A WEB BASED E-COMMERCE SYSTEM FOR
EL-GENEINA COMMERCIAL FARM

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LIST OF ACRONYMS

DBMS-Database Management System

HTML- HyperText Markup Language

PHP- Hypertext Pre-Processor language

MYSQL- My Structured Query language

CPU-Central Processing Unit

RAM-Random Access Memory

UML-Unified Modeling Language

PC-Personal Computer

GB- Gigabyte

UPS-Uninterrupted Power Supply

ABSTRACT

E-commerce is a new way of doing business. Companies that wish to maintain competitive advantage within markets must integrate e-commerce into their daily business operations.

E-commerce brings many benefits to companies. Among these is the ability of e-commerce to increase businesses productivity. One way in which e-commerce increases productivity is by linking together people with a common interest or expertise to discuss and find solutions to problems they face in their particular field of expertise. These groups of people are known as communities of practice.

Farming communities are also communities of practice and e-commerce can be a powerful tool in improving their productivity. Unfortunately, e-commerce is not fully integrated into farming businesses.

The methodology used in the research project is a survey research. A qualitative approach was used to gather the necessary data for system development. A literature study was done on the three topics involved in the research project: marketing, sales, productivity, e-commerce and community of practice/clients.

CHAPTER ONE

1.1 Background of the Study

E-commerce is a new way of doing business. Companies that wish to maintain a competitive advantage within markets must integrate e-commerce into their daily business operations. Ecommerce brings many benefits to companies. Among these is the ability to increase business productivity through increased sales.

El-Geneina commercial farm was established by Mr. Benison Frank Bariyo in 2008 and is currently focusing on animal husbandry dealing mainly in diary, fish, and poultry products. Over the years the farm has been a success because of Mr. Bariyo's financial input, diligence, dedication, teamwork and discipline.

The production of high quality farm products has quickly attracted small numbers of customers from far and nearby villages. However the farm still faces challenges in finding better markets to sell its products.

The size of the market can greatly be increased through advertisement which plays a huge role in promoting and publicizing of merchandise leading to increased sales.

The remote location of the farm has made access to urban communities a challenge and this has made it so difficult for the farm to compete favorably with other farms within and outside Uganda.

This research therefore aims at developing a global platform onto which El-Geneina commercial farm will publicize and trade its products.

1.2 Problem Statement

El-Geneina commercial farm like any fast paced expanding business in the World faces challenges in marketing and selling of its products to potential clients.

With the current system, the farm's marketing manager who is in charge of all issues pertaining publicizing and finding prospective buyers for the farm products relies on incompetent middlemen, the use of newspapers to advertise farm products upon which buyers contact her by mobile phone for more details. Aside from the small number of customers coming from nearby village communities, it is becoming a challenge to generate sufficient profits through sales and reports for planning, budgeting and decision making for the farm. This has negatively affected farm operations and overall performance of the farm. This has also required the sole proprietor of the farm to stop dealing with the inept middlemen.

On the side of the customers, those buyers who wish to purchase a product need to locate the farm through phone contact, place an order and buy the product directly from the farm premises sometimes middlemen are involved in the sales process though they tend to be incompetent, untrustworthy and insufficient when intermediating between cooperatives and customers for example a scenario were middlemen lied to the farm staff about how the milk got spoilt before they made it to the dairy cooperative.

The general management of the farm is generally slowed down since most marketing and sales related activities are core in the running of the farm such as providing reinvestment capital, this therefore creates a decrease in the trade of farm products attributed to the low number of customers. With these drawbacks identified, it is noted the current system is the sole cause of

the inadequacies in the marketing and sale of farm products and hence necessitating an ecommerce application for the farm.

1.3 Main objective

To develop an e-commerce web based system for El-Geneina commercial farm.

1.4 Other Objectives

a) To identify the benefits of ecommerce to the agricultural farm.

b) To explore the various activities associated with the sale and marketing of products El-Geneina commercial farm.

c) To explore and examine the various techniques and methodologies used in the development of ecommerce applications.

d) To find out the challenges faced by El- Geneina commercial farm in marketing products to potential clients.

e) To come up with requirements for the new ecommerce application basing on the weaknesses of the current system.

f) To test and validate the developed ecommerce application.

1.5 Research questions

a) What are the benefits of having an ecommerce application at a commercial farm?

b) Which techniques, methodologies and guidelines could be used in the development of ecommerce applications?

c) How is marketing and sales done at El-Geneina commercial farm and which challenges are associated with the current marketing and sales system?

d) What are the requirements for the new ecommerce application?

e) Which methods and techniques could be used in testing and validating of ecommerce applications?

1.6 Scope of the study

In this study an e-commerce web based system will be developed for El-Geneina commercial farm which is located in Buko village, Wakiso district 6km from Kasanje town. It is accessible through three routes via Entebbe by ferry from Nakiwogo landing site to Buwaya 9km, Mpigi town 11km and Nateete 28km.

In this study the benefits of ecommerce to agricultural farms will be documented, the various activities associated with the sale and marketing of products for El-Geneina commercial farm will be examined, the various techniques and methodologies used in the development of ecommerce applications will be explored, the challenges faced by El- Geneina commercial farm in delivering products to clients will be identified ,requirements for the new ecommerce application basing on the weaknesses of the current system will be formulated, testing and validating the developed ecommerce application will be done.

1.7 Significance of the study

a) The proposed marketing and sales system will advertise and promote El-Geneina farm products and services at both national and international level resulting into higher profit margins through increased sales from a large customer base.

b) The ecommerce application will help sell more products through the help of payment programs/methods such as PayPal,

mobile money and the web as the internet is used by various people the world over.

c) The new system will improve communications between farm administration through connecting to current and potential customers via email or the internet this strengthens customer relationships.

d) The ecommerce system will save time, labor and money. Given the ecommerce application is cost efficient as it eliminates middle men, public relation officers. The system is also time efficient as it includes payment methods such as cash on delivery, shipping and operates 24 hours a day.

e) The proposed system will create better and quicker customer service since the ecommerce application has a provision for customers to contact the farm administration through posting complaints, queries, inquiries and feedback.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter gives an account of the fundamental concepts and terminologies for the study. The aim of the literature review is to provide a deeper understanding of the system concepts based on the previous projects attempted by various groups and then find out their relevance to the developed system.

2.2 Benefits of ecommerce to agriculture

According to Martin Gaedke and Klaus Turowski (2000), Integrating Web-based E-Commerce Applications with Business Application Systems, the World Wide Web has become an environment for distributed applications of all kinds. The originally intended use of the Web as distributed system for knowledge-interchange seems to disappear compared to the increasing number of Electronic Commerce Web applications. Organizations offer products and services in the Web, and use the Web as a means to integrate their (heterogeneous) business application systems. Offering Web-based products requires combining services of different application systems, which were built on the coarse-grained Web implementation model. Reusing the respective fine-grained services and application systems respectively integrating these cross-platform application systems increases quality and reduces costs of the new product. However, communication between (legacy) business application systems has to be ensured on an abstract level to realize this scenario. The Web as a global point of sale seems to be very

promising but obviously suffers from its heritage - the coarse-grained implementation model. We introduce a generic integration layer that uses an object-oriented approach as well as the Web Composition Markup Language to facilitate the reuse of code and de- sign, and show how inter-application communication can be provided by means of an additional basic integration layer.

The first decade of the new millennium has witnessed a profound change and dramatic increase in the way business and trade takes place electronically. Each day more users in least- developed and developing countries are accessing the internet through terminals. A growing percentage of users are now also accessing the web through mobile technology. Predictions call for the internet and especially the use of mobile applications to expand exponentially in the decades ahead. There is enormous potential for using information and communication technologies (ICTs) to contribute to the social and economic progress of developing countries worldwide. A key role in this regard is played by small and medium-sized businesses.

According to World Trade Organization (2013), electronic commerce, development and small medium-sized enterprises, the first decade of the new millennium has witnessed a profound change and dramatic increase in the way business and trade takes place electronically. Each day more users in least- developed and developing countries are accessing the internet through terminals. A growing percentage of users are now also accessing the web through mobile technology. Predictions call for the internet and especially the use of mobile applications to expand exponentially in the decades ahead. There is enormous potential for using information and communication technologies (ICTs) to contribute to the social and economic progress of developing

countries worldwide. A key role in this regard is played by small and medium-sized businesses.

According to UNCTAD's recent Information Economy Report (2010), it shows how ICT use by micro- and small and medium-sized enterprises (SMEs) has improved not only business performance but has helped improve livelihoods in some of the world's poorest regions and communities. Many entrepreneurs in developing countries now have a real possibility to benefit from ICTs in their business activities. In many cases, this has resulted in gains in enhanced productivity. By improving communication channels, both domestically and internationally, the application of relevant ICTs can greatly enhance the competitiveness of business. Government efforts to further improve, upgrade and expand ICT use by the private sector should, therefore, be reinforced. UNCTAD's study finds that governments and their various partners, including the private sector, are far from taking full advantage of the opportunities that are emerging in the new ICT landscape. This is evident in part from the relatively limited attention that has been given to ICTs in strategies aimed at promoting private sector development (PSD).

The rapid technological advances in ICT and the steady increase in the number of users are changing the global economic landscape. From 1990 to early 2000, the estimated number of internet users grew more than tenfold to roughly 300 million. This had a direct effect on the way in which people communicate and do business. Today, however, these 300 million users represent barely two-thirds of the size of subscribers active on "Facebook" alone. Today, there are more than five times as many internet users as there were in 2000. Growing from two billion

at the start of this decade, there were an estimated 2.25 billion users in 2011. Chart 1 describes the increase in internet users over the past ten years.

Seitz, Nelson and Halcrow (2002:417) claim that the "effect of new technology on agricultural development and growth depends on how effective they are in increasing productivity and how profitable they are for farmers to use." With this in mind, the aim of this study is to determine the role e-commerce can play to improve productivity of El-Geneina commercial farm.

2.3 Categories of e-commerce transactions in relation to business activities.

There are numerous types of commercial transactions that occur on line, from buying goods such as farming products, books or clothes to purchasing services such as airline tickets or making hotel or car rental reservations. Since the main focus of this paper is on how SMEs use the internet, the discussion here will concern only a few services which relate closely to SME economic activity. These include: electronic communications in the area of Business-to-Business (B2B), Business-to-Consumer (B2C), Business-to-Government (B2G) and mobile e-commerce.

2.3.1 Business-to-Business (B2B)

B2B is e-commerce between businesses such as between a manufacturer and a wholesaler, or between a wholesaler and a retailer. This is the exchange of products, services, or information between businesses rather than between businesses and consumers. Global B2B transactions comprise 90% of all e-commerce. According to research conducted by the US-based International Data Corporation (IDC), it is estimated that global B2B e-commerce, especially among wholesalers and distributors, amounted to US$12.4 trillion at the end of 2012.

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If the expansion in e-commerce continues at this rapid pace in developed markets as is expected, then B2B and B2C e-commerce transactions will account for about 5% of all inter-company transactions and retail sales by 2017.

2.3.2 Business-to-Consumer (B2C)

Although B2C e-commerce receives a lot of attention, B2B transactions far exceed B2C transactions. According to the IDC, global B2C transactions are estimated to reach US$1.2 trillion at the end of 2012, ten times less than B2B transactions. B2C e-commerce entails businesses selling to the general public typically through catalogues that make use of shopping cart software. Although B2C e-commerce only accounts for only a small share of e-commerce as a whole, it continues to grow. B2C e-commerce is highest in Norway, Denmark, Sweden, the United Kingdom and the US and covers mainly computer-related products, clothing and digitized products. Despite the low value of its transactions, B2C e-commerce has received the most attention, partly because issues such as consumer trust and data protection have received considerable concern from policy makers.

2.3.3 Business-to-Government (B2G)

Business-to-Government or B2G commerce is generally defined as ecommerce between companies and the public sector. It refers to the use of the internet for public procurement, licensing procedures, and other government-related operations. In B2G e-commerce, the public sector generally assumes the pilot role in establishing e-commerce in an effort to make its procurement system more efficient. The size of the B2G e-commerce market as a component of total e-commerce is still rather insignificant as government e-procurement systems still remain comparatively undeveloped.

By the nature of transactions, e-commerce is also classified as;
Consumer-to-business(C2B), consumer-to-consumer (C2C), non-business e-commerce and Intra-business e-commerce according to Turban et al., 2000:11; Saloner& Spence, 2002:8. B2B includes transactions between organizations. B2C encompasses all retailing transactions with individual shoppers. C2B includes individuals' transactions with organizations whether by selling either products or services according to Turban et al., 2000:13.C2C e-commerce is where one consumer does business or interacts with other consumers on-line according to Bothma, 2000:40. Non-business e-commerce refers to non-business institutions that are using various types of e-commerce to reduce their expenses conferring to Turban et al., 2000:13. Intra-business e-commerce includes all internal activities normally performed by intranets that involve exchange of goods, services or information according to Kalakota&Whinston., 1996.
E-commerce is an interdisciplinary field. According to Turban et al. (2000:13), the major disciplines of e-commerce are marketing, computer sciences, consumer behavior and psychology. Finance, economics, management information systems, accounting and auditing, management, business law and ethics are also provided by Turban et al. (2000:13) as major disciplines of EC.

2.4 Development tools used in the development of ecommerce applications.

2.4.1 Browsers
Browsers are application software specifically designed to run web application pages. For this project Google chrome, Mozilla Firefox and Internet Explorer are the browsers that will be used.

2.4.2 Server Software

Since PHP is server side software, server software will be needed to see the output as the system is being designed. WAMP 2.0a apache server is the particular software that will be used for this project, the main reason being that it is free and easily accessible. It is also easy to use.

2.4.3 Text Editor

This is software used to write and edit code. For this project it will be used to write and edit PHP code as well as HTML. Notepad++ will be used during the course of this project. Other text editors include Note pad and Kate for Linux systems.

2.4.4 Graphics design Tools

Adobe CS6 will be used to design the images, text, logo that will be used in creating a suitable interface for the system. Adobe CS6 contains Adobe Illustrator, Adobe Photoshop, Adobe In-Design and Dream weaver.

2.4.5 Operating Systems

Windows 7 is operating system that will be used to develop this software however it will be able to run on windows and Linux environment.

2.4.6 Hyper Text Markup Language (HTML)

HTML is a simple language use to describe the structure of text based information. It is used to create web pages.

2.4.7 Hyper Text Pre-processor (PHP)

PHP can be defined as a Hypertext Pre-processor, and it is a server side scripting language. According to J.Meloni., 2004 when a browser accesses a URL, it is making a request to a web server. When a PHP page is requested, a web server wakes up the parsing engine and then the parsing engine runs through the PHP code found in home.php, and returns the resulting output. This

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output is passed back to the web server as part of the HTML code in the document, which in turn is passed on to your browser, which displays it to you.

2.4.8 The Database Management System

By definition a database is a single collection of structured data store with the minimum of duplication of data items, to provide a consistent and controlled pool of data.

A Database management system is software that enables users to define, create, maintain and control accesses to the database. Examples include MySQL, Oracle, Microsoft Access, Informix and Sybase. It allows users to define the database, usually through a data definition language.

The DDL is used by the DBMS to physically establish the record types, field and structural relationships. Additionally the DDL defines views of the database. Views restrict which portion of the database that may be used or accessed by different users and programs.

According to J.L. Whitten., 2008 the database management system also provides a data manipulation language is used to create, read, update and delete records in the database and to navigate between different records and types of records.

2.4.9 User Involvement

Customers or suppliers of the systems should be involved at various stages of the e-commerce operations and be included in periodic reviews. Customer input is essential at the strategy development and business analysis stages and may involve the use of market research teams to obtain information on what customers require and barriers to using the Web. More detailed requirements can be obtained in Group Requirements Sessions,

telephone interviews or questionnaires. Customers can be involved in evaluating design issues through the use of prototype Web systems and they should be included in testing and evaluation of the Web site. Feedback can be obtained from users once the Web site is 'live'. As the ecommerce strategy is likely to evolve through time focus groups can be used to provide input through reviewing the current system and making recommendations

2.4.10 Entity-Relationship Diagram

ER diagrams consist of entities, attributes and relationships. An entity is something that can be identified in the users' work environment, and is pictured in boxes while relationships are shown in diamonds. The attributes for each entity classes are listed next to the entity, and the primary key is underlined. Entities of a given type are grouped in entity classes. An instance of an entity class is the representation of a particular entity. Entity instances have identifiers, which are attributes that are unique to that entity instances. These identifiers or primary keys are underlined on ER diagrams.

Entities have attributes or properties that describe the entity's characteristics and are associated with one another in relationships, which can include many entities. The number of relationships is the degree of the relationship.

The ER modeling is valuable because the process allows database designers to talk with users throughout the organization to ensure that all the entities and the relationships among them are represented. This process underscores the importance of all users in designing organizational databases.

2.5 Comparison of development methodologies

2.5.1 Protégé and OWL Ontologies

Protégé is an integrated software tool used by knowledge engineers and domain experts to develop knowledge-based systems (OWL, 2004). It provides a graphical and interactive ontology design and knowledge based development environment. Applications developed with Protégé can be used in problem solving and decision making in particular domain of interest. The knowledge acquisition tool allows problem domain knowledge to be entered. The resulting knowledge base can be used with a problem solving method to answer the questions. Protégé domain ontologies and problem solving methods can be reused. This can reduce the development and program maintenance time. Protégé uses component-based architecture. This enables system developers to add new functionality by creating suitable plug-ins. We use the Protégé-OWL plug-in for creating OWL ontologies.

2.5.2 Extensible StyleSheet Language Transformations (XSLT)

The Extensible Stylesheet Language Transformations (XSLT) (Clark, 1999) is a language used to transform and process XML documents. XSLT is a language used to develop transformation of programs. The transformation process requires an XML document, an XML parser and an XSLT style sheet. The XML document and the XSLT style sheet work as the input for the parser. During the transformation, XSLT transforms an XML source-tree into an XML result-tree. The parser reads the input XML document into memory, creating a tree depiction of the input XML document based on its hierarchical structure. This structure is then compared against the XSLT style sheet for any matching templates or chunks of code that should be applied to a specified section of the XML document.

2.6 Guidelines for developing ecommerce applications

According to Oracle 2011 these are some of the guidelines used in the development of ecommerce applications.

2.6.1 Scalability an e-commerce Website is only as good as its ability to handle its peak traffic. As your Website popularity increases, it needs to scale with minimal effort so you can avoid incurring disproportionate infrastructure management costs.

When evaluating e-commerce applications, look for businesses that are similar in size and profile to yours. Ask yourself the following questions:

a)   What is the peak number of visits (or open sessions) the site has supported?

b)   How many orders per day does the site take?

c)   How many page views per visit does each visitor make on average?

d)   How big or complex is the product catalog, and how many categories, products, and stock-keeping units (SKUs) are in it?

e)   What is the average response time of the home page and typical detail pages?

f)   How much hardware, software, and infrastructure are required to handle these volumes?

2.6.2 The Product Catalog has to effectively promote the items you most want to push, and simultaneously help your customers find the items they are looking for. But poorly constructed product catalogs can be rigid and uncompromising, especially if the product attributes you want to store don't naturally align

with the definitions set in your e-commerce application. To make an inflexible product catalog accommodate business realities, companies end up misusing data fields, filling irrelevant mandatory data fields with gibberish, duplicating data in multiple places, and inventing esoteric codes to artificially accommodate information the catalog doesn't natively support.

It can be difficult to predict what kind of products you will be selling in the future, and what other applications may need to populate your catalogs.

When evaluating e-commerce applications, understand how flexible the product catalog really is. Ask yourself the following questions:

a)   Can the catalog represent different types of products with different attributes, and what are the limitations?

b)   How many product categories and subcategories will the catalog support?

c)   Can a single product or subcategory exist in multiple categories without data duplication?

d)   Can different catalogs be defined for purposes other than a business-to-consumer (B2C) store?

e)   How easy is it to relate accessories and create bundles?

2.6.3 Business User Control

Will my application directly empower my merchandisers, marketing managers, and other business owners?

Many IT managers long for a world where there are no demanding business users. They long for the end of business requests that seemingly come from left field, or arrive urgently at the last

minute. They crave a way to offload day-to-day updates and edits back to the business. Many e-commerce applications require IT resources for daily maintenance, let alone major projects. As a result, your business users are totally disconnected from the daily workings of your e-commerce site. They send their change requests to IT, and IT has no choice but to react. IT has difficulty planning and prioritizing, as they deal with a continual barrage of urgent high-priority updates.

But business users like to take control, and every task that they can safely do themselves means one less task that IT will have to do.

When evaluating e-commerce applications, you must make sure that the application you choose will be technically and architecturally sound with proven capabilities. But also look for tools that your business managers can use themselves. Ask yourself the following questions:

a) Can product and category managers control their parts of the catalog?

b) Can merchandisers define promotions and discounts on products, orders, and shipments without IT involvement?

c) Can a targeted e-mail campaign be sent without IT extracting the customer lists?

d) Can executives pull their own standard reports, and even create their own new ones?

e) Can business users directly manage critical and constantly changing content such as the home page?

2.7 Conclusion

In this chapter the researcher revisited the research questions in chapter one and discussed how and to which extent these questions have been addressed along with the methodologies used to develop the ecommerce system and comparison with other development methodologies.

CHAPTER THREE

METHODOLOGY

3.1 Introduction

The chapter provides a general idea on how the research was conducted. It also constitutes a theoretical foundation of how research was carried out based on the development of the system through literature review, data collection, analysis, system design implementation and testing.

3.2 Literature Review

The literature review assisted the researcher to get a better understanding of the topic. The researcher was able to recognize the benefits of the ecommerce applications, business transactions related to ecommerce and necessary methodologies relevant in the designing and implementation of the proposed system. The sources used for literature review included text books, online journals, articles and lecturers.

3.3 Data collection

The following methods were used for data collection.

3.3.1 Unstructured interviews the project required to carry out interview with the operators of the system and the community to analyze what they really expect from the system and see their stand over the deployment of the system. There was a one to one discussion with the users (administrator) and oral guide questions that are to be administered. This helped me in finding facts about the existing system, its background and information

in terms of usage, the control and how it will manage farm business.

 Interviews were used because they are time saving, seek classification of questions and provide instant responses. Interviews are also useful as follow-up to certain respondents to questionnaires.

3.3.2 Reading of various information like articles, projects and books from different sources most especially internet. The project further required to go ahead and read about various e-commerce web based systems that are used elsewhere in the world. This was done through reading journals, books and documents. The importance of this was to get an overview of existing similar systems and how they operate. The literature review enabled the project developer to acquire a better understanding of already existing systems, their strengths and weaknesses and how the information was relevant to the developed system.

3.3.3 Observation data was also collected through observation of the farm activities as I visited the farm and acquired information as regards the day to day operations of the farm. I obtained this information through taking a tour around the farm analyzing the various processes such as the selling of plantain, milk and fish which involved customers making their way to the farm premises to purchase the products.

3.4 Development methodology
Analysis method was used to develop the system a delicate balance exists between model detail and the ability to effectively and efficiently analyze the mode. Modeling detail may offer better reality at increased computational expense. Under certain circumstances, a simple model may prove more

valuable than a more complex model. The type of model chosen depends on system, the objectives, perspective (time scale) of models

After gathering the data, structured systems analysis approach was used for information analysis and modeling the system design. Structured analysis views a system from the perspective of the data flowing through it. This allows attention to be focused on pertinent details and avoids confusion from looking at irrelevant details. The data collected was reviewed and analyzed both qualitatively and quantitatively for correctness and consistency. The functional and non-functional requirements for designing and developing the System were determined.

3.5 System design

During system design the project required Data Flow Diagrams (DFDs) and Entity Relationship Diagrams (ERDs) to identify and partition system functionality in order to come up with a well-designed database. Some of the tools and techniques associated with the development of the e-commerce web based system include the following;

3.5.1 Router

This is the device that helps to allow connection or access to the internet. It is used to connect the server computer storing the project files to the other access devices like laptops.

3.5.2 Authentication

The system was fully used by registered and authenticated users and to achieve this I used Pre-Processor language (PHP) from Dreamweaver 8.0, HTML to allow the system to display in the web browser.

3.5.3 Database management system

I used MySQL as the DBMS from wampserver to store information such as system user information which is captured after the submission of each buyer's order form and an administrator who will thereafter be authorized to use the system's backend. It also keeps record from the inputs from user.

3.5.4 Switch

This is the device that connects other computers to the LAN that is in the same geographical area.

3.6 Conceptual design

For the conceptual design, flow charts, and flow diagrams were used in the project using the Unified Modeling Language (UML). For example flow chart for system operation and logical Data Flow Diagram was used.

3.7 Physical design

The system consists of a server machine that runs the web server software and client machines that run the web browsers.
The project needed a number of tools during development. They were mainly grouped into two categories;

3.7.1 System development software requirements

For the development of the system various tools were needed and these included the following;

  a) Pre-Processor language (PHP), HTML, and Dreamweaver 8.0.
  b) Apache Tomcat 7.0
  c) WampServer 2.0i
  d) MYSQL the Database Management System (DBMS)

3.7.2 System development hardware requirements

a) A computer system that is a central processing unit (**CPU**), monitor, mouse and keyboard
b) Switch
c) Router
d) RJ-45
e) Network cables, cat-6e

3.8 System Implementation and testing

E-Commerce web based system was developed. The files were stored to the web server, data base and a web page (the user interface). Through the web page, users access and make input parameters change the status of the data in relation with their rights or privileges.

The developed system was tested by issuing different parameters to the system. Testing involved internally checking the system by the developer to identify errors and weakness and to correct them. The types of system testing included the following:

3.8.1 Module Testing

Module testing is concerned with the testing of the smallest piece of system for which a separate specification exists. It may also be known as unit or component testing phase.

Module testing was carried out with a goal of isolating each part or module of the program such as the user registration module, log in module, the reports module and the system settings module. As a result, this helped the developer to detect any faults and correct them early enough during system development.

3.8.2 System Testing

The system was tested in modules to check if it is in line with the user requirements. This was done in stages first before being tested as a whole. The different pages were tested individually and then after there was proof of functionally they were then linked together to form the entire system. After everything was put together then sample data was used to view all the different functionalities of the system.

3.8.3 Evaluation

This was achieved by executing the keyed in commands by the system operator such that the desired changes are acquired leading to flexibility of the developed system.

3.8.4 Acquired results

a) Allows on authenticated use with valid username and password when logging in as administrator.
b) Ensuring remote access of the system services.
c) Reduce the headache of filling data in books of records and daily movements for a better long healthy life of the clients.
d) Minimize labor and time required to monitor record and the farm.

3.9 System testing

This was done in stages first before tested as a whole. The different pages were tested individually and then after there was proof of functionality as they were linked together to form the entire system.

3.10 Conclusion

In this chapter we have discussed the methodologies, technologies and tools that were used in the development of the web based ecommerce system for El-Geneina commercial farm.

CHAPTER FOUR

RESEARCH FINDINGS AND ANALYSIS

4.1 Introduction

This chapter covers the findings and their analysis. It includes an evaluation of the current system at the farm its weaknesses and strengths of the new system. The requirements for the new system are also discussed in this chapter.

4.2 Background of case study

El-Geneina was established by Mr. Benison Frank Bariyo in 2008 and is currently focusing on animal husbandry which boosts various sectors such as diary, fish, and poultry. El-Geneina farm's mission is to cater the food and nutritional needs of the general public and produce outputs that meet their project specifications with higher standard of workmanship and quality services. Over the years the farm has been a success because of Mr. Bariyo's financial input, diligence, dedication, teamwork and discipline. This led to the production of high quality farm products which has attracted small numbers of customers from far and nearby villages. El-Geneina commercial farm is located in Buko village, Wakiso district 6km from Kasanje town. It is accessible through three routes via Entebbe by ferry from Nakiwogo landing site to Buwaya 9km, Mpigi town 11km and Nateete 28km.

4.3 Organizational structure of El-Geneina commercial farm

El-Geneina commercial farm has a vertical hierarchy with the sole proprietor/owner at the top, the staff and associations followed by their respective departments, unions and faculty

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                        ┌──────────────┐
                        │     FARM     │
                        │    OWNER     │
                        └──────┬───────┘
                               │
                 ┌─────────────┴──────────────►┌──────────────┐
                 │                              │ ASSOCIATIONS │
                 ▼                              └──────┬───────┘
          ┌──────────────┐                            │
          │    STAFF     │              ┌─────────────┴──────────────┐
          └──────┬───────┘              ▼                            ▼
                 │               ┌──────────────┐           ┌──────────────┐
                 │               │   WAFISCO    │           │ MUK Food and │
                 │               └──────────────┘           │science faculty│
                 │                                          └──────────────┘
  ┌──────────┬───┴─────┬──────────────┐
  ▼          ▼         ▼              ▼
┌────────┐ ┌────────┐ ┌──────────┐ ┌────────┐
│HERDSMEN│ │ POND   │ │PLANTATION│ │ BIRD   │
│        │ │ATTEND. │ │ WORKERS  │ │BREEDERS│
└───┬────┘ └───┬────┘ └────┬─────┘ └───┬────┘
    ▼          ▼           ▼           ▼
┌────────┐ ┌────────┐ ┌──────────┐ ┌────────┐
│ DIARY  │ │ FISH   │ │ PLANTAIN │ │POULTRY │
│ SECTOR │ │ SECTOR │ │  SECTOR  │ │ SECTOR │
└────────┘ └────────┘ └──────────┘ └────────┘
```
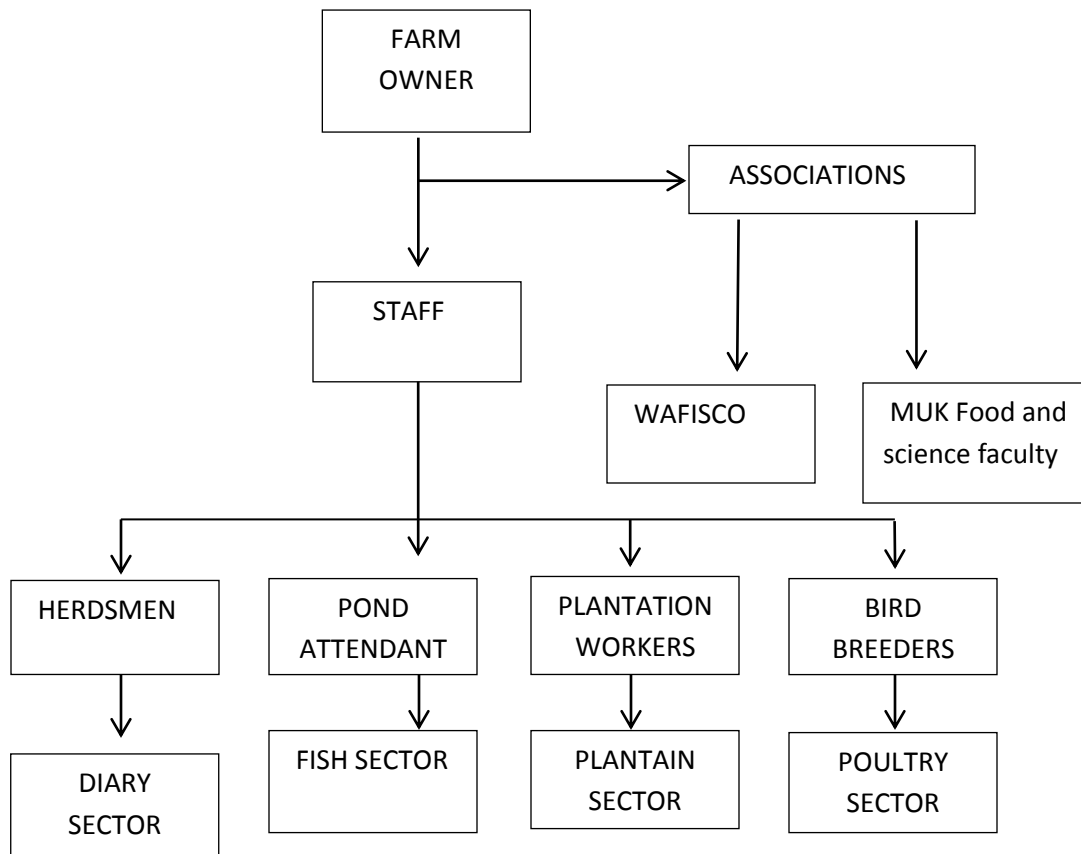
Figure: 4.3

    4.3.1 Sole Proprietor/Owner: Bariyo Frank Benison is the sole owner of El-Geneina commercial farm. He founded El-Geneina in 2008with an ambition to create an extensive commercial farm comprising of dairy, cattle, turkey and fish. Through hard work patience together with adequate financing, close supervision and monitoring El-Geneina has flourished. Mr. Bariyo is a sole proprietor of the franchise and therefore makes all the decisions and implements the policies that govern the farm.

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4.3.2   Departments: El-Geneina commercial farm comprises of various departments that is to say; fish sector, diary sector, poultry sector, plantain sector. The departments operate together and complement one another to be able to cater the food and nutritional needs of the general public and produce outputs that meet their project specifications with higher standard of workmanship and quality services.

4.3.3 Staff: the staff at El-Geneina commercial farm comprises of eleven manual workers namely; five herdsmen, one pond attendant, two plantation workers, three bird breeders who also take shifts as night watchmen and also help in the sale of products.

4.3.4 Associations: El-Geneina commercial farm works in a close relationship with certain associations such as Wakiso Fish Cooperative (WAFISCO), Makerere University Faculty of Food and Science, NAADs to attain new skills, share ideas, technical information and knowledge through agricultural workshops and seminars.

4.4 Marketing and selling of products at El-Geneina commercial farm
El-Geneina as a commercial farm produces high quality farm products which draw small numbers of customers from far and nearby village markets, communities and wholesalers who basically make business transactions from the farm premises at low prices for example selling of fish which involves the buyer being at the farm and participating in fishing, packing and transportation of the product, the sale of milk through ineffective middlemen to nearby cooperatives. Therefore the

inadequate size of the market indicates that marketing of farm products is poor and eventually results into low sales.

4.5 Tools, documents and Instruments used in sales and marketing of products at El-Geneina.

Newspaper, El-Geneina currently uses newspapers as a medium of advertisement of its merchandises which is a relatively ineffective means of creating awareness of the farm products.

Mobile phone, this is a device that transmits and receives calls, messages between two or more individuals. A phone is the most basic mode of communication at the farm it is used to transact with buyers and keep track of farm activities like sale of products.

Receipt book, when merchandise is bought and paid for in cash, the seller in a modern business will make out a cash receipt which is printed in duplicate. The original cash receipt is given to the buyer. The buyer should keep the receipt and later enter it in his cash book. The duplicate remains in the book of the seller; later on the seller will summarize the duplicates and enter them in his Cash Analysis book.

4.6 Analysis of the current system
The current system is mainly labor-intensive. Commercial transactions at the farm are mainly handled at the farm premises' for example selling of fish involves the buyer establishing contact with the farm owner before transacting upon which a date is set on which to carry out the process. The buyer

has to be at the farm and participates in fishing, packing and transportation of the product. Therefore this indicates that marketing of farm products is inadequate as the buyers from neighboring communities come to the farm premises and make purchases, and so the small size of the market eventually results into low sales.

4.7 Weaknesses of the current system

a) There are various weaknesses of the current system. They include the following:

b) The current system does not have provision to market the products that are sold at El-Geneina farm. The only form of advertisement is newspapers and word of mouth which are really not effective.

c) The current system does not enable online ordering and shopping of products from the farm.

d) The current system does not give a platform to the customers to make comments and suggestions about the farm products or give reviews and lend opinions.

4.8 Needs of El-Geneina Farm

a) There is a need to create awareness of farm products so as to increase the market size and thus boost sales.

b) The need to eliminate middlemen that is to say intermediaries who provide no added value, by enabling direct contact between buyers and sellers and facilitating the exchange of information, computer networks will reduce the need for intermediaries standing between the two.

c) The need to decrease operational cost savings, for example; reducing costs of creating, processing, distributing, storing and retrieving paper-based information.

d) The need to be competitive, which involves ensuring that El-Geneina commercial farm, stays ahead of or at least keeps up with competitors and various well established farms.

4.9 Strengths of the current system

The current system has the following strengths regardless;

a) The current system has provision for marketing the products that are sold at El-Geneina farm.
b) It is easy to use and quite inexpensive to use.
c) It does not require very skilled labor to use the system.

4.10 Requirements for the proposed ecommerce application

4.10.1 Informational Requirements

The ecommerce application should have informational requirements that allow a buyer to view, compare, and place orders for products along accessing information about the various products offered by the farm.

All orders should be assigned a sequential unique number along with the appropriate order date. The ecommerce system should also allow multiple items and quantities to be ordered on a single order. The ecommerce application must automatically calculate the order total

4.10.2 Functional Requirements

These are sub-divided into two. Namely

i. **Administrative requirements**

a) The new system should be able to allow remote login and logout into the administrator accounts.

b) The new system should allow the easy management of products. That is it should allow deletion, addition and updating of products depending on the situation.

c) The new system should enable the administrator to be able to edit the site dynamically

ii. **Customer requirements**

a) The new system should enable the customer to view the available products through the system's gallery.

b) The new system should enable the customer to make an order for the different products offered.

c) The new system should enable the user make a post or give feedback via email.

4.10.3 Non-functional requirements

The system has the following properties;

a) **Interoperability** refers to the capability of devices of different types and from different manufacturers to communicate and cooperate.

b) **Scalability** refers primarily to scalability in terms of geographical distance and location independence. In the context of offering remote access as a service, scalability in terms of capacity would also be an issue.

c) **Security** is probably the most important issue among them and

the hardest to deal with regarding the media used in wireless communications.

d) **Reliability** refers to the amount of time the system functions without fails

4.10.4 System Requirements

  a) Processor: At least Pentium IV with 2.4 GHz speed or above

  b) RAM: 2 GB of memory

  c) Hard Disk: At least free space of 160GB

  d) Operating System: Microsoft Windows server 2003/2008

  e) Anti-virus: Network Version anti-virus software preferably Norton Corporate Edition.

  f) Backup software: Any third party backup software such as Arc server

  g) Server software: A web server is required preferably Apache web server

4.10.5 Design Requirements

Easy to get components are used to design the system. The design of the system is not complex, so that further editing and modification can be easily done. The software must be flexible for other technical development.

i.   **Hardware designing tools**

a)   A working computer; this is what the researcher used to run the different software which were used in the actual design. The researcher also on the same computer to do research on the internet concerning things to do with the project

b)   Other computer accessories which included; USB flash drives, compact disks and printers were used to store backup the system as it transformed through the different development stages.

ii.   Software Tools

a)   Text editors like note pad which were used by the researcher to write the necessary code

b)   PHP also known as hypertext pre-processor was a language used in the designing of the functionalities of the system.

c)   Data base management systems like MySQL on the WAMP Server

4.10.6 Target users

a) **System administrator** is a person who is responsible for the upkeep, configuration, and reliable operation of computer systems. The system administrator seeks to ensure that the uptime, performance, resources, and security of the computers he or she manages meet the needs of the users. Other roles of system administrators are to acquire, install, or upgrade computer components and software; automate routine tasks; write computer programs; troubleshoot; train and/or supervise staff; and provide technical support.

b) **Users/clients** are able to view, compare products for sale and make a choice to place orders for products through choosing a method of payment and delivery that allows them to submit an order form that generates a receipt to confirm the purchase.

4.10.7 Functional Analysis

For the system to perform as expected, the following requirements were considered;

a)   Full-time high speed (broadband) internet
connection.

b)   Stable power supply

c)   Power backup system such as batteries and
high voltage UPSs

d)   Timely remote system access and control

e)   Computer system connected to the router to
support remote access.

4.10.8 Other requirements include;

a)   The status of the data should be synchronized
with the database values dynamically.

b) The local network should continue to work
locally even in absence of an internet connection
so as to enable local access to system services.

c) Effect a change made by a user remotely via a web page.

d) Always display the most current status of each item upon
accessing the system.

e) For proper functioning of the system there is need for
appropriate hardware and software support.

4.11 System Security

The security of the system is designed to be implemented at
different levels such as user authentication at login, at the
server and during transmission of the data over the network. In
addition a login/password based access is setup to prevent
unauthorized accesses. With the internet page, authorized users
can login to the system, monitor and change records and according
to their preferences.

For administrative authentication, a login username and password which are registered in system database are used to control access to the system. Only administrators are allowed to have access and rights to modify the status of the system. On the network and at the server, secure socket layer encryption is used to encrypt the data during transmission. This prevents hackers from modifying and making use of the data in transmission.

4.12 Conclusion

This chapter looked at the current system's pros and cons, the requirements that is, system, target users, software, hardware, and system security.

CHAPTER FIVE

SYSTEM DESIGN

5.1 Introduction

This chapter presents the design of the proposed system. The chapter presents the description and architectural design of the proposed system, Structural, functional and behavioral designs of the user interfaces. The entity relationship diagram, data structures, validation checks, database diagram and the query design are also presented as part of the logical and physical database designs of the proposed ecommerce application.

5.2 Description of proposed system

The proposed system is an online ecommerce system that is to be used by El-Geneina commercial farm to market and sell its products. The system comprises of a dynamic website along with a database. That is to say it will have a frontend and backend design. Potential buyers will access the system via the internet upon completion and utilize its functionalities such as viewing products in the gallery, selecting products, placing orders, sending feed back to the administrator of the system, accessing information on the about page. The system also enables a user to remotely login/logout and access information regarding feedback, placed orders both pending and delivered; the user has options to update the system other functionalities include generation of receipts and a report.

5.3 Architectural design

The system uses the internet as the link between the remote end and the control station end (server end). The remote end is the user's PC or Laptop with a browser and an internet connection whereas the control station end is composed of a server machine which contains the database server, control software, data acquisition device and high security parameters. As shown below, the layout of the proposed architecture shows the basic components with their interaction.
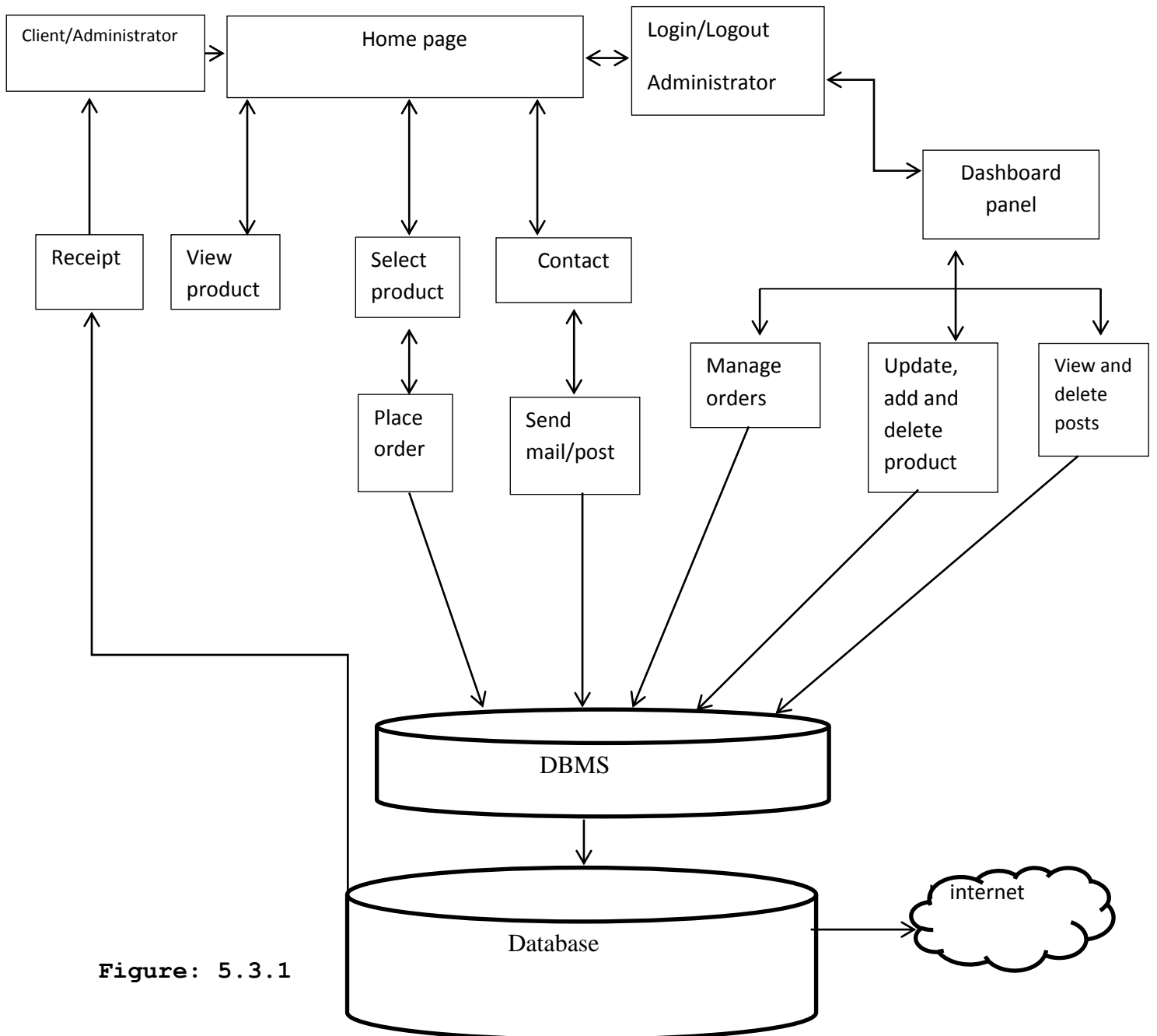
Figure: 5.3.1

5.4 User interface structural and behavioral designs

a) Homepage

LOGO	FARM IMAGE SLIDE SHOW < || >
PRODUCTS	
ABOUT	
GALLERY	
CONTACT	
LOGIN	

Figure: 5.4.1

This page enables a user to navigate and access the various pages of the system that is to say products, about, gallery, contact, and login pages.

b) Admin login page

```
┌──────────────────────────────────────────────────────────────────┐
│  ┌──────────────┐                                                  │
│  │ LOGO         │            ┌────────────────────────┐           │
│  ├──────────────┤            │ ADMIN LOGIN FORM        │           │
│  │ PRODUCTS     │            │                         │           │
│  ├──────────────┤            │                         │           │
│  │ ABOUT        │            └────────────────────────┘           │
│  ├──────────────┤     ┌──────────────┐          ┌──────────────┐  │
│  │ GALLERY      │     │ Username     │          │ Login        │  │
│  ├──────────────┤     └──────────────┘          └──────────────┘  │
│  │ CONTACT      │          ┌────────────────────────┐             │
│  ├──────────────┤          │ Password               │             │
│  │ LOGIN        │          └────────────────────────┘             │
│  ├──────────────┤                                                  │
│  │              │                                                  │
│  │              │                                                  │
│  └──────────────┘                                                  │
│                                                                    │
└──────────────────────────────────────────────────────────────────┘
```
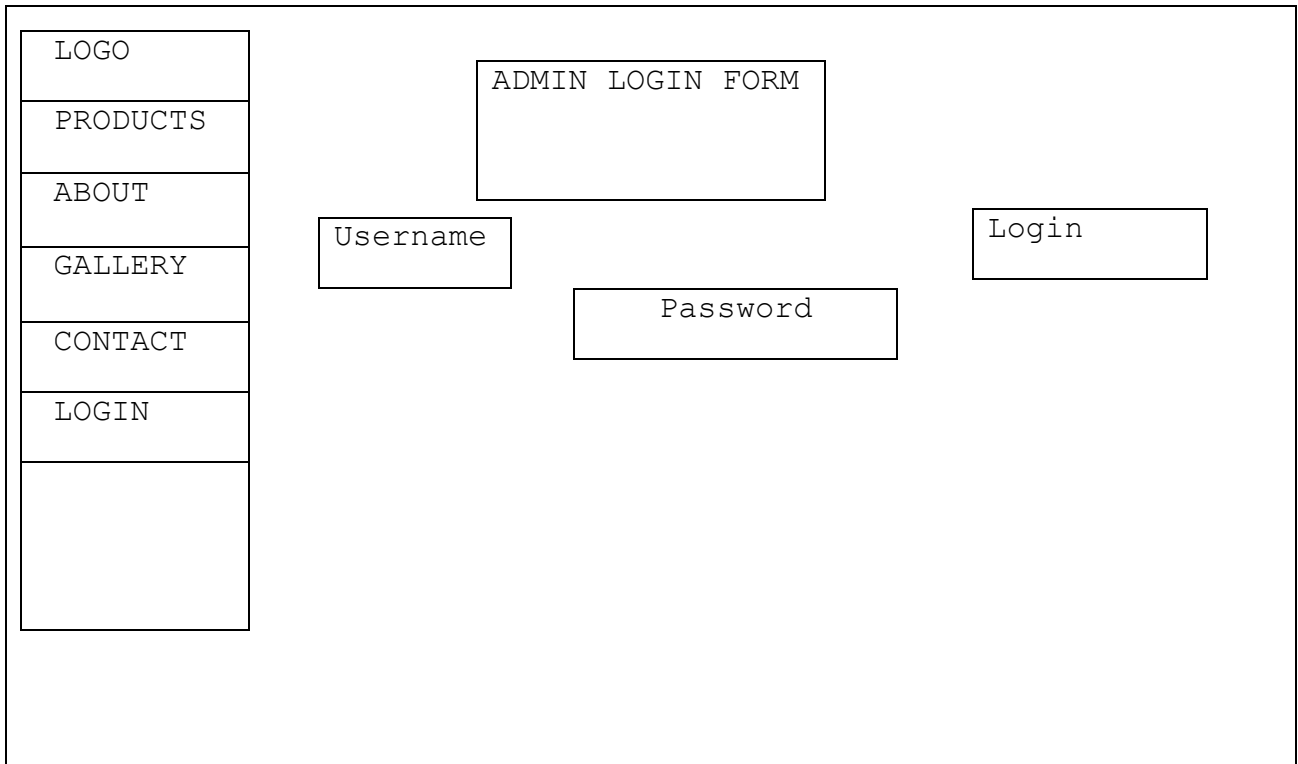
Figure: 5.4.2

This page enables the administrator to gain access to the back end of the system for example the dashboard panel through which they are able to update delete and add products, mail, and orders.

c) Products page.

Qty	Name	Total
Grandtotal		
Delivery method		
Payment method		
	Checkout	

PRODUCTS

Figure: 5.4.3

Products page enables a buyer to make a choice from the products displayed and place an order through choosing a delivery and payment method and submitting an order form with particulars such as name, address, telephone number.

c) **Contact us page**

```
┌────────────────────────────────────────────────────────────────────────────┐
│ ┌──────────────┐              ┌──────────────────┐                          │
│ │ LOGO         │              │   FEEDBACK       │                          │
│ ├──────────────┤              │     FORM         │                          │
│ │ PRODUCTS     │              └──────────────────┘                          │
│ ├──────────────┤    ┌──────────────┐   ┌──────────────┐   ┌──────────────┐  │
│ │ ABOUT        │    │ NAME         │   │ EMAIL        │   │ SUBJECT      │  │
│ ├──────────────┤    └──────────────┘   └──────────────┘   └──────────────┘  │
│ │ GALLERY      │                                                            │
│ ├──────────────┤    ┌──────────────────────────────────┐                    │
│ │ CONTACT      │    │ MESSAGE                          │                    │
│ ├──────────────┤    │                                  │                    │
│ │ LOGIN        │    │                                  │                    │
│ ├──────────────┤    │                                  │                    │
│ │              │    │                                  │                    │
│ │              │    └──────────────────────────────────┘                    │
│ └──────────────┘    ┌──────────────┐                                        │
│                     │ EMAIL        │                                        │
│                     └──────────────┘                                        │
└────────────────────────────────────────────────────────────────────────────┘
```
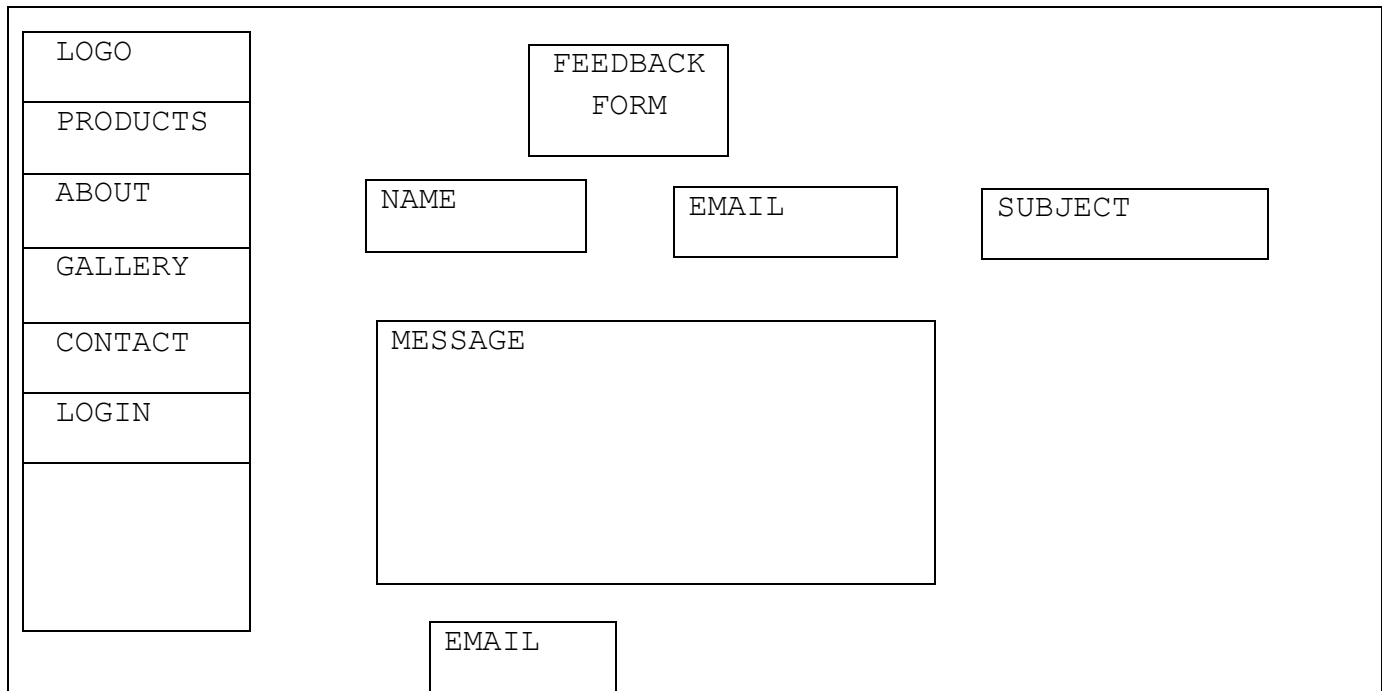
Figure: 5.4.4

Contact us page allows the user/buyer to post a comment or send a message to the system administrator which may be feedback, inquiry or complaint

5.5 Database design
  a) **Name of database**
  - onlinefarm
  b) **Tables in database**
  - message
  - orders
  - paymentm
  - product
  - reservation

c) **Table structures**

- **message table**

Field	Type	Null	Key	Default	Extra
message_id	int(11)	NO	PRI	NULL	auto_increment
Name	varchar(30)	NO			
Email	varchar(100)	NO			
Subject	varchar(100)	NO			
Message	varchar(500)	NO			

- **orders table**

Field	Type	Null	Key	Default	Extra
Id	int(11)	NO	PRI	NULL	auto_increment
Product	varchar(100)	NO			
Qty	int(11)	NO			
Confirmation	varchar(30)	NO			
Total	varchar(100)	NO			
Design	varchar(300)	NO			
Note	varchar(500)	NO			

- **paymentm table**

Field	Type	Null	Key	Default	Extra
Id	int(11)	NO	PRI	NULL	auto_increment
Dmethodid	varchar(30)	NO			
Methodname	varchar(100)	NO			

- **product table**

Field	Type	Null	Key	Default	Extra
Id	int(6)	NO	PRI	NULL	auto_increment
Img	varchar(32)	NO	UNI		
Name	varchar(64)	NO			
Description	Text	NO			
Price	Double	NO			

- **reservation table**

Field	Type	Null	Key	Default	Extra
reservation_id	int(11)	NO	PRI	NULL	auto_increment

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Firstname	varchar(30)	NO			
Lastname	varchar(30)	NO			
City	varchar(30)	NO			
Address	varchar(30)	NO			
Country	varchar(30)	NO			

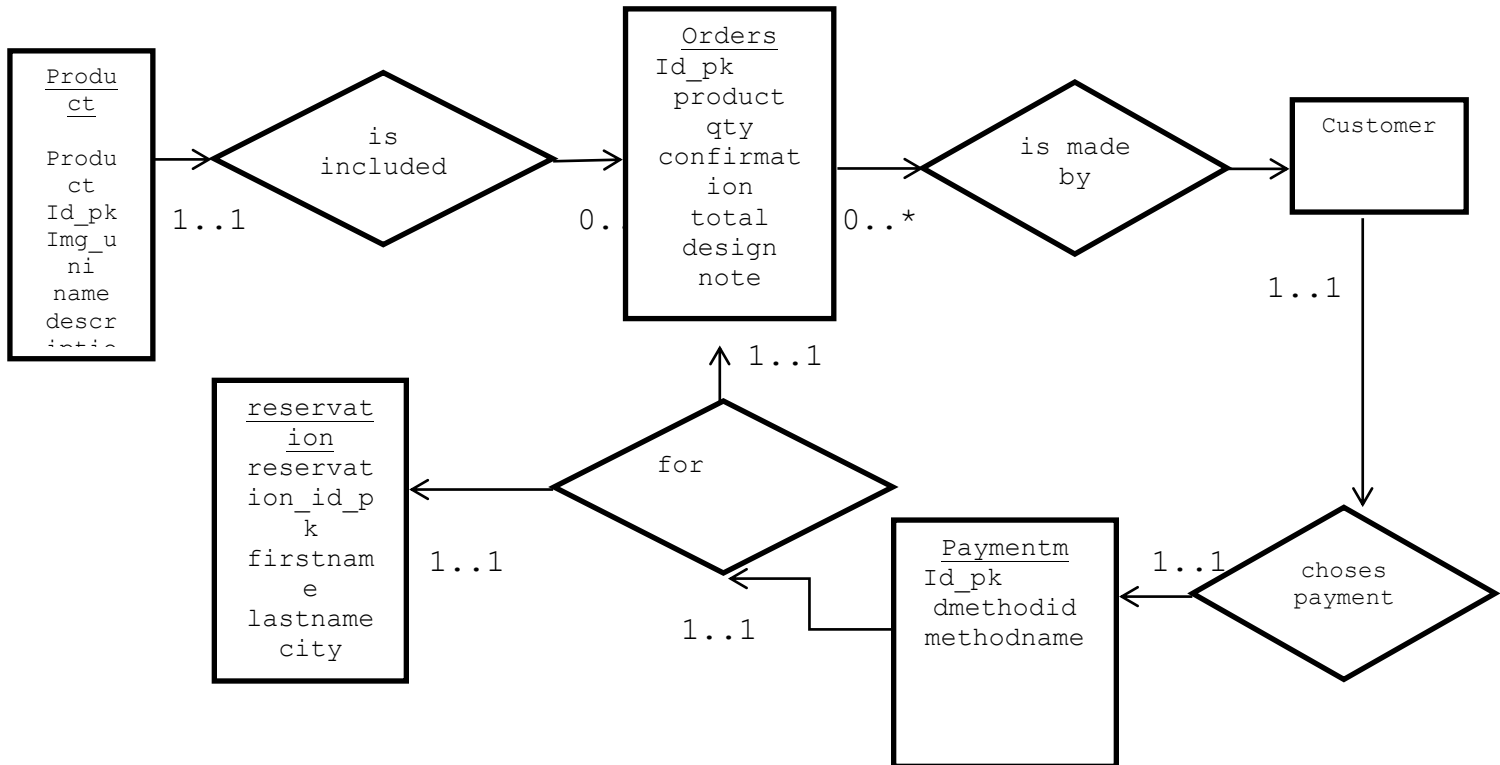## 5.6 Entity relationship diagram model

Figure: 5.6

5.7 Physical design

The database and its corresponding tables will be created using the following SQL statements.

Create table Message (Message_idint(11) NOT NULL
auto_increment,Namevarchar (30) NOT NULL,Emailvarchar (100) NOT
NULL ,Subject varchar (100) NOT NULL,Messagevarchar (500) NOT
NULL);

```
Create tableOrders(Id int(11) NOT NULL
auto_increment,Productvarchar (100) NOT NULL,Qtyint(11) NOT
NULL,Confirmation(30) NOT NULL,Totalvarchar(100) NOT
NULL,Designvarchar (300) NOT NULL,Notevarchar (500) NOT NULL);



Create table (PaymentmIdint(11) NOT NULL auto
increment,Dmethodidvarchar (30) NOT NULL,Methodnamevarchar (100)
NOT NULL);



Create table product (Id int(6) NOT NULL auto_in3crement
,Imgvarchar (32) NOT NULL,Namevarchar (64) NOT NULL,Description
text NOT NULL);



Create table reservation (Reservation_idint(11) NOT NULL
auto_increment,Firstnamevarchar(30) NOT NULL,Lastnamevarchar(30)
NOT NULL,Cityvarchar (30) NOT NULL,Addressvarchar (30) NOT
NULL,Countryvarchar (30) NOT NULL,Emailvarchar (50) NOT
NULL,Contactint(20) NOT NULL,Payableint(11) NOT
NULL,Statusvarchar(10) NOT NULL,Confirmationvarchar (20) NOT
NULL,Deliveryvarchar (300) NOT NULL,Date date NOT
NULL,Timevarchar (100) NOT NULL,Paymentvarchar (100) NOT
NULL,Delivery_typevarchar (100) NOT NULL);



Create table user (User_idint(11) NOT NULL,Usernamevarchar(30)
NOT NULL,Passwordvarchar(30) NOT NULL,Positionvarchar (45) NOT
NULL);
```

CHAPTER SIX

IMPLEMENTATION

6.1 Introduction

This chapter explains how the designs were translated into a working system. It explains the various implementation tools and presents snap shots for the various interfaces and the implemented database. It also explains how testing was done.

6.2 Tools and Technologies used

The following tools were used during the development and implementation of the proposed system;

6.2.1 Server Software, since PHP is server side software, server software will be needed to see the output as the system is being designed. WAMP 2.0a apache server is the particular software that will be used for this project, the main reason being that it is free and easily accessible. It is also easy to use.

6.2.2 Operating Systems, windows 7 is operating system that will be used to develop this software however it will be able to run on windows and Linux environment.

6.2.3 Graphics design Tools, like adobe CS6 will be used to design the images, text, logo that will be used in creating a suitable interface for the system. Adobe CS6 contains Adobe Illustrator, Adobe Photoshop, Adobe In-Design and Dream weaver.

6.2.4 Hyper Text Mark-up Language (HTML), HTML is a simple language use to describe the structure of text based information. It is used to create web pages.

6.2.5 Hyper Text Pre-processor (PHP), PHP can be defined as a Hypertext Pre-processor, and it is a server side scripting language. According to J.Meloni., 2004 when a browser accesses a URL, it is making a request to a web server a PHP page is requested, a web server wakes up the parsing engine and then the parsing engine runs through the PHP code found in home.php, and returns the resulting output. This output is passed back to the web server as part of the HTML code in the document, which in turn is passed on to your browser, which displays it to you.

6.2.6 The Database Management System, by definition a database is a single collection of structured data store with the minimum of duplication of data items, to provide a consistent and controlled pool of data.

A Database management system is software that enables users to define, create, maintain and control accesses to the database. Examples include MySQL, Oracle, Microsoft Access, Informix and Sybase. It allows users to define the database, usually through a data definition language.

6.3 User interface implementation
The following are snap shots of the various system interfaces

6.3.1 Homepage

Figure: 6.3.1

a)**Homepage** this page enables a user to navigate and access the various pages of the system that is to say products, about, gallery, contact, and administrator login pages
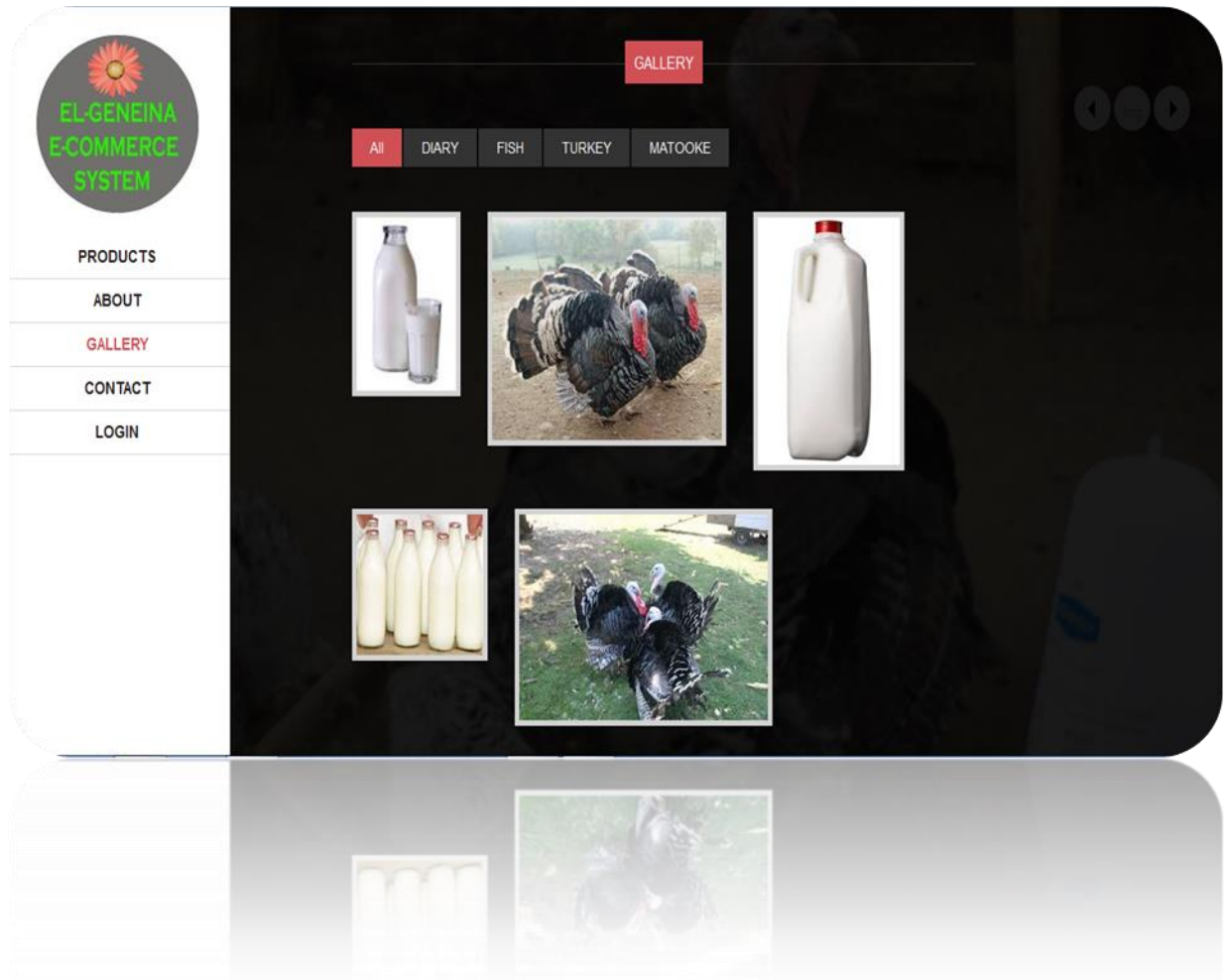
6.3.2 Gallery page

Figure: 6.3.2

b) **Gallery page** this page allows the buyer to view, compare products offered by the farm and can make an informed decision on which product to purchase.
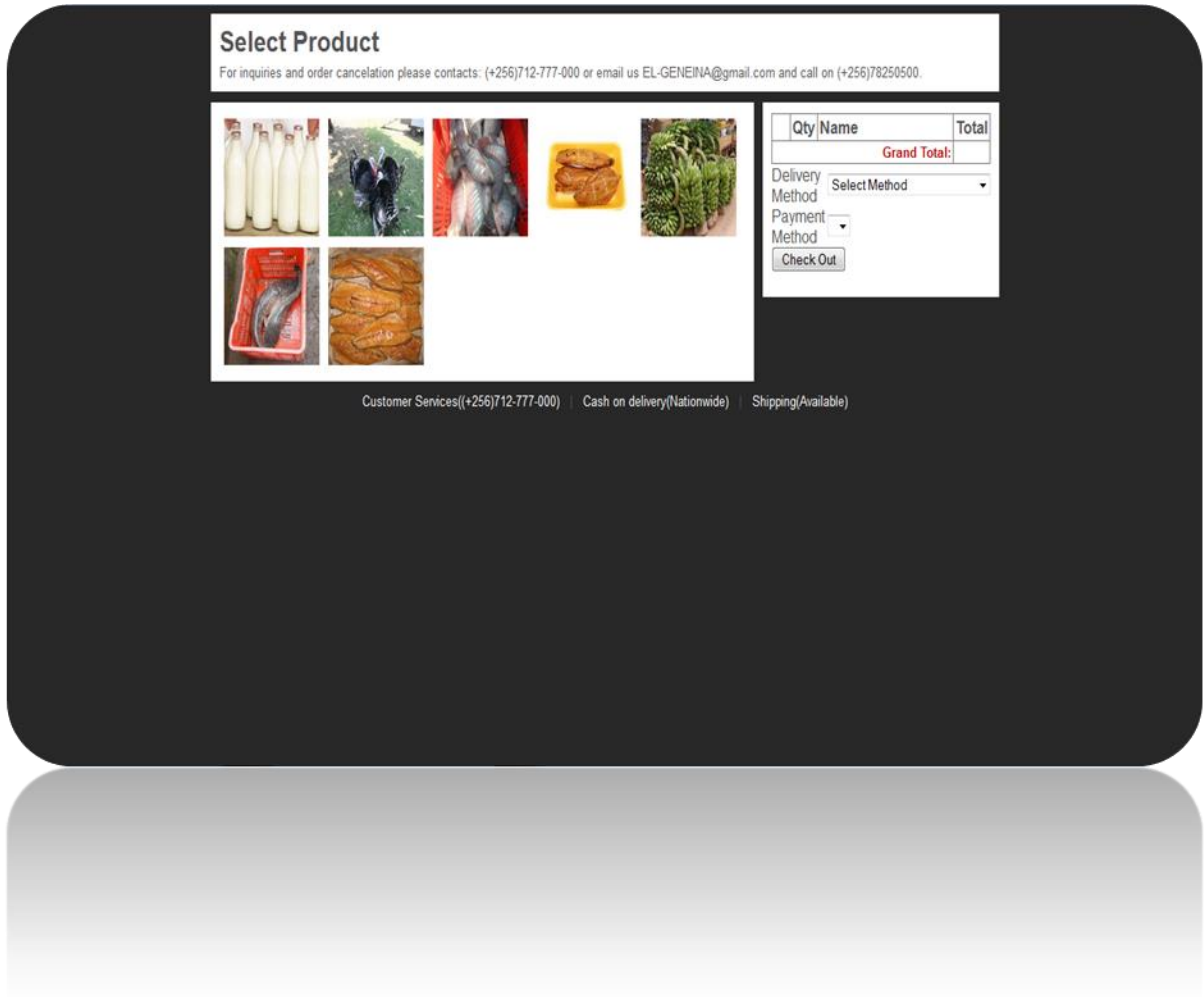
6.3.3 Product page

Figure: 6.3.3

c) **Product page** enables a buyer to make a choice from the products displayed and place an order through choosing a delivery and payment method and submitting an order form with their particulars such as name, address, telephone number.
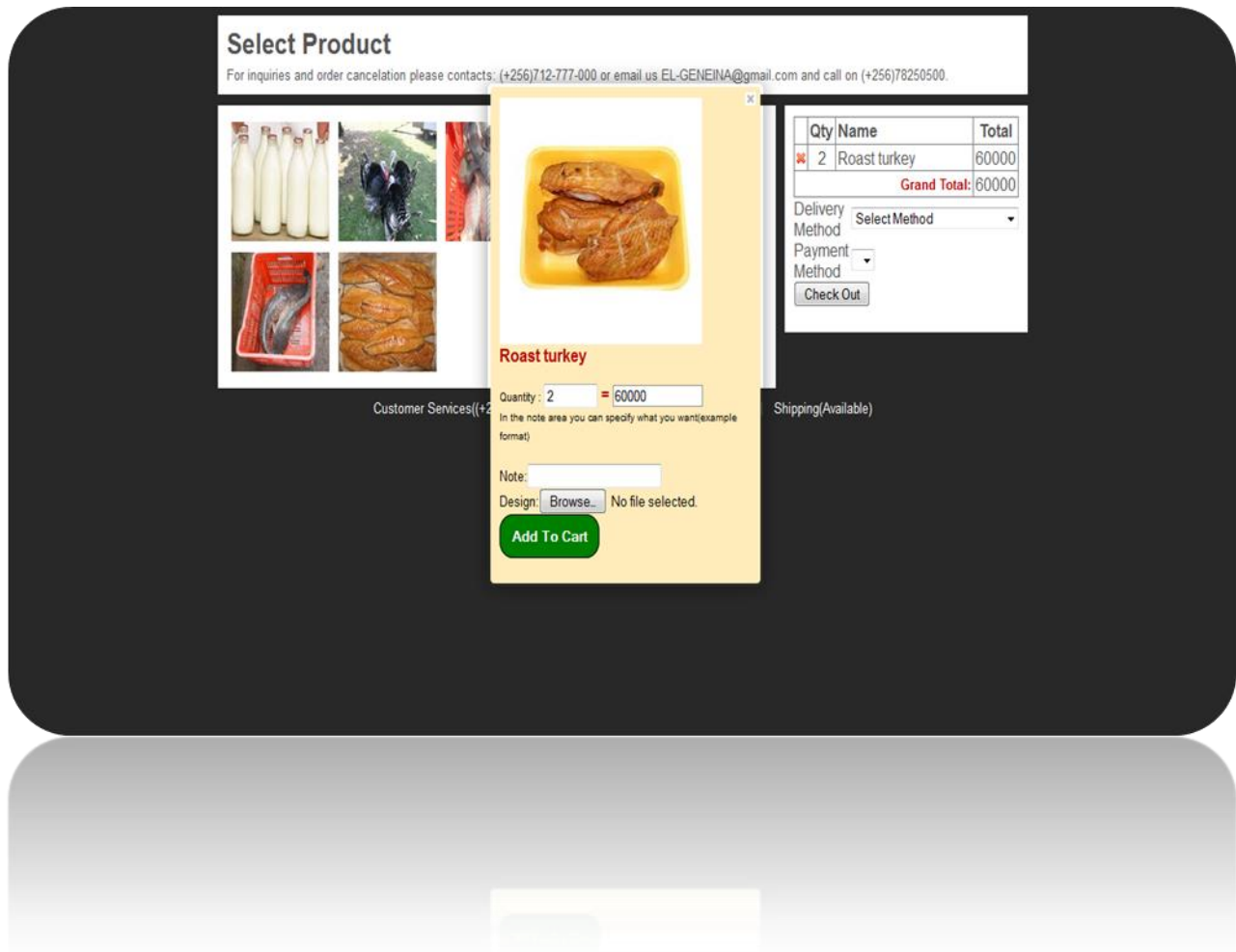
6.3.4 Shopping cart

Figure:6.3.4

d) **Shopping cart** is a functionality that facilitates the purchasing process through allowing a buyer to input the quantity of the product selected to which it adjusts the price in accordance and has a provision for placing a note.

6.3.5 Order form

Personal Information form

Note: This note inform/s you when you can receive your order
Within Uganda: 1000 above~ 2 days | 1000 below~ 1 day
Outside Uganda: 1000 above~ 4 days | 1000 below~ 3 days

First Name — Add your first name: bariyo

Last Name — Add your last name: john

Contact No. — Add your Contact number: 0793237236

Email — Add a valid address: bariyojohn@gmail.com

Address — permanent address: zana

City — permanent address: kampala

Delivery Addres — Delivery Address: ZANA

Confirm

Figure:6.3.5

e)**Order form** permits a buyer to submit his/her particulars upon placing an order such as name, address, telephone number, delivery address.

6.3.6 Reciept

El-Geneina Commercial Farm System
Kampala City
Email Us: EL-GENEINA@gmail.com
Contact: (+256)0712-777-000 and call on
(+256)72850500

Date: 0000-00-00
Name: bariyo john
Address: zana kampala
Email: bariyojohn@gmail.com
Contact number: 793237236
Confirmation: GYPL-IYU
Payment Method:
Delivery Type:
note: if the Delivery Type is Outside Kampala It has an 5000 delivery charge

Name	Quantity
Roast turkey	2
Total Payable	0

Figure:6.3.6

a) **Receipt** is generated by the ecommerce application when a buyer submits the order form. It includes the company logo, contacts, email and the buyer's particulars along a unique code which confirms the given client's order.
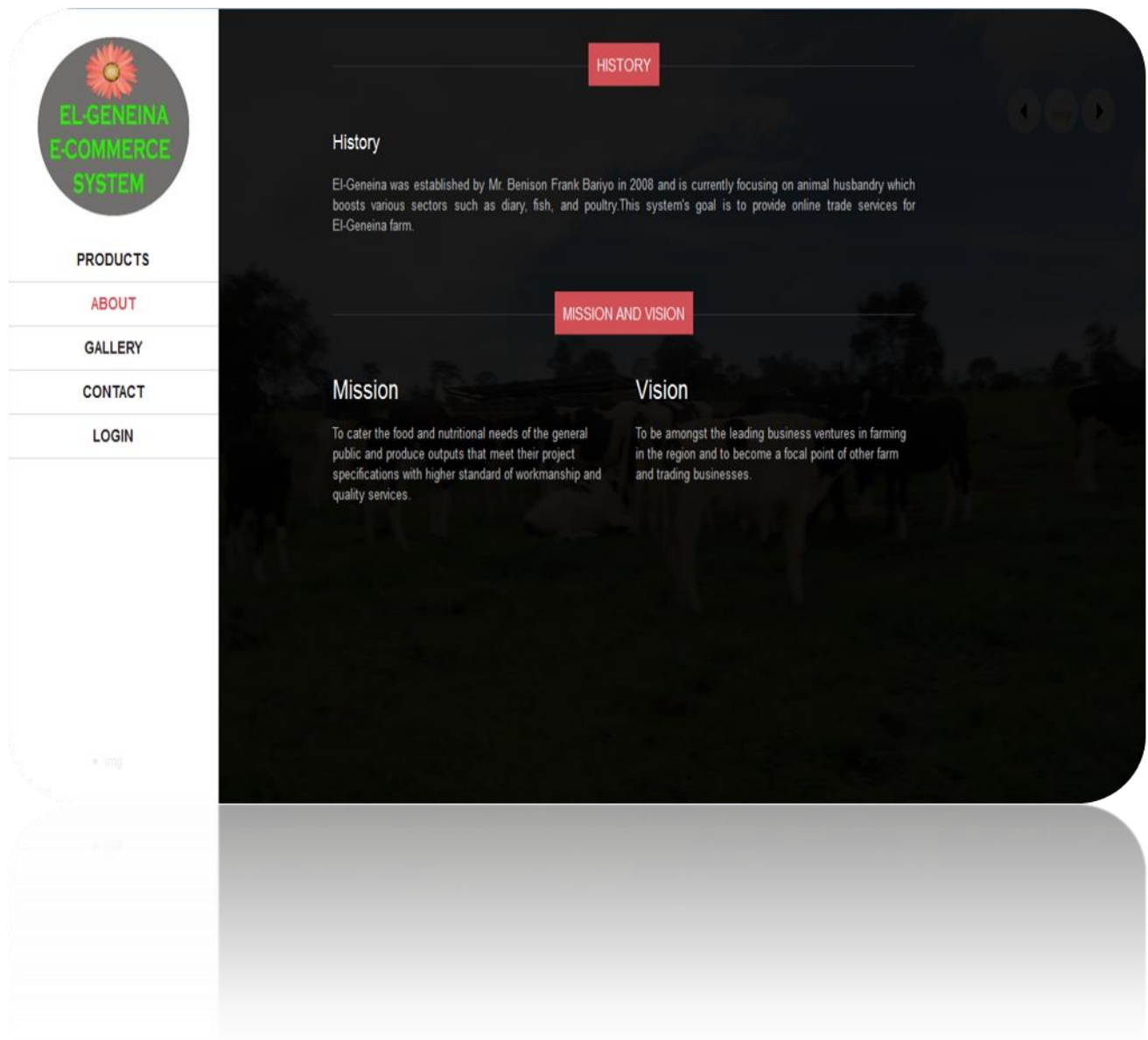
6.3.7 About us page

Figure: 6.3.7

b) **About us** is a page that contains information regarding the
   history of the farm, its mission and vision statements.
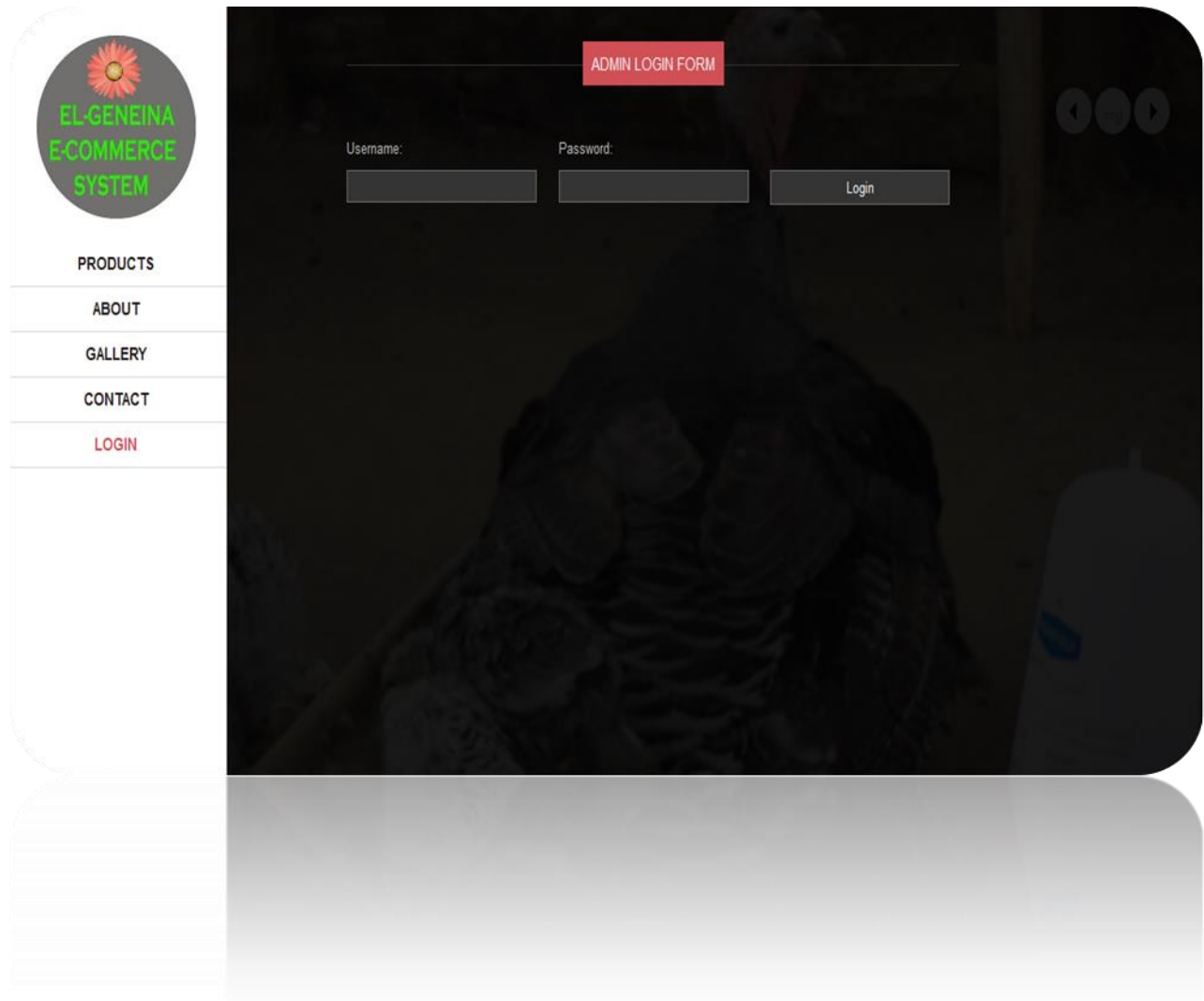
6.3.8 Admin Login Form

Figure 6.3.8

h) **Administrator login form** is a page that enables access to the dashboard panel restricted to only the administrator. It includes input fields for username, password and the login button.
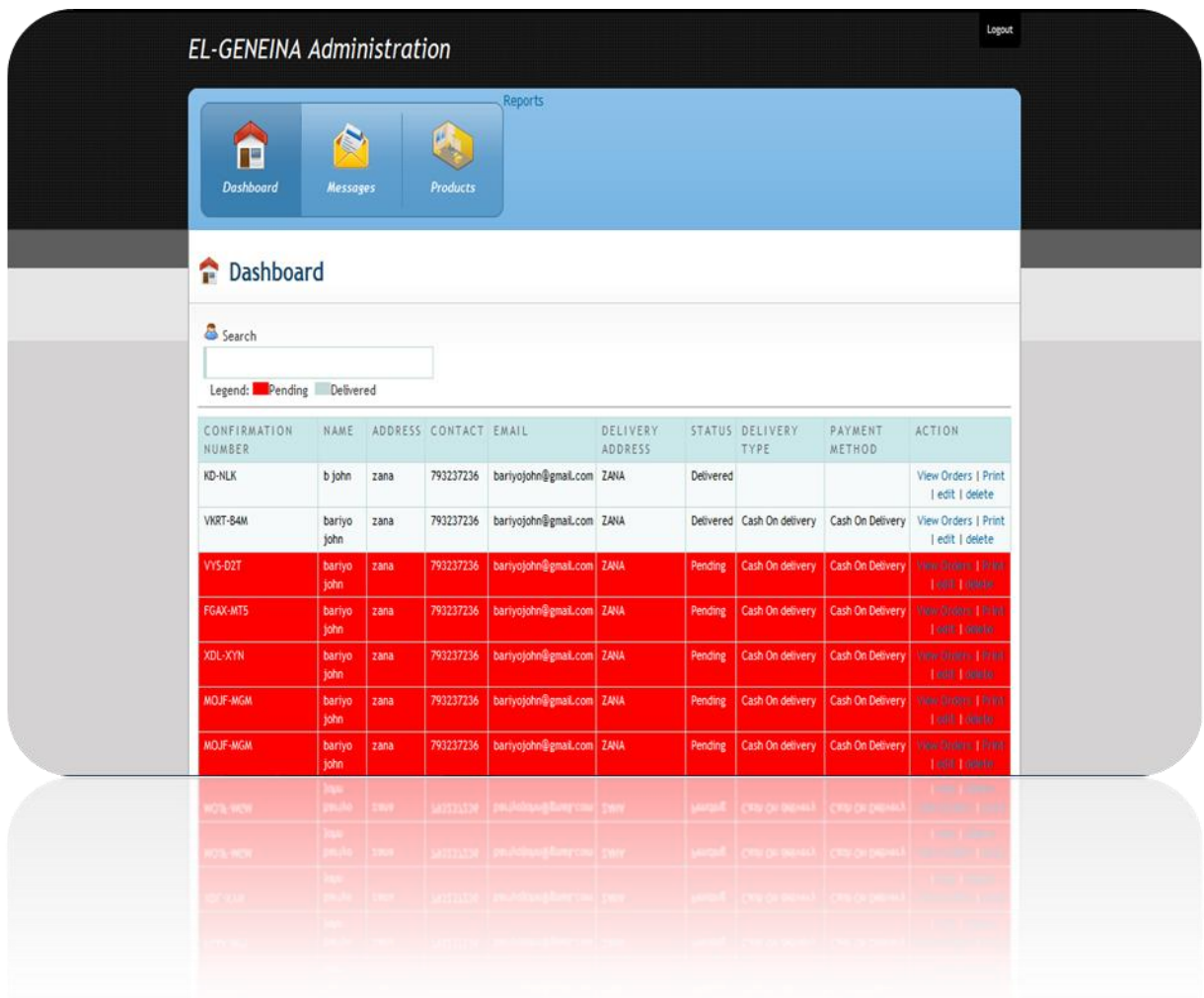
6.3.9 Back end of the system

Figure: 6.3.9

i) **Back end of the system (dashboard panel)** is only accessible
by the administrator who can update delete and add products,
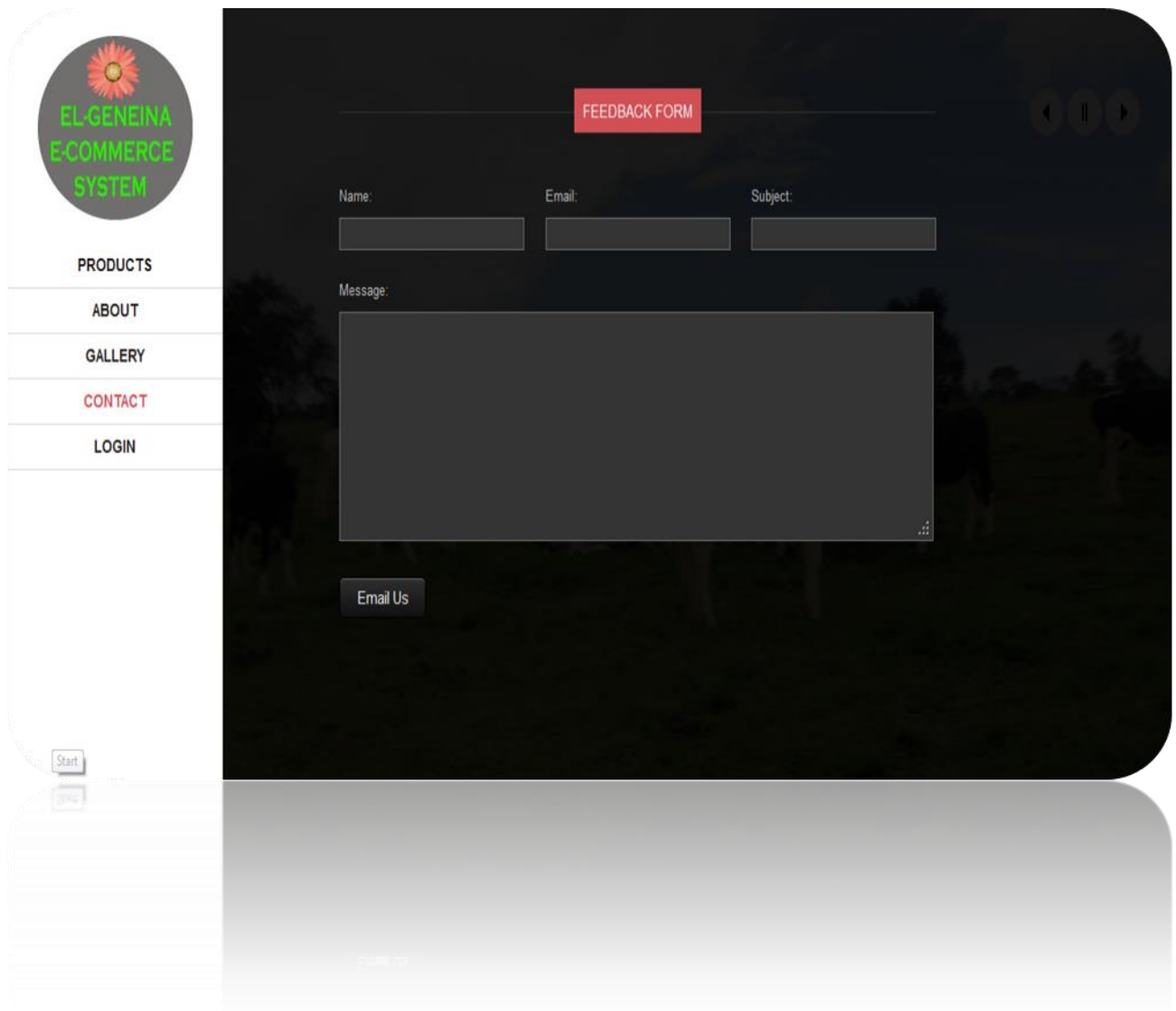edit messages, and manage orders.

6.3.10 Feedback form page

Figure: 6.3.10

Contact us is a page dedicated to allowing the user/buyer to post a comment or send a message to the system administrator which may be feedback, inquiry or complaint.

6.4 Database implementation

Then database was implemented using MySQL to create the database onlinefarm and its corresponding tables along with their given entities and attributes.

6.4.1 Database onlinefarm

Figure: 6.4.1

6.4.2 Tables in the onlinefarmdatabase

Figure: 6.4.2

6.4.3 Description of orders table

```
mysql> desc orders;
+--------------+--------------+------+-----+---------+----------------+
| Field        | Type         | Null | Key | Default | Extra          |
+--------------+--------------+------+-----+---------+----------------+
| id           | int(11)      | NO   | PRI | NULL    | auto_increment |
| product      | varchar(100) | NO   |     |         |                |
| qty          | int(11)      | NO   |     |         |                |
| confirmation | varchar(30)  | NO   |     |         |                |
| total        | varchar(100) | NO   |     |         |                |
| design       | varchar(300) | NO   |     |         |                |
| note         | varchar(500) | NO   |     |         |                |
+--------------+--------------+------+-----+---------+----------------+
7 rows in set (0.00 sec)
```

Figure: 6.4.3

6.4.4 Description of reservation table

```
mysql> desc reservation;
+----------------+---------------+------+-----+---------+----------------+
| Field          | Type          | Null | Key | Default | Extra          |
+----------------+---------------+------+-----+---------+----------------+
| reservation_id | int(11)       | NO   | PRI | NULL    | auto_increment |
| firstname      | varchar(30)   | NO   |     |         |                |
| lastname       | varchar(30)   | NO   |     |         |                |
| city           | varchar(30)   | NO   |     |         |                |
| address        | varchar(30)   | NO   |     |         |                |
| country        | varchar(30)   | NO   |     |         |                |
| email          | varchar(50)   | NO   |     |         |                |
| contact        | int(20)       | NO   |     |         |                |
| payable        | int(11)       | NO   |     |         |                |
| status         | varchar(10)   | NO   |     |         |                |
| confirmation   | varchar(20)   | NO   |     |         |                |
| delivery       | varchar(300)  | NO   |     |         |                |
| date           | date          | NO   |     |         |                |
| time           | varchar(100)  | NO   |     |         |                |
| payment        | varchar(100)  | NO   |     |         |                |
| delivery_type  | varchar(100)  | NO   |     |         |                |
+----------------+---------------+------+-----+---------+----------------+
16 rows in set (0.07 sec)
```

Figure: 6.4.4

6.4.5 Description of paymentm table

```
mysql> desc paymentm;
+------------+--------------+------+-----+---------+----------------+
| Field      | Type         | Null | Key | Default | Extra          |
+------------+--------------+------+-----+---------+----------------+
| id         | int(11)      | NO   | PRI | NULL    | auto_increment |
| dmethodid  | varchar(30)  | NO   |     |         |                |
| methodname | varchar(100) | NO   |     |         |                |
+------------+--------------+------+-----+---------+----------------+
3 rows in set (0.09 sec)
```

Figure: 6.4.5

6.4.6 Description of user table

```
mysql> desc user;
+----------+-------------+------+-----+---------+----------------+
| Field    | Type        | Null | Key | Default | Extra          |
+----------+-------------+------+-----+---------+----------------+
| user_id  | int(11)     | NO   | PRI | NULL    | auto_increment |
| username | varchar(30) | NO   |     |         |                |
| password | varchar(30) | NO   |     |         |                |
| position | varchar(45) | NO   |     |         |                |
+----------+-------------+------+-----+---------+----------------+
4 rows in set (0.06 sec)
```

Figure: 6.4.6

6.5 System Implementation and testing

E-Commerce web based system was developed. The files were stored to the web server, data base and a web page (the user interface). Through the web page, users access and make input parameters change the status of the data in relation with their rights or privileges.

The developed system was tested by issuing different parameters to the system. Testing involved internally checking the system by the developer to identify errors and weakness and to correct them. The types of system testing included the following:

a) **Module Testing** is concerned with the testing of the smallest piece of system for which a separate specification exists. It may also be known as unit or component testing phase. Module testing was carried out with a goal of isolating each part or module of the program such as the user registration module, log in module, the reports module and the system settings module. As a result, this helped the developer to detect any faults and correct them early enough during system development.

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b) **System Testing,** the system was tested in modules to check if it is in line with the user requirements. This was done in stages first before being tested as a whole. The different pages were tested individually and then after there was proof of functionally they were then linked together to form the entire system. After everything was put together then sample data was used to view all the different functionalities of the system.

CHAPTER SEVEN

Conclusions and Recommendations

7.1 Introduction
In this chapter, recommendations and conclusions shall be made for both the system and for future work and research of similar objectives. The project is aimed at designing and implementation of system for a web based ecommerce system with the sub objective of ushering a smooth transition from the old system to the new system.

7.2 Conclusion
The previous chapters gave an over view of the old system, the new one and gave a comparison of the two. By replacing the old system, farm products and services will be advertised and promoted at both national and international level resulting into higher profit margins through increased sales from a large customer base. The new system will save time, labor and money thesince its cost efficient as it eliminates middle men, public relations officers. The system is time efficient as it includes payment methods such as cash on delivery, shipping and operates 24 hours a day.

7.3 Recommendations
With an improved marketing and sales system for El-Geneina commercial farm, it is evident that the majority of the problems experienced with the old system are solved with the new one.

To gain fully from the new system the following should be done during implementation.

a) The ecommerce system should allow uses of multiple variants for each product to permit options with unique inventory tracking, prices and weights.

b) The ecommerce application in due time should support customizable views of orders filtered by their current status along real time notifications for orders using WebHooks.

c) The ecommerce system should include feature for a full asset system which lets you use and re-use your stock photography, logos or product pdfs whenever you need them.

d) The ecommerce system should later integrate a track payment and shipping status on orders with detailed reports along with order cancellation with automated chargeback options.

7.4 Future work and research

Currently the system is intended to advertise, enable purchase, update, edit, adding and deletion of farm products.

This concept however has a lot of room for expansion as new farm products and customers may arise along with a variety of customers with varying needs and specific wants.

The researcher could not develop a fully integrated system as it was deemed to have a 'scope too wide' and hence need for downscaling. In the future an attempt can be made to develop a fully integrate information system that caters for customized products, customer registration and detailed product information.

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APPENDICES

APPENDIX 1: LIST OF FIGURES

APPENDIX 2: INTERVIEWS

STATEMENT OF CONFIDENTIALITY

The information that will be availed by you shall be kept with the strictest confidentiality unless specially authorized by (you) the respondent to reveal him or her as the source. The use of aliases shall be done if need be for referral purposes. I therefore encourage you to speak out as honestly and as freely as possible.

Thank you.

GUIDE

The following need to be fully or at least partly answered by the end of the interview

Interview questions

1. The respondent's roles at the farm.
2. How much the respondent knows about onlineordering systems?
3. The role of the current information system in the achievement of the farm's objectives.
4. How long does it take to accomplish the task with the current system?
5. With how much ease or difficulty is the task accomplished?
6. Do these difficulties, if any, have a negative effect to your work in any way?
7. How can the current system be improved?
8. Will further computerization of the marketing department improve on the situation? if so, how?

9. Is thefarm ready for the change from the old system to a more electronic system?

APPENDIX 3: SAMPLE CODE
HTML Code for the Administrator login form

```html
<div class="title-wrapper">

<h2>Admin Login Form</h2>

</div>

<div class="contact_form">

<form   method="post"   action="login.php"   name="contact-form"
id="contact-form">

<div id="main">

<div class="one_third">

<label>Username:</label>

<p><input type="text" name="user" id="name" size="30" /></p>

</div>

<div class="one_third">

<label>Password:</label>

<p><input  type="password"  name="password"  id="email"  size="30"
/></p>

</div>

<div class="one_third_last">

            <label> </label>

<input        class="contact_button    button"     type="submit"
name="submit" id="submit" value="Login" />

</div>

</div>
```

```
</form>

</div>

</li>

<!--adminlogin End-->


</ul>

</article>

</div>

<!--Content End-->


</div>

<!--Page wrapper End-->

</body>

</html>
```