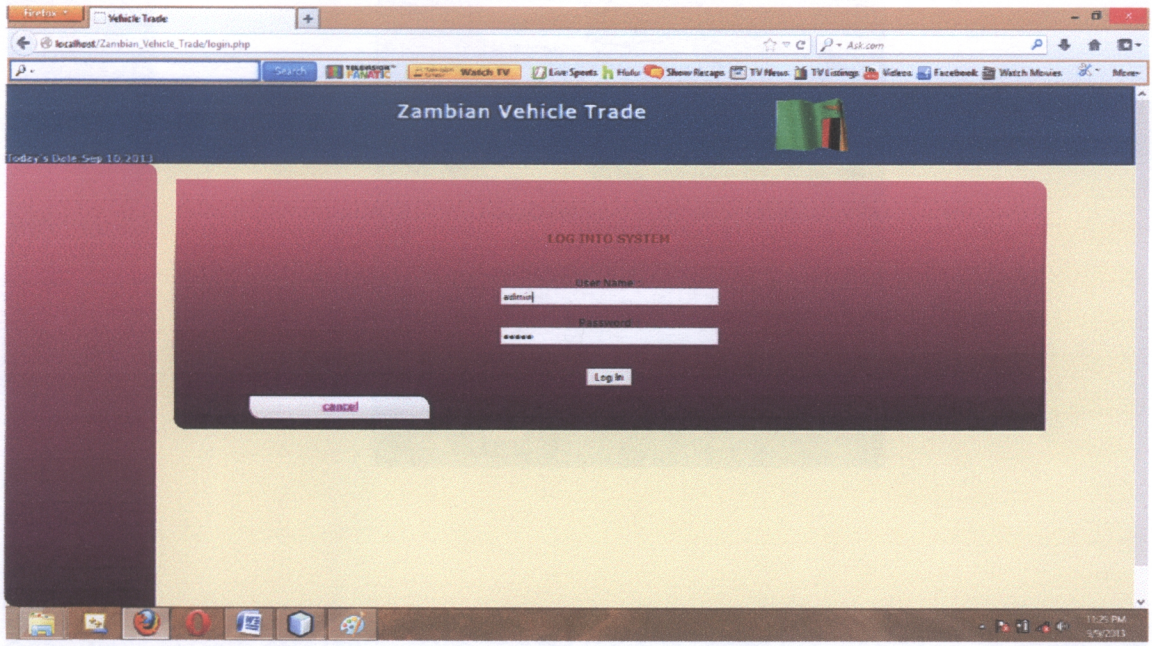


Figure 3.11: Login page

If User selects link<cancel> goto index.php//which is the main page

If User selects button <log In>

Check

If isset User Name && Password

Else

If !isset User Name && Password

Echo "Username and Password must be filled out";

If User Name && Password == $username && $password //stored in the database

THEN

Goto staff.php

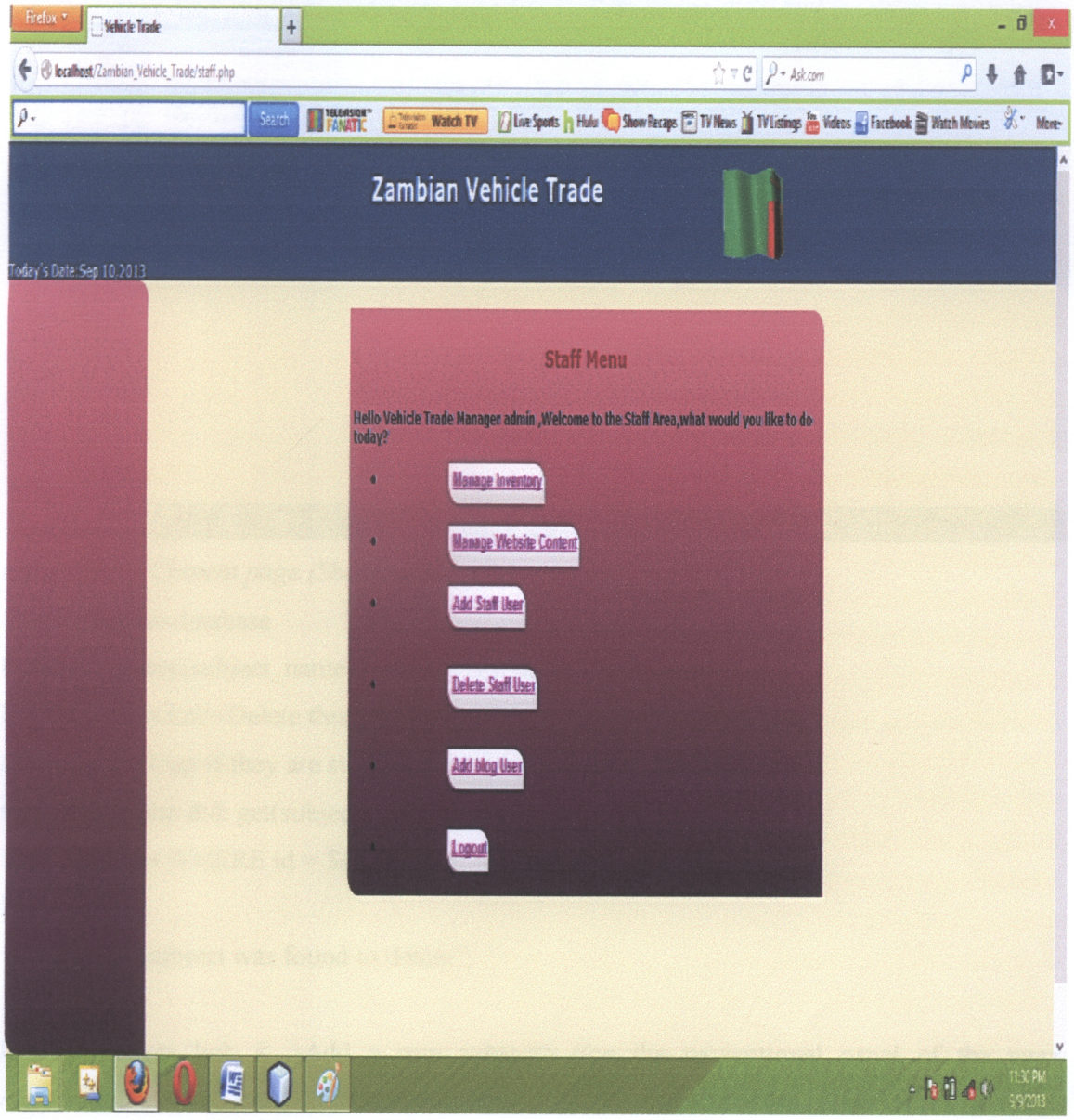


Figure 3.12: Staff menu page

IF User selects option 1 <Manage Website Content> goto content.php

//Prompt the User to select a subject or page add/edit from the navigational menu.

If User selects subject to edit from navigation panel

Get(subject_name,position ,visible);

If User selects <Edit subject> button;

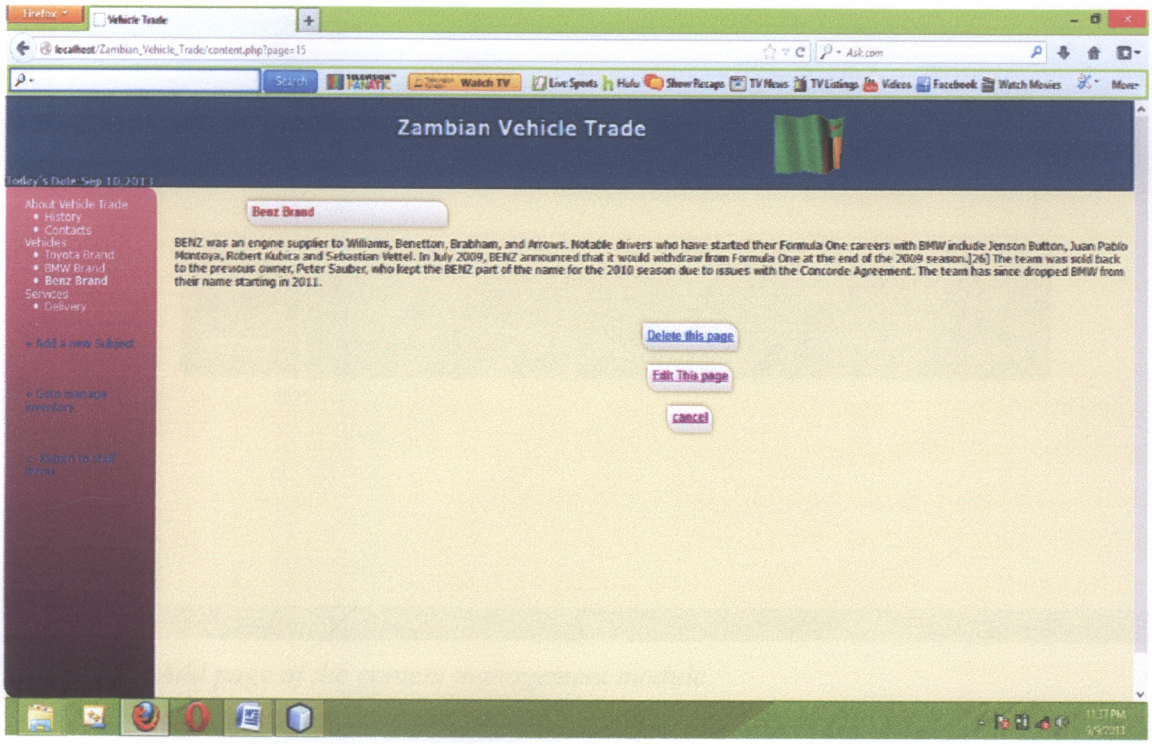


Figure 3.13: Content page (Showing the editing page).

//send query to database

Database_query(subject_name,position,visible);//edit subject

If User selects link<Delete this subject>

//Prompt the User if they are sure they want to delete the selected subject

Goto delete.php && get(subject_id)//run database query to delete

Delete subject WHERE id = $subject_id;

Else

Echo "No subject was found to delete";

If User selects link < +Add a new subject> //on the navigational panel of the page //content.php

THEN goto new_subject.php

//Prompt User to Enter

Subject name:……..//$subject_name

Position : ……..//$position

Visible:……..//$visible

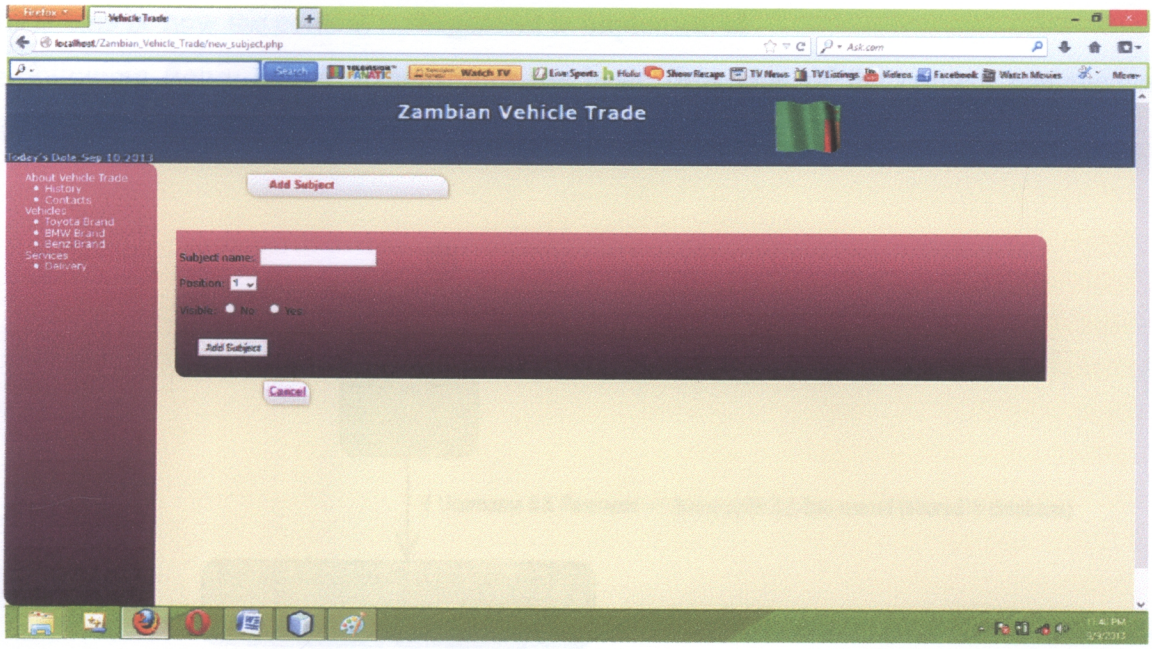


Figure 3.14:Add page of the content management module

If User selects button <add subject>//run database query to submit the entered values into the //database

INSERT INTO subjects VALUES ($subject_name,$position,$visible) //database query

If User selects link <+ Add page to this subject> goto new_page.php && get(subject_id)

//Prompt User to Enter the following

Page Name:……..//$page_name

Position:……..//$position

Visible:……..//$visible

Content:……..//$content

If User selects button <Add page>//run database query to submit entered values in database

INSERT INTO pages VALUES ($page_name, $position, $visible, $content);//run query

If User selects button <Delete this page>

//Prompt the User if they are sure about deleting the selected page

Goto delete_page.php && get(page_id);

//Run the following query on the database

Delete from pages WHERE id = page_id //This query deletes the page from the navigation //pane

END // This is how the content management is implemented

The following figure below demonstrates the basic flow chat of the content management system

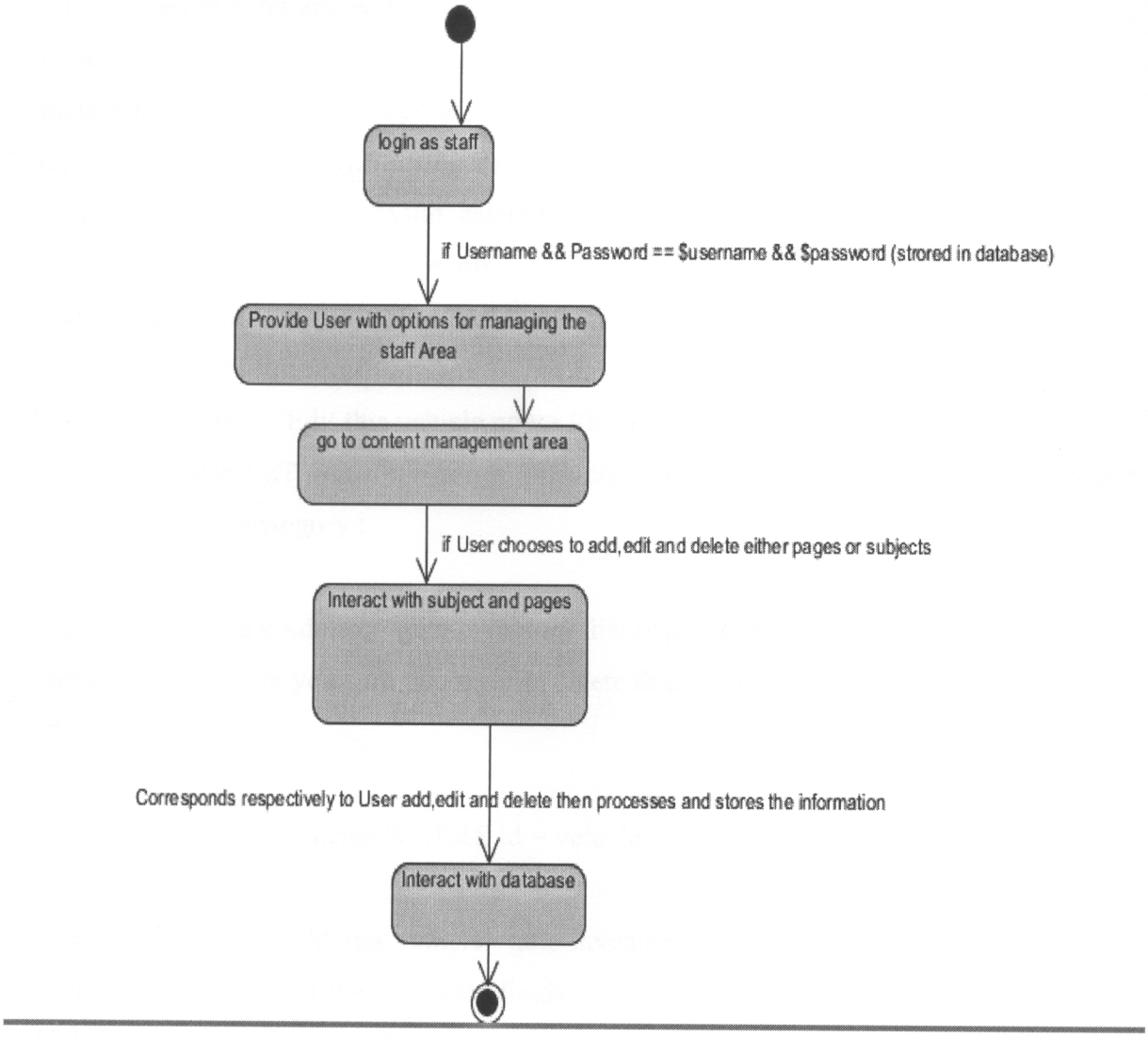


Figure 3.15: Basic flow chart of the content management system

The following pseudo-code algorithm illustrates the option 2 which is the inventory section of the backend system:

If User selects option 2<Manage Inventory> goto inventory_list.php

//Welcome the User to the inventory section

//display the inventory_list(what is stored in database)

Get(date_added , vehicle_id, vehicle_name,price)//get from database

Echo "date_added , vehicle_id,vehicle_name,price);

Foreach echo

//Prompt the User to edit / delete

If User selects the link<edit> goto inventory_edit.php && get(vehicle_id);

// Prompt User to enter and edit

Vehicle Name:.....//$vehicle_name

Vehicle Price:.....//$price

Category:.....//$category

Sub_category:.....//$sub_category

Vehicle Details:.....//$details

Vehicle image:.....//upload the image

If User selects button <Edit this vehicle now> //Run database query

UPDATE vehicles SET vehicle_name = $vehicle_name,price=$price , category =$category ,subcategory = $subcategory ;

If User selects the link <delete> goto inventory_list.php && get(vehicle_id);

//Prompt the User "Are you sure you want to delete this vehicle in inventory?";

If User accepts

THEN

Delete from vehicles WHERE id = vehicle_id ;//run this database query to delete

If User selects link <+ Add new vehicle> goto inventory_list.php

//Prompt the User to Enter the following fields

Vehicle Name:.....//$vehicle_name

Vehicle Price:.....//$price

Category:.....//$category

Sub_category:.....//$sub_category

Vehicle Details:.....//$details

Vehicle image:.....//upload the image

If User selects button <Add vehicle now> goto inventory_list.php

//Run the following database query

INSERT INTO vehicles VALUES ($vehicle_name,$price,$category,$sub_category,$details);

END//end of the inventory section of the system

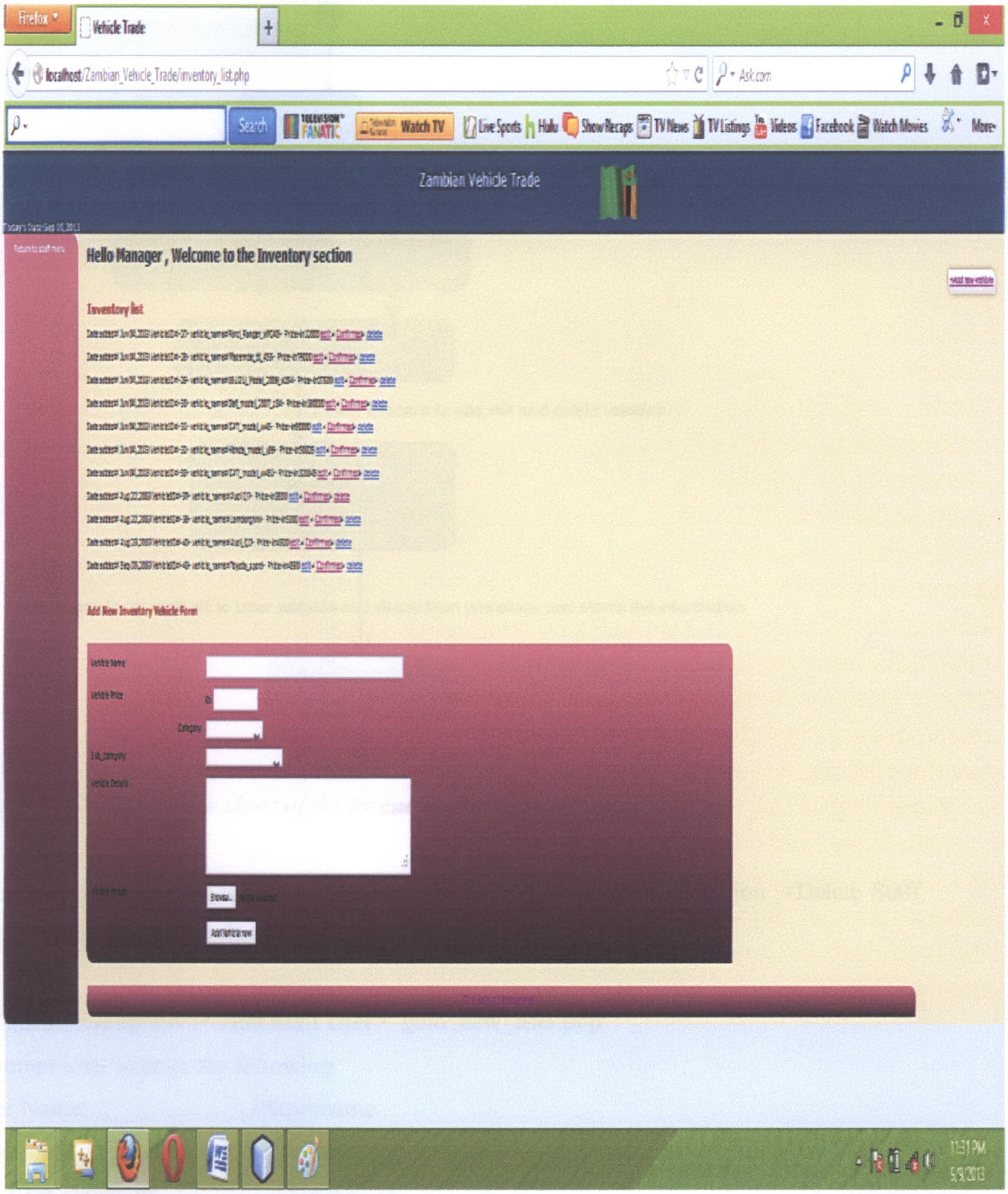


Figure 3.16: Inventory page

The following figure below demonstrates the basic flow chart of the inventory management system.

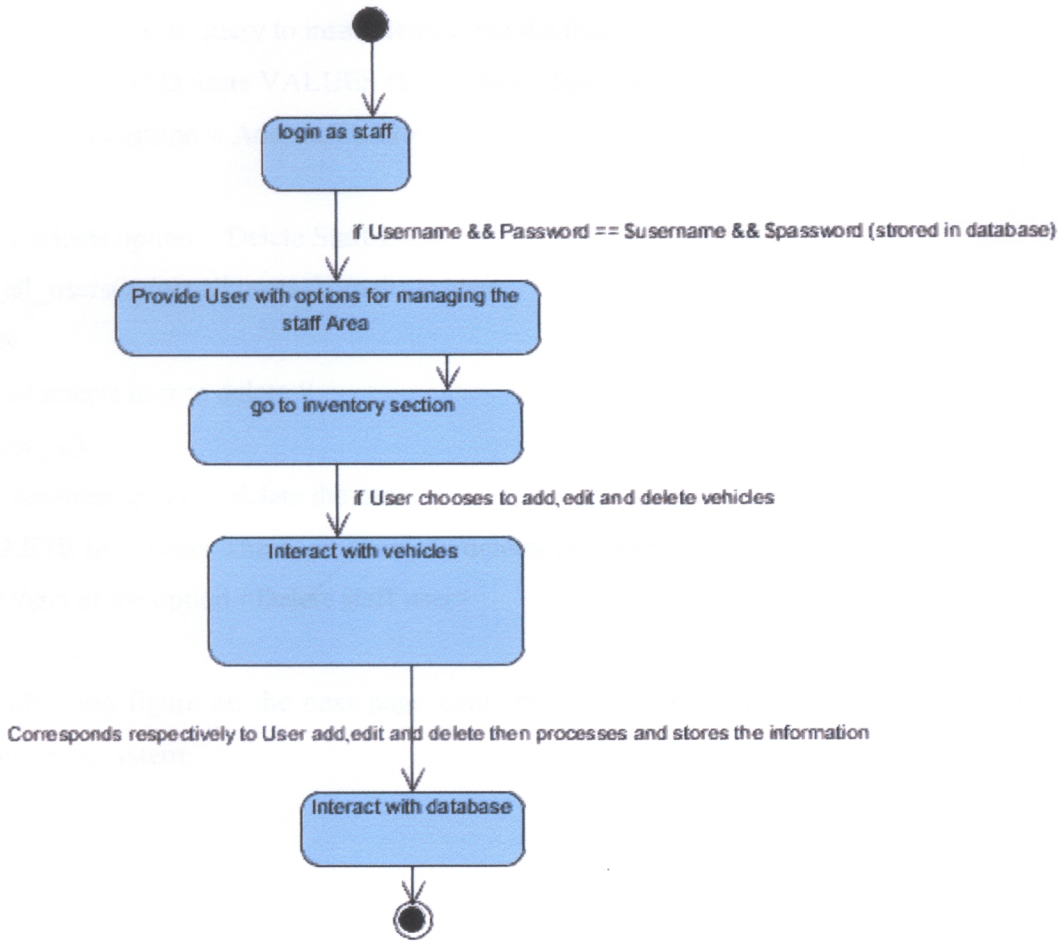


Figure 3.17: Basic flow chart of the Inventory management section.

The following psedo-code algorithm illustrates the <Add staff User> option ,<Delete Staff User> option and finally the <logout> option:

If User selects option 3< Add Staff User> goto new_user.php

//Prompt User to enter the following

User Name:……..//$username

Password :……..//$password

Confirm password:……..//$password

If User selects button <ADD>

CHECK

!isset($username,$password);

Echo "Username and Password/confirm must be filled out";

Else //Run database query to insert details into database

INSERT INTO users VALUES ($username , $password);

END //end of option < Add staff user>

If User selects option < Delete Staff User>

Get_all_users();//get all users from the system

THEN

User selects user to delete //

get(user_id);

//Run database query to delete the user

DELETE from users where id= user_id;//deletes user from database

END //end of the option <Delete staff user>

The following figure on the next page demonstrates the basic flow chart of the inventory management system.

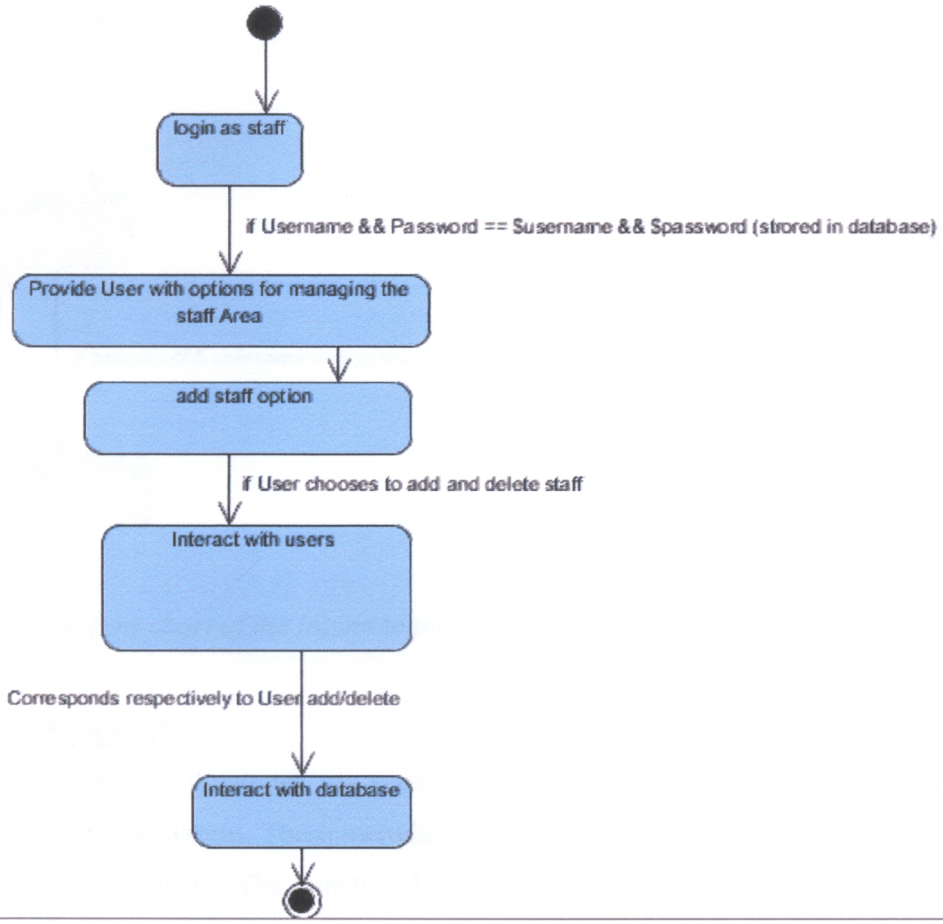


Figure 3.18: Basic flow chart of the add and delete staff User

If User selects option 4 <logout> goto login.php

Unset(User_session);//destroy the session for that specific user

Unset(user_cookie);//destroy the cookie store for that specific user

Echo "You are logged out now";

END // End of the logout option

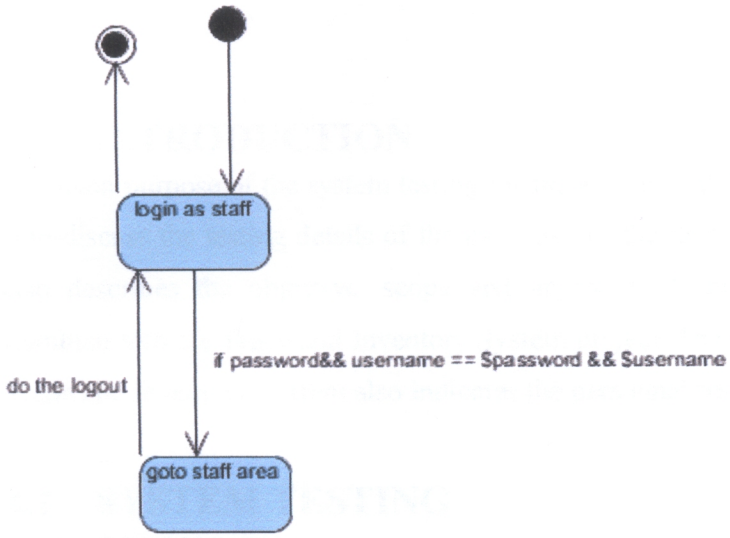


Figure 3.19:Basic flow chart of the logout implementation

3.5 SUMMARY

This chapter defines and illustrates the system design of the Zambian Vehicle Trade and Inventory Management System. These include system requirements which are functional and non-functional requirements. The functional requirements are features that the system is going to have while the non-functional requirement is metrics by which the system is measured upon. Use case diagram and the sequence diagram is provided to elaborate the Zambian Vehicle Trade and Inventory Management system. Implementation of the system focused on demonstration of system by providing an explained pseudo-code algorithm of the main system page and the frontend of the system. The diving in into the backend of the system and demonstrating the content management, staff management, inventory management. It further provides flow chart diagrams to shade more light on the demonstrations.

CHAPTER FOUR

4.1 INTRODUCTION

The main purpose of the system testing for the Zambian Vehicle Trade and Inventory System is to discuss the testing details of the use cases of the System. The software project test plan also describes the objective, scope and approach of the software testing effort for the Zambian Vehicle Trade and Inventory System project. The test plan for the Zambian Vehicle Trade and Inventory System also indicates the personnel responsible for each task.

4.2 SYSTEM TESTING

4.2.1 OBJECTIVES

The main objectives of the test plan for the Zambian Vehicle Trade and Inventory Management System are as follows:

- To identify the features of the system that will be tested.
- To identify and define all the activities necessary to prepare for and conduct the testing process on the Zambian Vehicle Trade and Inventory System
- To define the pass/fail criteria for each item that will be tested
- To identify the deliverables of the testing phase.

4.2.2 DEFINITIONS

The following are some of the terms and definitions that are related to the system testing of the Zambia Vehicle Trade and Inventory Management System:

- **ACCEPT/REJECT criteria:** Decision rules that are used to determine whether a software item passes or fails a test.
- **Test:** A collection of one or more test cases.
- **Test Item:** A software item that is an objective of testing.
- **Test Summary Report:** A table summarizing the testing activities and results.
- **Testing:** The process of analyzing a software item and making sure it meets the proposed objectives and aims of the project.

4.2.3 TYPES OF SYSTEM TESTING

UNIT TESTING

The Unit Testing is a test that tests each single module of the software to check for errors. This is mainly done to discover errors in the code of the Zambia Vehicle Trade and Inventory management System. The main goal of the unit testing would be to isolate each part of the program and to check the correctness of the code. In the case of the Zambian Vehicle Trade and Inventory System, all the web forms and the php code will be tested. The benefits for this unit testing are:

- The unit testing facilitates change in the code.
- It allows testing to be done in a bottom up fashion.

However, unit testing has some disadvantages such as, it might not identify each and every error in the system.

INTEGRATION TESTING

In Integration Testing, the individual software modules are combined and tested as a whole unit. The integration testing generally follows unit testing where each module is tested as a separate unit. The main purpose of the integration testing is to test the functional and performance requirements on the major items of the project. All the modules of the project developed individually would be combined together and tested as a whole system in the integration testing.

INCREMENTAL TESTING

The Regression Testing is generally done whenever modifications are made to the source code of a project. The INCREMENTAL Testing can also be defined as the process of testing changes made to the computer program and also makes sure that the older programming still works with the new changes(Wikipedia).So, before any new improvements, modifications and additions of a software product is released, the old test cases for the project will be run against the software with the changes made, to make sure that the old functionalities of the project still work.

ACCEPTANCE TESTING

This testing is generally performed when the project is nearing its end. This test mainly qualifies the project and decides if it will be accepted by the users of the system. The users or the customers of the project are responsible for the test.

SYSTEM TESTING

The system testing is mainly done on the whole integrated system to make sure that the project that has been developed meets all the requirements. The test cases for the system testing will be the combination of unit and integration tests.

4.2.4 TEST ITEMS

This section of the test plan lists all the items of the Zambian Vehicle Trade and Inventory Management System project that will be tested:

- Login.
- Add staff users/blog users(sellers) to the system.
- Search by vehicle name or make and contact vehicle sellers.
- Search by the price range of the vehicles and contact the searched vehicle sellers.
- CMS(content management system).
- Manage Inventory

TEST CASE 1 – USER LOGIN

- **Incorrect Input:** Incorrect username, which is the username in the case of the Zambian Vehicle Trade and Inventory System
- **Pass Criteria:** An appropriate message should be generated to indicate that an invalid Username/password combination has been typed.
- **Correct Input:** The correct input would be a valid and correct username/ password of the user which he/she uses to log in.
- **Pass Criteria:** The user should be directed to the webpage staff menu or seller menu that the user is intended to go to after he logs into the system.

TEST CASE 2 – ADD STAFF USERS/BLOG USERS (SELLERS) TO THE SYSTEM.

- **Incorrect Input:** Wrong format entered in the input fields for the adding page.
- **Pass Criteria:** An appropriate message should be generated to the user saying that he has entered the wrong format in the specific input field.

- **Correct Input:** The correct input would a correct format entered by the user into the input fields of the adding page and insert into the database.
- **Pass Criteria:** The pass criteria for this test case would be a successful addition of the user into the Zambian Vehicle Trade and Inventory Management System website. The system would log the user into the system after this.

TEST CASE 3 - SEARCH BY VEHICLE NAME OR MAKE AND CONTACT THE VEHICLE SELLERS.

- **Incorrect Input:** Incorrect input in this case, would be incorrect search criteria entered or incorrect format of data entered into the data entry fields of the search and page.
- **Pass criteria:** A message has to be generated to the user indicating the output of the results
- **Correct Input:** A correct input would be entering the data into the data entry fields in a correct format.
- **Pass Criteria:** The pass criteria for this test case would be that the search would return valid results.

TEST CASE 4 - CMS(CONTENT MANAGEMENT SYSTEM).

- **Incorrect Input:** Wrong format entered in the input fields for the adding, editing and deleting pages.
- **Pass Criteria:** An appropriate message should be generated to the user saying that he has entered the wrong format in the specific input field.
- **Correct Input:** The correct input would a correct format entered by the user into the input fields of the adding, editing and deleting subjects/pages and insert into the database.
- **Pass Criteria:** The pass criteria for this test case would be a successful addition, edition and deletion of the subjects/pages into the Zambian Vehicle Trade and Inventory Management System website.

TEST CASE 5 - MANAGE INVENTORY

- **Incorrect Input:** Wrong format entered in the input fields for the adding, editing and deleting inventory pages.
- **Pass Criteria:** An appropriate message should be generated to the user saying that he has entered the wrong format in the specific input field.

- **Correct Input:** The correct input would a correct format entered by the user into the Input fields of the adding, editing and deleting inventory pages and insert into the database.
- **Pass Criteria:** The pass criteria for this test case would be a successful addition, edition and deletion of the user into the Zambian Vehicle Trade and Inventory Management System website.

4.3 SYSTEM RESULTS

The summary of the test case results has been depicted in the table shown on the next page: These are the test cases for the User/staff pages. The major part of testing has been concentrated on the user pages, as they would be the main clients of the Zambian Vehicle Trade and Inventory System.

TEST CASE RESULTS

TEST CASE #	DESCRIPTION	RESULTS/COMMENTS
Test case 1	**Login**	**Passed**
Test case 2	**Add staff users/blog users**	**Passed**
Test case 3	**Search by price/make**	**Passed**
Test case 4	**CMS(content Management system)**	**Passed**
Test case 5	**Manage Inventory**	**Passed**

Table 4.1 Test case results

To start with, I have performed manual testing on the Zambian Vehicle Trade and Inventory System. Manual Testing is one of the oldest and rigorous methods of software testing. This testing strategy gives the best opportunity to check every page thoroughly and make sure it works in the expected manner. Due to the complexity of the various automation tools and the time available for testing the entire web application, I preferred to use manual testing based on the fact that it is one of the best methods of testing suggested for a beginner. For the security part of the system encryption was used. The encryption that was used was the SHA1 encryption algorithm. It was tested by randomly entering different username/password combinations.

4.4 SUMMARY

The Zambian Vehicle Trade and Inventory System was tested rigorously and passed the test cases that were designed for it. These tests include the Login, Add staff users/blog users(sellers) to the system, Search by vehicle name or make and contact vehicle sellers, Search by the price range of the vehicles and contact the searched vehicle sellers,CMS(content management system) and lastly not the least Manage Inventory. The SHA1 encryption proved to be reliable for this system.

CHAPTER FIVE

5.1 INTRODUCTION

This chapter is focused on the discussion, future works and concludes the whole project thesis of the Zambian Vehicle Trade and Inventory Management System (ZVTIMS).It also focuses on mainly on presenting the summary of experiences gained by me as a BSc student during the entire life cycle of the BSc project

5.2 DISCUSSION

Identifying a technology to work on for my BSc project was one of the basic difficulties that I have faced. But, to be frank, with my growing interest for PHP scripting language I decided that it would be the best fit for my BSc project. Since my BSc project **"The Zambian Vehicle Trade and Inventory Management System"** is a web application project thus PHP was chosen for the project. The different advantages offered by PHP technology and my craving for the technologies made me choose PHP.

Learning and experimenting with new technologies and languages is of great interest to me. I wanted to take up the challenge of learning a new technology and then implementing it later on. Learning this new technology has taken quite some time for me. I have had a few difficulties finding a good resource for learning PHP. I have learnt PHP through many tutorials available online and also the complete reference book for PHP has helped me a lot. Since all the examples available online were very simple, I had to work hard to implement some of the features in the project.

Initially I had planned to complete my BSc project by the end of the August 2013. But due system crash problems and also the availability of the committee members the project completed in September. Initially I had estimated the effort required for the project as 8 months.

My BSc project has been one of the rewarding experiences I have had. I have learnt a lot of things in the entire course of my Project. My desire to learn one of the fast evolving

technologies like PHP and MySQL has been satisfied. I have learnt the various coding techniques in PHP and MySQL. In all the projects I have done till now, I have either taken up the front end or the back end responsibility. But, this is the first project where I have taken up both the front end and back end responsibility. I have experienced a situation similar to the real-time work environment, where programmers and developers work under pressure and within a specified time deadline. Being new to the technology I had some difficulties with the coding part initially. Going through the entire life-cycle of the software development has given me a lot of knowledge and experience which will be useful for my future works and endeavors. I have also improved my coding skills through this project. The BSc project has also helped me realize that documentation for a project is as equally important as the coding of the project. Testing the Zambian Vehicle Trade and Inventory Management System project has helped me gain a lot of knowledge about the stress and load testing of the web applications. On the whole, I would like to thank the members of staff for guiding me through the entire project step by step and their valuable technical advice.

5.3 CONCLUSION

The Zambian Vehicle Trade and Inventory Management System that was developed provides a platform where sellers and buyers can meet online and transact in vehicles. It further provides a search facility that allows the buyers to search for the vehicles of interest to them quickly and fast. A blog section was implemented that actually makes it possible for the sellers and buyers to actually communicate. The content management system (CMS) is a module of the project. It makes it easy to maintain the site content. Then the inventory management which is a module of the project , which keeps track of the vehicles posted in the system and allows the administrator to confirm so that the vehicles appears on the front end of the system.

5.4 FUTURE WORKS

For this project the proposed future works include:

- Linking the system to a local bank(s) for online transactions.
- Using paypal and credit card transactions when transacting.
- Contextual awareness of the system. Meaning that it will optimize transactions according to the proximity of locations of people.
- Advertise vehicles to buyers in accordance with their current location.

5.5 SUMMARY

The project has been a great learning experience; I have learned a lot of things during the time of this project, like the different styles of programming in PHP and MySQL have also gotten exposed to the web environment and various technologies that are used on the web.

APPENDIX

The following is the sample PHP code of the Zambian Vehicle Trade and Inventory Management System.

These are the functions that called:

```
<?php
function get_default_page($subject_id){
   $page_set = get_pages_for_subject($subject_id, true);
   if($first_page = mysql_fetch_array($page_set)){
      return $first_page;
   }else
   {
      return null;
   }
}
function redirect_to($location = NULL) {
   if ($location != NULL) {
      header("Location:{$location}");
      exit;
   }
}

function confirm_query($result_set) {
   if (!$result_set) {
      die("Database query failed :" . mysql_error());
   }
}

function get_all_subjects($public=true) {
   global $connection;
   //Perform query in the selected database
   $query = "SELECT *
      FROM subjects ";
```

```
    if($public){
    $query .=  " WHERE visible = 1"; }
    $query  .=  " ORDER BY position ASC";
    $subject_set = mysql_query($query, $connection);
    confirm_query($subject_set);
    return $subject_set;
}

function get_pages_for_subject($subject_id, $public = true) {
    global $connection;
    //This here creates a relation because this a relational database
    //Relation exist on table:subjects with table:pages  were subjects is the parent table
    //and pages is the child table through id in subjects and subject_id in pages!
    $query = "SELECT * FROM pages";
     $query .= " WHERE subject_id = {$subject_id }  ";
         if($public)  { $query   .= " AND  visible = 1  ";}
          $query .= "  ORDER BY position ASC";
    $page_set = mysql_query($query, $connection);
    confirm_query($page_set);
    return $page_set;
}

function get_subject_by_id($subject_id) {
    global $connection;
    $query = "SELECT * FROM subjects WHERE id=" . $subject_id . "   " . " LIMIT 1 ";
    $result_set = mysql_query($query, $connection);
    confirm_query($result_set);
    //If no rolls are returned ,fetch array will return false
    if ($subject = mysql_fetch_array($result_set)) {
       return $subject;
    } else {
       return NULL;
    }
}
```

```
function get_page_by_id($page_id) {
    global $connection;
    $query = "SELECT * FROM pages WHERE id=" . $page_id . " " . "LIMIT 1";
    $result_set = mysql_query($query, $connection);
    confirm_query($result_set);
    if ($page = mysql_fetch_array($result_set)) {
        return $page;
    } else {
        return NULL;
    }
}

function find_selected_page() {
    global $sel_subject;
    global $sel_page;
    if (isset($_GET['subj'])) {

        $sel_subject = get_subject_by_id($_GET['subj']);
        $sel_page = get_default_page($sel_subject['id']);
    } elseif (isset($_GET['page'])) {
        $sel_subject = NULL;
        $sel_page = get_page_by_id($_GET['page']);
    } else {
        $sel_subject = NULL;
        $sel_page = NULL;
    }
}
function navigation($sel_subject, $sel_page,$public = false) {
    $output = "<ul class=\"subjects\">";
    $subject_set = get_all_subjects($public);
//Return the data thus read from the database for displaying on the browser
    while ($subject = mysql_fetch_array($subject_set)) {
        $output .= "<li";
```

```
    if ($subject['id'] == $sel_subject['id']) {
      $output .= " class=\"selected\"";
    }
    $output .= "><a href=\"edit_subject.php?subj=" . urlencode($subject["id"]) .
        " \">{$subject['menu_name']}</a></li>";
    $page_set = get_pages_for_subject($subject["id"], $public );
    $output .= "<ul class=\"pages\">";
    while ($page = mysql_fetch_array($page_set)) {
      $output .= "<li";
      if ($page["id"] == $sel_page['id']) {
        $output .= " class=\"selected\"";
      }
      $output .= " ><a href = \"content.php?page=" . urlencode($page["id"]) .
          "\"> {$page['menu_name']} </a></li>";
    }
    $output .= "</ul>";
  }
  $output .= " </ul>";
  return $output;
}
function public_navigation($sel_subject,$sel_page, $public=true){
  $output = "<ul class=\"subjects\">";
  $subject_set = get_all_subjects($public);
//Return the data thus read from the database for displaying on the browser
  while ($subject = mysql_fetch_array($subject_set)) {
    $output .= "<li";
    if ($subject['id'] == $sel_subject['id']) {
      $output .= " class=\"selected\"";
    }
    $output .= "><a href=\"index.php?subj=" . urlencode($subject["id"]) .
        " \">{$subject['menu_name']}</a></li>";
    $page_set = get_pages_for_subject($subject["id"] , $public);
    $output .= "<ul class=\"pages\">";
    while ($page = mysql_fetch_array($page_set)) {
```

```
            $output .= "<li";
            if ($page["id"] == $sel_page['id']) {
               $output .= " class=\"selected\"";
            }
            $output .= " ><a href = \"index.php?page=" . urlencode($page["id"]) .
                  "\"> {$page['menu_name']} </a></li>";
         }
         $output .= "</ul>";
      }
      $output .= " </ul>";
      return $output;
}
function mysql_prep($value) {
      $magic_quotes_active = get_magic_quotes_gpc();
      $new_enough_php = function_exists("mysql_real_escape_string");
      // i.e PHP greater or equal to v4.3.0
      if (!$new_enough_php) {//PHP v4.3.0 or higher undo any magic quote effects so that
mysql_real_escape_string can do the work
         if ($magic_quotes_active) {
            $value = stripslashes($value);
         }
         $value = mysql_real_escape_string($value);
      } else { //before PHP v4.3.0
         //if magic quotes aren't already on then addslashes manually
         if (!$magic_quotes_active) {
            $value = addslashes($value);
         }
         // if magic quotes are active , then the slashes already exist
      }
      return $value;
}
function get_all_pages()
{
      global $connection;
```

```
    //Perform query in the selected database
    $query = "SELECT *
                    FROM pages
                    ORDER BY position ASC";
    $page_set = mysql_query($query, $connection);
    confirm_query($page_set);
    return $page_set;
}
?>
```

The connection code

```
<?php
require_once("constants.php");
// connect to a server in this application server is localhost
$connection = mysql_connect(DB_SERVER, DB_USER);
if (!$connection) {
   die("Failed to connect to server :" . mysql_error());
}
//select a database in this case the database selected is on the localhost named vehicle_trade
$db_select = mysql_select_db(DB_NAME , $connection);
if (!$db_select) {
   die("Could not select the database :" . mysql_error());
}
?>
```

The session code:

```
<?php
/*
 * Author : Mulomba Wilson Choongo
 */
session_start();
function logged_in()
{
   return isset($_SESSION['user_id']);

}
```

```
function confirm_logged_in()
{

   if(!logged_in() && $_SESSION['access_level'] == 1 )
   {
      redirect_to("login.php");
   }
}

function logged_in_admin()
{
   return isset($_SESSION['admin_id']);
}
function confirm_logged_in_admin()
{
   if(!logged_in_admin())
   {
      redirect_to("login_admin.php");
   }
}
?>
```

This is the front page code:

```
<?php require_once("includes/connection.php"); ?>
<?php require_once("includes/functions.php"); ?>
<?php
//execute a query to select my 8 newest vehicles added in the database!
$dynamicList = "";
$sql = mysql_query("SELECT * FROM products where confirmed = 0 ORDER BY
date_added DESC LIMIT 6");
$vehicleCount = mysql_num_rows($sql);
if ($vehicleCount > 0) {
   while ($row = mysql_fetch_array($sql)) {
      $id = $row['id'];
      $vehicle_name = $row['vehicle_name'];
```

```
    $price = $row['price'];
    $dynamicList .='
                    <tr>
                      <td width="17%"><a href="product.php?id=' . $id . '"><img
style="border: #cc00cc 1px solid;" src="images/' . $id . '.jpg" alt="' . $vehicle_name . '"
width="77" /></a></td>
                      <td width="83%" style="" >Vehicle Name:' . $vehicle_name . ' <br/>
                          Vehicle Price:Kr' . $price . '<br/> <br/>
                          <a class="button" href="product.php?id=' . $id . '">View
Vehicle</a>
                      </td>
                    </tr>

                  ';
  }
} else {
  $dynamicList = "We have no vehicles currently to be sold,sorry try later";
}
?>
<?php require ("includes/header.php"); ?>
<?php
find_selected_page();
?>
<table id="structure">
  <tr>
    <td id="navigation">
      <?php
          echo public_navigation($sel_subject, $sel_page); ?>
      <br/>
      <br/>
       <a href="search.php" style="color: black;"><b id="form">SEARCH
VEHICLES</b></a> <br/>
      <br/>
      <br/>
```

```
<a href="seller_signup.php" style="color: black;"><b id="form">SIGN UP AS SELLER</b></a> <br/>
<br/>
<a href="buy.php" style="color: black;"><b id="form">VIEW YOUR BUYING TABLE</b></a> <br/>
<br/>
<br/>
<a href="login.php" style="color: black;"><b id="form">Log in</b></a> <br/>
</td>
<td id="page">
<div>
<h3>Welcome to the Zambian Vehicle Trade!</h3>
<table width="100%" border="0" cellspacing="0" cellpadding="0" background="images/screen.jpg" >
<tr>
<td width="24%" valign="top"><p><b>
<h2> <?php echo $sel_subject['menu_name']; ?> </h2>
<?php if($sel_page){?>
<h3 style="color:purple;"><?php echo htmlentities($sel_page['menu_name'] )?></h3>
<div class="page_content">
<?php echo nl2br($sel_page['content']); ?>
</div>
<?php } else { ?>
<h4>_____ </h4>
<?php } ?>
</b></p></td>
<td width="53%" valign="top"><p><b> Newest Vehicles added! </b></p>
<table width="100%" border="0" cellspacing="0" cellpadding="6">
<?php echo $dynamicList ?>
</table>
</td>
<td width="23%" valign="top"><p><b class="button"> Blog Section</b></p>
```

```
<?php
// index.php
echo '<h3>Welcome to the Vehicle Trade Blog!</h3>';
echo "<em>Showing the way trade should be done</em><hr/>";
$query = "SELECT * FROM posts ORDER BY date DESC";
$result = mysql_query($query);
if(!mysql_num_rows($result)) {
   echo 'No posts yet.';
} else {
   while($row = mysql_fetch_assoc($result)) {
      echo '<h2 style="color:blue">'.$row['title'].'</h2>';
      $body = substr($row['body'], 0, 300);
      echo nl2br($body).'...<br/>';
      echo '<a href="post_view.php?id='.$row['id'].'">Read More</a> | ';
      echo  '<a  href="post_view.php?id='.$row['id'].'#comments">'.$row['num_comments'].'
comments</a>';
      echo '<hr/>';
   }
}
echo <<<HTML
<a href="post_add.php">+ New Post</a>
HTML;
?>
            </td>
            </tr>
         </table>
      </div>
   </td>
  </tr>
</table>
```

The inventory page code:

```
<?php require_once("includes/connection.php"); ?>
<?php require_once ("includes/session.php"); ?>
<?php require_once("includes/functions.php"); ?>
<?php confirm_logged_in(); ?>
<?php require ("includes/header.php"); ?>
<table id="structure"  background="images/lambo2.jpg" >
  <tr>
    <td id="navigation">
      <a  href="staff.php">Return to staff menu </a><br>
    </td>
    <td id="page">
      <div>
        <h1> Hello  Manager <?php
//$manager = mysql_prep($_SESSION["manager"]);
//echo $manager; ?> , Welcome to the Inventory section </h1>
        <?php
        if(isset ($_GET['deleteid']))
        {
          $id_to_delete = mysql_prep($_GET['deleteid']);
          $query = "DELETE FROM products WHERE id = $id_to_delete LIMIT 1";
          $sql = mysql_query($query);
          confirm_query($sql);
          $image_to_delete = ("images/$id_to_delete.jpg");
          if(file_exists($image_to_delete))
          {
            unlink($image_to_delete);
          }
        }
        ?>
        <?php
         if(isset ($_GET['confirm']))
        {
          $id_to_confirm = mysql_prep($_GET['confirm']);
```

```
            $sql = mysql_query("UPDATE products SET confirmed = 0  WHERE id =
{$id_to_confirm}");
              }
            ?>
            <?php
            $vehicle_list = "";
            $sql = mysql_query("SELECT * FROM products");
            $vehicleCount = mysql_num_rows($sql);
            if ($vehicleCount > 0) {
              while ($row = mysql_fetch_array($sql)) {
                $id = $row['id'];
                $confirmed = $row['confirmed'];
                $vehicle_name = $row['vehicle_name'];
                $date = strtotime($row['date_added']);
                $date_added = date("M d,Y", $date);
                $price = $row['price'];
                if($confirmed == 0){
                $vehicle_list .= "Date added# {$date_added} VehicleID#-{$id}-
 vehicle_name#{$vehicle_name}-                 Price-kr{$price} <a
href='inventory_edit.php?pid=$id'>edit</a> &bull; <a href='#'>Confirmed</a>&bull;
<a href='inventory_list.php?deleteid=$id' onclick=\"return confirm('Are you sure you want to
delete this vehicle in inventory?')\">delete</a><br/><br/>";}
                else
                {
                 $vehicle_list  .=  "Date  added# {$date_added} VehicleID#-
{$id}- vehicle_name#{$vehicle_name}-                 Price-kr{$price} <a
href='inventory_edit.php?pid=$id'>edit</a>                                    &bull; <a
href='inventory_list.php?confirm=$id'>Not      Confirmed(Confirm      Now?)</a>      <a
href='inventory_list.php?deleteid=$id' onclick=\"return confirm('Are you sure you want to
delete this vehicle in inventory?')\">delete</a><br/><br/>";
                }
              }
            } else {
              $vehicle_list = "You have no vehicles listed in your inventory yet";
```

```
}
        <div align="right" style="margin-right: 24px;"> <a class="button" href="inventory_list.php#inventoryForm">+Add new vehicle</a> </div>
<div align="left" style="margin-right: 24px;" >
  <h2> Inventory list </h2>
<?php echo $vehicle_list . "<br/>"; ?>
</div>
<a name="inventoryForm"></a>
<h3>Add New Inventory Vehicle Form</h3>
<script type="text/javascript">
  function validateForm2()
  {
    var x=document.forms["form2"]["vehicle_name"].value;
    var y=document.forms["form2"]["price"].value;
    var a=document.forms["form2"]["category"].value;
    var b=document.forms["form2"]["subcatery"].value;
    var c=document.forms["form2"]["details"].value;
    if (x == null || y==null || x=="" || y=="" || a==null || b==null || c==null)
    {
      alert("No Field should be left empty , Please try again.");
      return false;
    }
  }
</script>
<form name="form2" id="form2" action="inventory_list.php" enctype="multipart/form-data" onsubmit="return validateForm2()" method="POST">
  <table width="90%" border="0" cellspacing="0" cellpadding="6">
    <tr>
      <td width="20%">Vehicle Name</td>
      <td width="80%"> <label>
          <input name="vehicle_name" type="text" size="64"/>
        </label>
      </td>
    </tr>
```

```
<tr>
  <td>Vehicle Price</td>
  <td><label>
      Kr <input name="price" type="text" size="12"/>
      </label></td>
</tr>
<tr>
  <td align="right">Category</td>
  <td><label><select name="category">
        <option value=""></option>
        <option value="TOYOTA">TOYOTA</option>
        <option value="BENZ">MECEDEZ BENZ</option>
        <option value="NISSAN">NISSAN</option>
        <option value="ISUZU">ISUZU</option>
        <option value="HONDA">HONDA</option>
        <option value="BMW">BMW</option>
        <option value="TATA">TATA</option>
        <option value="SUZUKI">SUZUKI</option>
        <option value="OPEL">OPEL</option>
        <option value="MAZDA">MAZDA</option>
        <option value="LAMBORGHINI">LAMBORGHINI</option>
        <option value="FORD">FORD</option>
        <option value="TANKER">TANKER</option>
        <option value="AUDI">AUDI</option>
        <option value="PAJERO">PAJERO</option>
        <option value="RANGE ROVER">RANGE ROVER</option>
        <option value="LAND ROVER">LAND ROVER</option>
        <option value="VOX WAGON">VOX WAGON</option>
        <option value="HITACHI">HITACHI</option>
        <option value="VOLVO">VOLVO</option>
        <option value="JEEP">JEEP</option>
        <option value="DAF">DAF</option>
        <option value="CAT">CAT</option>
```

```
                </select></label></td>
            </tr>
            <tr>
              <td>Sub_category</td>
              <td><label><select name="subcategory" >
                    <option value=""></option>
                    <option value="PICK_UP_TRUCK">PICK_UP_TRUCK</option>
                    <option value="OPEN_VAN">OPEN_VAN</option>
                    <option value="CLOSED_VAN">CLOSED_VAN</option>
                    <option value="BUS">BUS</option>
                    <option value="LIGHT_TRUCK">LIGHT_TRUCK</option>
                    <option value="HEAVY_TRUCK">HEAVY_TRUCK</option>
                    <option value="BIKE">BIKE</option>
                    <option value="BOAT">BOAT</option>
                    <option
value="HEAVY_DUTY_VEHILE">HEAVY_DUTY_VEHICLE</option>
                    <option value="CAR">CAR</option>
                  </select></label></td>
            </tr>
            <tr>
              <td>Vehicle Details</td>
              <td><label>          <textarea          name="details"          cols="64"
rows="5"></textarea></label></td>
            </tr>
            <tr>
              <td>Vehicle image</td>
              <td><label>          <input          type="file"          name="fileField"
id="fileField"/></label></td>
            </tr>
            <tr>
              <td> </td>
              <td><label> <input type="submit" name="button" value="Add Vehicle
now"/></label></td>
            </tr>
```

```
        </table>
      </form>
      <?php
      if(isset ($_POST['vehicle_name']))
      {
        $vehicle_name=mysql_prep($_POST['vehicle_name']);
        $price = mysql_prep($_POST['price']);
        $category = mysql_prep($_POST['category']);
        $subcategory = mysql_prep($_POST['subcategory']);
        $details = mysql_prep($_POST['details']);
        $sql = mysql_query("SELECT id FROM products WHERE
vehicle_name='{$vehicle_name}' LIMIT 1");
        $vehicleMatch = mysql_num_rows($sql);//count the output amount to determine
if a match exits
        if($vehicleMatch > 0)
        {
          echo "Duplicate name";
          exit();
        }
        $sql = mysql_query("INSERT INTO products
(vehicle_name,price,details,category,subcategory,date_added) VALUES
('{$vehicle_name}','{$price}','{$details}','{$category}','{$subcategory}',now())") or
die(mysql_error());
        $pid = mysql_insert_id();
        $newname= "$pid.jpg";
        move_uploaded_file($_FILES['fileField']['tmp_name'],"images/$newname");
        redirect_to("inventory_list.php");
      }
      ?>
      <br/>
      <a id="form" href="content.php">Click Here to Manage content</a><br>
       <?php
      //if(isset($_POST['submit1']))
      {
```

```
            //session_destroy();
          }
          // ?>
           </div>
      </td>
   </tr>
</table>
<?php //require("/includes/footer.php"); ?>
```

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