DESIGN AND IMPLEMENTATION OF A FARM MANAGEMENT INFORMATION SYSTEM

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CERTIFICATION

This is to certify that the Project Report entitled "**FARM MANAGEMENT INFORMATION SYSTEM**" was carried out **by ALATISHE BABAJIDE RUFAI** with matric no. **CSC/11/0269**, under my guidance and supervision in partial fulfilment of the requirements for award of the degree of Bachelor of Science in **Computer Science** year 2015.

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DATE

DEDICATION

I dedicate this project first and foremost to Almighty ALLAH who has been there right from the beginning to this very point. Special dedication also to my ever supportive folks, for their relentless support and compassion towards me during the course of my four years in the university. A big thanks to all the staff in the Department of computer science (FUOYE), my best friends and lastly to my mentor (Mr. Fasunon Oloruntoba) for his guidance.

To God is the glory.

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ABSTRACT

A Farm Management Information System (FMIS) is a system for ''collecting, processing, storing and dissemination of data in the form of information needed to carry out the operations of the farm. Accurate and easy to use Farm Management Information Systems (FMIS) are of fundamental importance for a successful management of a farm. Despite the electronic data processing revolution, many farmers still embrace the manual record keeping system that is error prone with no facility for periodic assessment of farm inputs and output.

This project work aim to design and implement a computerized farm management information system, named FMIS, focus on information needs of a farm which empowers a farmer to allocate the scarce resources of the farm, and monitor input/output relationship with profit making. The Farm management information system was designed and implemented using HTML (Hypertext Markup language), CSS (Cascading style sheet), PHP (Hypertext pre-processor), MYSQL database and Apache as the webserver. The system was developed using V-model software development approach. An evaluation carried out in this project determined that the project achieved many of its predefined objectives. This system has been tested and proved satisfactory.

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Agriculture is a science of farming. It can be practice for either animal production or crop production purposes. A Farm Management Information System (FMIS) is a system for ''collecting, processing, storing and disseminating of data in the form of information needed to carry out the operations functions of the farm (Salami and Ahmadi 2010). These functions include strategic, tactical and operational planning, implementation, and documentation, assessment and optimization of the performed work on the fields or on the farms.

Accurate and easy to use Farm Management Information Systems (FMIS) are of fundamental importance for a successful operational farm management. However, still today many farmers do not use FMISs for various reasons, like lack of knowledge and the complexity of many available FMISs. In particular for small to medium-sized farms and for multifunctional farms appropriate FMISs hardly exist.

1.2 Statement of the Problem

Research about FMIS raised a growing interest in the previous years, because agricultural activities have become more and more complex and decision-making activities need to be supported by a larger amount of information. Till now, many famers were used to carrying out analytical activities by hand, but the information processing load has become more and more intensive (Sørensen et al., 2010).

1.3 Aim and Objectives

Aim of this project is to design a computerized farm management information system.

The objectives of the study are as follows

i. Implement the farm management information system designed.
ii. Test the system developed

The objective that led to this project work is basically to expose the Nigeria farmers in general with the effective, efficient, accurate and timely form of management information system.

1.4 Significance of the Study

It is believed that the introduction of a computerized system of Farm management system will change the whole thing positively. It will totally eliminate the inherent problem which will in turn bring about immense cash value to all farm managers in Nigeria. It will definitely expose and enlighten the Nigeria farmer on what they supposed to know about their management.

1.4 Scope of the Study

The project farm management information system which will automate the major farm operations. The first subsystem is the registration of the employee to the system to keep track of all staff. The second subsystem is the adding of farm records into the farm management information system. The third subsystem is to edit and delete farm record and lastly to view the report for record purpose.

1.5 Organization of the Research

This Project report is organized in five chapters. Chapter one is on the Introduction, Chapter two is on Literature Review. Chapter three is on Research Methodology and System Design, Chapter four Testing and Implementation. Chapter Five is on recommendations and Conclusions.

1.7 Definition Term

Farm Management Information System (FMIS):- farm management information system is a system for ‘‘collecting, processing, storing and disseminating of data in the form of information needed to carry out the operations functions of the farm''(Salami and Ahmadi 2010)

Agriculture: - is a science of farming. It can be practice for either animal production or crop production purposes.

CHAPTER TWO

LITERATURE REVIEW

2.1 Literature Review on Farm management information system

A Farm Management Information System (FMIS) is a system for ''collecting, processing, storing and disseminating of data in the form of information needed to carry out the operations functions of the farm'' (Salami and Ahmadi, 2010). These functions include strategic, tactical and operational planning, implementation, and documentation, assessment and optimization of the performed work on the fields or on the farms. For improvement of the execution of these functions, various management systems, database network structures and software architecture have been proposed to serve these purposes (Beck (2001); Nikkilä, Seilonenen and Koskinenen (2010); Sørensen, et al, (2011)). This project subject are functioning FMISs for multifunctional farms that support farmers in managing their farms both effective and efficiently. Within the scope of this project the term "Management" encompasses the following activities:

i. Planning;

ii. Organization;

iii. Monitoring;

iv. Controlling.

The objective of this project is to deduce a specific FMIS from a general FMIS to support the management of multifunctional and medium-sized farms. The intended FMIS has to accurately display all branches of the farm at hand necessary to develop a new FMIS which represents a valuable tool for the farmer to successfully manage his farm. Successful farm management in this context implies that the farmer is capable of allocating scarce resources in a way that maximizes his profit. To empower the farmer in achieving this aim the FMIS has to master the planning, organization, monitoring, and controlling of all the farm's production and business processes. Besides, the FMIS has to pay special attention to the farm's internal interdependences of the different branches of production and services. Lastly, the FMIS has to be easy to understand and to use, and to be readily adaptable. Only then the system will be most likely used by the farmer. Only if all the mentioned conditions are met, the Information system might have the capability of enhancing the farmer's decision making process and increasing his/her income.

Accurate and easy to use Farm Management Information Systems (FMIS) are of fundamental importance for a successful operational farm management. Unfortunately, most farmers do not use FMISs when it comes to operating their businesses, despite the increasing professionalism in the agricultural sector and its increasing usage of information technologies. The skilful and conceived management is one of the most important success factors for today's farms (Mishra, El-Osta, and Steele, 1999; Muhammad, Tegegne and Ekanem 2004). Only when a farm is well managed, it can generate the funds to finance its sustainable development and thereby its survival in today's fast changing environment. However, a sophisticated management is a challenging and time-consuming task, and has to be organized as efficiently as possible (Forster, 2002; Doye, et al., 2000).

Reasons that explain the importance of a sophisticated farm management are certainly diverse, however, three major factors have been identified (Inderhees, 2006; Sørensen and Bochtis, 2010) to include:

i. A complex environment;

ii. Complex farm structures;

iii. The introduction of modern technologies to the agricultural sector (Glauben, and Weiss 2006).

The environment the farms are involved in has become more and more complex over the past decades. Until late 1980s when it was enough to supply a society with cheap and sufficient food products. Today however, much more is expected from the agricultural sector, in particular when it comes to environmental concerns (Rohwer, 2010). Agricultural business has shifted from a simple production sector to a multifunctional service sector (Schöpe, 2005). The expectations incorporate compliance with regulations to be entitled for European union subsidies (Morgan, Cotter, and Dowd 2012; Sørensen and Bochtis 2010), new and stricter guidelines for the use of agrochemicals (Villaverde, et al., 2014), food safety (Magnuson, et al 2013) and animal welfare requirements and environmental concerns (Malcolm 2004) and (BMELV, 2004).

Furthermore, agricultural production has become an international business because of the liberalization of agricultural markets (Weiss, Thiele, 2002; Mußhoff and Hirschauer 2004). Together with the decrease of shipment costs, it became economically feasible to trade agricultural commodities on the world market. This development makes it possible that a farmer in one country is affected by a change of agricultural policy in another country by more volatile prices (Malcolm 2004);

The second reason, why farm management became more and more difficult lays within the farms themselves. In Germany for instance, the total number of farms has decreased since the 1970s whereas the cultivated area did not change substantially (Statistisches and Bundesamt, 2012). Consequently, the remaining farms have become larger to benefit from economies of scale (Nause, 2003) but they also became more difficult to manage (Glauben, Tietje, and Weiss, 2006). But not all farmers reacted in the way of augmenting their cultivated area. A significant number of farmers started to diversify the business, by introducing new branches of production, offering services or by starting direct-marketing of crops (Weiss, Thiele, 2002; Horstmann and Schulze 2011). Either way, the management of farms became more complex.

The introduction of modern technology contributed to the challenge of sophisticated farm management. In this context modern technology incorporates in particular, the usage of PCs coupled with the application of the corresponding software of the financial statements of farms, planning tasks for land cultivation husbandry etc. Additionally, many farmer introduced GPS added tractors and "smart" machinery, GIS-supported landscape modeling and other state of the art technology, making special knowledge indispensable (Linseisen, Spangler and Hank, 2000; and Zeddies 2001). All these technologies can be combined under the expression "Wired Farm" or "Precision Farming" (Sigrimis, et al., 1999).

A major outcome of the three developments described is the generation of large data volumes. To handle and to benefit from theses enormous data volumes, farmers have to be capable of performing the following tasks:

i. Collection of Data;

ii. Processing of Data;

iii. Providing Data;

iv. Using Data.

To deal with these four tasks farmers have to introduce an integrated Information System (IS) - sometimes also called DSS (decision support systems). Integrated in this context means that the IS has to be the connecting part between the farm's ERP (enterprise resource planning system) and the FMIS (farm management information system), (Sørensen and Bochtis, 2010). Only when an IS fulfils, both the data handling and the integration requirements it can satisfy its overall goal, namely to make the available data usable (McCown, 2002; Bryant 1999; Kuhlmann and Brodersen, 2001), to contribute to a better decision-making process, and finally to a better management of the farm (Fountas et al 2005). At the end farm management is always about analysing data and making choices in order to allocate the scarce resources of the farm in the best way (Malcolm 2004; and Parker, 2003). However, a well-designed and easy to use FMIS for medium-sized and multi-functional farms has not been developed yet.

2.2 Literature Review on cassava

In Nigeria, and most African countries, cassava is one of the most important carbohydrate sources. It is usually consumed in processed forms. In recent times, several processing options have emerged from cassava such as garri, fufu, starch, flour and chips. Irrespective of these options, garri (roasted granules) and edible starch (which is a by-product from drying the grated tubers) have maintained an important position in the food timetable of many households in Nigeria, although starch consumption is most notable in the south-south region of Nigeria (Erhabor and Emokoro, 2007). Cassava is grown throughout the tropics and could be regarded as the most important food root crop in terms of area cultivated and total production. Cassava roots are rich in energy, containing mainly starch and soluble carbohydrates, but are poor in protein; these and other features endowed it with a special capacity to bridge the gap in food security, poverty alleviation and environmental protection (Clair and Etukudoh, 2000).

Among the starchy staples, cassava gives a carbohydrate production which is about 40 percent higher than rice and 25 percent higher than maize with results that cassava is the cheapest source of calories for both human nutrition and animal feeding.

The wide acceptance of garri and edible starch in Nigeria holds much promise for food security in the country. However, cassava processing into garri and edible starch is not oriented towards commercialization, but instead farmers processed cassava on subsistence level (Ugwu 2008).

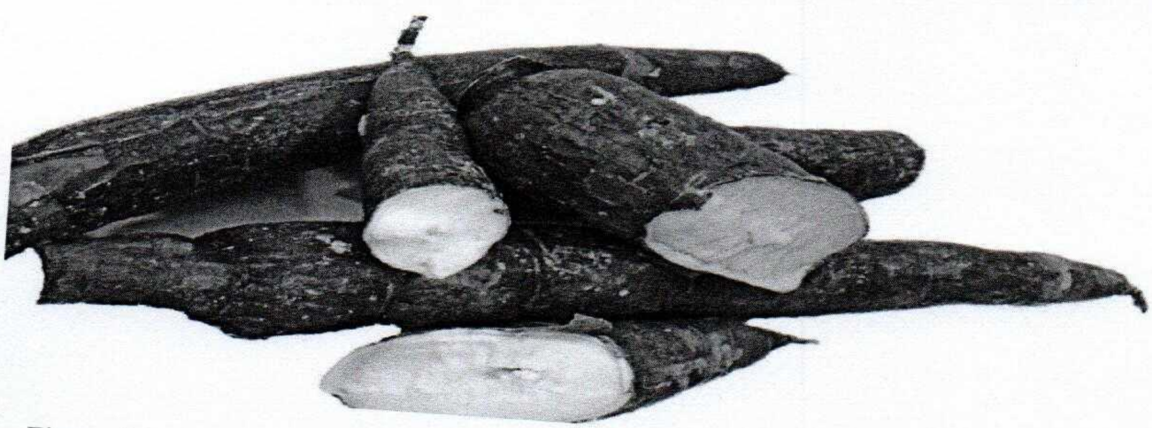

Figure 2.1 Diagram of Cassava (Retrieved from http://www.nivoba.com/cassava)

2.2.1 Method of production

In general, the processing stages in processing of garri cassava include peeling, washing, grating, chipping, drying, dewatering/fermenting, pulverizing, and sieving/sifting, and frying (Peter, Agbetoye and Ogunlowo, 2010).

i. Peeling/washing is the first stage performed after the cassava tubers have been harvested. Washing should be carried out thoroughly to avoid contamination of the final product with peel, sand, and so on.

ii. The next stage is grating with the use of graters. Dewatering/fermentation of cassava mash is the most difficult operation in cassava processing. Fermentation and pressing/dewatering are done in one operation. Fermentation must be properly controlled, as too short a period will result in incomplete detoxification and a bland product. Too long a period will give the product a strong sour taste. Both over- and under-fermentation also badly affect the texture of the final garri. In Nigeria, this lasts between 1 to 4 days. The duration affects the colour, taste and texture of the cassava mash (Peter et al., 2010).

iii. The next step is drying. If too much liquid is pressed from the grated cassava, the gelatinization of starch during subsequent roasting is affected and the product is whiter. If sufficient liquid is not removed, however, the formation of granules during roasting is affected and the dough is more likely to form into lumps. The ideal moisture content is 47-50 percent, and this is assessed visually by experienced garri producers (Hahn & Onabolu, 1988).

iv. After drying, the cassava mash is sieved and fried in shallow pans. Sieving is important to obtain a high-quality product, free of fibrous contaminants and with similar-sized granules. Frying/roasting is a complex procedure which depends on the skill of the operator. The granules must be roasted to about 80 °C/175 °F to achieve partial gelatinization of the starch. If lower temperatures are used, the product simply dries and produces a dry white powder. Too high a temperature will cause charring of the product and make it stick to the roasting pan. Palm oil may be added to prevent the pulp from burning during roasting and to give a light yellow colour to the garri. When palm oil is not added, a white garri is produced. Palm oil contains substantial quantities of vitamin A; therefore, yellow garri is 10-30 percent more nutritious and usually more expensive than white garri.

Then the fried garri is spread to cool before packaging. Cassava is commonly consumed either by being soaked in cold water with sugar, coconut, roasted groundnuts, dry fish, or boiled cowpea as complements or as a paste made with hot water and eaten with vegetable sauce. When properly stored, it has a shelf-life of six months or more (IITA, 2005). Cassava plays different but important roles in African development depending on the stage of the cassava transformation in a particular country: famine reserve, rural food staple, cash crop and urban food staple, industrial raw material, and livestock feed. The first three roles currently account for 95 per cent of Africa's cassava production while the last two account for only 5 per cent (Nweke, 2004). Cassava is a very important food crop that is capable of providing food security.

However, a lot of problems prevent the development and use of modern equipment for its production. Most of the cassava produced still comes from peasant farmers who depend on manual tools for their field operations and these farmers are instrumental to making Nigeria the world's largest producer of the crop. An increase in production of cassava to sustain the world food security needs improved machinery to allow its continuous cultivation and processing (Kolawole et al., 2010).

2.3 Literature Review on Maize

Maize (Zea mays L.) is a member of the grass family (gramineae). It originated from South and Central America. It was introduced to West Africa by the Portuguese in the 10th century. Maize is one of the most important grains in Nigeria, not only on the basis of the number of farmers that engaged in its cultivation, but also in its economic value. Maize is a major important cereal being cultivated in the rainforest and the derived savannah zones of Nigeria. Maize over time does not only serve as the source of food for man and livestock but also as a source of income and foreign exchange. Ransom et al., (2003) reported that maize dominates the agricultural sector of Terai, employing 60% of the work force and 28% of the gross domestic product (GDP). In Nigeria, it is the third most important cereal after sorghum and millet (Ojo, 2000; Faranti 2005) in a study reported that maize farming was profitable in Akoko North East and South West Local Government Areas of Ondo-State with gross margin and net returns of N2,637.80 and N2,141.00 respectively in the previous farming year.

Grains produced in Nigeria are maize, rice, cowpea, soybean, sorghum, millet and groundnut. Maize has been in the diet of Nigerians for centuries. It started as a subsistence crop and has gradually become a more important crop. Maize has now risen to a commercial crop on which many agro-based industries depend for raw materials (Iken and Amusa, 2004). Maize is the most important cereal in the world after wheat and rice with regard to cultivation areas and total production (Purseglove, 1992; Osagie and Eka, 1998). Maize can be classified according to the structure of the grain. We have sweet corn, flint corn, popcorn, dent corn, soft or flour corn and pod corn. According to IITA (2001) report, maize contains 80percent carbohydrate, 10percent protein, 3.5percent fiber and 2percent mineral. Iron and Vitamin B are also present in maize.

Africans consume maize as a starchy base in a wide variety of porridges, pastes, grits and beer. Green maize (fresh on the cob) is eaten parched, baked, roasted or boiled and plays an important role in filling the hunger gap after the dry season. According to Khawar et al., (2007). Maize has a variety of uses. Its grain is a rich source of starch, vitamins, proteins and minerals. The starch extracted from maize grain is used in making confectionary and noodles. Corn syrup from maize contains high fructose and act as sweetener and retains moisture when added to foods. Plastic and fabrics are made from corn stocks. Ethanol obtained from maize can be used as a biomass fuel. Stigmas from female corn-flowers, known as corn silk, can be used as herbal supplements. Maize straw is a cheap source of energy and can be used in home-heating furnaces.

Maize can be used as forage, feed for livestock and making silage after fermentation of corn stocks. Maize is used extensively as the main source of calories in animal feeding and feed formulation. Maize gives the highest conversion of dry substance to meat, milk and eggs compared with other cereal grains. Maize is a valuable feed grain, because it is among the highest in net energy content and lowest in protein and fibre content. . Maize is a cereal plant that produces grains that can be cooked, roasted, fried, ground, pounded or crushed to prepare various food items like pap, 'tuwo' 'gwate', dokunnu' and host of others. All these food types are readily available in various parts of Nigeria among different ethnic groups, notably among which are Yorubas, Hausas, Ibos, Ibiras, Ishan, Binis, Efiks, Yalas e.t.c. Preparation and uses of the maize grains varied from group to group, though at times with some similarities. Apart from food, maize is also useful as medicines and as raw materials for industries.

About 28 food items or dishes and 6 medical values of maize were discussed in a study carried out by Abdulrahaman and Kolawole (2008). Some of these include hot and cold pap, 'tuwo', donkunnu', 'maasa', 'cous cous', 'Akple', 'Ukejuka', 'Gwate', 'Nakia', 'Dambu alubosa', 'Abari', 'Egbo', 'Donkwa', 'Popcorn', 'Ajepasi', 'Aadun', 'Kokoro', 'Elekute', cooked and roasted maize. Maize is a multipurpose crop because every part of its plant has economic value. The grain, leaves, stalk, tassel and cob can all be used to produce a large variety of food and non-food products (IITA, 2001). In industrialized countries, maize is largely used as livestock feed and as a raw material for industrial products, while in low-income countries, it is mainly used for human consumption (IITA, 2001). Although maize is increasingly being utilized for livestock feed, it is still a very important staple food for millions of Nigerians.

Figure 2.2 Diagram of Maize (retrieved from http://www.nivoba.com/maize)

2.3.1 Method of planting maize

i. Till the soil with a rototiller or a hoe to a depth of 6 inches. Test the soil to verify that the pH level is between 6 to 6.5. Correct the soil, if necessary with powdered lime.

ii. Fertilize the soil with 12-12-12 fertilizer, 3 pounds for every 100 feet of garden. Add a second layer of fertilizer later in the growing season, when plants are 12 inches tall.

iii. Create even rows in the garden using a hoe. Space rows 30 to 36 inches apart. Pile each row into a narrow hill. Corn needs pollination to produce its vegetables, so create several rows rather than one long one. A set of short rows produces more corn than one or two rows.

iv. Poke the top of the hill with your finger, creating a hole from 1 to 1 1/2 inches deep. Drop in one or two kernels of corn. Cover the top of the hole loosely with soil. Do not pack the soil. Move down the hill approximately 8 inches and poke another hole into the hill. Continue to add corn until all the corn is planted.

v. Water the corn the day after planting the seeds.

2.4 Literature review on Yam

Yams (Dioscorea species) are annual root tuber bearing plants with more than 600 species out of which six are socially and economically important in terms of food, cash and medicine (IITA, 2009). Some of the yam species are water yam (Dioscorea alata), white yam (Dioscorea rotundata), yellow yam (Dioscorea cayanensis), Chinese yam (Dioscorea esculant) and three-leaf yams (Ike and Inoni, 2006; Olubukola and Bolarin, 2006; Zaknayiba and Tanko, 2013). Yams as a stable food crops do not only serve as integral vehicle for food security, but also as a source of income, and employer of labour in the producing areas in Nigeria. Lack of finance, inadequate farm inputs, storage facilities and high cost of labour are identified as the primary constraints to yam production in the country. They are grown in tropical regions and mostly produced in the savannah region of West Africa, where rainfalls are divided into wet and dry seasons (FAO, 1997).

This crop is also grown in Latin American and Caribbean countries like Colombia, Brazil, Haiti, Cuba and Jamaica (FAO, 2013). Nigeria is the largest producer of yams in the world, followed by Ghana, Cote D'Ivoire, Benin, Togo, and Cameroon (FAO, 2013). Yams are mostly marketed as fresh tubers and prepared for consumption. Yams are the most harvested crops in Nigeria, following are cassava, maize, guinea corn, and beans/cowpeas. More so, cassava, yams are the most commonly harvested tuber crops in the country (National Bureau of Statistics, 2012). Yams do not only serve as the main source of earnings and food consumption, but also as a major employer of labour in Nigeria. Maikasuwa and Ala (2013) examine some determinants of yam production in particular regions in Nigeria.

They find that the factors of production such as labour, finance and material inputs like fertilizer have influenced yam production in the region. In the same direction, (Etim, Thompson and Onyenweaku 2013) investigate the relationship between farm level and output-oriented technical efficiency indices. Their results suggest that farmers' education, family labour, extension contact and experience of farmers have a positive effect on the farm level technical efficiency and yam output.

2.4.1 Socioeconomic Importance of Yam Production

Yams are among major cash and most consumed food crops West African countries (GTZ, 1999) like Nigeria (Babaleye, 2003; National Bureau of Statistics, 2012). Its cultivation is very profitable despite high costs of production and price fluctuations in the markets (IITA, 2013; Izekor and Olumese, 2010). An average profit per yam seed, after harvest and storage in Nigeria, was calculated at over US$13, 000 per hectare harvested (IITA, 2013). Households demand for yam consumption is very high in Sub-Saharan Africa. Nutritionally, yam is a major staple food consumption, providing food for millions of people in the West Africa. It is eaten in different forms such as fufu (the so-called poundo yam and Amala in Nigeria), boiled, fried and roasted (Aidoo, 2009; IITA, 2009).

2.4.2 Constraints to Yam Production

Some studies (Ayanwuyi, Akinboye and Oyetoro 2011; Kleih, Phillips, Mignouna, Ogbonna and Siwoku, 2012), stressed that low soil fertility, lack of improved yam varieties, poor road networks, high cost of labour and lack of finance to carry out necessary farming activities were the constraints to productivity. Yams like many other crops in Nigeria are labour intensive. The high cost of labour has been among the major constraints to yam production. It has constrained smallholder yam farmers from enhancing productivity (Ayanwuyi, Akinboye and Oyetoro, 2011; Migap and Audu, 2012). The labour cost of yam production from mounding to staking, especially in the forest areas account for approximately 40% of cultivation costs. In addition, about 50% of the expenditure goes to the planting process (IITA, 2009). In order to cut labour cost, most family members practically do all the production and marketing activities themselves (Ike and Inoni, 2006). Okeoghene, Egbodion and Ose (2013), confirmed that over 65% of smallholder farmers used family labour in Delta State, Nigeria. Pests' related issues have also been identified as major constraints to yam production.

These include parasitic nematodes; insects such as leaf and tuber beetles; fungi such as leaf spot, tuber rot, and other viruses (Asante Mensah and Wahaga, 2007; ITA, 2009; Zaknayiba and Tanko, 2013). Insufficient farm inputs and modern technologies are also constraints to yam production in developing countries like Nigeria, Ghana, Cote d'Ivoire, Benin and Togo. Consequently, the majority of smallholder yam farmers in these areas still used traditional farming methods such as hand hoes, axes, woods and cutlasses for farm related activities mostly. More so, insufficient chemicals and fertilizer applications and the declining of soil fertility are identified as the factors that are constraining output growth in recent time. The financial resource is another major constraint to yam production as farmers are poor, and they suffered from limited access to credit facilities, thereby impeding higher productivity and output (Izekor and Olumese, 2010).

Lack of adequate provision for agricultural loans from the financial institutions to producers has constrained a sustainable yam cultivation in Nigeria. Presently, wealthy farmers have started using modern farm inputs such as fertilizer, machinery, insecticides to boost productivity and enhance the quality of yam cultivation in the areas. Whereas the majority poor smallholder yam farmers are still using traditional methods of farming (Verter and Bečvařova, 2014).

Figure 2.3 Diagram of Yam (Missouri (1996) retrieved from http://www.google.com)

Tuber is the main part of the yam plant which has high carbohydrate content (low in fat and protein) and provides a good source of energy. Unpeeled yam has vitamin C. Yam, sweet in flavour, is consumed as boiled yam (as cooked vegetable) or fried in oil and then consumed. It is often pounded into a thick paste after boiling and is consumed.

i. Cut tubers into several pieces in spring, making sure each piece contains a bud or "eye." The upper tip of the tuber is the most viable part and is called a "sett."
ii. Allow your cut pieces to cure for one to two days before you plant them to prevent rotting in the ground. Dip the cut portion of each sett in wood ash if you wish, which helps the curing process. Store the pieces in a warm, dark, dry and well-ventilated area.
iii. Prepare a planting area in full sun. Select an area that is relatively free of rocks. Amend the soil with organic compost and other organic materials, such as fallen leaves, grass clippings and chopped plant parts. Spread a 2- to 3-inch layer of organic material on the soil surface, and then mix it into your soil with your shovel. If you will be planting more than one row of purple yams, space the rows about 4 feet apart.

iv. Make planting holes about 6 inches deep and 10 to 12 inches apart. Drop one of your cut pieces into each hole, and fill with the soil mixed with organic materials.
v. Build up your rows after plants begin to grow. Shovel soil from the areas to either side of each row, and pile it on top of the row.
vi. Fertilize your yams with a plant food containing equal amounts of nitrogen, phosphorus and potassium. Fertilize when you first plant your yams, six weeks after that and again 12 weeks later. Yams also benefit from the addition of mirconutrients such as calcium, magnesium, sulfur, boron, chlorine, copper, manganese, molybdenum

2.5 Literature Review on Poultry

Poultry is a team addressing wide variety of domestic birds such as chickens, ducks, geese, turkeys, guinea fowls and ostriches. Poultry keeping is a lucrative business venture and it requires little investment to start (Banerjee, 2005). Thus, Ezeibe (2010) reported that poultry production is a very important arm of the livestock sector as poultry has high feed conversion rate, high fecundity and contributes high to economic gains of the operators in Nigeria. He stressed further that poultry production enjoys high interest among livestock production and the meat has high demand in Nigerian markets because of its nutritional facility. But, Mohammad and Fatholah, (2011) reported that the distance of demand and supply of poultry products is very high to provide the least needed animal protein of 36g per person in a day. A skill is an ability to do something expertly well (Egbe, 2005).

In this study, skills are the abilities of poultry operators to correctly take decisions and set goals of the enterprise, mobilize and utilize resources, utilize technical skills in poultry business venture, manage risks and market poultry farm manager take informed decisions and work toward maximizing profits. These are the consonants with the views of Arena (1998) that farm managers require marketing, financing and accounting skills in order to choose the best time to sell their products, record sales and estimate profits of the farm. Onuka and Olaiton (2007) added that poultry producers need skills for daily inspection and sanitary of the farm, proper feeding management of resources like feeds and keeping records of farm activities. But the extent the poultry operators possess and use these skills in the study area has not been defined.

Figure 2.4: Diagram of Hen (retrieved from http:// www.chickens.wikia.com)

2.5.1 Method of production

Simple rules for better health of chickens:

- **i.** Give access to the right feed and clean water (potable water wherever possible), in particular for small chicks;
- ii. Build houses or shelters against diseases, wind and rain;
- iii. Clean houses weekly and apply lime wash on the floor and the walls every three to six months; For Small scale confined production systems: make sure to leave the house empty for 2-3 weeks and disinfect the house properly between flocks. Provide clean and dry litter regularly;

iv. Do not put too many birds together (5 hens per m^2 in the house for layers and 10 - 15 chicks/m2 for broilers);

v. Different species of poultry, for example hens, turkeys, pigeons, ducks, and guinea fowls should be kept separate; Small scale confined farmers should not keep other species than the commercial chickens:

vi. Separate chicks from adult birds with exception of the mother hen; Vaccinate chicks against the most important diseases and revaccinate if necessary;

2.5.2 Good practices in small scale poultry production

i. Isolate and treat sick birds – if medication is not possible then kill the sick birds and never eat such birds;

ii. Burn or bury killed birds - They should never be eaten; Simple fences such as hedges should be put in place to separate flock houses/areas;

iii. Visitors should not be allowed to enter the farm;

iv. Dedicated clothing and shoes should be used exclusively in the flock houses and at abattoirs;

v. A disinfectant dip should be provided at the entrance of the flock houses.

2.6.1 Literature review on snail

2.6.2 Housing of Snail

Amuson and Omidiji (1999) stated that there are three main housing systems for rearing of snail. They are extensive system also referred as pasture, free range or outdoor system, semi - intensive (outdoor) and intensive system which may be indoor or outdoor. Amuson and Omidiji (1999) stated that there are three main housing systems for rearing of snail.

2.6.3 Feeds and Feeding of Snails

Giants' African snails have voracious appetite. They are known to eat at least 500 different types of plants including peanuts, beans, peas and melon. If fruits or vegetable are not available that snail will eat, they will take a wild variety of ornamental plants, and tree barks (Akinnusi, 1998). The food also includes grains waste product, such as maize, plantain and succulent vegetable including, nuts, cherry, water leave, cassava, cocoyam, soft sheets and lettuce (Okafor, 2001).

2.6.3 Nutritional Composition of Snail Meat

Snail as human and livestock food serve as valuable sources of nutrition to human and animals with high level of protein, iron, lysine, leucine, arginine, calcium and phosphorus, relatively low amount of sodium, fat and cholesterol compared to poultry and other livestock. (Imevbore and Ademosun 1988; Simpson 1990; Thompson 1996; and Wosu 2003). In general, the nutritional compositions of fresh snail meat are shown in table 2.1.

Table 2.1: Nutritional Composition of Fresh Snail (retrieved from http://www.wikipedia)

Nutrients	Value
Crude	18.20%
Carbohydrate	2.88%
Ether extracts	1.36%
Fat	1.01%
Ash	1.87%
Nitrogen free extracts	4.95
Iron	12.12mg/100g
Water	74.06
Constituents	50.50mg/100g

2.6.5 Profitability of Snail Farming

According to Ogunniji (2009) snail farmer's made profits from their production with gross margin of N29.432.78 and net farm income of N 24.089.03 per farming season, showing that snail farming in the study area is a profitability business. Also Ahmadu and Ojogho (2012) reported that snail production required as low as about N37 only to raise a snail to an average marketable size.

2.6.6 Constraints to Snail Farming

Ogunniyi (2009) stated that the major problems faced by snail farmers are predators such as lizards, snake, frog, bird, ants, termites, cockroaches and theft. Parasite, nematodes, fungi and arthropods may equally attack snail. Okorie (2012) noted that the natural enemies/predators of snails are members of namely vertebrate groups, ground beetles, crickets, centipedes, snakes, toads, turtle, birds, rats, mice and lizard. Humans also pose very serious threat to snails through pollution and destruction of natural habitants of snails.

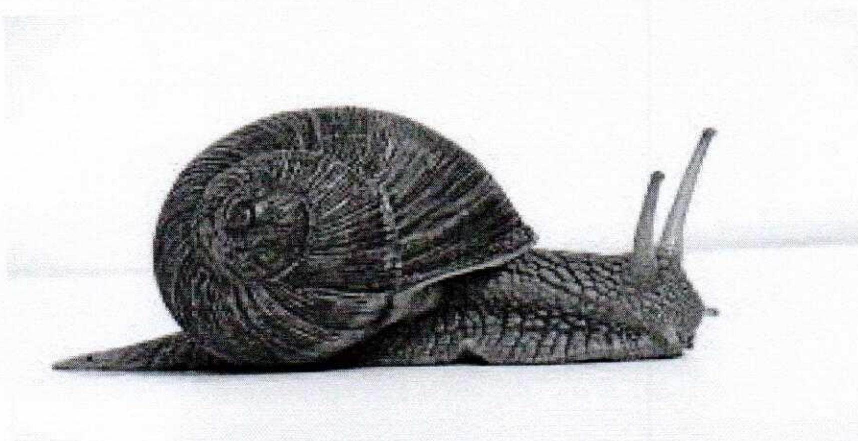

Figure 2.5 Diagram of Snail (retrieved from

2.7.1 Literature review on Fish pond

The increasing demand for required protein production can be satisfied through increasing fish culture by utilizing a large network of natural and man-made reservoirs like ponds, tanks and cages etc. as well as by increasing production per unit area. The extensive fish cultures is dependent upon the natural or inherit pond productivity, while the semi-intensive fish culture system makes more optimum use of various inputs such as manures, fertilizers and supplementary feed. In freshwater fish ponds, total primary fish production, mainly depend upon the availability of nutrients, nutrient recycling and primary nutrients in the form of organic and inorganic fertilization (Moriarity, 1997) and artificial feed (Hargreaves, 1998).

2.7.2 Manuring and Fertilization

Pond fertilization is a management protocol to enhance biological productivity using both organic manure and inorganic chemical fertilizers. Evaluation of fertilizer value of different organic manure (pig, cow, chicken and green manure) has been a subject of research in aquaculture (Green, 1990; Morissens et al., 1996; Yaro et al., 2005).

There are many kinds of potential fertilizers for fish pond fertilization, including inorganic fertilizer and organic fertilizer (manure, poultry droppings and sewage) in which manures from livestock are used more often (Knud-Hansen et al.,1991; Green 1992; Akhteruzzaman and Kiaya, 2003). Fertilizers, fresh feed or both are manipulated in fish ponds to increase production (Nandeesha, 1993; Lane, 2000). For improvement of pond fisheries and to get maximum yield from given fresh waters, it is necessary to fertilize the pond water with good quality inorganic as well as organic fertilizers (Diana et al., 1991; Chattopadhyay and Dev, 2000).

Aquaculture ponds are fertilized to increase the available natural food (phytoplankton and zooplankton) for fry or larval fish, or for species that are efficient filter feeders (Brunson et al, 1999). Since long times, animal manures are exploited in fish ponds as a source of soluble phosphorus, nitrogen and carbon to maximize the algal growth and natural food production (Ali, 1993; Njoku, 1997; Knud-Hansen, 1998; Abbas et al., 2004). Animal manure is often used in semi-intensive systems to improve the primary production of the ponds and fish growth (Nwachukwu, 1997). Excessive application of organic manure and nitrogen fertilizer @ 200 to 400 kg/ha, increased the microbial activity. Fertilizers proved to be an efficient source of nitrates, which are recognized as soil oxidants (Boyd, 2003). The ratio of wet and dry manure to fish weight is found to be positively related with manure conversion of fish yield (Edwards et al., 1994). Cow dung is found to be an effective source of organic fertilization, which positively influences the growth performance of major carps in respect of fish production (Sughra et al., 2003; Kanwal et al., 2003). High doses of cow dung and poultry manuring is found to reduce the value of dissolved oxygen (DO), while optimum dose i-e 0.26 kg m-3 maintain the better water quality and abundance of planktonic biomass, which improves the growth of carps species (Jha et al., 2004).

2.7.3 Requirements for raising fish Pond

Setting up a fish business doesn't require hundreds of thousands as it's imagined and made to seem in literatures, with just N40,000, you can setup a fish pond business. Follow this simple process. The major requirements for raising fishes are land and source of suitable and dependable water supply. The land issue can be solved by building a wooden pond to house the fishes. To culture 100-200 fishes, you'll require a 8 ft Length x 4 ft Breadth x 3 ft High wooden pond, the interior should be covered by a white tarpaulin. The pond should have stands and a slight slope (2-4cm) allowed. Provide water inlet and outlet pipes for the pond if your source of water is a pump driven well, but outlet pipes only if you are to be filling the pond manually. The source of water should be dependable and portable (but not chemicalised, such as tap water). Well water is an advisable option.

After the pond might have been constructed, rub every part of the tarpaulin interior with palm oil (3 milk tins of palm oil is enough), leave for 3days and wash afterwards with soap and disinfectants (such as IZAL).

2.7.4 Juveniles

Of all the culturable fishes, the cat fish Clarias gariepinus (Commonly called Clarias) is advisable for this type of pond. It's strongly advised that you start rearing them from the "juvenile stage". Get your stock from a respectable fish farm in your locality, go to the farm with a container, on the farm, and request that the container be filled with water to 1/3 of its capacity. The water should contain between 2 tablespoonfuls of salt. Time your journey to arrive in the evening, lower the container into the pond which you have earlier filled to 2/3 of it's volume of water, wait for 5 minutes and up, then turn the remaining fishes into the pond. It is advisable to place your pond under a shade. Do not feed your fishes that evening, start feeding them the following morning. You can use feeds like Coppens, Dirante or Multifeed.

Table 2.2 Feeding Schedule (retrieved from http://www.google)

Week	Feed size (mm)	Quantity (Milk tin)	Time of the day	Remark
Day 1	–	–	–	Starve the fish
Day 2-4 Weeks	0.8-1.2	2	MAE	M=Morning (6-7am)A= Afternoon (11-12pm)E= Evening (6-7pm)Afternoon ration= Morning ration divided by 2. Morning=Evening
5-8 Weeks	2	3	MAE	
9-12 Weeks	3	3-4	MAE	3 with supplements or 4 tins without supplements
13-16 Weeks	3-6	4-5	MAE	

2.7.5 Management tips

i. Change the water every week or whenever any green spot is noticed in the pond or whenever the water becomes foul. It may be necessary to wash the pond with soap and disinfectant.

ii. Change the water early in the morning, do not feed before or after you might have changed the water. On such days, feed in the afternoon and evening only.

iii. For the small sized feeds, it is advisable to buy big sized feeds like 2mm and grind it to sizes like 0.8mm or 1.2mm, this is synonymous with ''lebo" and ''gari'' sizes.

iv. Feed supplements like chopped bread, biscuits and "kuli-kuli" can be fed to the fishes as from 9 weeks, but this should not replace the normal feed, it should only act as supplement and it should be in moderate quantity in order to prevent water fouling. Feed these only in the afternoon. Choose feeding spots (preferably at the edge).

v. Do not store your feed for more than a month; always check the expiry date of the feed before purchase. After each use, tie the tip of the feed tightly to prevent nutrient escape.

vi. It is advisable to familiarize yourself with the colour and scent of the feed you are using-so as to easily detect when it's expired.

vii. Insist on juveniles as a first timer and book beforehand so as to prevent being given unhealthy juveniles.

viii. Observe your fishes every day for their condition, if anyone is lying at the bottom of the pond, disturb it, if it wakes, swim and relax again, then something is wrong. In addition, if anyone is gasping on the water surface, disturb it but if it comes back to gasp, something is definitely wrong. If white spots appear on their skin or the fishes fail to pick their feed, it is advisable to consult an aqua-culturist. But as a first aid, administer moderate dose (say 8-10 tablets) of grinded coloured vitamin C on the surface of the water.

ix. Keep record of all activities particularly financial ones-in order to know how much the business gulps and vomits

x. Inform your prospective customers before harvesting.

2.7.6 Harvesting and sales

For total harvesting, harvest on the 14th week and dispose off;. but for retail harvesting, you can start harvesting from the 3rd month to harvest, drain all the drainable water and use scoop net to collect the fishes into a large basin for disposal. Apart from selling them fresh, you can also smoke, sun-dry or prepare pepper soup both for sales and consumption

CHAPTER THREE

SYSTEM ANALYSIS AND DESIGN

3.1 Introduction

System analysis and design is a term used to describe a process, techniques or manner in which an action is performed. Under the development of a system, system analysis and design refers to a step taken in order to ensure that the system is efficiently made. In the development of Farm management information system the following methods are used;

Observation Method:

The researcher personally visited some farmers in Oye-Ekiti to physically examine how most of the operations are being performed manually.

Interviewing Method:

The researcher was introduced to the manager of Bright farms limited in Oye-Ekiti to interview him on how their operations are carried out.

3.2 Analysis of the existing system

The existing way of analysing farm record process was only through the manual process which is tedious. The ability to project into the future based on the quantity of inputs and outputs in relation to profit making and investment purpose is a very useful part of farm management system, this was lacking in the present system. Some of the problems found in the existing system are:

i. Inputs and output relationship did not exist.

ii. Periodic Report generation was absent.

iii. Timely report generation was absent

3.2.2 Description of the proposed system

A Farm Management Information System (FMIS) is a system for ''collecting, processing, storing and disseminating of data in the form of information needed to carry out the operations functions of the farm''. The system will have two level of accessibility which will include administrator page, farmer page. The admin will be able to perform functions which ranges from adding day-to-day record of sales, delete, edit record and report. The farmer page will only be used for registration.

3.2.3 Advantage of the proposed system

Farm management information system helps farmers to carry out some functions such as strategic, tactical and operational planning, implementation, and documentation, assessment and optimization of the performed work on the farm. The advantage of the proposed systems are as follows;

i. Reports are generated dynamically on a periodic basis.

ii. Inputs and output relationship exist.

iii. Timely report generation is absent

iv. User queries and answer are maintain

3.3 System Design

The proposed system is designed in modules and each modules working together to perform the goal of farm management information system in order to enhance the performance of the existing system.

3.3.1 Structure of the proposed system

Figure 3.1 below is the technical view of the FMIS with the connected systems grouped to four categories. The architecture will be discussed bottom-to-top, starting with the data storage and then moving on to the application logic. The application logic is further divided to class library, data transformation and communication layers. Finally the data transfer and formats to the different systems are considered. All data within the Farm management information system are stored to several RDBMS (relational database management system) using the SQL (structured query language) query language for interaction. Authentication database contains the identification and authentication information for all users of the system. Also contained within the authentication database are the access permissions to data that are used when dealing with for example authorities and contractors.

The authentication database additionally contains the authentication information to other services; if a mutual trust and agreement exists between the maintainers of the Farm management information system and some external service, the Farm management information system can automatically authenticate users for the external service. General Farm management information system database contains the same heterogeneous collection of information about the farm that is stored by any commercial Farm management information system. One difference is that the general Farm management information system database must also contain information on farm equipment required for precision agriculture. GIS (Geography information system) database contains exclusively data related to precision agriculture. The data need not be stored in a native GIS format though several relational databases have GIS extensions available to provide efficient queries for the stored GIS data. The GIS database is also the first database expected to exhibit performance problems under an increasing load.

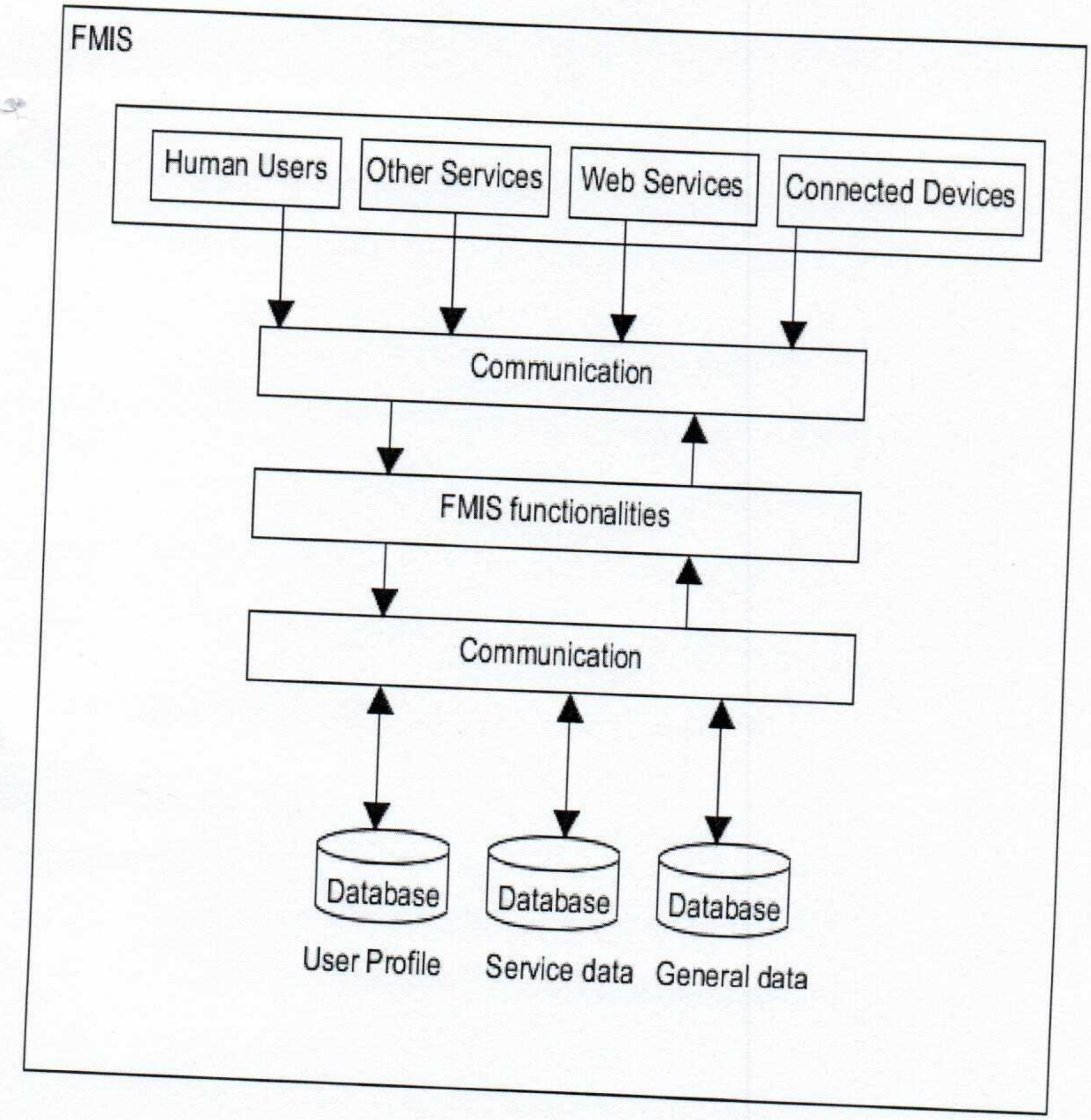

Figure 3.1: Structure of FMIS

3.3.2 System Architecture

Figure 3.2 shows a sample system architecture as it should be understood by the user of the system. The essential structure that should be understood is the centrality of the FMIS as the system to which all other parties are connected. The arrows, representing communication, are purposely left vague in the sense that they do not specify the protocol or content of the communication. This is because the end user need not know or even care how the communication between the various systems is handled, only that it occurs and that it is possible.

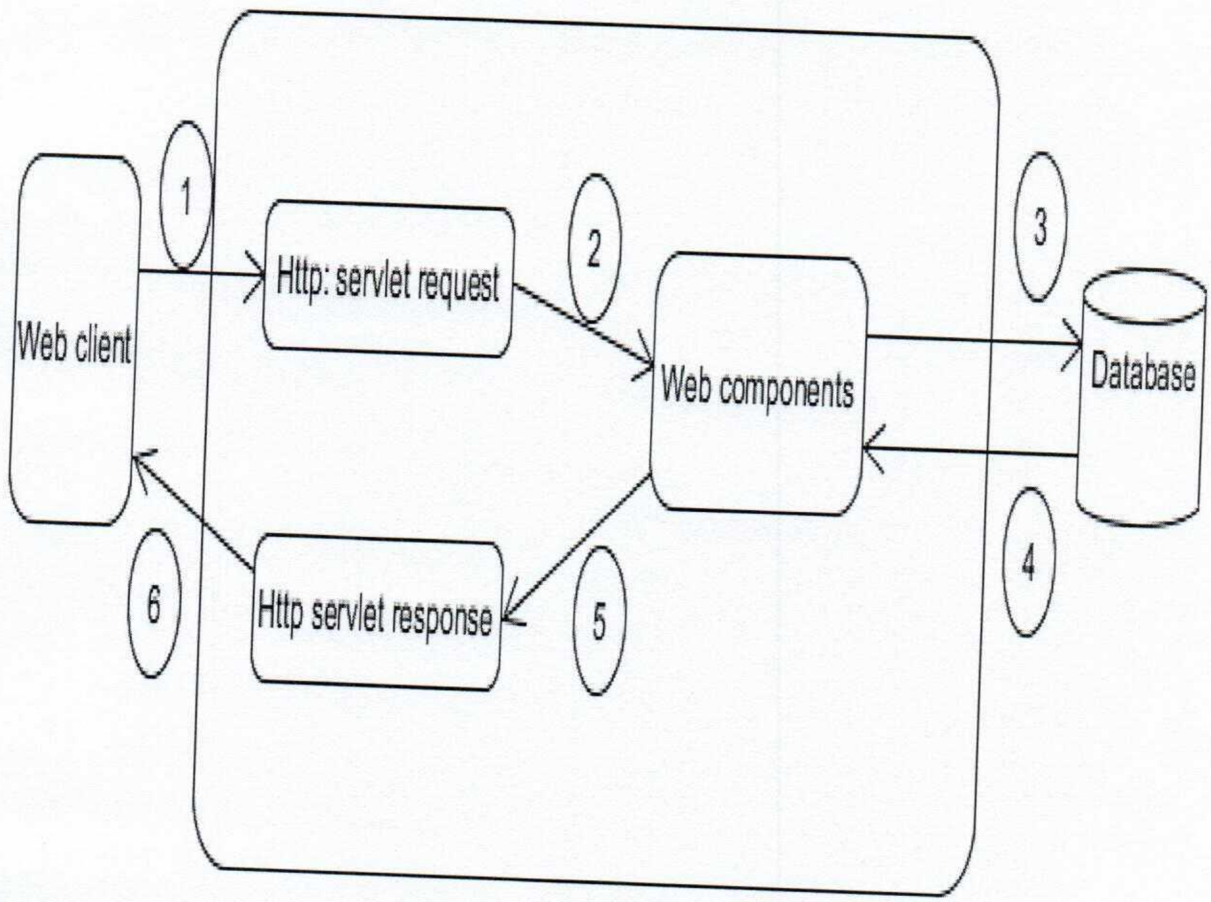

Figure 3.2 System Architecture

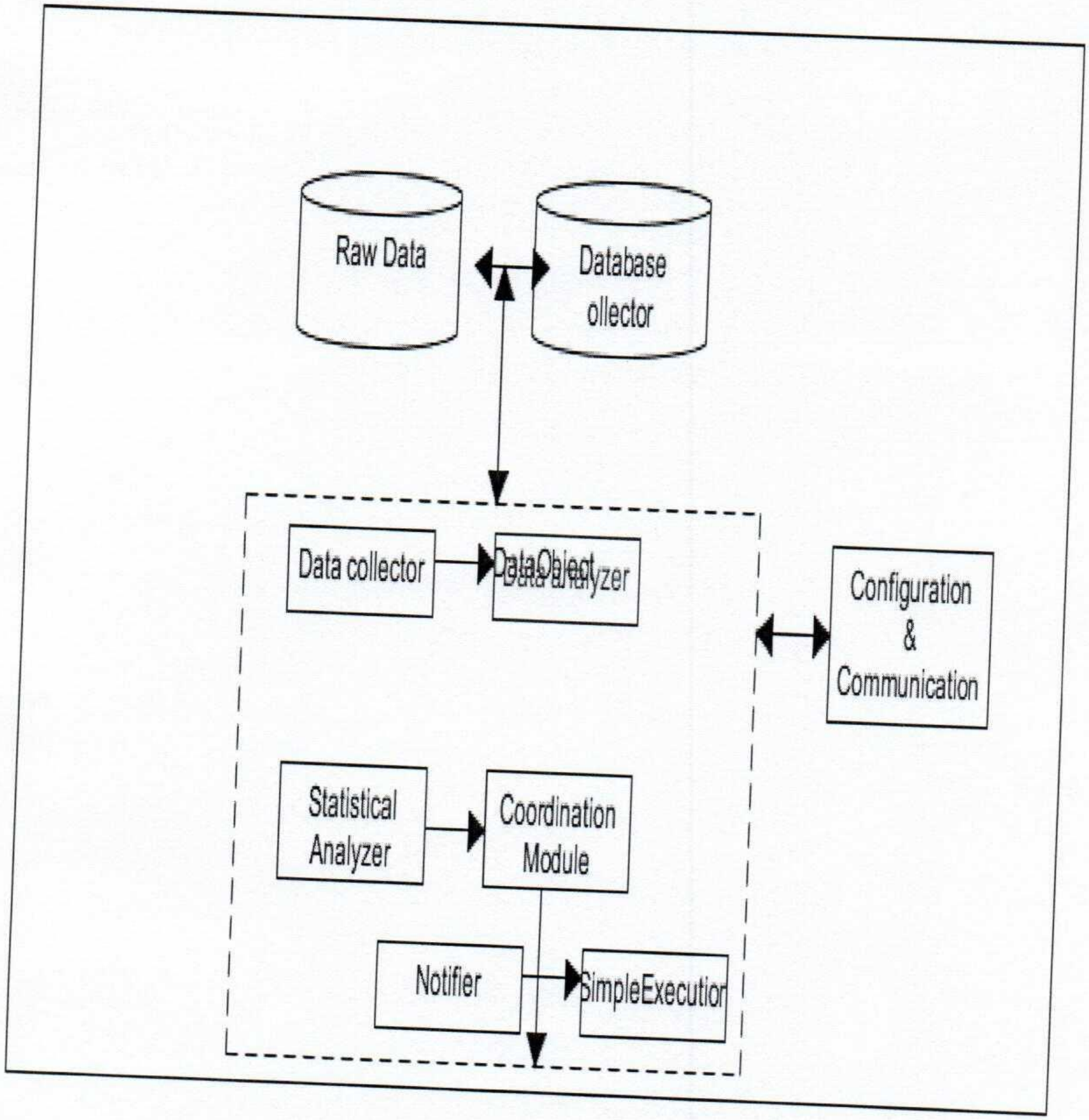

Figure 3.3: FMIS Controller

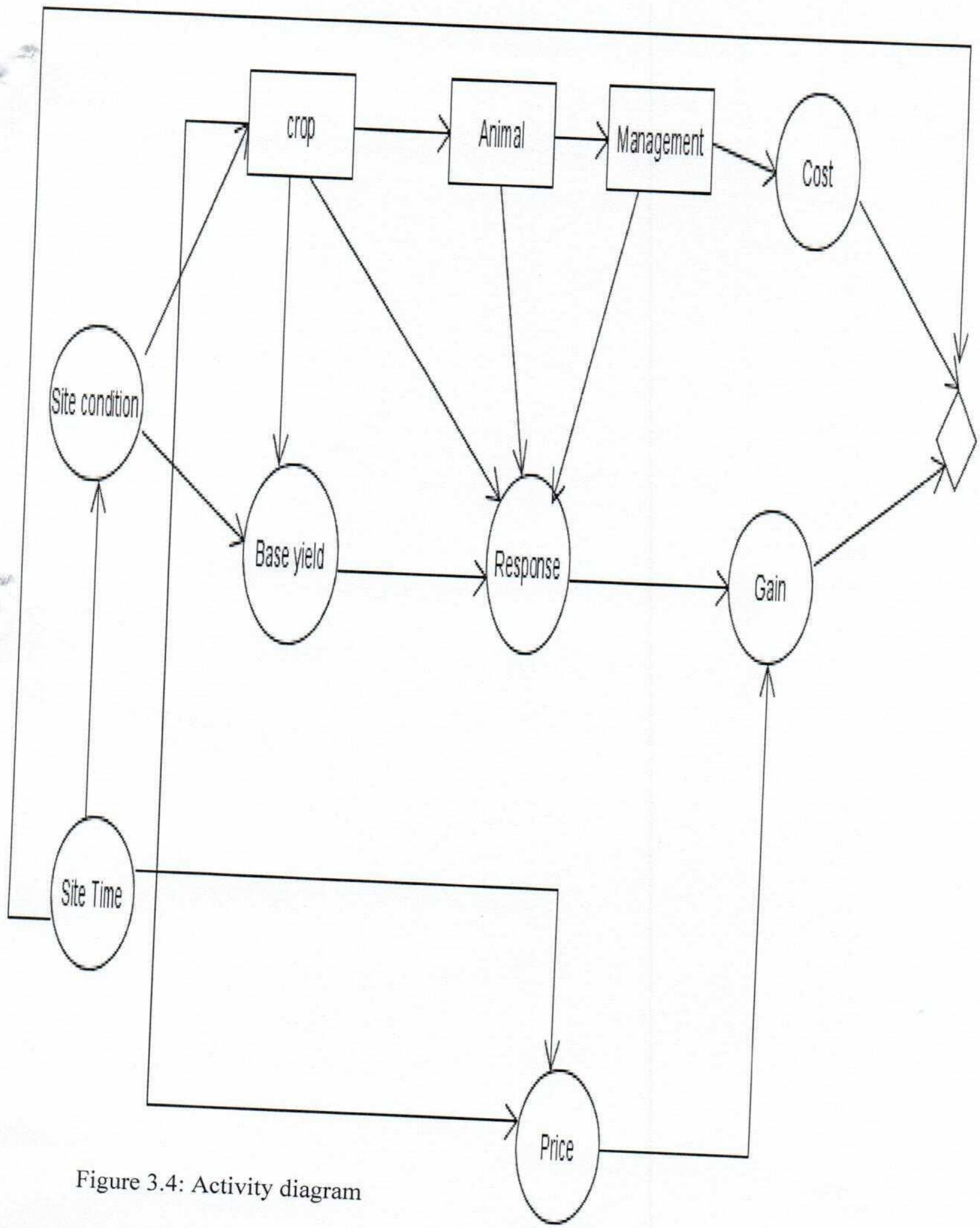

Figure 3.4: Activity diagram

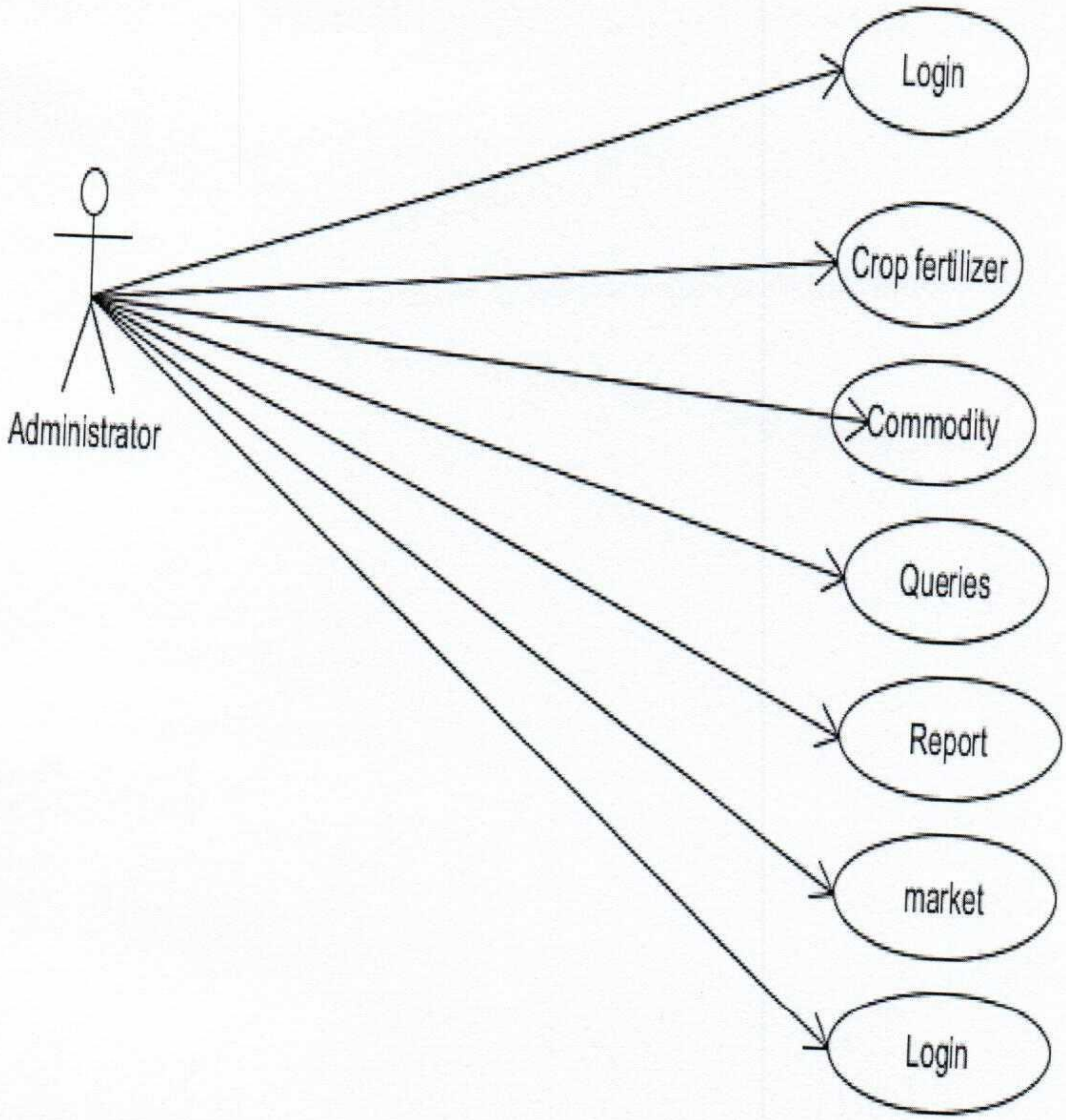

Figure 3.5: Use Case Diagram

3.4 Data Modelling Table

Table 3.1 Enter new farm record Table

Field	Type	Constraint
Product	Char(30)	Not Null
Cost per unit	Int(20)	Not Null
Total unit consumed	Varchar(30)	Not Null
Month	Char(10)	Not Null
Year	Char(10)	Not Null

Table 3.2 Edit record Table

Field	Type	Constraint
Name of Crop/Animal	Char(30)	Not Null
Number in stock	Int(20)	Not Null
Cost of feeding per unit	Int(20)	Not Null
Total unit consumed	Varchar(30)	Not Null
Month	Varchar(10)	Not Null
Year	Int(10)	Not Null

Table 3.3 Daily sales Table

Field	Type	Constraint
No of Crop/Animal sales per day	Int(10)	Not Null
Total cost per day	Int (20)	Not Null
Total cost per month	Int(20)	Not Null
Total cost per year	Int(20)	Not Null

Table 3.4 Report Table

Field	Type	Constraint
Total unit input per year	Varchar(50)	Not Null
Cost of purchase(input)	Int(30)	Not Null
Total sales per year	Varchar(30)	Not Null

3.5 Class Diagram:

A class diagram is an illustration of the relationships and source code dependencies among classes in the unified modeling language. In this context, a class defines the methods and variables in an object, which is a specific entity in a program or the unit of code representing that entity.

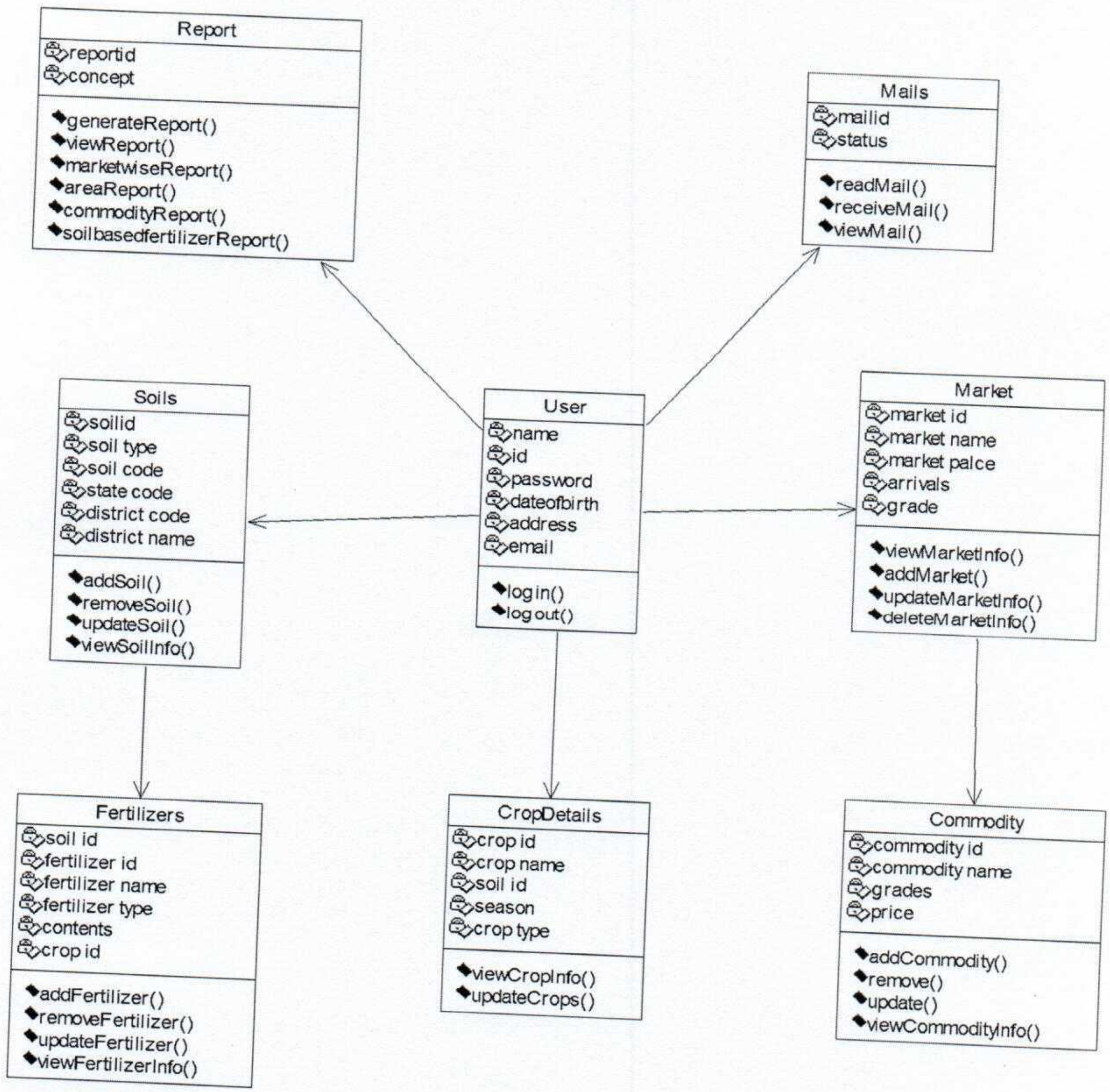

Figure 3.6 Class Diagram

3.5.1 Sequence Diagrams:

Sequence diagram is a diagram that shows object interactions arranged in time sequence. In particular it shows objects participating in the interaction and the sequence of messages exchanged.

Administrator:

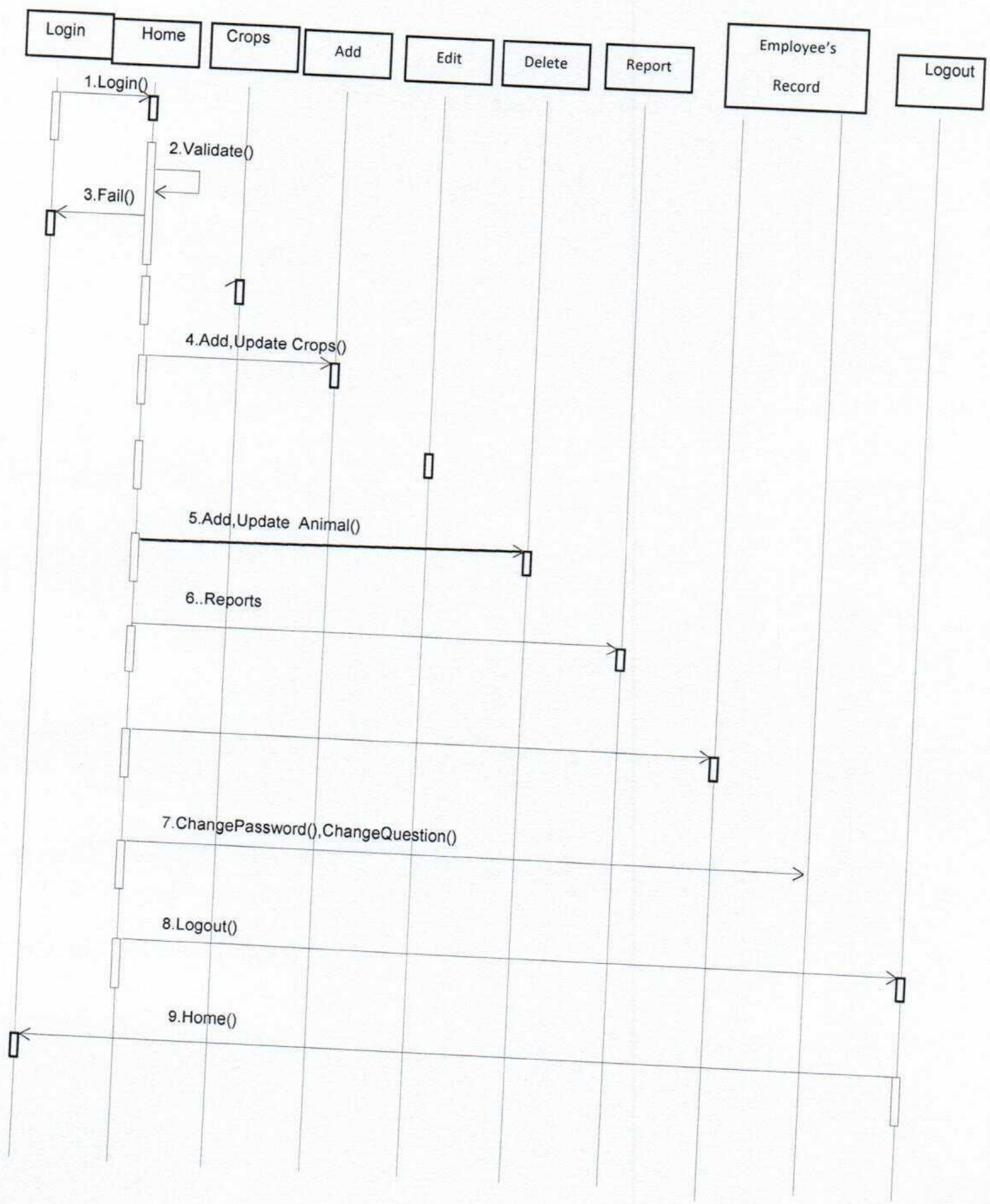

Figure 3.7: Sequence Diagram for administrator

3.5.3 Collaboration Diagrams:

A collaboration diagram also called a communication diagram or interaction diagram is an illustration of the relationships and interactions among software objects in the unified modeling language.

Administrator

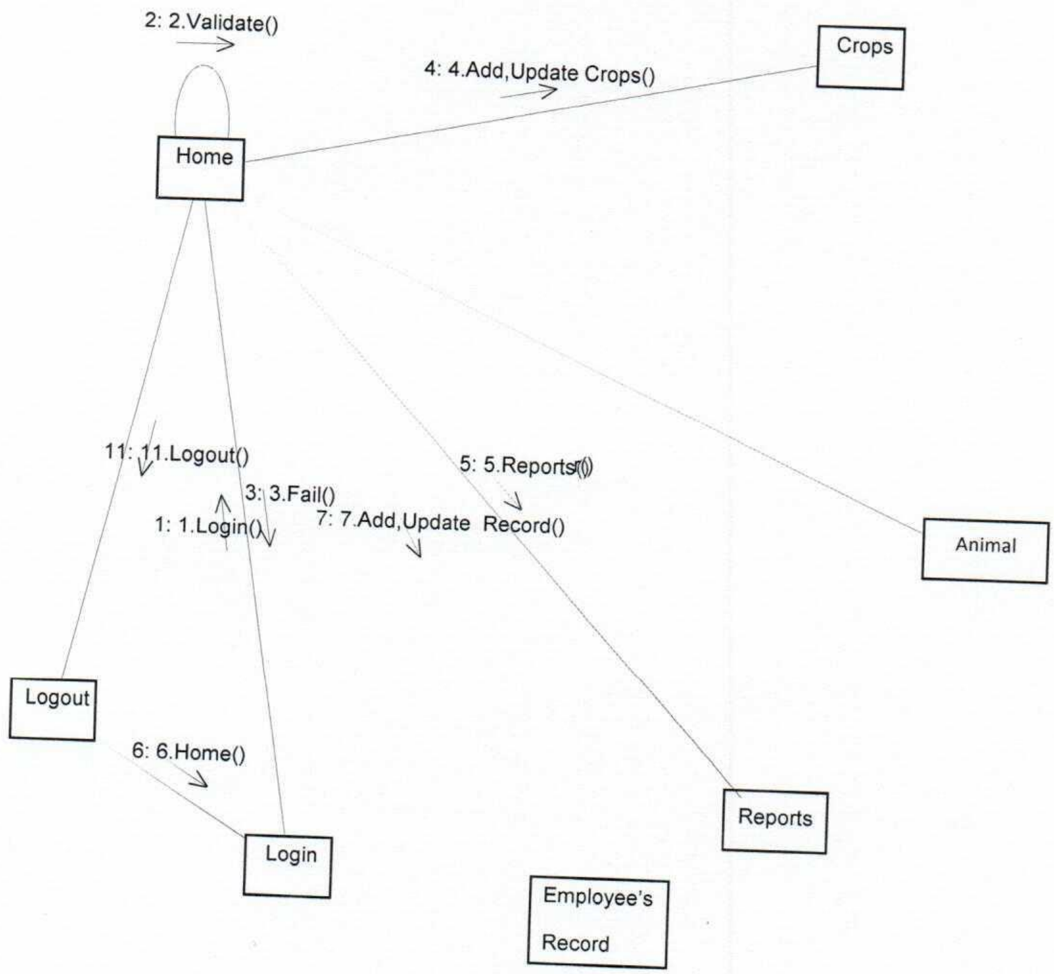

Figure 3.8: Collaboration Diagram for administrator

3.6.1 Pseudo Codes

Log in to system

Startup system

Enter login name and password

On clicking the login button

Verify to know whether user credentials are correct

If not

Deny access and return login page with an error message

If correct

Check if credentials are for administrator

If yes

Allow login

Set admin session

Re-direct administrator to admin home page

If no

Allow login

Set user session

Re-direct user to user home page

Registration

Register a new farmer

Check if unique field value entered already exists

If correct exist

System message: user already exists

If not

Registration of user successful

Adding Record

Enter Record Details

If record exists

Return record already exists

If not

Registration of Record successful

Click on edit button

Query the database to retrieve details

If record exists

Return record details

Check if all fields entered are correct

If not

System message: fields incorrect

If correct

System message: record successfully edited

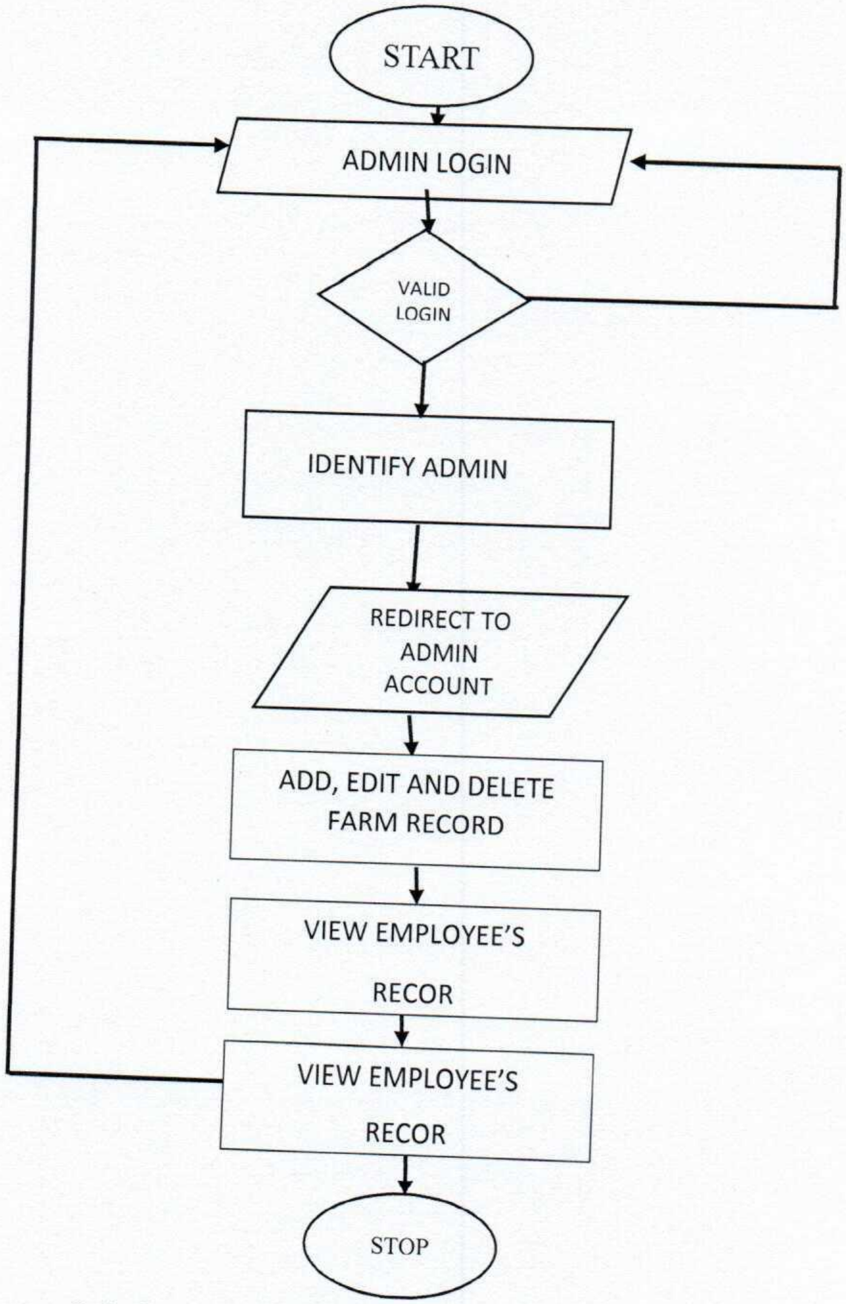

Figure 3.9: System Flow Chart

CHAPTER FOUR

SYSTEM IMPLEMENTATION AND DOCUMENTATION

4.1 Introduction

This describes how the system works and how best computers together with other resources may be applied to perform data storage, management and retrieval for decision making. System design and specification is very important in every software development. At this stage, the researcher put every factor into consideration while making this design. In the course of the design, the system has to be designed in a way that there will be a close relationship between the inputs and outputs. Also, the design format must be acceptable to the end users.

4.2 System implementation

4.2.1 Choice of programming language

The requirement of the research work demands that a capable programming language be used for its implementation. Hence, HTML(Hypertext Markup Language), CSS (Cascading stylesheet), and PHP(Hypertext Pre-processor) was chosen. it was selected because it offers Rapid Application Development (RAD) features that enables software developers to put up visually appealing user interface design in less time. They includes several features to help user develop applications that access data, the data source configuration wizard simplifies connecting your application to data in database. The code Editor has several enhancements, such as word wrap, incremental search, code outlining, and collapse to definition, line numbering, colour printing and shortcuts. Finally it has powerful debugging facility that provides useful hints and suggestion for error handling.

4.2.2 Hardware support

The software was designed on a system with the following configuration.

i. A system running on Pentium 2 or higher processor

ii. The random access memory (ram) should be at least 512mb.

iii. Enhanced keyboard.

iv. At least 20 GB hard disk.

v. V.G.A or a coloured monitor.

4.2.3 Software support

The software specification for the system on which the software was developed are as follows.

i. A window 98 or higher version for faster processing.

ii. MySQL database

iii. Micromedia dreamwaver and Wamp Server.

4.3 Implementation and Testing

4.3.1 Procedure design

The procedural design describes the system generally. It describes the various main programs in the system as well as the relationship that exist between all subprograms included. The procedural designs in this new system are of 5 menus of which each menu has it sub menu.

The application also contains several modules of which each module has its own specific function. The purpose of dividing the program into modules is because it enhances maintainability, readability and easy debugging.

4.3.2 Implementation

Implementation is a very important aspect in the development of any computerized system, and this also applies to the development of the farm management information system. Pro-development Implementation usually involves two main steps, these are;

i. **System Construction**: The system is built and tested to make sure it performs as designed.

ii. **Installation**: Preparation is made to support the installed system. This involves associated documentation

Under system construction, the main task is testing. In the next section is a detailed description of how this was carried out in the designed Farm management information system;

4.3.3 Testing:

Testing is critical for a newly developed system as a prerequisite for it being put into an environment where the end users can use it. Exhaustive testing is conducted to ensure accuracy and reliability and to ensure that bugs are detected as early as possible. In the process of designing the Farm management information system, three levels of testing were conducted, namely, unit testing, integration testing and system testing.

4.3.4 Unit Test

Unit test is where the system is tested partially and independently, component by component, to ensure that particular portion or module is workable within it. In the development of the records management system, each component was tested independently before finally integrating each of them into one system. This test was carried out in other to verify that every input of data was assigned to the appropriate tables and fields. Most of the modules were rather similar and therefore required a rather easy reusable testing process. However, the patient accounts module accessible to the system administrator was one of the unique components that needed to be carefully tested in the Farm management information system. This involved testing each module. This was necessary to ensure that everything is working fine independently.

4.3.5 Integration Test

Integration test is where a combination of several portions or components/sub components of programs are being tested sequentially and continuously. At this stage, all the system components were integrated and a test was based on how they worked together. This involved observing the interaction of the database and the interfaces. After which the system test followed

4.3.6 System Test

A system normally consists of all components that makeup the total system to function. It is required to ensure the smooth running of the system as a whole, and it should perform as expected and as required. Here, technical and functional testing was performed. The technical testing involved the process of testing the systems compatibility with the hardware, operating system, data integrity in the database and user authorization access rights. Functional testing was also carried out to establish how the system would function in its intended working environment.

4.3.7 User Acceptance Test

Due to a few constraints, this part of testing was not done by the researcher, however, after the oral presentation of the project work, the system developer intends to review the system with the intended system users so as to analyze acceptability and usability and also to identify areas that may require modification before the system can fully be commissioned for use.

4.4 System documentation

The software (Application program) was written using PHP, HTML and CSS and can be run on any window operating system. To run the system, the folder that contains the application program is open and the form by selecting any of the option provided.

Also good maintenance should be adopted to see that the system is continuously and correctly working for long period of time.

4.4.1 Program documentation

The need for documentation of a program arises from the fact that the program may develop problems usually referred to as 'bugs' long after it had been written. In this project work a detailed documentation is given for each module, therefore will ease the maintenances of the project work.

4.4.2 Operating the system

Before this project work can be used it requires the user to be trained by the programmer, therefore, will enable the user to be familiar with the modules contained in the program and the function of each modules are expected to be explained in details by the programmer. Before the running of the program, it has to be installed on a PC and launched by the user.

4.4.3 Input design

In input design, user – generated inputs are converted to a computer compatible format. The purpose of designing input is to make data accurate as possible. The first step in input design process is to organize the sources document. Then decision is made as to which media will accommodate data entry into the system. Below are the input interface in the proposed design and description on how to use the software;

4.4.3.1 Administrator Page

The Administrator Page below can only be access with username and password and this password is known by the administrator only. The administrator can add, delete and update farm record only when the username and password is provided.

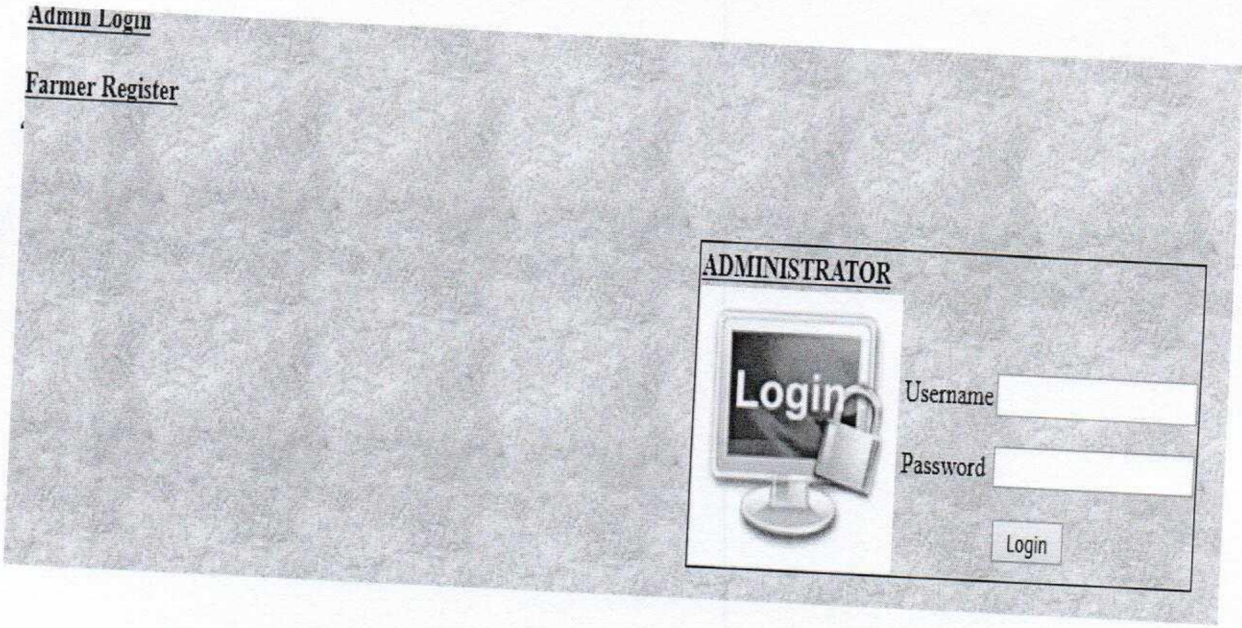

Figure 4.1: Administrator login Page

Here, only the admin have the authorized access to add a particular farm record to the

Figure 4.2: Add Farm Records

4.3.3 Edit Farm Records

Here, only the admin have the authorized access to edit a particular farm record and later store it in the system. The user have no access to this.

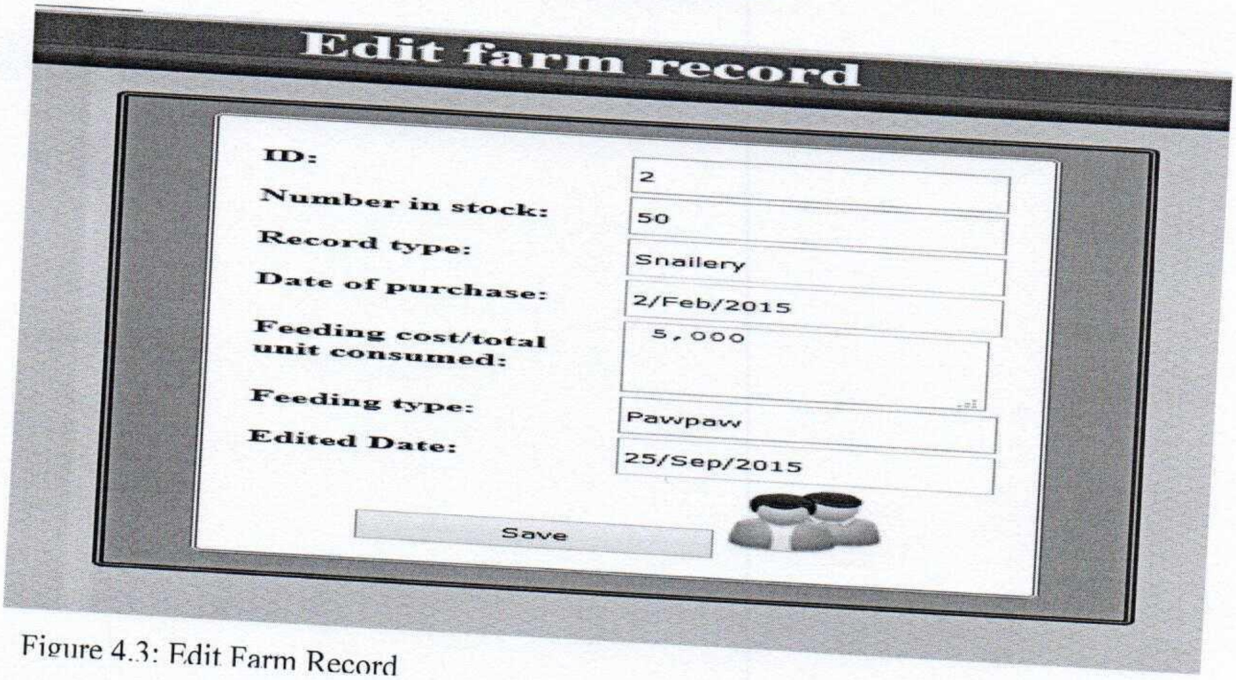

Figure 4.3: Edit Farm Record

4.4.3.4 Delete Farm Records

Here, only the admin have the authorized access to delete a particular farm record stored in the system. The user have no access to this except the admin.

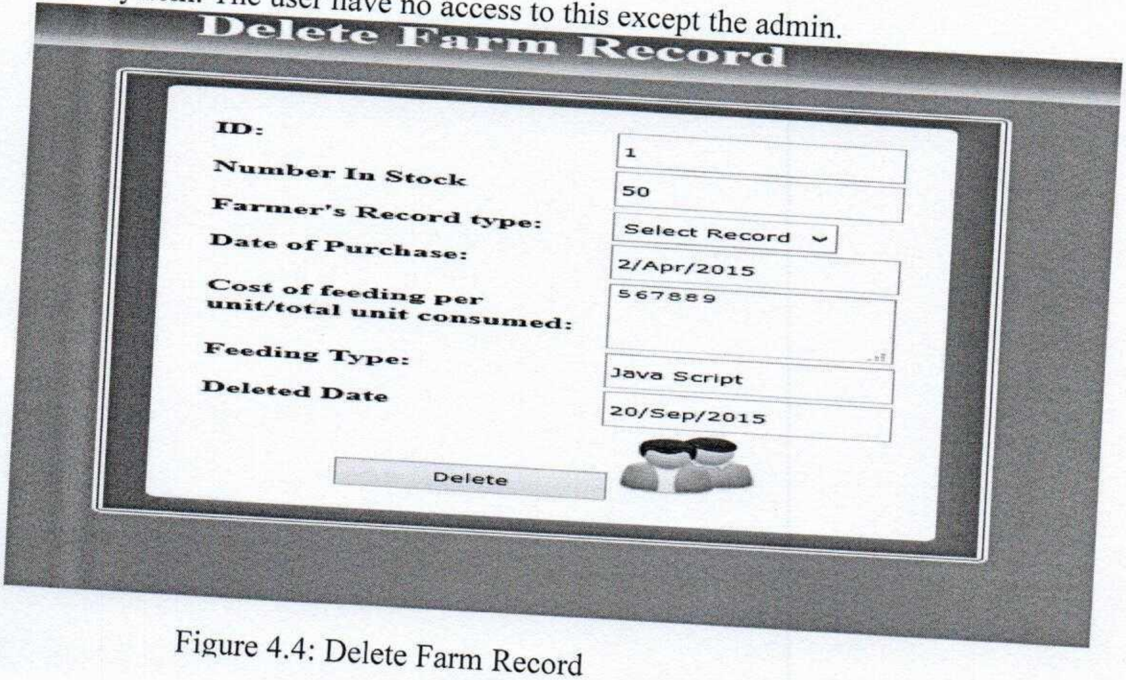

Figure 4.4: Delete Farm Record

4.4.3.5 Employee's Registration form

Here, a new staff records on the farm can be added to the system. A staff member here is the one who helps the farmer in carrying out the farm task. The staff member of the farm gets registered by themselves not by the admin.

For registration the member has to provide his/her user name, gender, home address, cell phone number and other details.

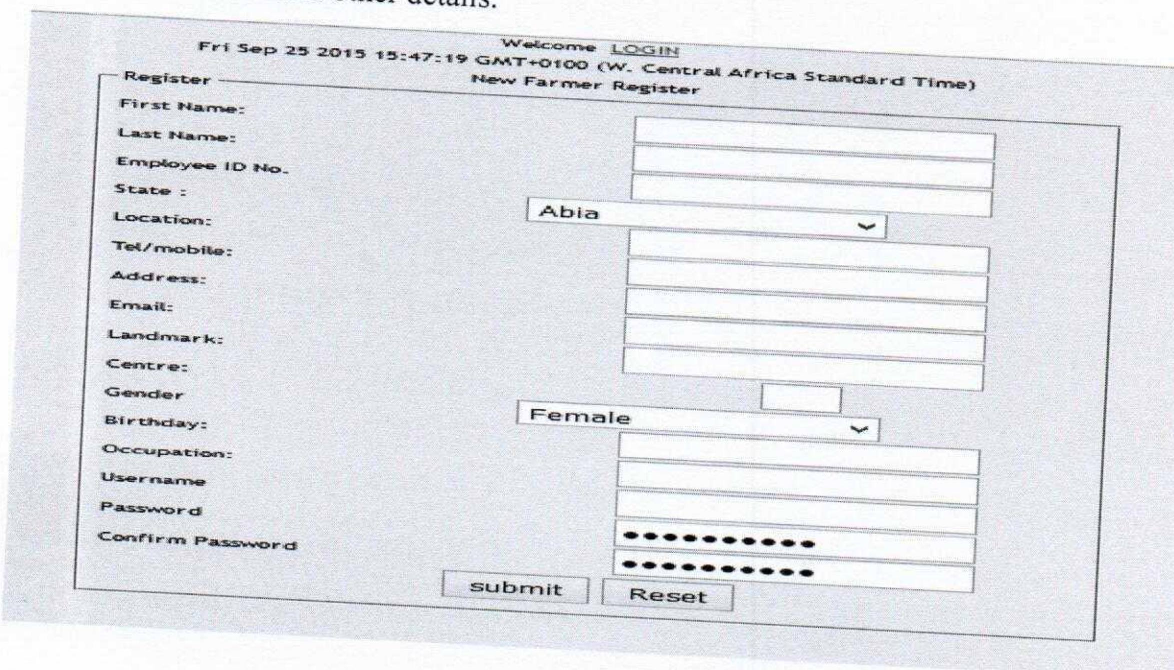

Figure 4.5: Employee's Registration

With the below form any user who come across this software can send his/her comment or recommendation about this software to the administrator.

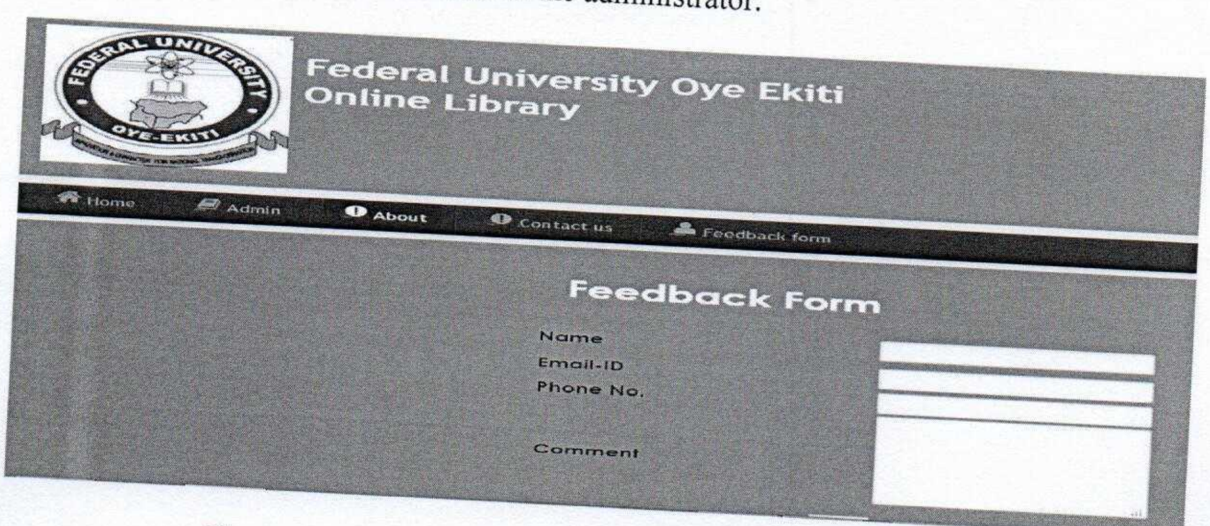

Figure 4.6: Feedback form

4.4.4 Output design

This is the area that deals with the description of the output of the new or proposed system implemented. The output design used in this design are shown below;

4.4.4.1 Home Page

This is the first interface of the farm management information system, it provides the basic page where user and admin can click on to access the farm management information system.

The home, admin, contact us, about and feedback sections are entailed in this page. Both the admin and the users of the system can access the home page of the farm management information system as it has been authorized and authenticated for use.

Below is the screen shot of the homepage of the farm management information system.

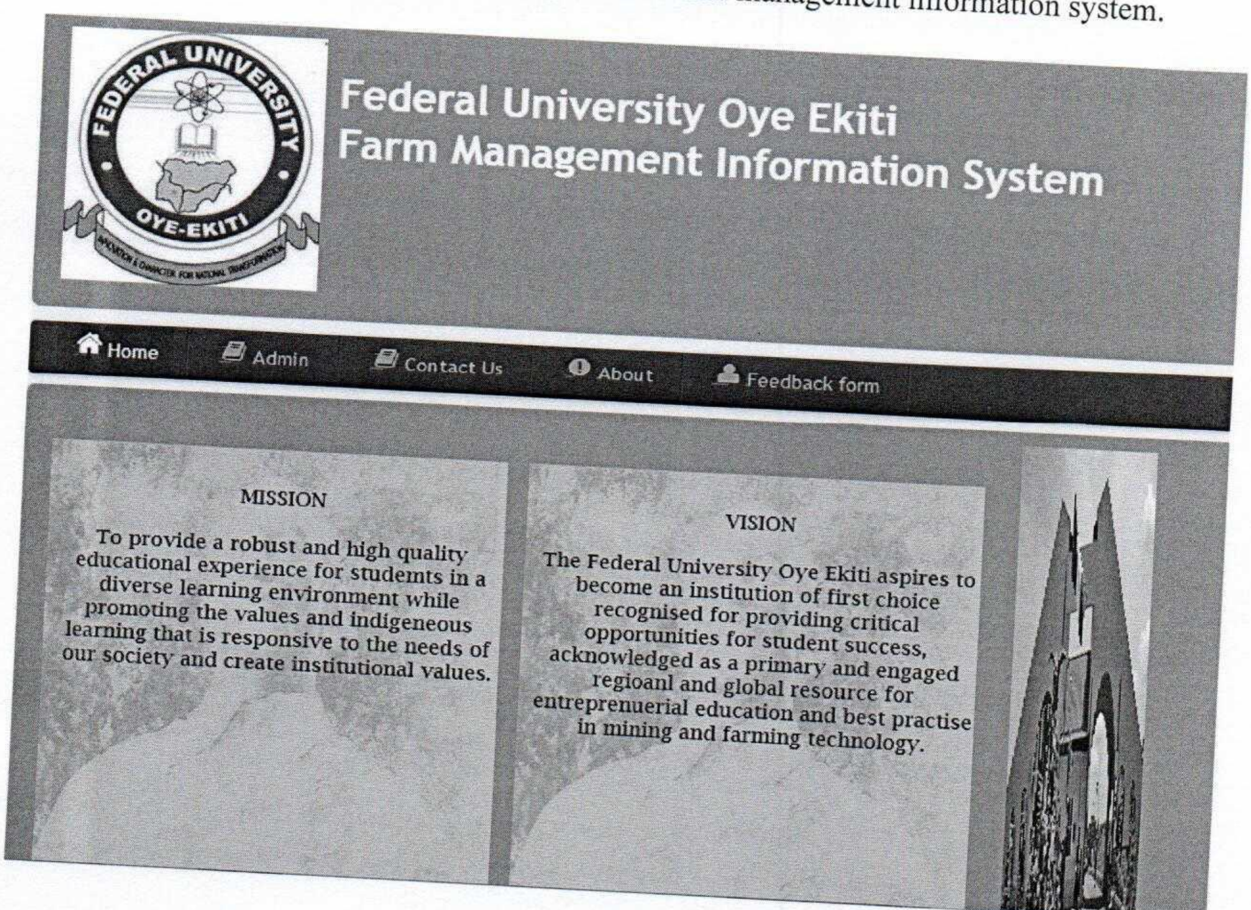

Figure 4.7: Home page

4.4.4.2 Data Storage Interface

After the data in entered into the system, it is stored and can be retrieved at any time using the display functionality

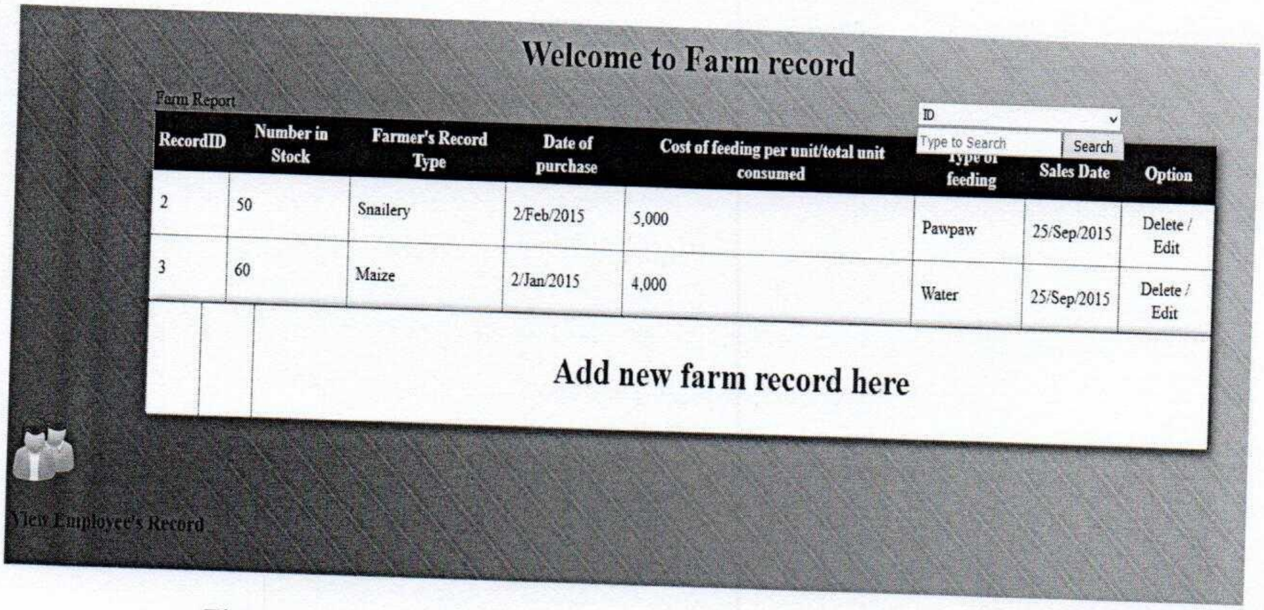

Figure 4.8: Farm Report Page

4.4.4.3 Contact us Page

This page provides few about the developer of farm management information system software. Both user and admin have access to the contact us page of the farm management information system.

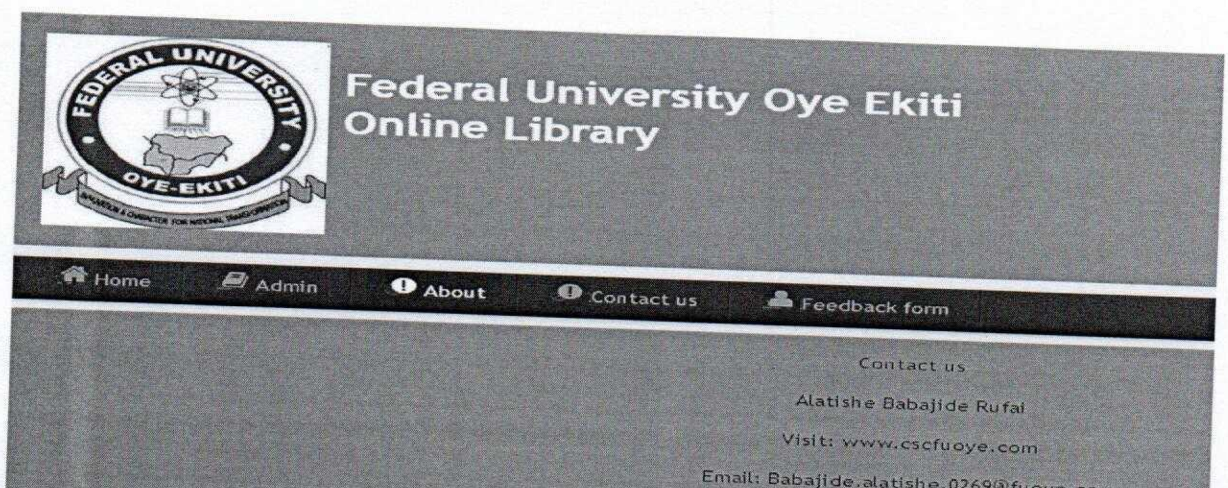

Figure 4.9: Contact us Page

4.4.5 Database structure

Files held in this project are made up of different data types. These types are integer, varchar, text, date/time, etc. some of the files used are designed and linked with database. Also in the project design, MySQL database was used.

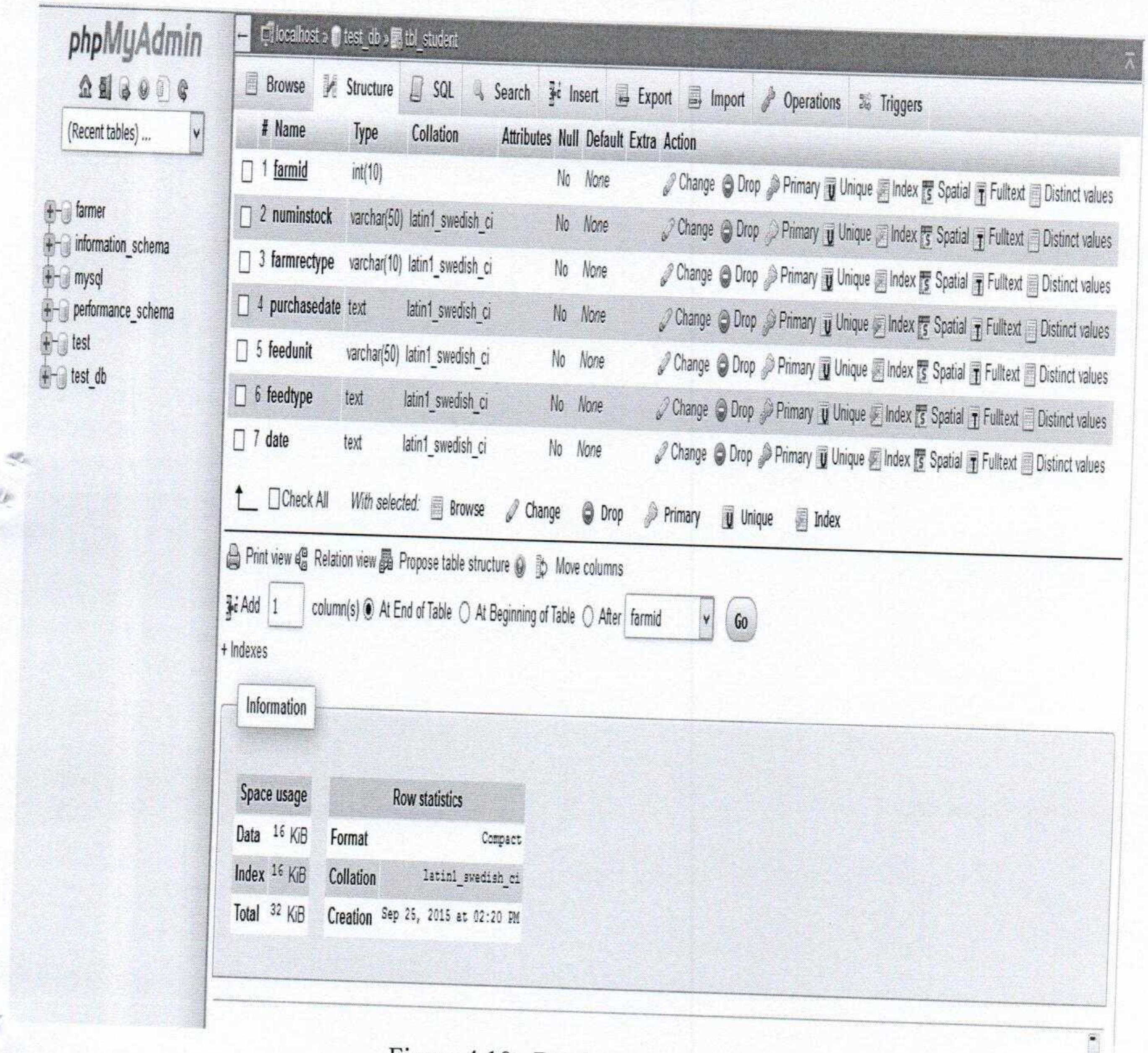

Figure 4.10: Database

4.5 Steps on how to use the system

In order for the proposed system to be used on any computer system it takes the following steps;

i. Boot the system

ii. Copy the folder to www inside WAMP folder of the drive C: after WAMP server is installed onto the system.

iii. Open any browser on the system (Microsoft internet Explorer, Mozilla Firefox, Netscape Navigator, Opera, Flock, Safari etc.)

iv. Type http://localhost/FMIS/ on the address bar and press the return key or enter key.

4.5.1 Maintaining the system

Maintenance is any activities carried out after the implementation of the new system to make sure that the system is correctly and constant running. This can be any of the following types of maintenance.

(a) Corrective maintenance: This is done to correct and defect that discover in the course of using the new system to keep the system in tune with day to day function.

(b) Adaptive maintenance: This is done to make sure that the system is not obsolete and adapt to any new systems of technology.

(c) Preventive Maintenance: This is a kind of maintenance adopted for continuous improvement in new system without waiting for the failure to occur or for the user to change. This is adopted to prevent the occurrence of failure.

4.6 Evaluations of the System

In an attempt to evaluate the designed system, it is important that we look back at the predefined functionalities, goals and objectives and analyze those in relation to the expectations met by the system. The Farm Management information System was evaluated based on the set of predefined objectives and expected functionalities it was able to fulfil. The farm

Management information system was designed to facilitate efficient records management in farm management information system by providing an efficient, reliable computerized farm management information system and after a careful evaluation process; it met a considerable portion of those expectations.

The main objective was to implement system that enables faster and more efficient storage, retrieval and updating of farm management records. As far as this is concerned, the system met this expectation by giving direct benefit to the farm such as fast records retrieval. It also included functionalities that enable all data entrants to access the system web base with the assumption that a client-server architecture is in place, retrieve records on demand and execute important reports to support daily farm tasks.

Fundamentally, the effectiveness of this project depended on meeting the project's specific objectives which were as follows; to carry out a feasibility study for the possibility of developing a farm management information system for FUOYE; to design and implement a farm management information system for FUOYE; to test the farm management information system. All the objectives were met by the system, to a certain extent;

Analysis was successfully completed. This evaluation is based on the fact that data requirements were collected that successfully enabled the design and development of the system.

The system design and development was carried out in a systematic manner and was based on user requirements defined by the end users. The design objectives of creating an efficient farm management information system was further accomplished with the creation of add, delete, search and edit functionalities in the system that not only enable computerized but rather efficient, reliable and fast data entry. All these functionalities possess a relatively high level of accuracy. In evaluating this objective in relation to the system's performance, it would therefore be accurate to state that it was achieved to a large extent.

Still while evaluating the system design and performance, the system enables the synchronization of records through its server-client architecture with a single database. Therefore data entered from one recording station will be seen on another recording station using the same system.

4.6.1 Critical Evaluation

For an evaluation process to be fully comprehensive, it should also include a critical assessment of the system. Therefore, despite the fact that the findings obtained after an evaluation showed that the system met its expectations to a large extent, it had a few shortcomings. These limitations are discussed in the next section.

4.6.2. Problems Encountered

In attempting to design the system, the following problems were encountered.

4.6.3 Accessing Research Material

Accessing associated research material was quite a challenge. This was particularly the case because of the limited variety of books and journals in relation to the research topic in the local library. To further escalate the challenge, online resources were close to impossible to access due to the university's slow internet speeds that made it impossible to download books and journals.

4.6.4 Understanding Key Concepts

Limitations as far as understanding the key concepts also posed a major challenge. Considering the fact that most of the concepts were new, I had to spend a considerable amount of time learning the concepts. This took away a lot of valuable time that would otherwise be fully dedicated and utilized to the design of the system.

4.6.5 Programming skills

Learning PHP, CSS and HTML and MySQL requires considerable practice for one to gain the programming skills. With limited knowledge and ability, this limited the number of functionalities that I could implement into the system.

4.6.6 Unanticipated Expenditure

Also I was met with a few financial constraints as a result of unanticipated expenditure. In order to cater for the slow internet speeds in the university premises, I had to subscribe for a dial-up internet connection in order to proceed with the project unhindered. This expenditure was however unforeseen and therefore posed a challenge.

4.7 Limitations of the System

Throughout the development of the Farm Management System, I overlooked few areas. Some of these limitations can be presented as follows;

4.7.1 Usability

With regard to its use, the system only caters for English speakers. The GUI and associated documentation is in English. This may present a problem for non- English speaking users

4.7.2 Security

Unauthorized user can manipulate or steal information once the username and password is provided. The system developer didn't embed biometric characteristics as security means.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATION

5.1 Summary

The quest to make life easier and processing faster has led to computerization of various processes. Computer Technology has transformed so many sectors especially the Agricultural sector in no small measure. In an effort to foster technology driven education, we have designed and developed a farm management information system that can add, edit, delete and generate report on daily interval.

5.2 Conclusion

In Conclusion, from a proper analysis and assessment of the designed system, it can be safely concluded that the system is an efficient, usable and reliable farm management information system. It is working properly and adequately meets the minimum expectations that were set for it initially. The new system is expected to give benefits to the farmers in terms of increased overall productivity, performance and efficient records management.

5.3 Recommendations/Future Research

As well as addressing the limitations presented in Section 5, there is scope for work to further the functionality and usefulness of this project. I would therefore make the following recommendations for future enhancements to the system.

5.3.1 Widening the scope

Given the limited amount of time given to the developer, the project's scope was rather limited to only record farm management information system. To make a more integrated comprehensive system that covers the entire farm management information system.

5.3.2 Increased accessibility

The system can also be further enhanced so that the workers in the farm can access their information online in a secure manner.

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APPENDIX (A)

Source code

```
<?php include('config.php'); include('head.php');
?><style>
.fadein {
position:relative; height:250px; width:800px; margin-left:-15px;
background: url("slideshow-bg.png") repeat-x scroll left top transparent;
padding: 0px;
}
-->
</style>
<script src="jquery.js"></script>
<script>
$(function(){
        $('.fadein img:gt(0)').hide();
        setInterval(function(){$('.fadein:first-
child').fadeOut().next('img').fadeIn().end().appendTo('.fadein');}, 7000);
});
</script>
<html>
<link rel="stylesheet" href="style.css" type="text/css" />
<title>FUOYE FMIS</title></head>
<body>
<div class="wrapper">
<div class="hero-unit">
```

```
<img src="admin/img/fuoye.jpg" width="180" height="180">
<div class="title_head">
<h2>Federal University Oye Ekiti</h2>
<h2>Farm Management Information System</h2>
</div>
</div>
<div class="navbar">
<div class="navbar-inner">
<div class="container">
<ul class="nav">
<li class="active">
<a href="index.php"><i class="icon-home icon-large"></i>Home</a>
</li>
<li class="divider-vertical"></li>
<li class="dropdown">
<a href="admin.php">
<i class="icon-book icon-large"></i>Admin
</a>
<li class="divider-vertical"></li>
<li class="dropdown">
<a href="contactus.php">
<i class="icon-book icon-large"></i>Contact Us
</a>
</li>
<li class="divider-vertical"></li>
```

```
<li><a href="about.php"><i class="icon-exclamation-sign icon-large"></i>About</a></li>

<li class="divider-vertical"></li>

<li><a href="feedbak.php"><i class="icon-user icon-large"></i>Feedback form</a>
</li>

<li class="divider-vertical"></li>
</ul>
</div>
</div>
</div>
<div id="photobox">
<p align="center"><strong><b>MISSION</b></strong><br><br/>
<strong>To provide a robust and high quality educational experience for studemts in a diverse learning environment while promoting the values and indigeneous learning that is responsive to the needs of our society and create institutional values.</strong></p>
</div>
<div id="vision">
<p align="center"><strong>&shy;&shy;<b>VISION</b></strong><br><br/>
<strong>The Federal University Oye Ekiti aspires to become an institution of first choice recognised for providing critical opportunities for student success, acknowledged as a primary and engaged regioanl and global resource for entreprenuerial education and best practise in mining and farming technology.</strong></p>
</div>
<div class="hero-unit-book12">
<div class="fadein" align="right" >
```

```
<img src="/FMIS/slider/slide1.jpg" width="95" height="350px" />
<img src="/FMIS/slider/41340282_market2_ap416.jpg" width="95px" height="350px">
<img src="/FMIS/slider/Fish-Farming.jpg" width="95px" height="350px">
<img src="/FMIS/slider/IMG_1748.jpg" width="95px" height="350px">
<img src="/FMIS/slider/Poultry-Farm-filter.jpg" width="95px" height="350px">
<img src="/FMIS/slider/layaers.jpg"width="95px" height="350px">
<img src="/FMIS/slider/poultry-farm.jpg" width="95px" height="350px">
<img src="/FMIS/slider/photo0013.jpg" width="95px" height="350px">
</div></div>
<?php include('footer.php'); ?>
<div class="modal hide fade" id="myModal">
        <div class="modal-header">
        <button type="button" class="close" data-dismiss="modal">×</button>
            <h3> </h3>
</div>
        <div class="modal-body">
         <p><font color="gray">Are You Sure you Want to LogOut?</font></p>
        </div>
        <div class="modal-footer">
         <a href="#" class="btn" data-dismiss="modal">No</a>
         <a href="logout.php" class="btn btn-primary">Yes</a>
    </div>
</div>
            <div class="modal hide fade" id="about">
    <div class="modal-header">
```

```
<button type="button" class="close" data-dismiss="modal">×</button>
  <h3> </h3>
 </div>
 <div class="modal-body">
 </div>
 <div class="modal-footer">
  <a href="#" class="btn" data-dismiss="modal">Close</a>
      </div>
      </div>
</div>
</body>
</html>
```