DOI: http://dx.doi.org/10.26483/ijarcs.v9i1.5529

Volume 9, No. 1, January-February 2018

ISSN No. 0976-5697

International Journal of Advanced Research in Computer Science

RESEARCH PAPER

Available Online at www.ijarcs.info

DEVELOPMENT AND IMPLEMENTATION OF E-COMMERCE SYSTEM

Y. M. Malgwi
Computer Science Department
ModibboAdama University of Technology, Yola, - Nigeria

L. Mathias
Computer Science Department
Adamawa State University, Mubi, - Nigeria.

L.J. Muhammad
Mathematics and Computer Science Department
Federal University, Kashere, Nigeria.

Abstract: Considerable numbers of people are limited to selling and buying their products in the brick-and-mortar market, otherwise known as physical market due to insufficient indigenous e-commerce systems, thereby facing the problems of distance to market, insecurity, traffic, choice and pricing. The purpose of this project is to create a platform that will bring sellers and buyers to interact and do business together. The research was carried out to develop a system that will provide the most convenient and shortest way to make an online trading, otherwise known as e-commerce. An investigation was carried out, and the system was analyzed, design using UML tools, then implemented using PHP, jQuery, MYSQL, CSS and HTML 5 on local host server (XAMPP).It was observed that with e-commerce system, people can post or make offer for items at any time.

Keywords: E-commerce, Electronic, Commerce ATM, POS and C2C.

1. INTRODUCTION

In this era of advanced technology, most things happen online. Long gone are those days, when people would have to go to physical market to sell or buy items. As the internet continues to gain popularity, the need of online trading, where people can either add new items for trading or received items as offered, becomes necessary.

E-commerce is a type of business where the Internet or the Web is used as a marketplace for transactions. In e-commerce, digitally enabled commercial transactions are commonly engaged between and among individuals/organizations around the world[1] .Digitally enabled transactions refer to transactions that occur over the Internet and the Web with the help of digital technologies. E-commerce is pertinent in the technologically advanced world of business. It has created electronic markets and provided opportunities for businesses to be done electronically. This is due to advancement in information and communication technology (ICT). Information and communication technology offers enormous opportunities such as storing, processing, retrieving, disseminating and sharing of information [2]. The continued existence of businesses in the 21st century is engendered by information and communication technology. The adoption of ICT would change the way businesses operate in this era of globalization by changing business structures, increasing competition, creating competitive advantage and changing2. business operations [3].

As the world has become a place where many distant parts can be reached within the fraction of a second using the3. Internet, similarly there is a growing demand for sustained research into the field of e-commerce. The technological explosion in the 21st century has given rise to people seeking more convenient and cost-effective method of doing business. Gone are the days when people only deal with their neighbors. The world has become a global village where people now do business without any personal contact; only by the use of the web [4].

The availability of goods and services on the internet will quench the stress of people difficulties of buying and selling goods, or product and services over the internet at any given period of time. As this project is concerned, it becomes simpler and easier for people to carry out their businesses without the barrier of time or distance, people can log on to the Internet at any time, be it day or night and sell or buy goods, product and services at a single click of a mouse.

Nigeria is a developing West African nation with a growing internet communication infrastructure. However, Information Technology literacy in the country is quite low. The country's citizens are limited to selling and buying their products within the country, thereby facing the problems of distance to the market, insecurity, choice and pricing.

These above mentioned challenges are summon sable through the realization of an integrated e-commerce system.

The aim of this research is to develop and implement an e-commerce system with social network where users can add items for trading at the comfort of their homes through the internet. In order to achieve this aim, the objectives of this project are as follows:

1. To review relevant systems developed for e-commerce.

To create an online e-commerce system through which merchants/Nigerians can sell and buy goods, products and services within the country and make profit.

An interactive social networking component will be implemented in the system with secured internet transactions to provide an accurate and efficient e-commerce for Customer to Customer (C2C).

The most significant part of this piece of work is to see the functions that e-commerce can play to business sector and to ease human life. E-commerce supports 24 hours 7 days' transactions. Customer can do transactions for the product or enquire about any product/services provided by the customer and the company at anytime, anywhere from any location. E-commerce reduces paper work and helps to deliver public services like health care, education and social services [5].

The rise of social networks is having a positive impact on e-commerce in the world. Social network can support e-commerce in the following ways promote brand awareness, help overcome custom reluctance to purchase, improve customer loyalty, provide marketing insights.

2.DEFINATIONS

In order to understand e-commerce, it is important to identify the different terms that are used and to assess their origin and usage. E-commerce is sharing business information, maintaining business relationships and conducting business transactions by means of telecommunications networks'. In its purest form, e-commerce has existed for over 40 years, originating from the electronic transmission of messages during the Berlin airlift in 1948. From this, Electronic Data Interchange (EDI) was the next stage of e-commerce development. [5].

E-commerce is buying and selling of products or services over electronic systems such as the Internet and other computer networks. However, the term may refer to more than just buying and selling products online. It also includes the entire online process of developing marketing, selling material, delivering servicing and paying for products and services. The amount of trade conducted electronically has grown extraordinarily with widespread Internet usage. The use of e-commerce is conducted in various places in the world currently [6].

Below are some of the definitions of e-commerce by other authors.

- E-commerce is the use of electronic communications and digital information processing technology in business transactions to create, transform, and redefine relationships for value creation between or among organizations and between organizations and individuals.
- E-commerce is usually associated with buying and selling over the Internet, or conducting any transaction involving the transfer of ownership or rights to use goods or services through a computer- mediated network [7].However in [5] highlighted some of the definitions of e-commerce often heard and found in publications and the media as follows:
- E-commerce is where business transactions take place via telecommunications networks, especially the internet.
- E-commerce describes the buying and selling of products, services, and information via computer networks including the internet.
- E-commerce is defined as the conduct of a financial transaction by electronic means.

3. RELATED WORK

In an attempt to review the related online websites developed for e-commerce, three (3) out of many sites in the world where different kinds of e-commerce businesses are carried out, were cited as follows:

1. Amazon.com:- started in 1994 as online store for books. But very later, they were expanded to all other products like DVD, CDs, software, videotapes, cloth, baby products, electronics, beauty products, gourmet food, groceries, health and personal-care items, industrial & scientific supplies, kitchen items, jewelry and watches, lawn and garden items, musical instruments, sporting goods, tools, and toys & games.

   In August 2007, amazon.com announced Amazon Fresh, a grocery service offering perishable and nonperishable foods. Customers can have orders delivered to their homes at dawn or during a specified daytime window. In 2012, amazon.com announced the launch of Vine.com for buying green products including groceries, household items and apparel. It is part of Quidsi, the company that amazon bought in 2010 that also runs the sites Diapers.com (baby), Wag.com (pets) and YoYo.com (toys). Amazon.com also owns other e-commerce sites like Shopbop.com, Woot.com and Zappos.com. amazon.com's Subscribe & Save program offers a discounted price on an item (usually sold in bulk), free shipping on every subscribe& save shipment and automatic shipment of the item every one, two, three or six months. In 2013, Amazon launched its site in India, amazon.in. It has started with electronic goods and plans to expand into fashion apparel, beauty, home essentials, and healthcare categories by the end of 2013. Amazon.com operating income, net income, total assets, total equity and revenue are US$ 745.0 million US$ 274.0 million, US$ 40.1 billion, US$ 9.7 billion and US$ 74.4 billion in 2013 respectively and employment capacity is 132,600 employees as at June 2014[8].
2. BestBuy.com:- is an American multinationalconsumer electronics corporation headquartered in Richfield, Minnesota. It operates in the United States, Puerto Rico, Mexico, Canada, and China. The company was founded by Richard M. Schulze and Gary Smoliak in 1966 as an audio specialty store. BestBuy.com sells merchandise, including software, video games, music, DVDs, mobile phones, digital cameras, car stereos and video cameras, in addition to home appliances (washing machines, dryers, and refrigerators. Best Buy was named "Company of the Year" by Forbes magazine in 2004, "Specialty Retailer of the Decade" by Discount Store News in 2001, ranked in the Top 10 of "America's Most Generous Corporations" by Forbes in 2005 and made Fortune magazine's List of Most Admired Companies in 2006.By the year 2013, Best Buy sale was worth approximately $775 million, operated 1,056 Best Buy and 409 Best Buy Mobile stand-alone stores in the US. Best Buy also operated 140 Future Shop, 72 Best Buy and 49 Best Buy Mobile stand-alone stores in Canada; 211 Five Star stores in China and 14 Best Buy stores in Mexico. Best Buy exited the European market [9].

4. RESEARCH METHODOLOGY

Questionnaire was administered in order to enquire from the general populace on their view about e-commerce. In total, 200 questionnaires were administered. Out of these, 100

were administered to students of ModibboAdama University of Technology (MAUTECH)Yola-Nigeria and the remaining 100 was administered in Jimeta-Yola Modern Market.

The questionnaire was focused on determining the followings:

1. People's expectation regarding e-commerce
2. People's expectation regarding traditional trade

Whether people do prefer e-commerce or traditional trade. The method adopted in analysing and designing of the software tools is of 3-tiers architecture comprising the client tier, the application server tier and the database tier.

The client tier is responsible for the presentation of data, receiving user elements and controlling the user interface; the application server tier serves as the middleware that is responsible for processing the user's requests, while the database tier is responsible for data storage. The 3-tier system architecture is shown below.

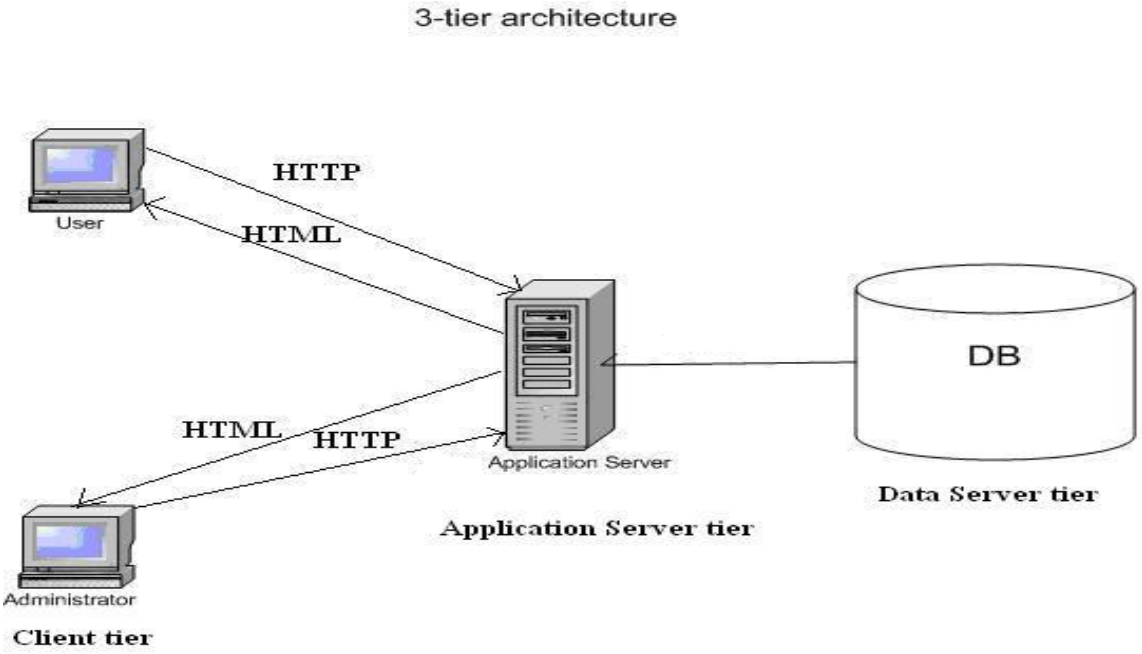

Figure 4.1: Three-Tier Architecture

4.1 Analysis and Requirement

In this phase,we studied how the current system operates with the aim of discovering the major setbacks, incapability and limitations of the system; consequently given recommendations about the functions of the new proposed system.

4.2 Non Functional Requirements

We use a these requirements tospecify criteria that can be used to judge the operation of a system rather than specific behaviors. Non-functional requirement are often called qualities of a system. The following are the non-functional requirements of the e-commerce system:

Usability: The E-commerce System is very easy to use by users. Any user just needs to register as a member then he/she can use the system to sell or buy item(s). And the system shall support the use of multiple users at a time.

i. **User Friendly:** The System can provide clean and attracting design for the users to let them easily navigate the pages. It can provide clearly guidelines for users like prompt out message box or giving instruction.

ii. **Security and Privacy:** Security of a system is very important for either individual or an organization. The system cannot disclose the members' personal information to others. The System ensures the safety of the system and prevents information from being exposed to others, so as not to reduce the confidence of the customers. All the transactions will be processed in an environment that is safe and secured, and all validation checks will be included during the processes.

iii. **Maintainability:** The system can be maintained with less effort as additional functionalities can added with ease. And we make sure the system can be easy to make changes so as to have high performance and efficiency.

4.2.1 Functional Requirement

The functional requirement is a requirement that defines specific behavior or function. The functional requirements define what a system is supposed to do. Algorithm technique will be used to define the function of e-commerce.

4.2.2Algorithm Technique: Pseudo Codes

A Precise English statement/expression will beuse as the algorithm to run the program as indicated below:

Start

1. INPUT URL to view home page (active items)
2. Login ()
3. IF (login () == user) THEN

User ADD item ()
User BUY item ()
User SEND message ()

4. ELSE IF (login ()== moderator) THEN

Moderators APPROVE pending items ()
Moderators DISAPPROVE pending items ()
Moderator DELETE user ()
Moderator DELETE items ()
Moderator ADD Admin ()
User ADD item ()

User BUY item ()
User SEND message ()
5. END IF

4.3 System Design

Here, we will discuss the design of the system using UML diagrams (Use cases, *activity* diagrams, state diagrams and sequence diagrams). We will design input and output and also a database.

4.3.1 Use case Diagrams

Use case is the interaction between external actors and the system to attain particular goals. They are used in order to: design system from user's perspective, communicate system behavior in user's term and enumerate all externally visible behavior. In this project we have two use case user and the moderator.

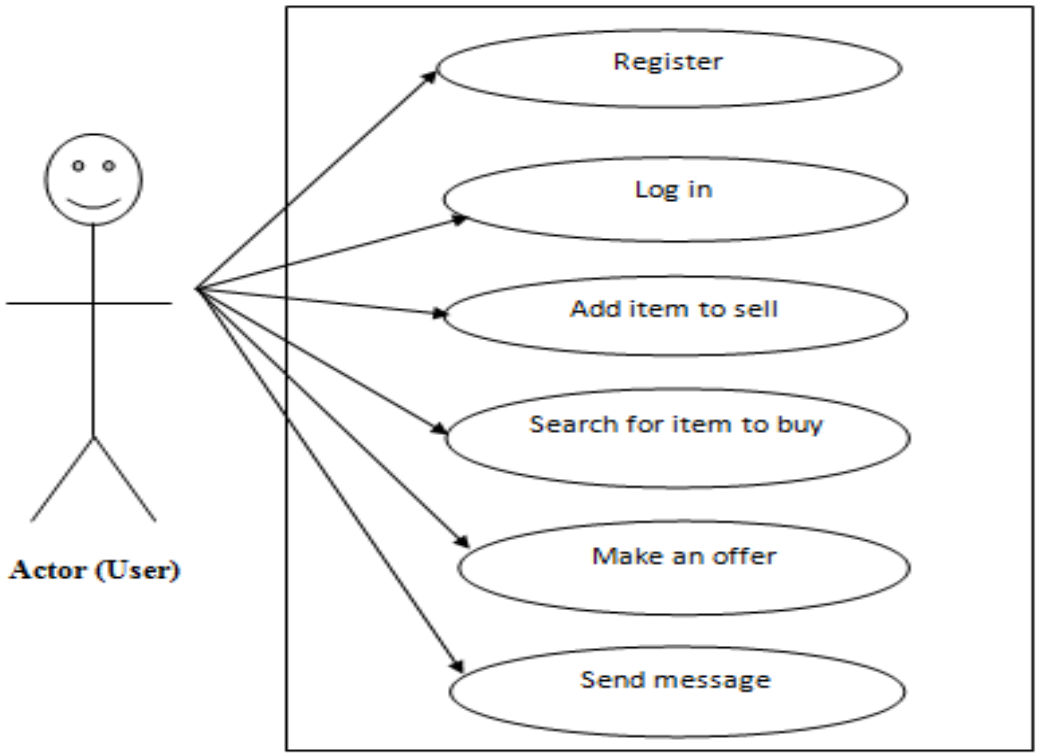

Figure 4.2 User Use Case

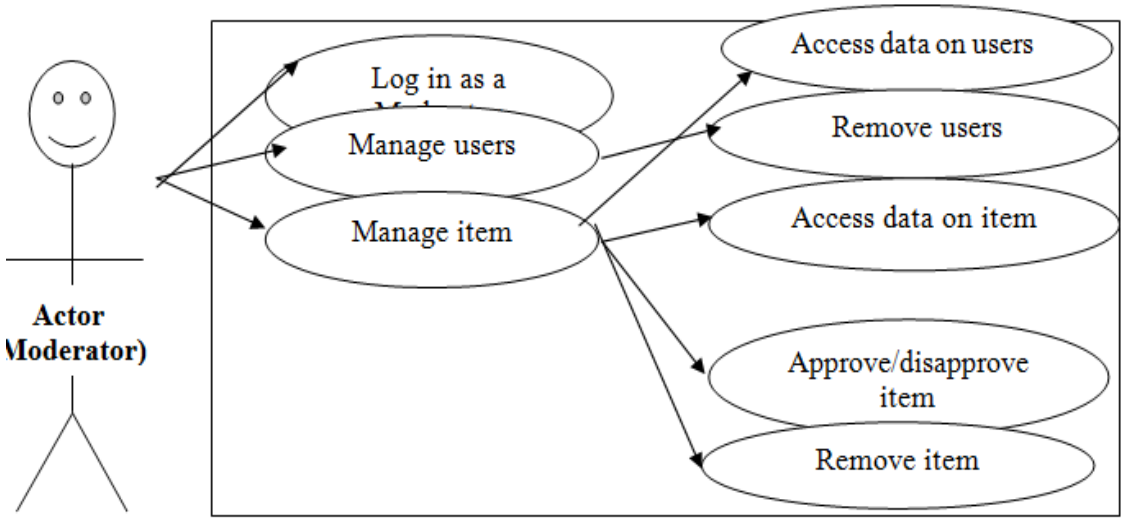

Figure 4.3: Moderator Use Case Diagram

In the Figures 4.2 and 4.3 above, there are two actors for the system: a normal user and a moderator;
A normal user can register to the system, browse the available items, add item for trading and make offer to buy peoples' items. The administrator, on the other hand, can manage users, manage admin and add items.

4.3.2. Activity diagrams for add and buy item(s)

Activity diagram is a special form of state diagram. Transitions in the diagram are mainly triggered by the completion of action by the source state.

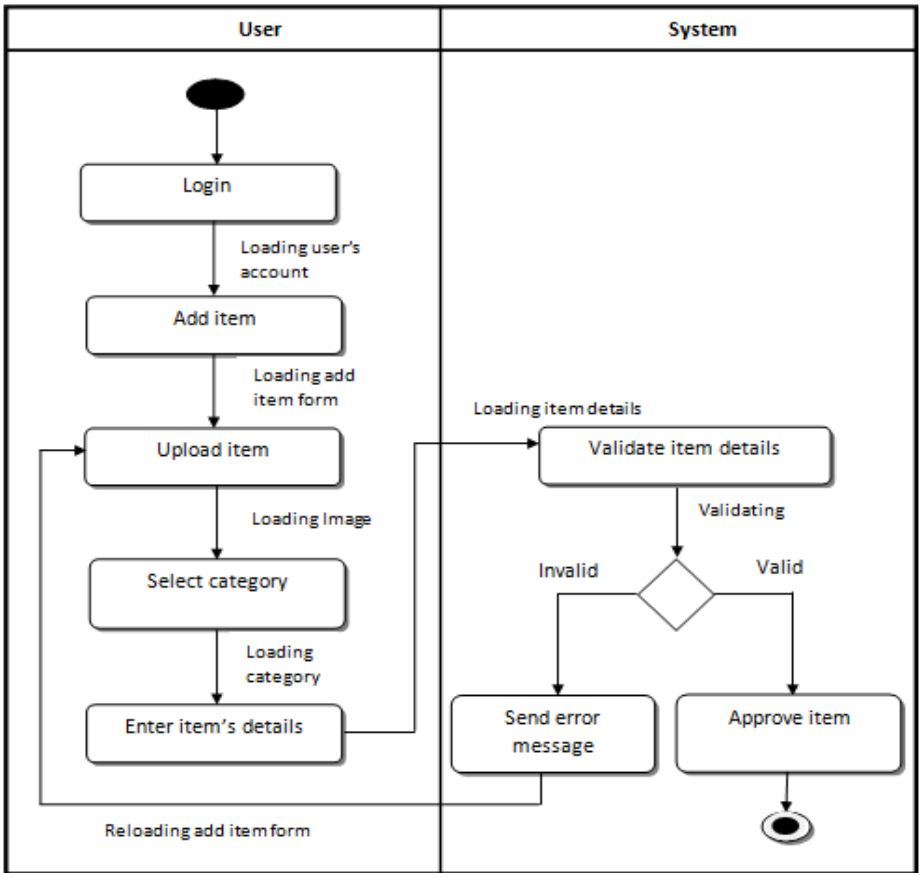

Figure 4.4: Activity diagram for add item

The diagram above is an activity diagram for add item. Users can click the add item link then system redirect them to the add item form. Users can then add item and enter the item's details after that the system will verify the format and size of the images, if correct the moderator will moderate and either approve or disapprove the item added, if not, the item will remain pending, in the owner's account.

4.3.3 Activity Diagram for Buy Item

The diagram below shows an activity diagram for add item.

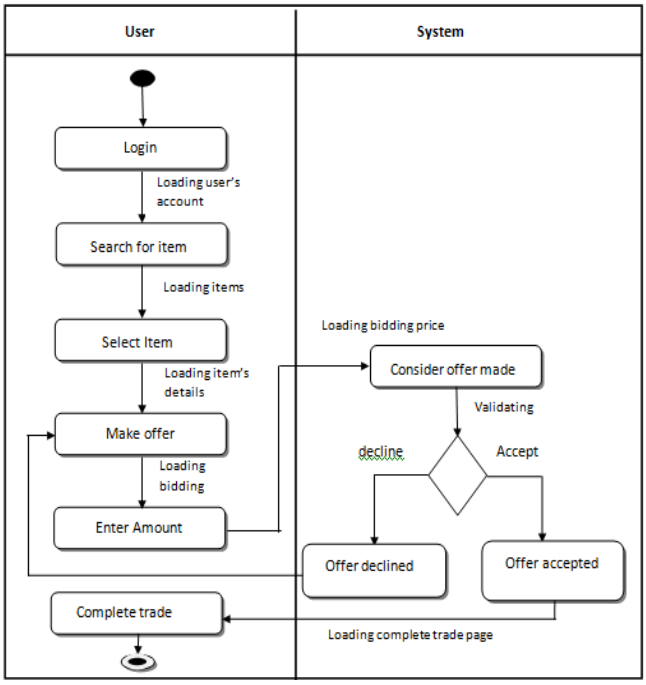

Figure 4.5: Activity Diagram for Buy Item

The diagram above is an activity diagram for buy Item. A member can search and select an item that he/she wants to buy and make an offer (that is pricing the item). Then the owner of the item can either accept or decline the offer made.

4.3.4Sequence Diagram for add item

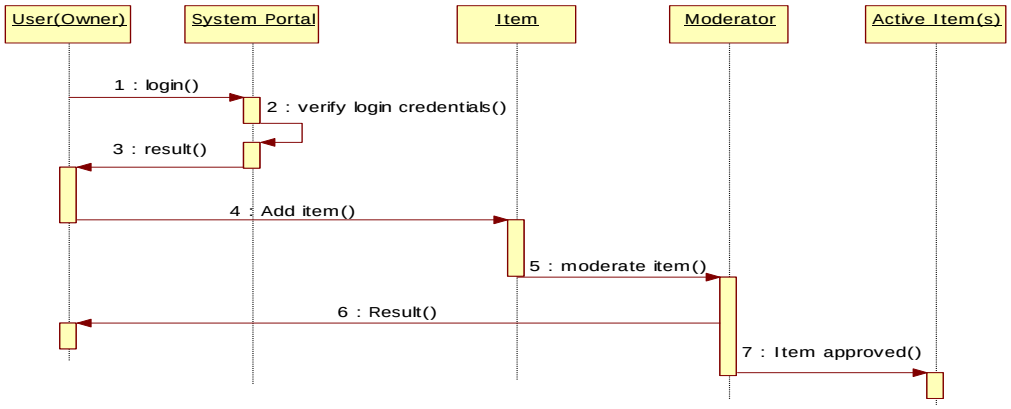

Figure 4.6: Sequence Diagram for Add Item

The diagram above is a sequence diagram for add item. Users can add new item details which include photo, title, description, price and then click submit. The moderator will verify the details, if the moderator is satisfied he then approves the item and the item will be (active) available for trading.

4.3.5 Sequence Diagram for Buy Item

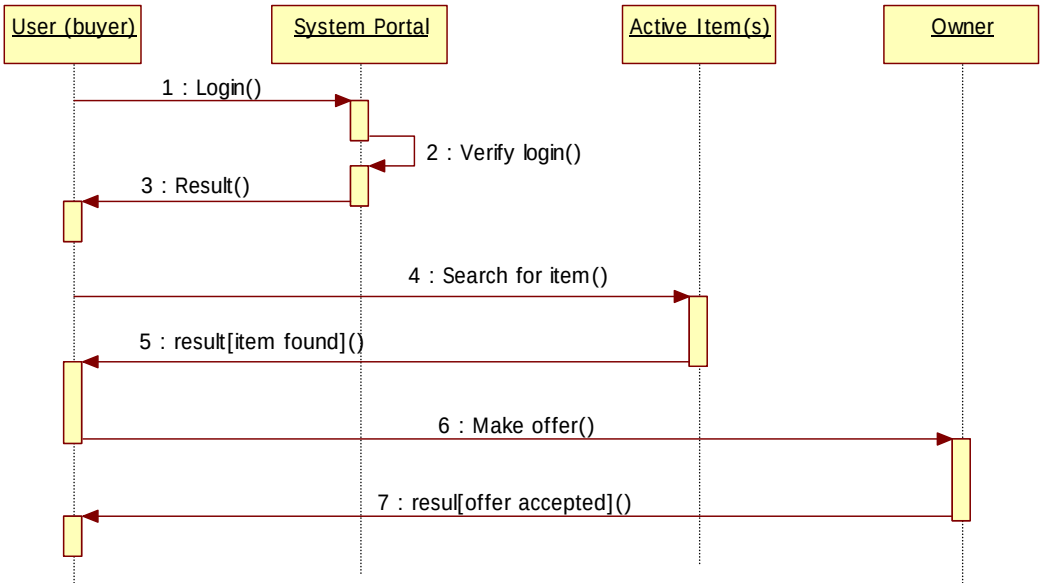

Figure 4.7Sequence Diagram for Buy Item

4.4.Input Design/Specification

The user interface is designed to accept information through a form. A new member must first register by supplying his/her username, email and password and the rest of the information such as full name, address, state, phone number etc can be filled by clicking shipping information link when he logs in. Upon entering all the required information and clicking the SUBMIT button the information is sent to the database.

4.5Output Designs/Specification

The specified output of the current system is the membership acceptance message. When a member provides all the required information, member by filling the form the information goes to the database on clicking the submit button. After the member records have been verified, message will be sent to member's email.

4.6 Database Design

The database for this system has been designed with MYSQL. This is due to its flexibility, reliability, ease of use, popularity and cost efficient. The database includes the following tables:

1. Users table;
2. Shipping info
3. Items available;
4. Items traded
5. Messages
6. Offers accepted
7. Offers declined
8. Offer open
9. Product table
10. Feedback table;

4.7 System Development Tools

The tools chosen for developing this system are: HTML 5, PHP, MYSQL, jQuery and XAMPP. They are chosen based on their popularity and ease of use.

i. **HTML 5:** Is a reversion of the Hypertext Markup Language (HTML), the standard programming for describing the contents and appearance of web pages. HTML is the most common language used in creating

web pages.A markup language is a set of markup tags and the tags describe document content.

ii. **PHP**: is an acronym for "PHP Hypertext Pre-processor"; originally called “Personal Home Page Tools. PHP is a server-side scripting language, and is a powerful tool for making dynamic and interactive Web pages quickly. PHP is a widely-used, platform independent, open source (Anyone may view, modify and redistribute source code and supported freely by community), free, and efficient alternative to competitors such as Microsoft's ASP. PHP scripts are executed on the server. .

iii. **jQuery**: jQueryis used to create an amazing effects and animations for interactive web applications.jQuery is a lightweight JavaScript library that emphasizes interaction between JavaScript and HTML. An advantage over just JavaScript ismuch easier to use and Eliminates cross-browser problems.

iv. **MYSQL**: MySQL is a Leading open source RDBMS, Ease of use -No frills, Fast, Robust, Security, Multiple OS support, Free (much cheaper than Oracle!), Technical support, Easy to use Shell for creating tables, querying tables, Support large database– up to 50 million rows, file size limit up to 8 Million TB etc.

5. IMPLEMENTATION

Since the objective of this project is to develop and implement an e-commerce system with social network flavor where users can buy or add items for trading at the comfort of their homes without barriers of stress, place and geographical location through the internet. Generally, the implementation of a system refers to the transformation of the system specification designed from the originally obtained requirement into program codes.

The system was implemented using PHP, jQuery, MYSQL, CSS and HTML5.The system is designed and programmed to validate users’ input. The user type in the Universal Resource Locator (URL) of the system in the address bar of the browser, the Web Server is contacted to get the requested information in the local host server. The sole task of a Web Server is to accept incoming http requests and to return the requested resource in an http response. If the requested file has the .php extension, PHP will route the request to be handle by Xampp Server.

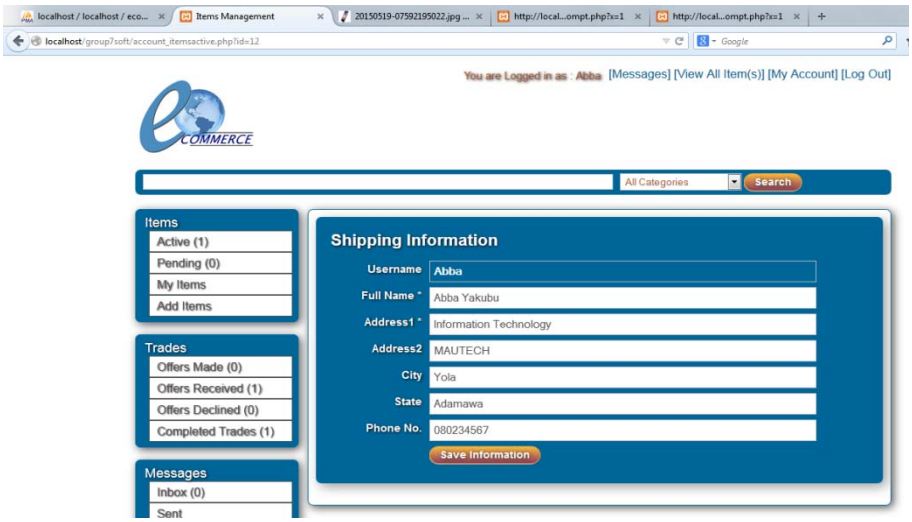

Figure 4.8Shipping information form

6. SUMMARY

With online trading people can sell or buy items anytime, anywhere and by anyone. Users can visit the site, search for items, make offers and add items for trading. In electronic commerce, there is no need to physical store setups or any crowds to deal with. Users can buy or sell from their houses comfortably without the stress of going to physical market, traffic, accident and insecurity. The importance of e-commerce system cannot be over emphasized; therefore, it should be encouraged.

This e-commerce system was developed and implemented using the following technologies: PHP, jQuery, Mysql, CSS and HTML 5 to fully meet the objectives of the system for which it was been developed.

7. CONCLUSIONS

Online trading offers lots of benefits to sellers and buyers. There are no geographical constraints in online trading. Sellers and buyers who have Internet access can participate from any part of the world. This reduces the stress of going to brick and mortar stores to buy or sell item. In online trading, items can be post as well as offers can be placed at any time. This gives purchasers option to search, decide, and then make offer for the item. Because of the large number of buyers, reduced selling costs, and ease of access, the number of sellers also increases with the passage of time. Hence, the process repeat in circle, and as the circle grows, the system becomes larger and more valuable for all sellers and buyers.

However, e-commerce is associated with some problems such as internet fraud, lack of power supply, lack of good internet connectivity and delay on product delivery.The e-commerce system we developed is different from other systems in the sense that we give room for posting and buying items by any user. Also users can bid for items.

8. RECOMMENDATIONS

The automation of online trading system which presents an efficient, fast, accurate, reliable and well secured database should be encouraged and be given maximum attention due to relevance regarding to information system. Considering the results obtained, the system can easily be adapted. Therefore, it is recommended that the government should encourage e-commerce system in the country and should try as much as possible with the little resources within its power to effect the process of increasing power supply and relevant equipment for accessing internet to the rural areas for grow and optimum efficiency of information technology in order to boost e-commerce in the country.

It is further recommended that more research should be done to improve on the system in the following areas:

i. Users or store owners should be able to add stores which will include different items under different categories instead of just adding a single item at a time.
ii. The few securities feature in the system are in the database where a usernames and passwords must be valid and unique before users can be registered, we used md5 to encrypt the password, and also we protected the database against sql injection. It is therefore recommended that more security measures should be added to the functionalities of the system.

REFERENCES

1] S. Shahrzad, M. Shadriari, and S. Gheiji, “E-commerce and its impacts on global trend and market” Vol.3, April, 2015. International Journal of Research Granthaalayah, pp.49-55

2] I. Apulu, and A. Latham, “Information and communication technology adoption:Challenges for Nigerian SMEs”, 4(2), 2009.TMC Academic Journal, pp. 64-80.

3] H. Ongori, “Role of Information Communication Technologies Adoption in SMEs: Evidence from Botswana”, Vol.1 (2), 2009, Research Journal of Information Technology, pp.79-85.

4] C. Peters, and C.D. Bodkin, “An exploratory investigation of problematic online auction behaviors: Experiences of eBay users” Vol. 14(1), 2007, Journal of Retailing & Consumer Services, pp. 1-16.

5] A. Obayi, (2013) “CIT415 Introduction to E-Commerce”. National Open University of Nigeria. ISBN: 978-058-184-7, First Printed 2013.

6] M.A. Remond, “Database” Encarta ® 2008.

7] T. M. McFadyen, “E-commerce best practices” Business Technology Society (3rd Edition). 2(3), 2008, , Prentice Hall, pp.234-238.

8] Y. A. Nanehkaran “An Introduction To Electronic Commerce” International Journal of Scientific & Technology Research Volume 2, Issue 4, April 2013.

9] C. R. Ikemelu, “e-commerce in Nigeria: Concept and Effective Implementation” Volume 4 No. 1, Journal of Research and Development, December, 2012.