



POULTRY FARM MANAGEMENT INFORMATION SYSTEM (A CASE STUDY OF BIYINZIKA POULTRY INTERNATIONAL LIMITED)

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ABSTRACT: *This report discusses a Poultry Farm Management Information System of Biyinzika Poultry Farm International Limited. The software is sectioned into the sales management section, Purchase management section, Product management section. This system was designed to overcome the problems identified with the current Poultry Farm Management information system of Biyinzika Poultry Farm International Limited. The Problems with the current system include: lack of information sharing in real-time, manual report generation on sales, purchases and the products, slow in information delivery especially in the determination of stock levels after transaction processes, a lot of time consumption, increasing the company costs, and lack of effective data recovery in case of any disaster such as fire outbreak, flood, damages among others. Literature relating to the Poultry Information Management Systems were reviewed. The legacy system used in the company was also studied in more details. With this, more requirements for the Poultry Farm Management Information System were obtained and the system was designed and implemented. The interfaces for the new system were implemented using HTML, Bootstrap and Java Script. MYSQL was also used for implementing the system database while PHP was used to create interactivity with the database. After the implementation, the new system was then tested and validated. When developing the system, the focus was on making the whole process of Information management in the poultry farm faster, more convenient and efficient for the company. This system automates the current poultry farm management information system in the organization.*

KEYWORDS: Poultry Farm Management, Information System, Sales Management, Purchase Management, Product Management



INTRODUCTION

Background

Over the world poultry farming is practiced for different reasons but mainly for commercial and food purposes. For example, Roy's farm, (2017) says that "the most commonly and widely raised poultry birds are chicken and are being raised every year as a source of food." Poultry farming is increasingly becoming profitable not only in Uganda, but globally. However, most of the literature about this enterprise tends to surround about profitability side without tackling the how question (SeedsOfGold, 2016).

For the case of Uganda, there are various poultry farms across the country, keeping different types of birds. For example, Muhaise (2016) presents a number of poultry farmers in Uganda such as Ugachick poultry breeders limited, Biyinzika, kigo prison, to mention but a few.

Biyinzika poultry international limited is a Ugandan poultry farm with various branches across the country that started as early as 1990. This farm currently majors in breeding of commercial broilers and layers and in addition keeps records of all business processes across all the branches. Being a key player in Uganda's poultry industry, Biyinzika poultry international limited owns several large farms for its poultry production in Mukono District. These include layer breeder, broiler breeder and commercial broiler operations.

Seemingly, Biyinzika poultry international limited is in a situation where it currently lacks a system that would help provide specialized security and functionalities tailored to the needs of management for successfully and easily managing the poultry farm. This has brought about bottlenecks and delays in making reports or handle issues regarding the poultry farm. Therefore, there is need for a poultry farm management system. A poultry farm management system is a "window-based" application for maintaining and managing a poultry farm (Bilmojit, 2015). Such a system commonly provides specialized security and functionalities tailored to the needs of management for successfully and easily managing the poultry farm. Further, it helps perform professional accounting tasks as needed and also enable the review of edited reports

METHODOLOGY

In order to achieve the objectives mentioned earlier, we used the waterfall model and techniques of structured analysis; whose steps are the following:

System Study

Under system study, we ensured that we collected more information on the current system. Thus, we carried out interviews, questionnaires, including some observation in order to understand the existing system. In addition to this we performed the feasibility study to guarantee the project is realistic.



Interviews

Interview technique was used to gain more information about the existing system that was being used for Poultry management at Biyinzika poultry farm and also achieve requirements for the proposed system. The major actors in Poultry management in the farm would be interviewed face to face.

Questionnaires

This technique was used to complement interviews conducted with the system users. Due to the distance of the project team and the system users, a form was developed for the users to fill which served as a questionnaire. Information from accordingly completed questionnaire was extracted and used to further understand the existing system and refine requirements.

System Analysis & Design

System Analysis

System analysis is about studying the data collected in system study to identify system requirements. The data collected was analyzed using Microsoft Excel to obtain statistical figure of the analysis in form of pie chart of all data analyzed.

System design

Under the design phase, we schemed the software architecture in terms of interface design, output design, security issues along with technology specifications both for the server and environment requirement. Some of the tools we used here included Context Diagram and Data Flow Diagrams (DFD) was used to show the flow of information and sequence of the events as they occur in the system, Entity Relationship Diagrams (ERD) was used to design the database of the proposed system showing the entities (databases and tables) in the system and the relationships that exist among these entities.

System Implementation

The implementation phase covers the development of system modules and integration of the system. Tools including Apache Wamp Server, PHP, Bootstrap, HTML and MySQL were used

The following tools were used to implement the system;

a) Wamp Server

WampServer is a free server software bundle that is used on Windows operating system. When installed on a windows operating system, it provided platforms for Apache server, PHP server-side scripting language and MySQL database.

b) PHP.

PHP (Hypertext Preprocessor) is an open-source server-side scripting language extensively used in creating dynamic web application. It is a popular server-side scripting language designed specifically for integration with HTML/XHTML. It was used in conjunction with MySQL for database access in web-based applications.



c) MySQL.

MySQL is also an open source Relational Database Management System (RDBMS) that uses Structured Query Language (SQL) for adding, retrieving, updating and deleting of information stored in a database. It is the most popular query language and it would be used for accessing and processing data in a database. MySQL was used because it is designed as a multi-tasking/multi-user database, which is one of the main requirements for a database to be used for implementing the proposed system.

d) HTML/XHTML.

HTML/XHTML simply refers to as Hypertext Markup Language or Extended Hypertext Markup Language. It was used for describing web pages.

e) Bootstrap.

Bootstrap is a technique of loading into a computer few initial instructions that enable the introduction by the rest of the program from an input device. Bootstrap is the most popular HTML, CSS and JS framework for developing responsive, mobile fast project on the web.

System Testing

At the end of the implementation phase, the system was tested to ensure it attains the stated objectives. We focused on the systematic discovery and debugging of defects. The following procedures were used to test the system:

- i. Unit testing where each component of the system was independently be tested
- ii. Integration testing where all system components was tested as a whole
- iii. And finally, user acceptance testing for the system to be tested by a small number of end-users of the system.
- iv. Once these phases are completed, the system was ready for installation, migration, support and maintenance.

System Study, Analysis and Design

System Study

In order for the project team to understand and gain requirements of the new system, the current Poultry farm management information system was studied. The system was studied by interacting with some of the personnel working in the organization through asking them a series of informal questions to obtain knowledge and understanding of the entire records kept at the farm and activities carried out in general. The interview data was recorded and then transcribed to produce text that was analyzed using quantitative and qualitative methods of data analysis. Furthermore, questionnaire was developed with a series of questions where the users responded positively to answering all the questions using a pencil to paper. Using the observational technique, we learnt about the sensitive issues that the participants in the existing system were unwilling to talk about.



We acquired contextual information needed to frame the evaluation and make sense of the data collected using other techniques.

The data collected was analyzed using both structured and non-structured analysis approaches. Using the above techniques, we were able to understand the existing system and to gain the users' opinions about the existing and the new system.

a) Questionnaires

Due to the distance of the project team and the system users, a questionnaire form was developed with a series of questions and filled by the respondents accordingly, only 32 stakeholders responded positively. The pie chart below shows the responses from the users of the system. Statistics and deduction generated from the responses of each question were also shown in tabular form below:

Question 1: Please specify who you are?

Table 2: Analysis of the First Question of the Questionnaire

Personnel	No' of Personnel	Percentage
Farm Manager	10	25
Secretary	10	25
Supervisor	8	20
Human Resource Manager	2	5
Farm Worker	10	25
Total	40	100

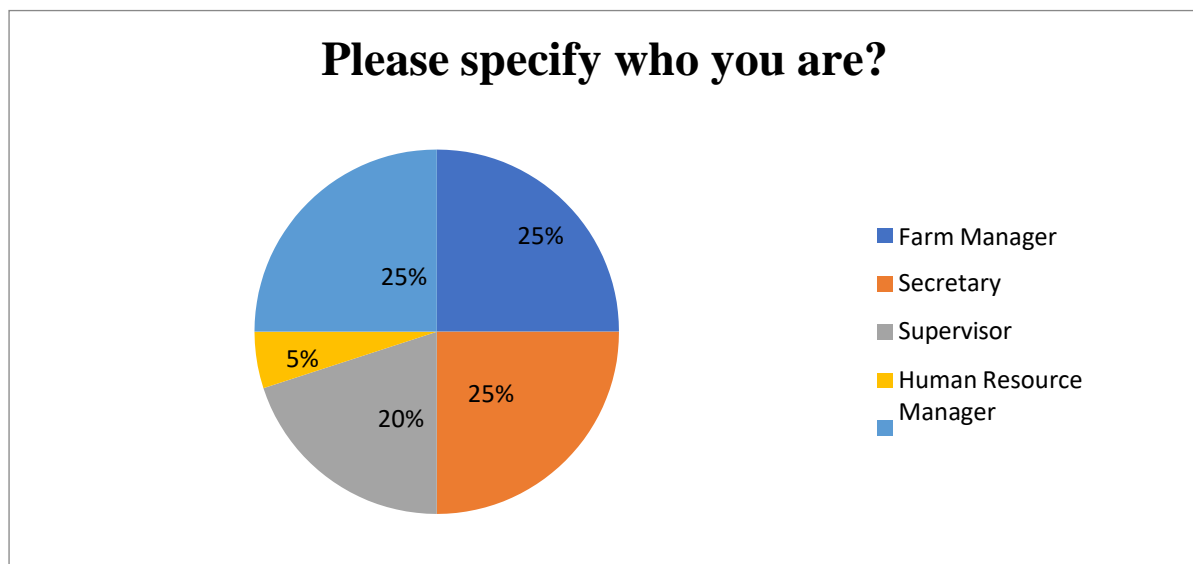


Figure 1: Pie Chart Showing Responses of the First Question of the Questionnaire

Question 2: Have you ever heard of a Poultry Information Management system?

Table 3: Analysis of Second Question of the Questionnaire

	No' of Personnel	Percentage (%)
Yes	32	80
No	8	20
Total	40	100

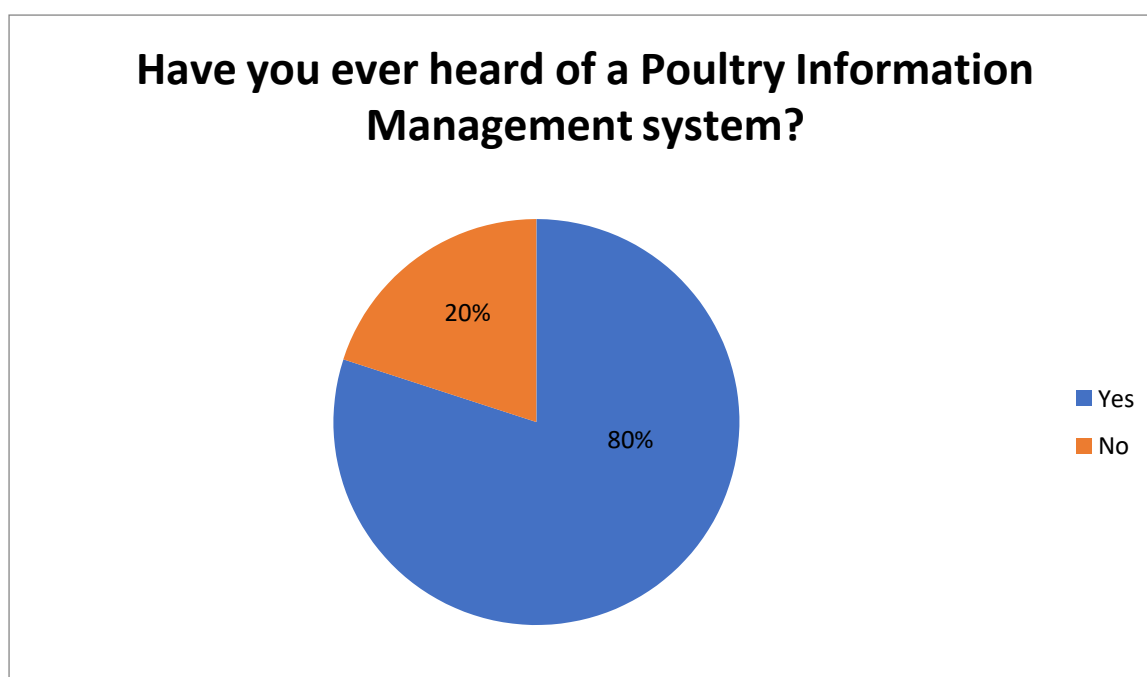


Figure 2: Pie Chart Showing Responses of the Second Question of the Questionnaire

Question 3: Would you like to use a Poultry information management system in your business processes within the company as a management tool for your inputs and outputs?

Table 4: Analysis of Third Question of the Questionnaire

	No' of Personnel	Percentage (%)
Absolutely	25	63
Maybe	11	27
Like to try first	2	5
Not at all	2	5

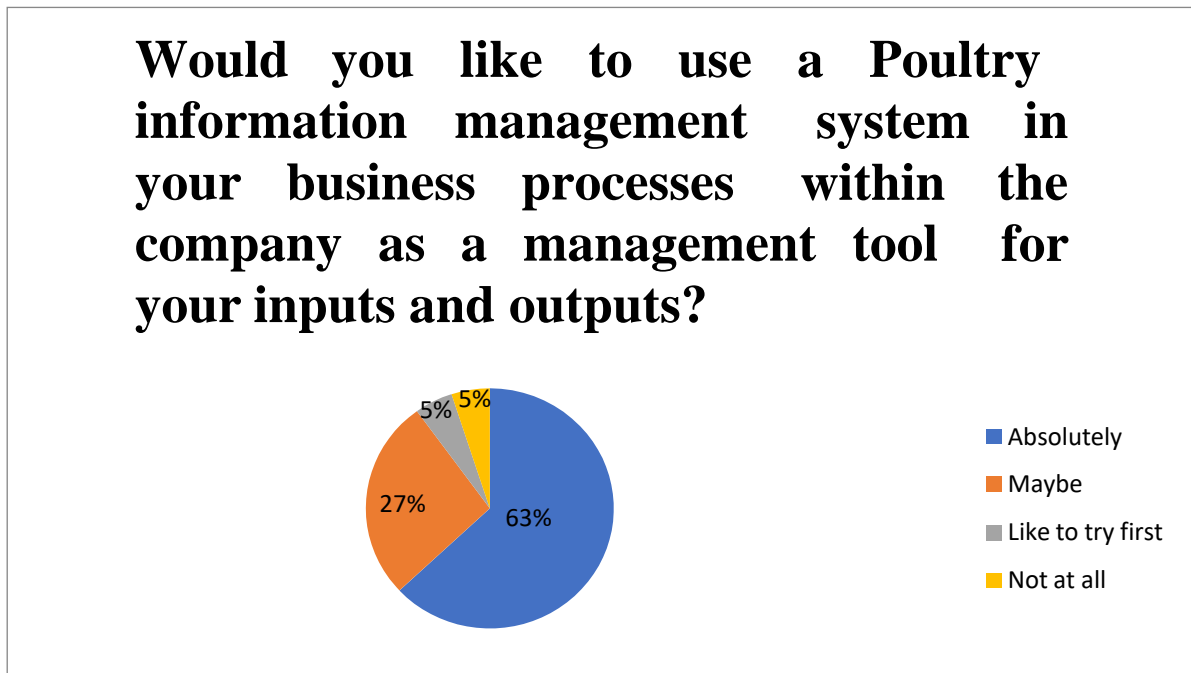


Figure 3: Pie Chart Showing Responses of the Third Question of the Questionnaire

Question 4: Do you think an automated Poultry information management system will improve management of the company?

Table 5: Analysis of Fourth Question of the Questionnaire

	No' of Personnel	Percentage
<i>Yes</i>	28	70
<i>No</i>	12	30
<i>Total</i>	40	20

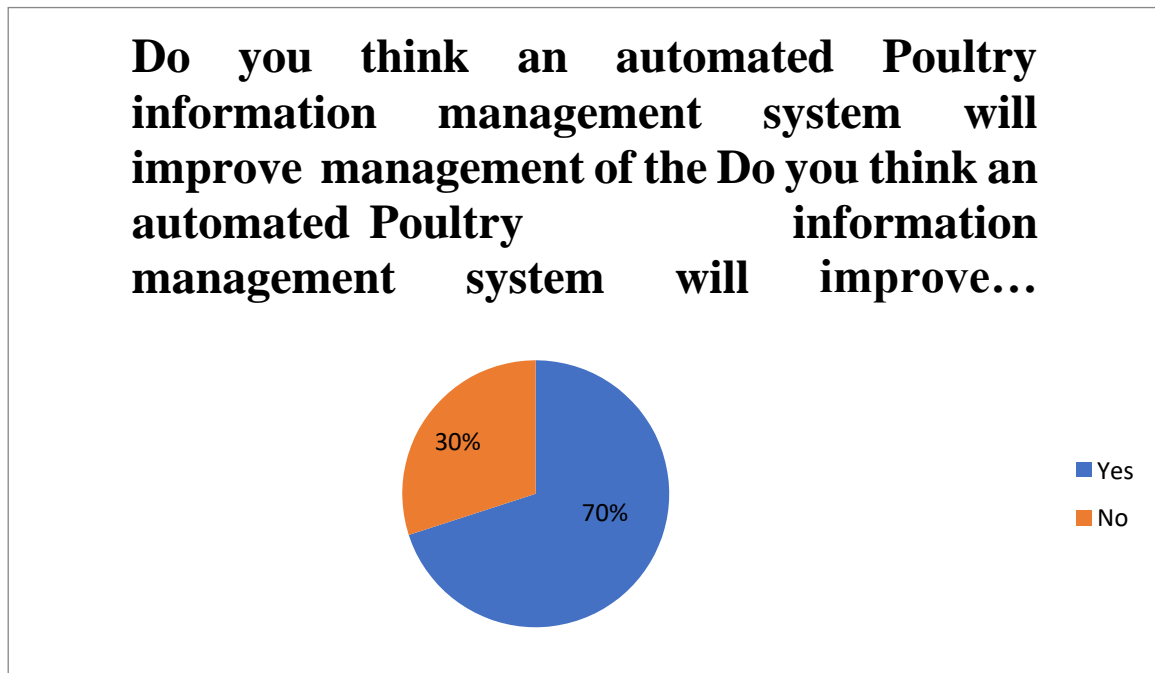


Figure 4: Pie Chart Showing Responses of the Fourth Question of the Questionnaire

Question 5: If the Poultry Management information system is implemented, how would you like it to affect the existing system?

Table 6: Analysis of Fifth Question of the Questionnaire

	No' of Personnel	Percentage (%)
Complete replacement	34	85
Alternative option	6	15
Total	40	100

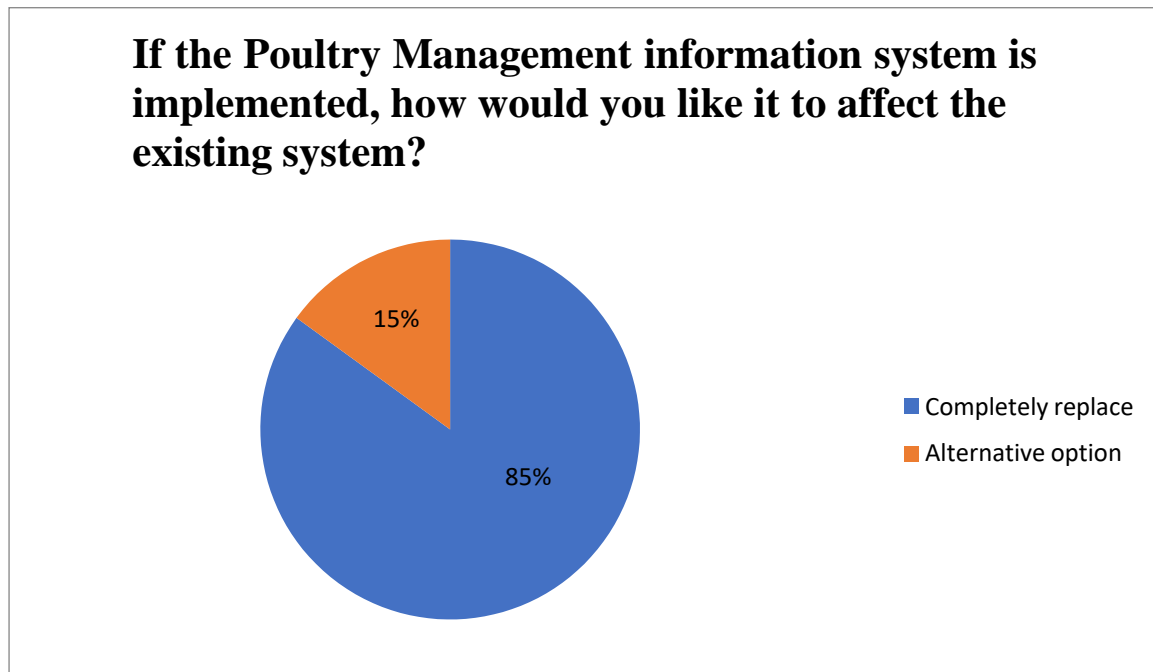


Figure 5: Pie Chart Showing Responses of the Fifth Question of the Questionnaire

Question 6: How do you want the system to be accessed by users?

Table 7: Analysis of sixth Question of the Questionnaire

	No' of Personnel	Percentage (%)
With restriction	30	75
Without restriction	10	25
Total	40	100

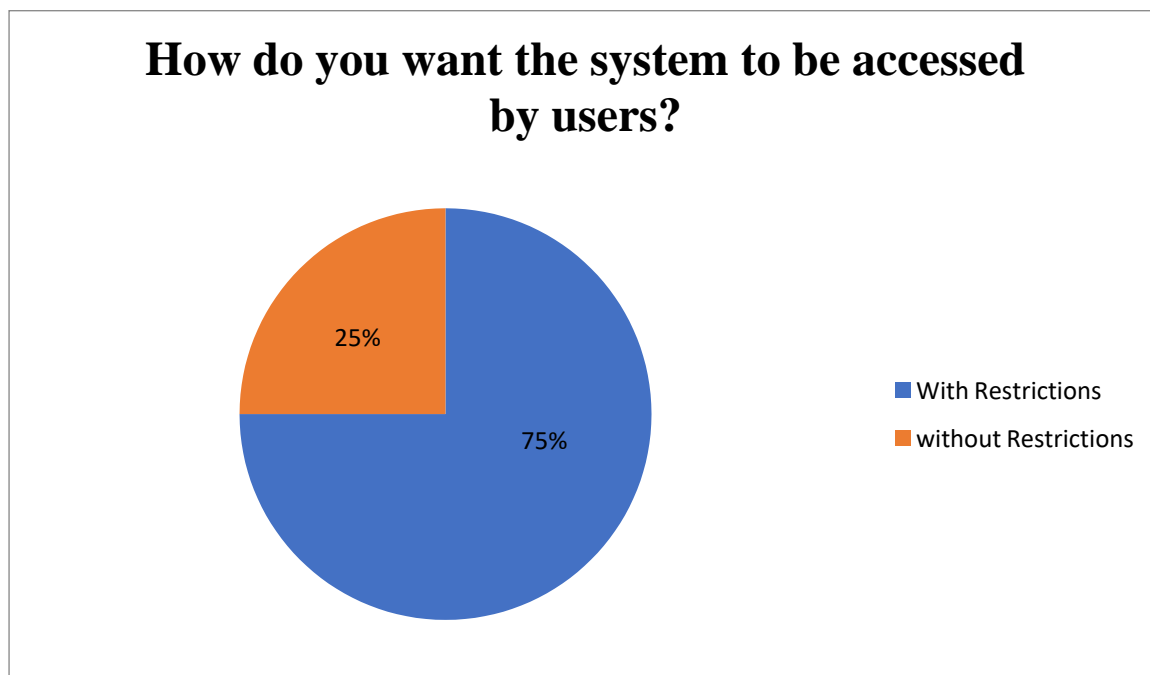


Figure 6: Pie Chart Showing Responses of the Seventh Question of the Questionnaire

a) Interview

Interview technique was used to gain more information about the existing system being used for Poultry management at Biyinzika Poultry Farm, to achieve requirements for the new system. During the interview, major stakeholder were interviewed face to face from the workers to the managers of the farm. An interview guide was planned and used which involved the set of questions that were asked similar to those in the questionnaires and respondents gave answers basing on their experience and personal understanding of the existing system. All the answers from the respondents were recorded and analyzed for further understanding of the existingsystem.

Below are the findings of the interview:

Table 8: Analysis of Interviews

Questions	Answer (1) Manager	Answer (2) Supervisor	Conclusion
Is it easy to keep track of records using the existing system?	It requires more time to go through files of previously recorded farm records.	It is not easy, since not all recorded information is found at the time of review	The existing system is not capable to track records because all records are kept in a file system format, which is tedious to those in charge of maintaining the record consistency.



<p>Is the process of recording and keeping farm records reliable? Give reason for your answer</p>	<p>No. because there are delays in time for payments for workers paid in wages, since daily activity records are balanced before payments are issued out.</p>	<p>No, there is working overtime to make analysis of the daily activities and expenses incurred.</p>	<p>The existing system is tiresome because all farm records are recorded manually on paper making it hard to generate reports for the farm in time.</p>
<p>Does it have an impact on your work? How does it have an impact?</p>	<p>Yes, it impacts on the daily activities especially on, delivering payment to Workers and generation of reports concerning Farm progress.</p>	<p>Yes, because there are delays with the process of ordering for farm feeds and Vaccination drugs since the entire management and accounting system is manual and all records are on paper, so it delays to know which unit in the farm requires attention.</p>	<p>The system requires a faster report generation process and real time communication in order to satisfy all units in the farm</p>
<p>What solution can you recommend?</p>	<p>We need a real-time communication system, to boost the process of recording daily farm activities and ensuring security</p>	<p>We need a faster report generating system to enhance and automate report generation, and easy monitoring on the records and the farm requirements</p>	<p>There is need for a farm management information system for Biyinzika poultry farm.</p>

Strength and weakness of the existing system

The existing system, currently being the mostly used and dependable method across the country by most poultry farms even though slightly computerized has its strengths and weaknesses.

a) Strength

The strength of the existing system is as follows:

- i. The existing system doesn't need computer knowledge or specialized professional personnel to maintain and work with the system.



- ii. The current system doesn't need internet connection, daily fee of internet subscriptions with the internet service provider (ISP) or an area supporting internet service in order to manage poultry farm records.
- iii. The current system doesn't require purchase of hard ware or subscriptions to software's for system update or upgrades of the operating system in order to manage records.

b) Weaknesses

The weaknesses of the existing system are as follows:

- i. Records kept in paper increases the chance of data loss due to bulk files requiring extra time to recover the records or to go through all the files and papers to find the needed information hence slowing down decision making at the farm.
- ii. Less security of farm records since they are kept using the file system which doesn't require authentication of user password to gain access to the farm records and official confidential data that is only restricted to staff of the poultry farm.
- iii. Inconsistency in data entry, prone to errors, mistaking information due to less certainty of the records gathered during daily activities.
- iv. Time consuming and costly to produce farm reports since all records are kept in paper form stored in files hence requiring one to type the record reports in the computer in order to print out reports which require extra money for the service.
- v. Difficulty in making backups of records since all records are on paper and kept in files which would require extra space and effort to go through all paper records and rewrite them on other paper hence being costly, tiresome.
- vi. Labor-intensive. The existing system requires continuous monitoring to ensure that each transaction is accounted for, that products are maintained at the appropriate stocking levels. It is also more difficult to share inventory information throughout the business, because the lack of computerization makes accessing inventory records a more cumbersome process. The time spent monitoring inventory levels could be used on more productive activities for the poultry farm.
- vii. Human Error. The existing system relies heavily on the actions of people which increase the possibility human error. People or employees might forget to record a transaction or simply miscount the number of eggs or poultry birds at the farm. Inaccurate physical counts could result in not ordering enough of the poultry feeds and poor measurements of vaccinating drugs for birds which may lead to death of birds at the farm and other related miss-management problems.



- viii. The current system requires more effort and space to keep track of paper documents, to find information and to keep details secure. When mistakes are made, changes or corrections are needed, often a manual transaction must be completely redone rather than just updated. With manual or partially automated systems information often has to be written down and copied or entered more than once. Systemization can reduce the amount of duplication of data entry.

System Analysis

Based on the outcomes from the system study the users, functional and non-functional requirements of the Poultry farm information management system were evaluated as follows:

User Requirements

From the system study, four users of the system were recognized. These are System Administrator, Sales Manager, Purchase supervisor and Product Manager. Their requirements in the system include the following:

- a) **Systems Administrator.** The administrator is the person that manages the computer systems in the organization. His requirements in the system include:
 - i. User registration (setup and maintain account).
 - ii. Maintain system.
 - iii. Verify that peripherals are working properly.
 - iv. Monitor system Performance.
 - v. Install software.
 - vi. Create a backup and recovery policy.
 - vii. Password and identity management.
- b) **Sales Manager.** The Sales manager is the person that is responsible for designing and implementing a strategic business plan that expands company's customer base and ensure its strong presence. Owns recruiting, objectives setting, coaching and performance monitoring of sales repetitively. His requirements in the system are as follow:
 - i. Able to account for daily farm activities.
 - ii. Able to view stock.
 - iii. Able to view sales report.
 - iv. Able to view stock report.
 - v. Able to register new employee.
 - vi. Able to view customer details.



c) Product manager. The Production manager is a person that is responsible for the technical management, supervision and control of the company's production processes. His requirements are as follows:

- i. Able to view daily activity programs.
- ii. Able to view stock.
- iii. Able to register product.
- iv. Able to view product.

d) Purchase Manager. The Purchase manager is a person that is responsible for buying the best quality equipment, goods and services, at the most competitive prices, to enable a company to operate.

- i. Able to register supplier details.
- ii. Able to view supplier details.
- iii. Able to register stock.
- iv. Able to view products details.
- v. Able to view purchase report.
- vi. Able to view stock.

Functional requirements

The functional requirements are activities that the system must be able to perform.

The system provides the following functionalities:

- a) The system should be able to store user details.
- b) The system should be able to provide views for all stored details.
- c) The system should be able to register product details.
- d) The system should have a simple user interface.

Non-Functional requirements

Nonfunctional requirements are the constraints that should be enforced on the services provided by the existing system. The system was designed to meet the following non-functional requirements.

- a) The system should verify or validate all user inputs and update accordingly.
- b) The system should be robust and able to run on most platforms with no errors.
- c) The system should be user friendly to the users.
- d) The system should be complete, consistent and reliable to the user.

- e) The system must not allow unauthorized users to access stored data.
- f) The system should be able to produce expected results when supplied with right inputs

System Design

The system was designed using process and data models. The design used to describe the system includes system architecture, level One DFD and database design.

Architectural Designs of the System

The architectural design gives a high-level view of the new system with the main components of the system and services they provide as well as how they communicate. The system using a three-tier architecture that encompasses of user interfaces, process management and DBMS as illustrated below. This structure ensures that users' interaction with the system is independent of storage consideration.

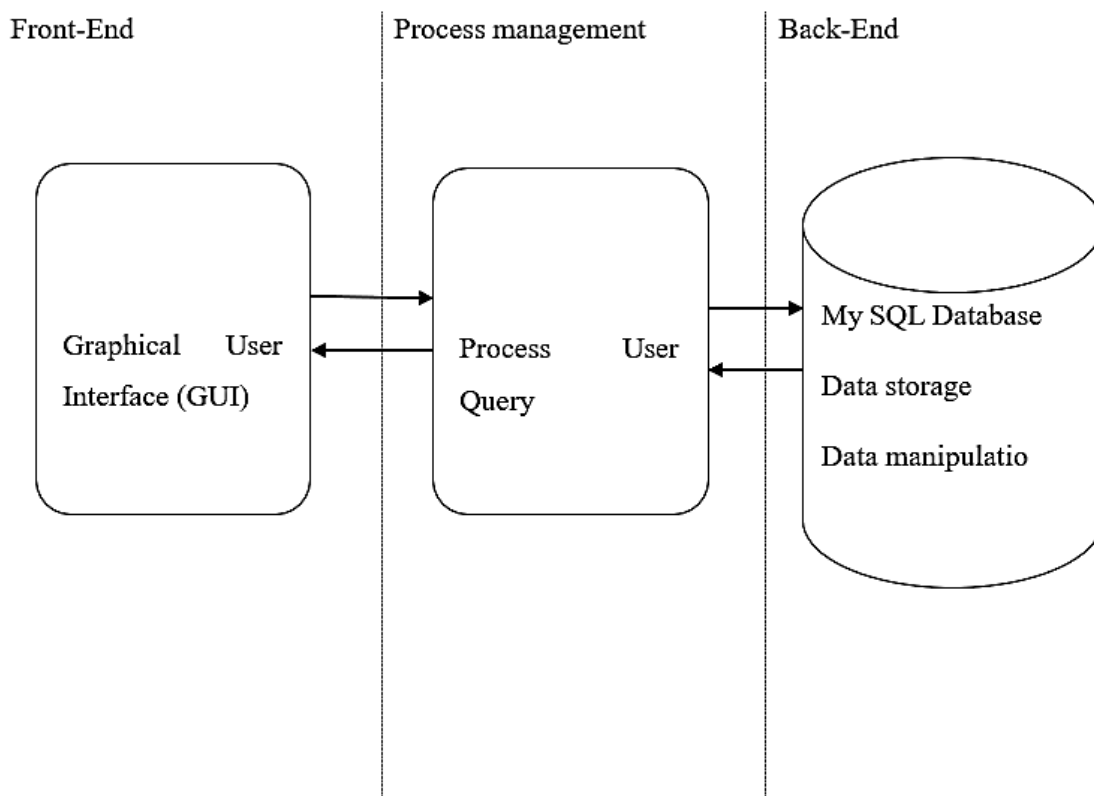


Figure 7: System Architecture

Process Modeling

In process modeling, the Sequence diagram was used to model the flow of logic within the proposed system in visual manner. It shows the major sub-processes identified in the Poultry Management information system. Data obtained from the Data Flow Diagram (DFD), were collectively used to produce the Data Dictionary (DD) of the system

a) Key Symbols Used in Process Modeling

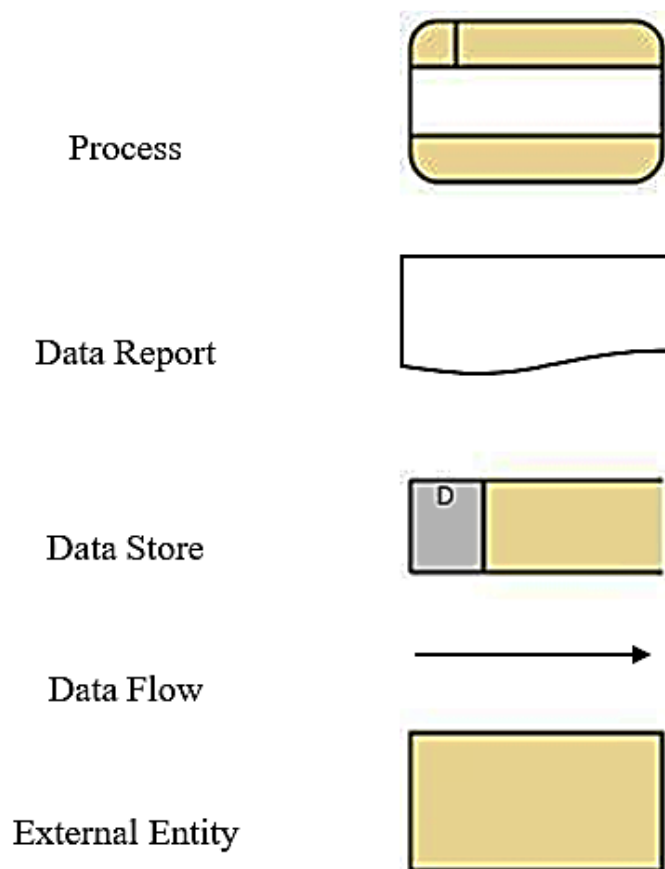


Figure 8: Symbol Used in Process Modeling

c) Level 1 Data Flow Diagram

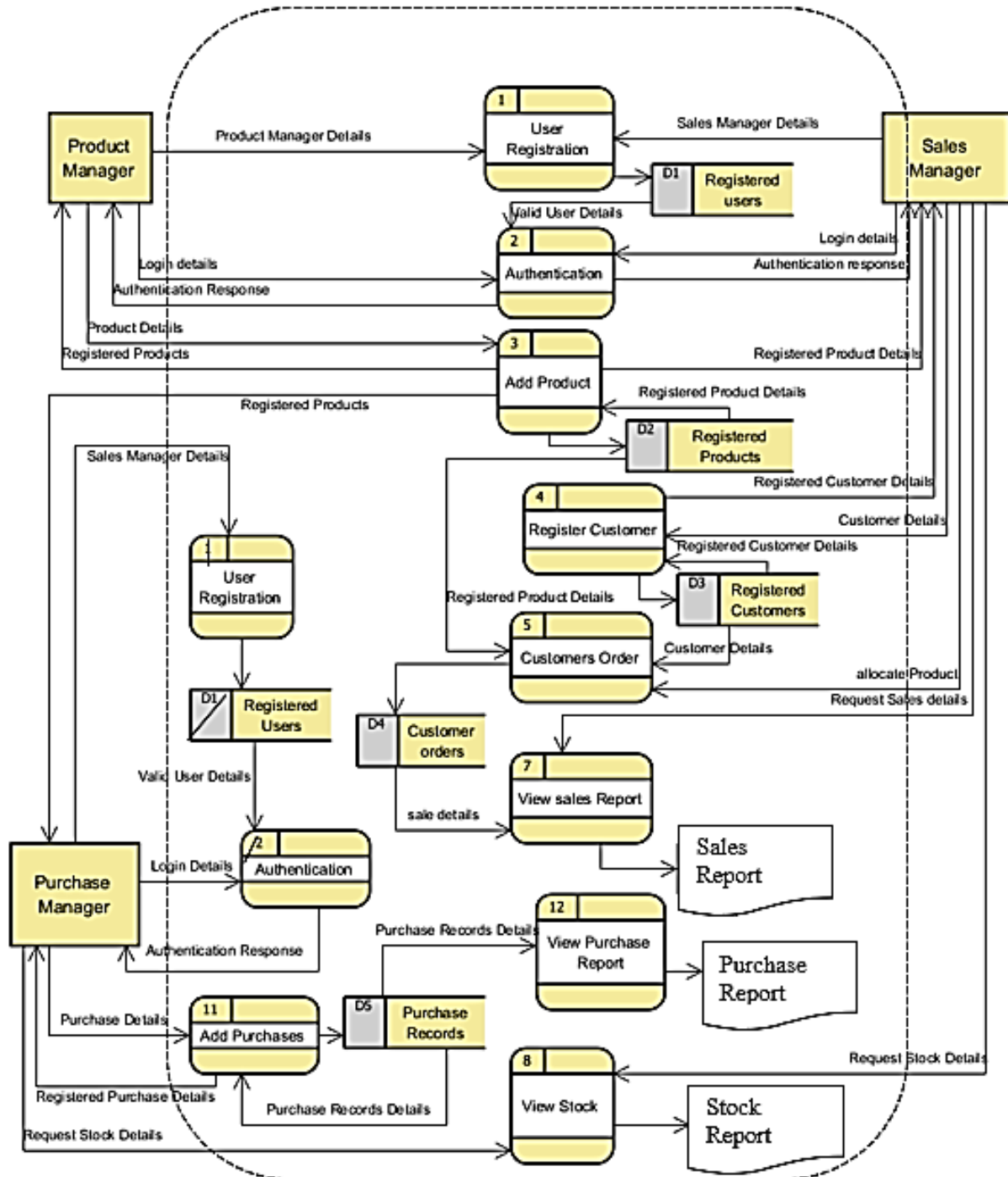


Figure 10: Level 1 Data Flow Diagram of the Poultry Farm Management Information System



d) Data Dictionary of Level 1 DFD of Biyinzika Poultry Farminformation management system.

Below are the descriptions of all the design objects used in the system development of Biyinzika Poultry Information Management System. These objects include processes, Datastores, and the External Entities involved in the system.

Table 9: Description of Process

Process	Description
User Registration	Allows the Product Manager, Sales Manager and PurchaseManger to insert their details into the system.
Authentication	Allows the system to authenticate registered users and provideauthentication response.
Add Product	Allows the Product manager and the purchase manager to register and view products in the system respectively.
Customer Order	It Processes customer orders and allows the sales manager toallocate a product to a customer.
View Sales report	Generates a sales reports on products sold to customers.
View Suppliers Report	Generates a supplier report.
Add Purchases	Allows the purchase manager to add purchases and also viewregistered purchases.
View Purchase Report	Generates a purchase report.

Table 10: Description of Data Stores

Data Stores	Description
Registered User	Stores details of registered users in the system
Registered Products	Stores details of registered products
Registered customer	Stores details of registered customers.
Sales records	Stores registered sales records of the products
Purchase Records	Stores registered Purchases.

Table 11: Description of External Entities

External Entity	Description
Sales Manager	The Sales manager is responsible for entering and updating Sales details, views product report, sales report and registration of new customers into the system.
Product Manager	The Product manager is responsible for registration of products and viewing registeredproduct report from the system.



Purchase Manager	The Purchase Manager is responsible for registration of all purchases made, recording supplier details and viewing stock report, supplier report and purchases report.
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Data Modeling

The data modeling of the system was done by ascertaining the data requirements, entities and their related attributes that make up the system. Modeling of the relationships between the entities was designed with an enriched entity relationship diagram for the system.

a) Data Requirements

- i. **Purchase.** This stores information about purchases made. The information stored includes the purchase ID, purchase date, Employee_id, quantity, transaction mode and remarks.
- ii. **Product.** This stores information about products. The information stored includes product ID, employee_id, name, quantity, date in, expiry date and cost
- iii. **Customer.** This stores information about customer. The information stored includes name, contact and address
- iv. **Employee.** This stores information about employees. The information stored includes first name, middle name, last name, role, address and email
- v. **Order.** This stores information about customer's order. The information stored includes customer_id, employee_id, Order_id, order date and product_id.

b) Identification of Entities and Associated Attributes.

Table 12: Entities and the associated Attributes

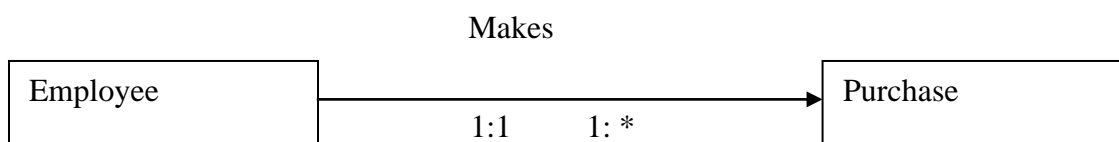
Entities	Attributes
Purchase	Purchase_id(pk)
	Quantity
	Purchase_date
	Transaction_mode
	Remarks
	Supplier_name
Product	Employee_id
	Product_id(pk)
	Name



	Cost
	Date_in
	Expiry_date
Customer	Customer_id(pk)
	Name
	Contact
	Address
Employee	Employee_id(pk)
	Name
	Role
	Password
	Address
	Contact
Customer_order	Order_id(pk)
	Order_date
	Status
	Product_id
	Customer_id

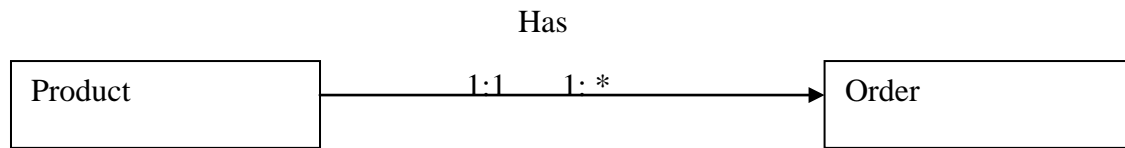
c) Modeling of Relationships between Entities.

The relationships modeled depicted some possible associations between the entities identified. It also gives the corresponding multiplicities (participation & cardinality) among the entities of the system.



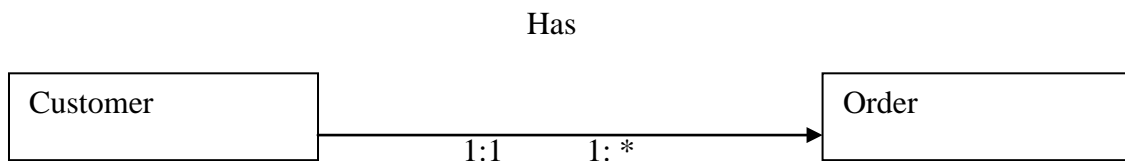
The Employee has one or more purchase and each Purchase instance belongs to a particular Employee. Hence the cardinality is 1: M

Figure 11: Relationship between the Employee and the purchase



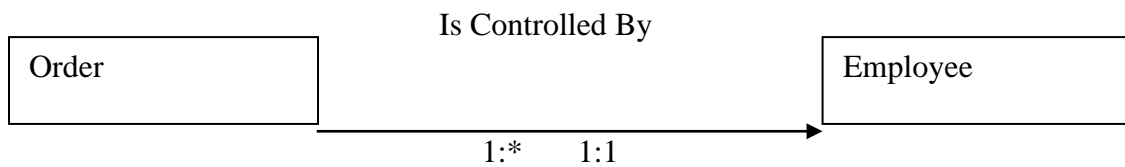
A product has one or many Order and each Order instance is for a particular product. Hence the cardinality is 1: M

Figure 12: Relationship between the product and the order



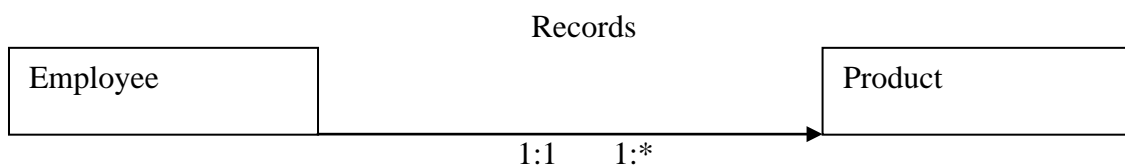
A Customer can make one or more Order and each order instance belongs to a particular customer. Hence the cardinality is 1:M

Figure 13: Relationship between the customer and the order



An Order is controlled by an employee and each employee instance controls one or more orders. Hence the cardinality is M:1

Figure 14: Relationship between the Order and Employee



An Employee records a product and each employee instance controls one or more Products. Hence the cardinality is 1:M.

The Entity Relationship Diagram (ERD)

The ERD presented below depicted the entities, some of their attributes and the relationships between them as it was presented individually above. The diagram further indicates the multiplicities between these entities. Therefore, we decided to include the attributes in the ERD in order to avoid presenting an outrageous diagram.

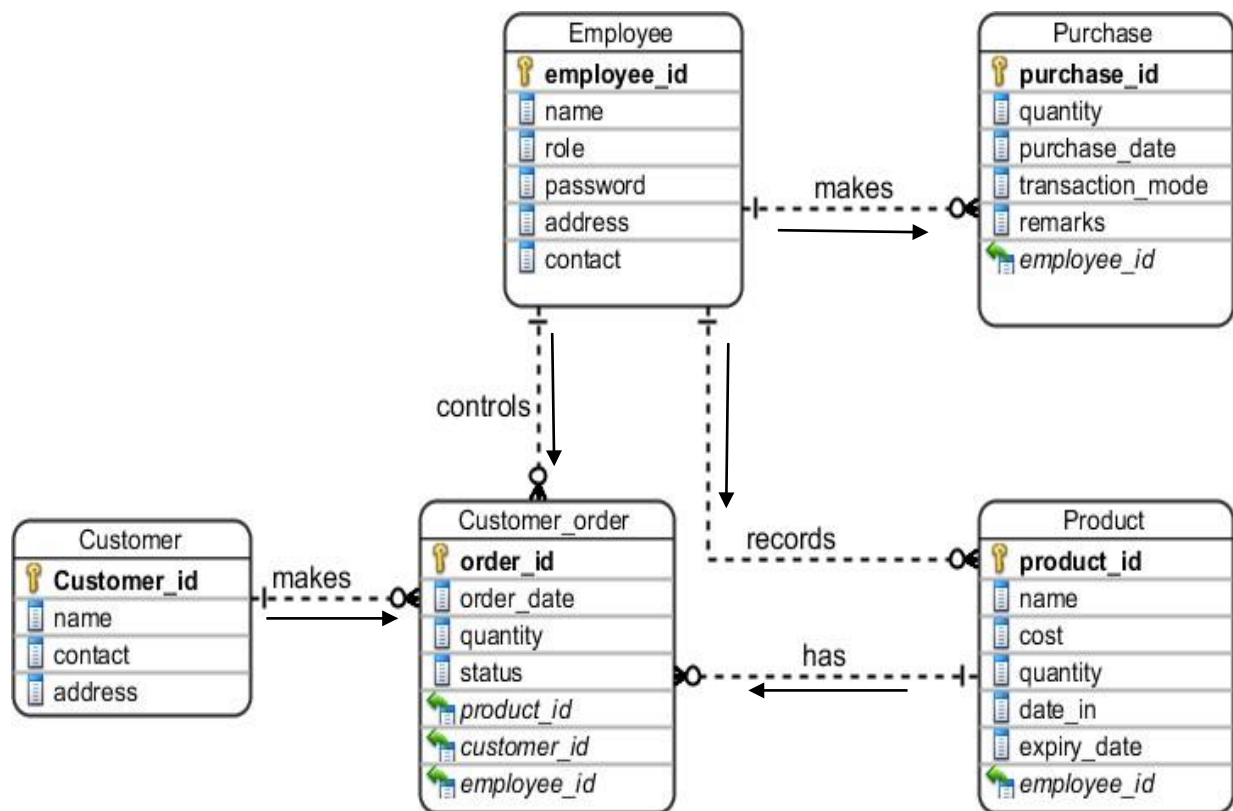


Figure 16: Entity Relationship Diagram (ERD) of Poultry Farm Management Information System.

d) Structure of Relationship of the Database

Table 13: Purchase Table Structure

Field name	Data type	Constraint
Purchase_id	Int	null, auto increment, primary key
Quantity	Varchar(45)	Not null
Purchase_date	Date	Not null



Transaction_mode	Enum(cash, credit)	Not null
Remarks	Text	
Supplier_name	Int	Not null
Employee_id	Int	Not null, foreign key REFERENCES Employee(employee_id)

Table 14: Product Table Structure

Field name	Data type	Constraint
Product_id	Int	Not null, auto increment, primary key
Name	Varchar(45)	Not null
Cost	Varchar(45)	Not null
Date_in	Date	Not null
Expiry_date	Date	Not null
Employee_id		Not null, foreign key REFERENCES Employee(employee_id)

Table 15: Customer Table Structure

Field name	Data type	Constraint
Customer_id	int	Not null, auto increment, primary key
Name	Varchar(45)	Not null
Contact	Varchar(45)	Not null
Address	Text	Not null

**Table 16: Employee Table Structure**

Field name	Data type	Constraint
Order_id	Int	Not null, auto increment, primary key
Order_date	Date	Not null
Quantity	Int	Not null
Product_id	Int	Not null, foreign key REFERENCES Product(product_id)
Status	int	Not null
Customer_id	Int	Not null, foreign key REFERENCES Customer(customer_id)

Table 17: Customer_order Table Structure

Field name	Data type	Constraint
Employee_id	int	Not null, auto increment, primary key
Name	Varchar(45)	Not null
Role	Varchar(45)	Not null
Password	Varchar(45)	Not null
Address	Text	Not null
Contact	Varchar(45)	Not null

System Implementation, Testing and Validation

Functions provided by the system

The poultry farm management information system provides different function to its users depending on their roles. The system prompts the users for their usernames and passwords, the users provide them then the system verifies the user. The user is then able to use the system for various tasks depending on his or her roles.

Functions provided by the Sales manager

The system enables the sales manager to control sales details. He also views registered customer's details which also include the customer order, registered product, sales report and stock report.

Functions provided by the Product manager

The system enables the product manager to register products and also view the registered products.

Functions provided by the Purchase manager

The system enables the purchase manager to control all purchase details. He also manages supplier details, views supplier report and purchases report.

Sample Screen Shots Capture

System login page

This shows the first page of the system. All the users have access to the system through this page. The users of the system have to be authenticated first by entering their required usernames(ID) and passwords before they can be able to access the system.

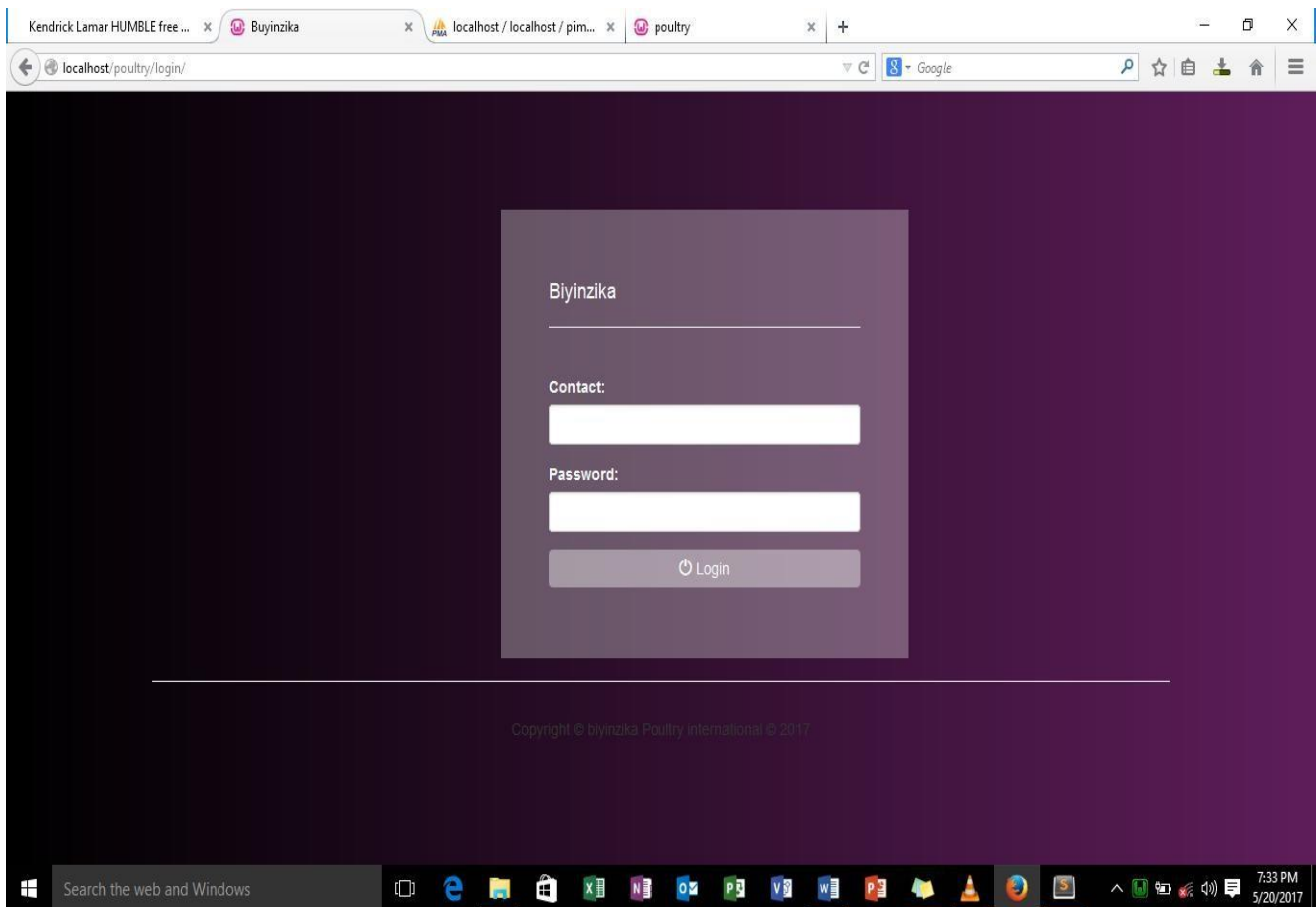


Figure 17: System Login

Authentication

Authentication allows the system to authenticates registered users and provide authenticationresponse when wrong login details are used to have access to the system.

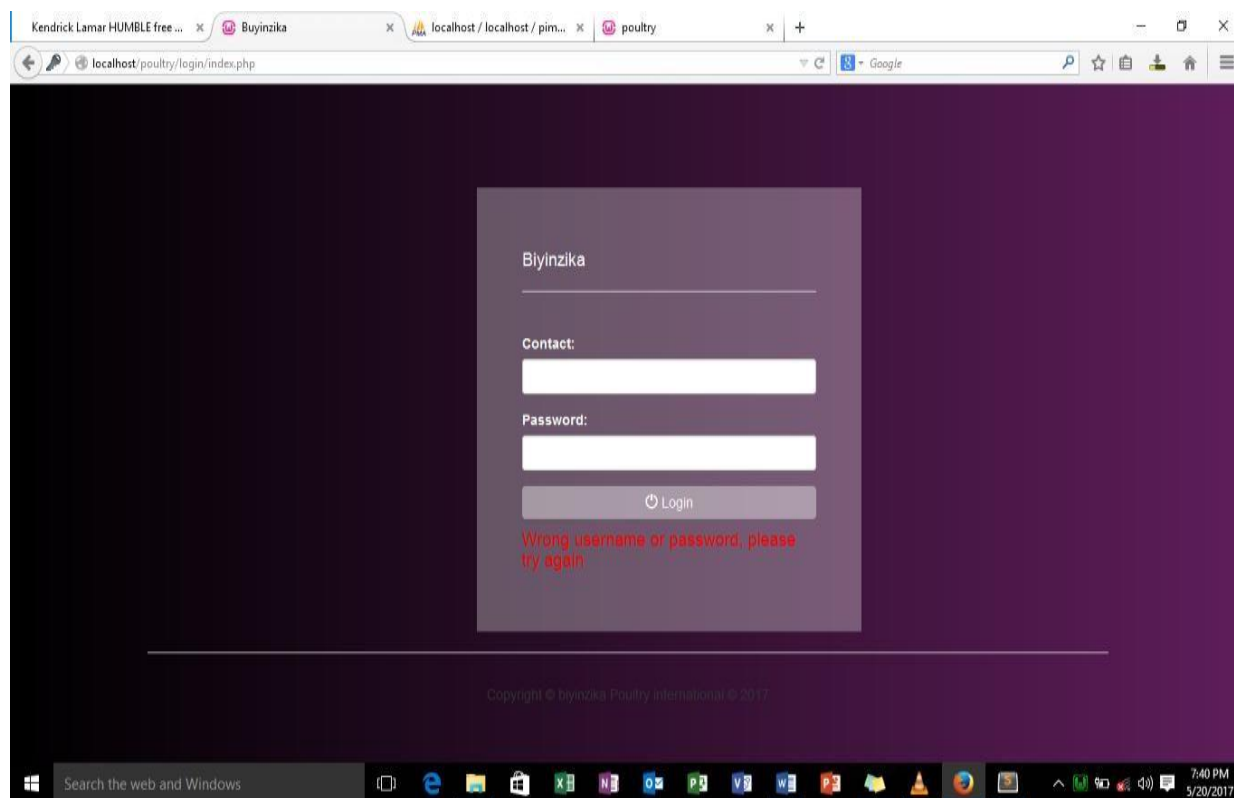


Figure 18: Authentication Response

User Registration

The User Registration allows the system administrator to register users of the system. Having the login as an Administrator, he creates a new user with a role and a unique password which is encrypted on submission to the system database.



Kendrick Lamar HUMBLE free ... x Add Stock Form x +

localhost/poultry/employee/add/ Google

Biyinzika Home Add New View Report Admin Logout

Employee Account Creation Form

Employee Name :

Role:

Employee Contact :

Password:

Employee Address :

Add Employee

Search the web and Windows 7:47 PM 5/20/2017

Figure 19: User Registration Form

Employee Report

View Employee report process allow the administrator to view complete report of the available employees in the system.

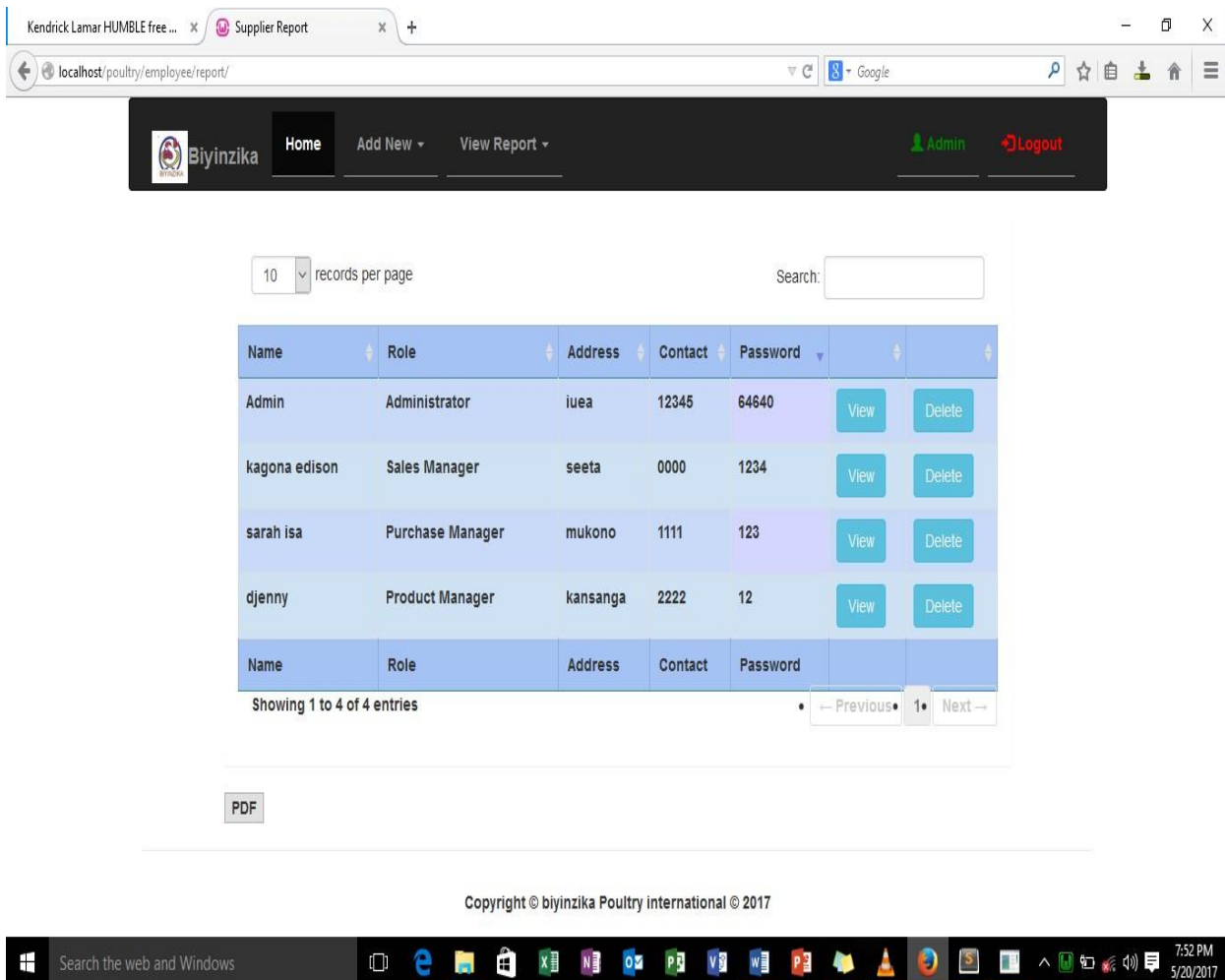
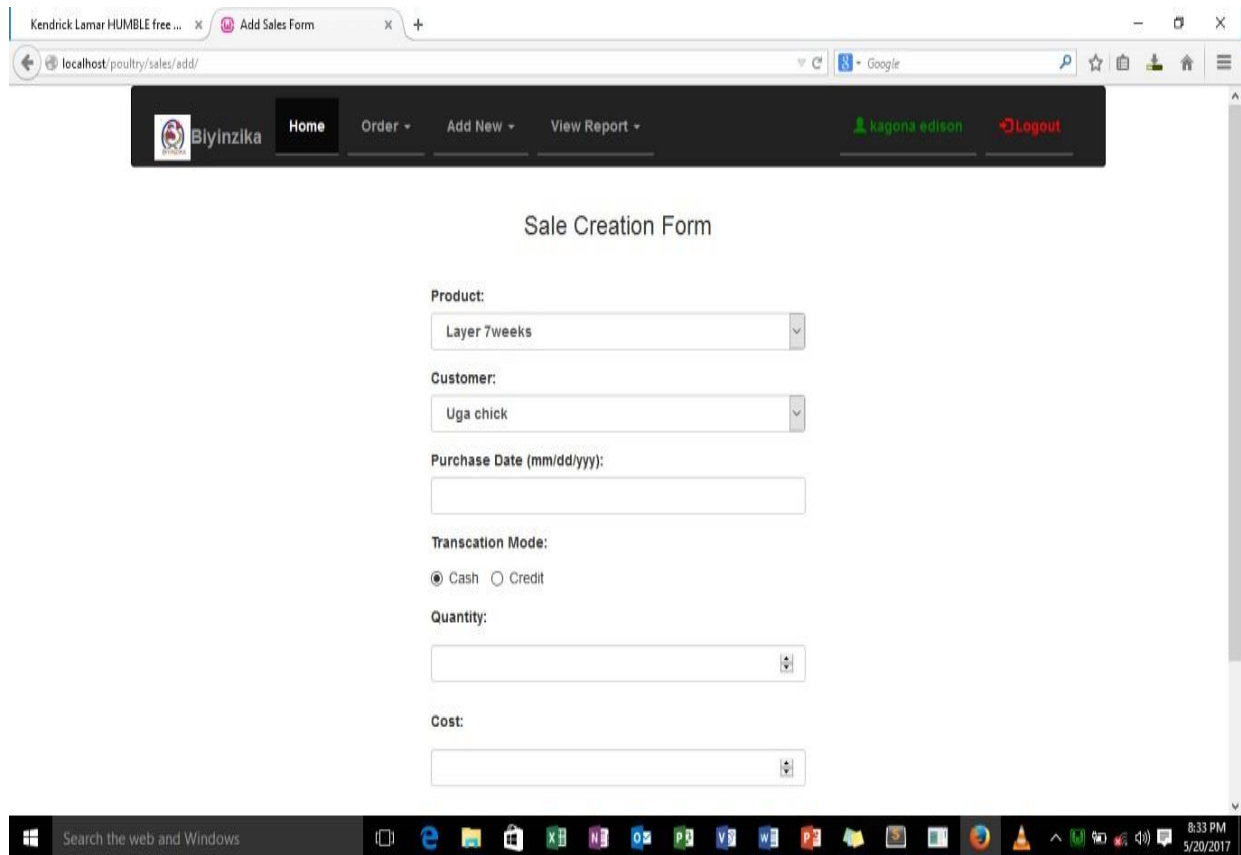


Figure 20: Employee report

Sale Creation Form

The Sales Creation Form allows the system Sale Manager to register orders from the customer in the system.



The screenshot displays a web browser window with two tabs: 'Kendrick Lamar HUMBLE free ...' and 'Add Sales Form'. The active tab shows a local development environment at 'localhost/poultry/sales/add/'. The page features a dark navigation bar with a logo for 'Biyinzika', a 'Home' button, and menu items for 'Order', 'Add New', and 'View Report'. On the right of the navigation bar, the user 'kagana edison' is logged in, and a 'Logout' link is visible. The main content area is titled 'Sale Creation Form' and contains the following fields:

- Product:** A dropdown menu with 'Layer 7weeks' selected.
- Customer:** A dropdown menu with 'Uga chick' selected.
- Purchase Date (mm/dd/yyyy):** An empty text input field.
- Transaction Mode:** Radio buttons for 'Cash' (selected) and 'Credit'.
- Quantity:** A text input field with a spinner control.
- Cost:** A text input field with a spinner control.

The Windows taskbar at the bottom shows the search bar, several application icons, and the system tray with the time '8:33 PM' and date '5/20/2017'.

Figure 21: Sales Creation Form

System testing and validation results

The poultry farm management information system was tested using unit, integration and system testing techniques. After every part of the system was implemented, it was tested using input to guarantee that each unit responded as expected. After individual units were tested as they were being developed, those whose functionality was association to others were integrated and also tested using integrated testing. With this, interaction between these units was verified and defects also corrected. System testing was performed on the complete integrated system to check whether all the specified requirements were met. These three types of testing were done by the project team developers. User acceptance system was done by the users of the system. A sample of six users of the system each was used to test the system functionality.

In general, the users stated that the system had a clean layout, was simple and easy to learn. In other words, it was user friendly. They also commented that it will easy information management within the different poultry farms of the company. Below are some of the tested cases that we are used to test the system:

**Table 18: Login Test Case**

Description	User's action	Expected System Response	Observed System Response
1. Login with right password	User with the right credentials	System to take user the appropriate pagebased on the user's roles.	System responded as expected
2. Login with wrong password	User input wrong credentials	System to prompt the user to enter correct credentials again.	System responded as expected.

Table 19: User Registration Test Case

Description	Admin's action	Expected System Response	Observed System Response
1. Registering a User	Admin enters details	System to registeredthe user based on hisroles.	System responded as expected.
2. Registering a user with wrong details or format	Admin input wrong details or format	System to prompt the Admin to enter the right detail again.	System responded as expected.

Table 20: Add Product Test Case

Description	Product Manager Action	Expected System Response	Observed System Response
1. The Product Manager Adds a product in the system	Product Manager enters a product details	System to addproduct recordssuccessfully	System responded as expected.
2. Adding a product with wrong detail or format	Product Manager enters a product details wit wrong details or format	System to prompt the Product manager to enter the right details again.	System responded as expected.

**Table 21: Add Purchase Test Case**

1. Purchase Manager registers a purchase from a supplier into the system	Purchase Manager enters Purchase details	System to add purchases successfully	System responded as expected.
2. Purchase Manager registers purchase details with wrong details or format	Purchase Manager registers purchases with wrong details or format	System to prompt the Purchase Manager to enter the right details again.	System responded as expected.

Table 22: Add Sale Test Case

Description	Sales Manager's action	Expected System Response	Observed System Response
1. The Sales Manager responds to customer orders in the System	The Sales Manager responds to the customer orders and registers the sales of the products in the system	System to add Sales Successfully	System responded as expected.
2. The Sales Manager did not view any Orders from Customer	When no Customer registered in the department	System to respond 'No Sale records found'.	System to responded as expected.

Table 23: View Product Report Test Case

Description	Product Manager's action	Expected System Response	Observed System Response
1. Product Manager views report of the products in the system	Product Manager tries to view report of a product in the system	System to display report successfully	System responded as expected.
2. No product record registered in the system	Product Manager tried to view report of a product in the system	System to respond 'No product records found.'	System responded as expected.

**Table 24: View Purchase Report Test Case**

Description	Purchase Manager's action	Expected System Response	Observed System Response
1. Purchase Manager views report of the purchases in the system	Purchase Manager tries to view report of a purchase in the system	System to display report successfully	System responded as expected.
2. No Purchase records registered in the system	Purchase Manager tries to view report of a purchase in the system	System to respond 'No purchase records found.'	System responded as expected.

Table 25: View Sales Report Test Case

Description	Sales Manager's action	Expected System Response	Observed System Response
1. Sales Manager views report of the Sales record in the system	Sales Manager tries to view report of a Sales in the system	System to display report successfully	System responded as expected.
2. No Sale records registered in the system	Sales Manager tries to view report of a Sales in the system	System to respond 'No Sale records found.'	System responded as expected.

Table 26: View Stock Report Test Case

Description	Product and Sales Manager's action	Expected System Response	Observed System Response
1. Product and Sales Manager views report of the Stock in the system	Product and Sales Manager tries to view report of a Stock in the system	System to display report successfully	System responded as expected.
2. No Stock records registered in the system	Product and Sales Manager tries to view report of a Stock in the system	System to respond 'No Stock records found.'	System responded as expected.



System Requirements

In order for the system to perform as expected, the following system specification for hardware and software are essential.

(i) Hardware Requirements

Table 27: Hardware Requirements

Hardware	System Requirement (Minimum)
Processor	Intel Pentium IV
Memory	512 MB RAM (1024 MB Recommended).
Disk space	30GB
USB Port	Version 2.0

(ii) Software Requirements

Table 28: Software Requirements

Software	System Requirement
Operating System	Microsoft Windows XP or higher
Web Browser	Mozilla, IE etc.

CONCLUSION

The stated objectives of the poultry farm management information system were attained. The current system was studied, processes and data modeled for a new system were designed and they were implemented, tested and validated as discussed. In addition, all the requirements are specified in the system analysis section were provided by the system. The system enables the product manager registers and views registered products. The system enables the sales manager to register sales details, it also allows the sales manager to view registered products and registered customer details. The system enables the purchase manager register purchase details, also allows the purchase manager to register a supplier.

All in all, the poultry farm management information system excluded the hard-pressing challenges presented by the current system as it automated the whole poultry recording processes in the company.



List of Abbreviations and Acronyms

HTML – Hyper Text Markup Language
XHTML – Extended Hyper Text Markup Language
URL – Uniform Resource Locator
RDBMS – Relational Database Management System
ERD – Entity Relational Database
IDE – Integrated Development Environment
DFDs – Data Flow Diagrams
DBMS – Database Management System
CSS – Cascading Style Sheets
ISP – Internet Service Provide

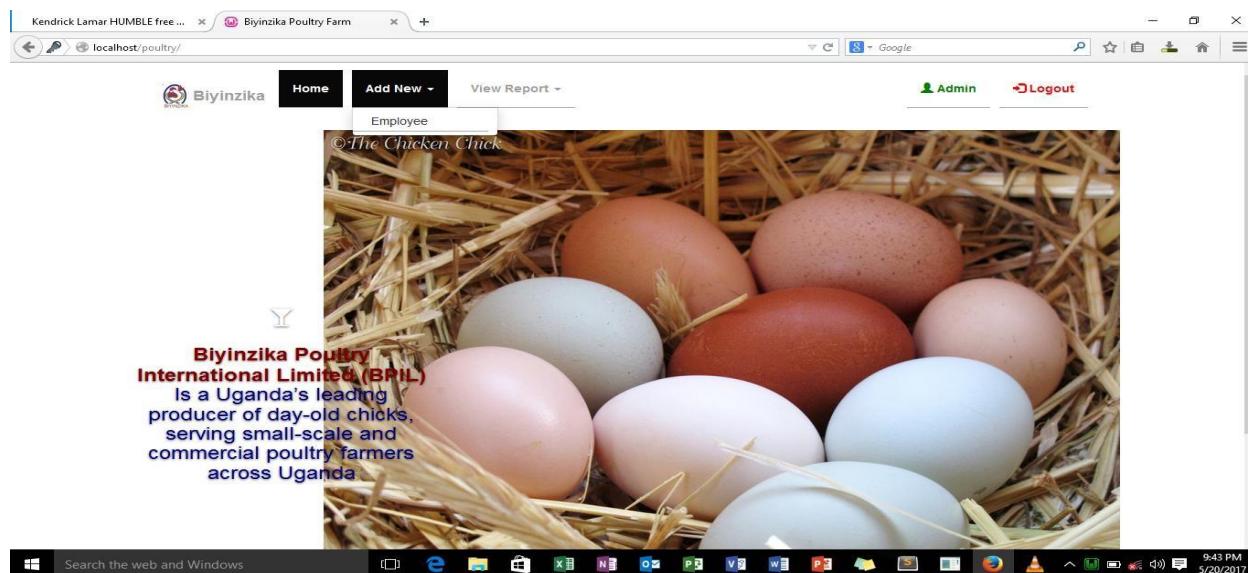
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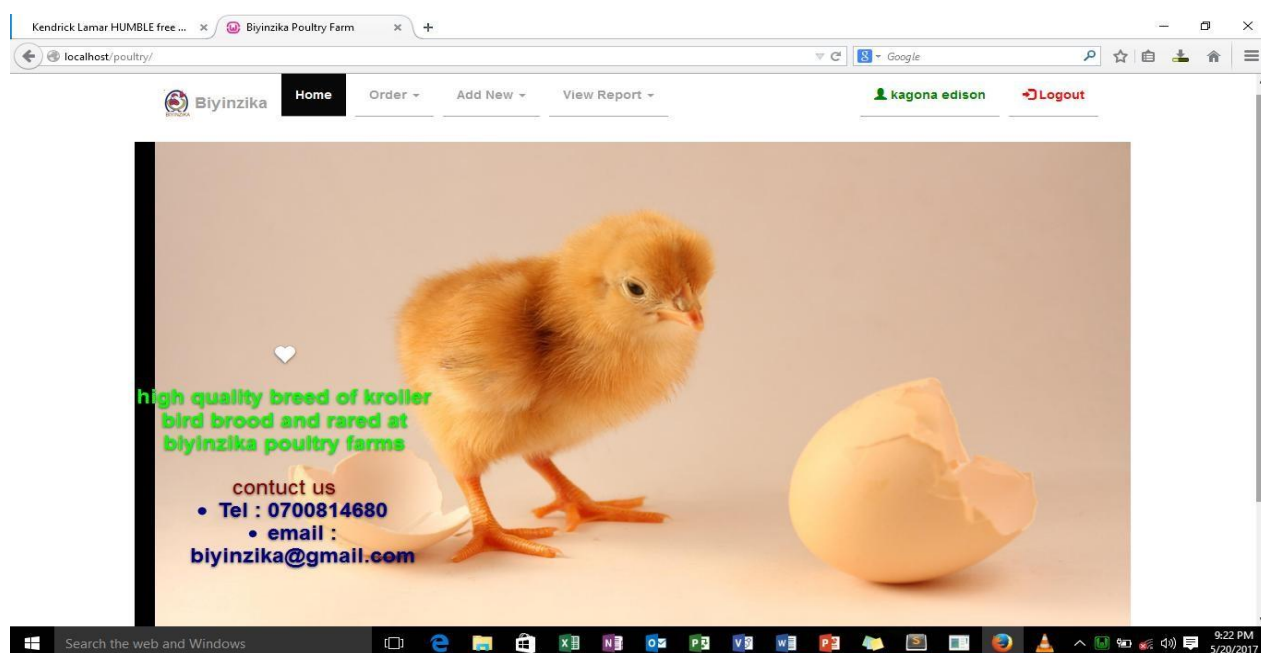
APPENDICES

Appendix A: Interface Sample

A.1.1 Administrator Interface



A.1.2 Sales Interface





Appendix B: System Pseudo Code

System Pseudo Code

User's Registration

Initialize Parameters to access data (username, password and role)

If Parameters are equal to null

Alert box, wrong username or password, please try again

Else

Go to Users page

End If

Authentication

If user login details match

Go to Users page

Else

Return to login page

End if

Register a Product

If Parameters equal to null

Alert box, please fill out this field

Else

Go to products report page

End if

Register Purchase

If Parameters is equal to null

Alert box, please fill out this field

Else

Go to purchase report page

End if



View Product Report

If product exist

Display Product Report

Else

Display blank page

End if

View Purchase Report

If purchase exist

Display Purchase Report

Else

Display blank page

End if

View Sales Report

If Sale exist

Display Sales Report

Else

Display blank page

End if