AN ANDROID BASED FARM MANAGEMENT SYSTEM FOR AUTOMATING DAIRY PROCESSES

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Class: BBIT 4A

An Information System Project 2 documentation submitted to the Faculty of Information Technology in partial fulfilment of the requirements for the award of the Bachelor's Degree in Business Information Technology of Strathmore University

Faculty of Information Technology

Strathmore University

Nairobi, Kenya

JANUARY 2021

Declaration

I declare that this work has not been previously submitted and approved for the award of a Bachelor's degree by this or any other University. To the best of my knowledge and belief, the proposal contains no material previously published or written by another person except where due reference is made in the proposal itself.

Student's signature:

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Abstract

This research seeks to provide a solution for the farm owners who lack up to date records from their farm managers on the dairy farm activities daily. The problem experienced is that it becomes hectic for the farm owners to keep track of whatever is going on in their farms when they are far away as it is done manually and at times it takes long for the farm managers to update the owners on what is going on due to the workload they have. There is also possible loss of data which cannot be repeated as there is usually only one set of records. It will help the farm owners to get reliable reports which will help them plan better on where to use their expenses better and how to improve their farms to run more effectively. It will also be used for accountability by the farm owners so that they know exactly what their farm managers are doing in the farm and how exactly the expenses are being used. The research methodology used is Software prototyping because it breaks the project into smaller and manageable sections and can test the system with the users of the system itself which helps to identify the mistakes that cannot by identified by the programmer. It also ensures that several tests are done before the final product is made which ensures that both the customer needs and functionality are met. The system being mobile based ensures that the records will be captured when one is offline and once there is internet the new data will be updated in the cloud. It also ensures that the data is available throughout. Tools that were used in the project include java programming language and firebase database tools. In conclusion, the project will benefit the farmers as they will be provided with a reliable, secure and effective record keeping application.

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List of Abbreviations

OOAD Object Oriented Analysis and Design

PCs Personal Computer

PDAs Personal Digital Assistants

SMS Short Message Service

USSD Unstructured Supplementary Service Data

Acknowledgments

I want to thank the Almighty God for giving me the strength, guidance and determination throughout this proposal. I sincerely thank my supervisor for his guidance and encouragement in carrying out this proposal. I also wish to express my gratitude to my lecturer, for imparting his knowledge and expertise in this unit. My thanks and appreciation also go to my colleagues and people who have helped with their abilities.

Chapter 1: Introduction

1.1 Background

Agriculture is the main source of economic growth in Kenya. About 75% of Kenyans earn their income from this sector. It is very important as there is always an increasing need for food supplies which creates the demand for agricultural products. It also creates employment through farming, business and research activities which raises the standard of living for individuals. (Birch, 2018)

In Kenya, dairy farming is a sub sector which is large in the agricultural sector. The rift valley and central regions produce most of the milk in the country. Other regions that produce milk include eastern, nyanza and western regions. Milk production in Kenya is mainly from cattle but other animals also produce milk including camel and goats.

Small scale dairy farmers dominate the dairy industry at the production level. The difference between the small-scale dairy farmers and large-scale dairy farmers is the size of their farms, level of management in the farms and the use of inputs (TechnoServe, 2008). Dairy farming is profitable by ensuring that one has good cows that produce a huge amount of milk, ensuring that the animal sheds are well taken care of in terms of their health and comfort, the animals should also be fed well and given nutrients to ensure that they produce good quality milk and farmers also ensure that they have cows that are able to reproduce which will eventually increase the milk production. (Muriuki, 2011)

Dairy farmers keep records of their daily activities through a manual system. The manual system helps to keep track of some of the activities and is not very efficient and reliable. It can capture a daily record of the milk that is being produced in the farm, it also shows the amount of milk that is being sold to consumers and milk that is being kept in the farm for daily use. It becomes hectic to keep on filling these records manually every single day and at times one might forget to update the records. The farm owners also have a difficult time getting to know exactly what is happening in their farms as the farm managers are not always available to keep on updating the owners every single time they are updating the records due to the workload they have daily. It also becomes expensive for the farm owners to keep on travelling to check on the progress of their farms frequently because while contacting their farm managers some of the details might be left out or forgotten.

1.2 Problem Statement

The current manual recording system in farms has been found to be inefficient and not reliable. The system leads to errors that lead to several challenges later. It also becomes hectic for the farm owners to keep track of whatever is going on in their farms when they are far away as it is done manually and at times it takes long for the farm managers to update the owners on what is going on due to the workload they have. The system is also not able to generate reliable reports which will help the farm owners know exactly what to improve on and what income their farm generates for them. The reports help the farmers know the amount of milk they produce monthly and how much income the milk generates as it is very tiresome because the records they keep are so bulky and before getting through all of them the reports generated after would not be efficient and reliable to the farm owner as some of the information might be miscalculated.

It also does not offer accountability to the farm owners as they are not aware of what their farm managers are doing in terms of how they use farm resources and the amount of milk they produce for each animal in the farm. The automation of the manual system will ensure that the records are kept well and when analysis is needed to be done it will be an easy task and very efficient. The owners will also be able to get regular updates on the farm activities and they will not have to keep on travelling to check on their farms.

1.3 Aim

The aim of this developed information system is to solve the problem identified. The system solves the problem of farmers by ensuring that they get daily updates of the farm activities that take place in their farms and help them generate monthly reports easily which ensures that the farm runs very effectively as the farm managers will also become more accountable for what they are doing daily. It will also help to keep the records more secure as opposed to the manual system that is being used.

1.4 Specific Objectives

I. To critique the current techniques of data capture of daily farm activities.
II. To review techniques of an automated system as opposed to a manual one.
III. To design and develop an android system that will facilitate the accountability of the activities in the farm.
IV. To test the system

1.5 Justification

The farmers will be able to benefit from this system because they will be able to get updates of all the farm activities in their farms. They will also be able to know the amount of milk the animals in the farm produce and the amount of income they get from the milk that is sold which will ensure that they do not lose money. It will also help them to get reliable reports which will help them plan better on where to use their expenses better and how to improve their farms to run more effectively.

1.6 Scope and Limitations

The system ensures that the owners get accurate daily updates on the farm activities which will help them know how exactly their farm runs and they can also be able to keep track on all their animal details like milk production and milk sales which ensures they do not incur losses. It also keeps track of the expenses in the farm and shows what exactly is being used and where it is being used. The system also keeps track of the animal medical details which ensures that they get their vaccinations on time. The limitations to the project are that it will ensure that the person that is using the system has a mobile phone where they will be able to download the application. They will also need to have access to the internet so that they are able to update any farm activity.

Chapter 2: Literature Review

2.1 Introduction

In this literature review the main things that will be focused on is the different challenges that affect dairy farmers with recording the various dairy processes in the farm. The main aim is to find the different challenges that they undergo so that there may be a solution for each of the problems that they experience to create a better working environment for those who will get to use the automated system to record the various dairy processes. It also points out the current system that is used to record the data in the farms and the challenges that are faced using this method. It will also aim to find out different approaches that will be there to enable the system to become automated. It will also review the different systems that exist in this field and highlight the gaps that exist in the various systems. Lastly it will also focus on the conceptual framework of the whole project.

2.2 A description of current dairy data capturing process.

The current data capturing method used by most farmers is the manual method while a few of them have adopted the digital way of storing their data. Farmers record their farm activities on paper in terms of the milk that is produced by the animal each day, the vaccination schedule of their animals and the details of each animal (Annette Kuteesa and Miriam Kyotalimye, 2019).

2.2.1 Challenges experienced with the current dairy data capturing process.

The manual way of data capturing is faced with certain challenges. They include:

a. Loss making due to poor record keeping.

Farmers who use manual records find it hard to keep accurate records which are up to date as some of the data might be lost by the book getting lost which is not easy to retrieve or redo again so one will not be able to know exactly how their farm is doing if such a thing happens. The data is not retrievable as there is usually no backup for the books they keep unlike if they had their data in digital systems which would have a backup therefore no data would have been lost. The farmer will also incur losses as they would not be aware of what exactly they should improve on in terms of the feeding regime for the animals, when an animal is due for its vaccination and there would be no record to show how the animals produce in a day and what amount of it is sold to customers. It also becomes difficult for

the farmers to access credit without having records that are conclusive and reliable. (Limo, 2017)

b. Bulky records

Farmers who keep manual records usually find it difficult to generate accurate reports monthly which would help them improve in terms of their productivity and planning during the next month. It will also show them how their expenses are being spent throughout the month and how they can review it to use their expenses in a better way when the next month approaches. (Annette Kuteesa and Miriam Kyotalimye, 2019)

2.3 A review of automated dairy data capturing systems.

Developers have attempted to introduce computer-based information systems that can help to replace the manual data capturing method that is being used. The systems include:

a. DigiCow

It is a mobile application that keeps track of dairy business. It gives feedback on multiple things depending on the data that is provided by the farmer. It has tutorials to guide the farmers on how to use the app. It generates reports for the farmer when needed which can be easily interpreted. It also sends alerts to remind the farmer of important dates so that the farmers do not forget. (Kinuthia, 2012). It is available on android phones for free.

b. ICow

It is a platform that has both USSD and SMS. It enables farmers to keep track of their animal gestation period. The farmers register their animals and receive and SMS with vital days during the gestation period. It also sends weekly messages with tips on nutrition, health, milk production and good dairy practices. It also has a customer care center where the registered users can call so that they get feedback on any inquiries they might have. (iCow, 2016). It is available on both platforms.

2.3.1 Gaps in existing automated dairy data capturing systems.

The systems that are currently present solve most of the challenges the manual system goes through. They can keep records for daily farm activities well. The systems share a single platform that is used both for the farm owners and managers and everything is accessible to

both. The system should be able to have different platforms for the farm managers and farm owners. The farm owner should be able to have a different platform that has more tabs than that for the farm manager. More features should be available to the farm owners and it should be accessible anywhere as most of the farm owners are usually not around the farms all the time which will allow them to be updated with how things are working in their farms. It also only focuses on cows instead of all dairy animals in the farm.

2.4 Mobile Applications Development Framework

It provides a systematic and comprehensive solution to mobile applications development and maintenance. It brings together elements such a software design, infrastructure, design and information that is accessed through multiple sources. It suggests the usage of mobile standards (2G, 3G or 4G) and wireless technologies. It brings out some important aspects that should be considered when developing applications that can handle complex business logic, transferring data back and forth over the mobile network and facilitating data storage to a database. (Unhelkar & Murugesan, 2010)

The proposed solution will focus on this and include push notifications that would enable the users to get notifications in terms of dates for vaccination, expenses, milk production sales and other details. It will enable the user to be up to date with their farm activities which will be helpful to them in terms of productivity.

It gives clear pointers on the basic components of a mobile application development model.

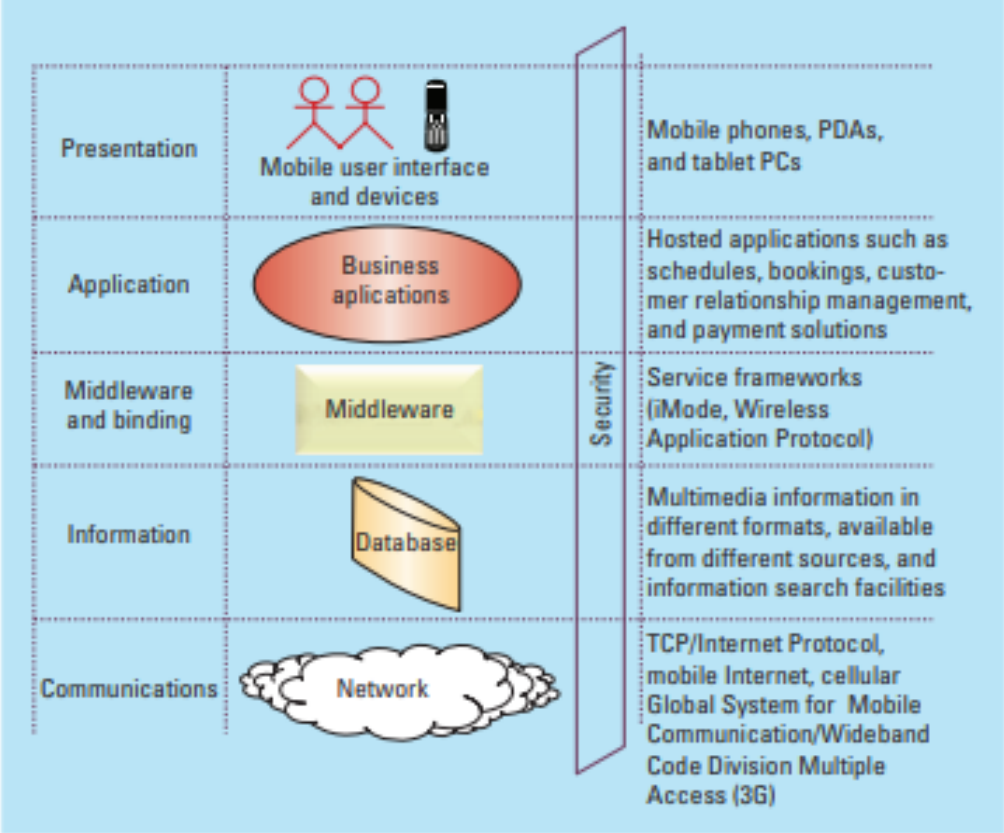


Figure 2. 1 The six layers of the enterprise mobile applications development framework

2.5 Conceptual Framework

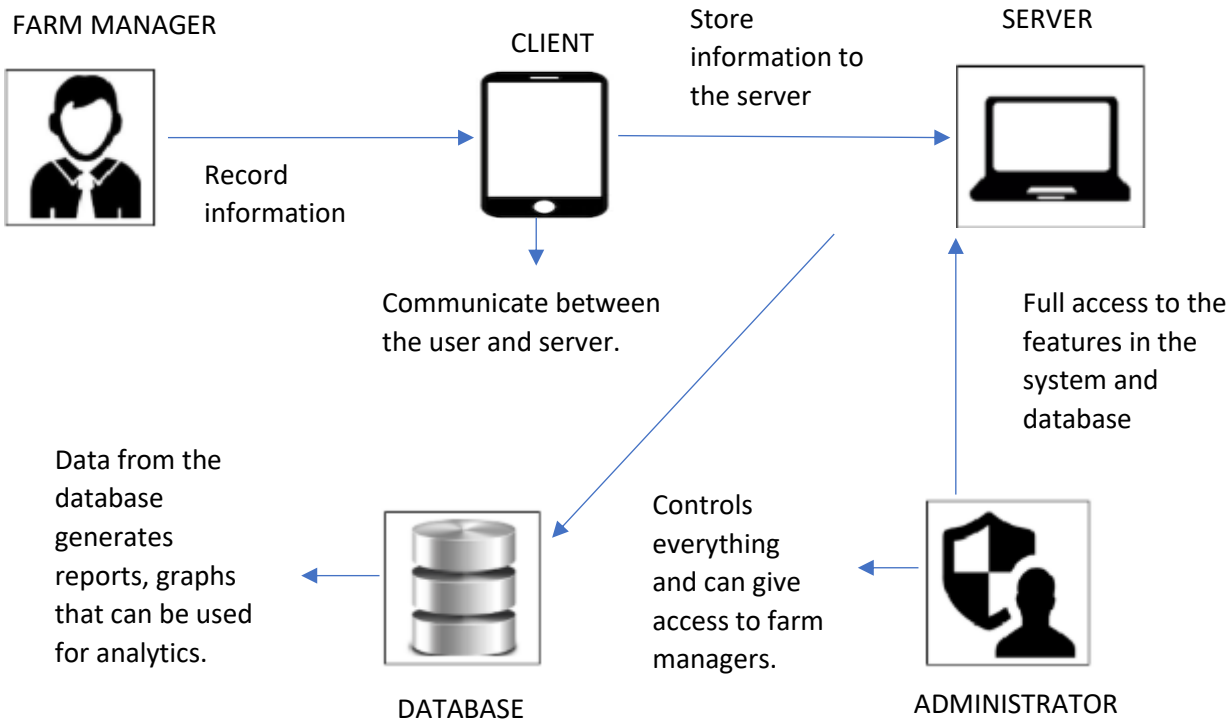


Figure 2. 2 Conceptual Framework

The system works in such a way that the farmer inputs details for the animals in the farm in terms of their breed, names, age and any other details. The farmer also inputs the dates for vaccinations for all the farm animals, the expenses used in the farm, the milk production of each animal and the milk sales. The system will be able to generate reports for the farmers when there is need of reports to help in planning.

The administrator will have a different platform from the farm manager as both will have different features. The farm manager will have the most basic features while the farm owner has more advanced features and is also the one who can add new farm manager by giving them access. The data that will be stored in the database will be the same as the one that will be entered in the mobile application.

Chapter 3: System Development Methodology

3.1 Introduction

This chapter will focus on the methodology that the system used. The design methodology that the system will follow on how the modules will be developed. It also explains the methodology used together with the steps that it follows while using this system. It also highlights both the functional and non-functional requirements that the system has.

The chapter will also list the diagrams that will be used according to the system design methodology which will be later drawn in a different chapter. It will also list the development tools used and the mode of execution which will now determine the tool to be used as the domain of execution guides someone to choose the right tools. It will also be able to tell how the system was tested. Lastly it will give the system architectures of the flow of the whole system.

3.2 System Design Methodology

The project applied object-oriented analysis and design (OOAD). It is a procedure of identifying the software engineering requirements and developing software specifications in terms of the objects of the software system, which comprises of objects which interact. It mainly focuses on its objects which integrate both the functions and data. They are modelled after real world objects that the system usually interacts with. The analysis of the method is that the requirements are viewed from the perspective of classes and objects found in the problem domain of the proposed project. It allows the reuse of functions which becomes easier and it saves on time. It is also very easy to maintain as opposed to other approaches as if an error occurs it

does not affect the system but only the specified module only. (Sankar, 2016)

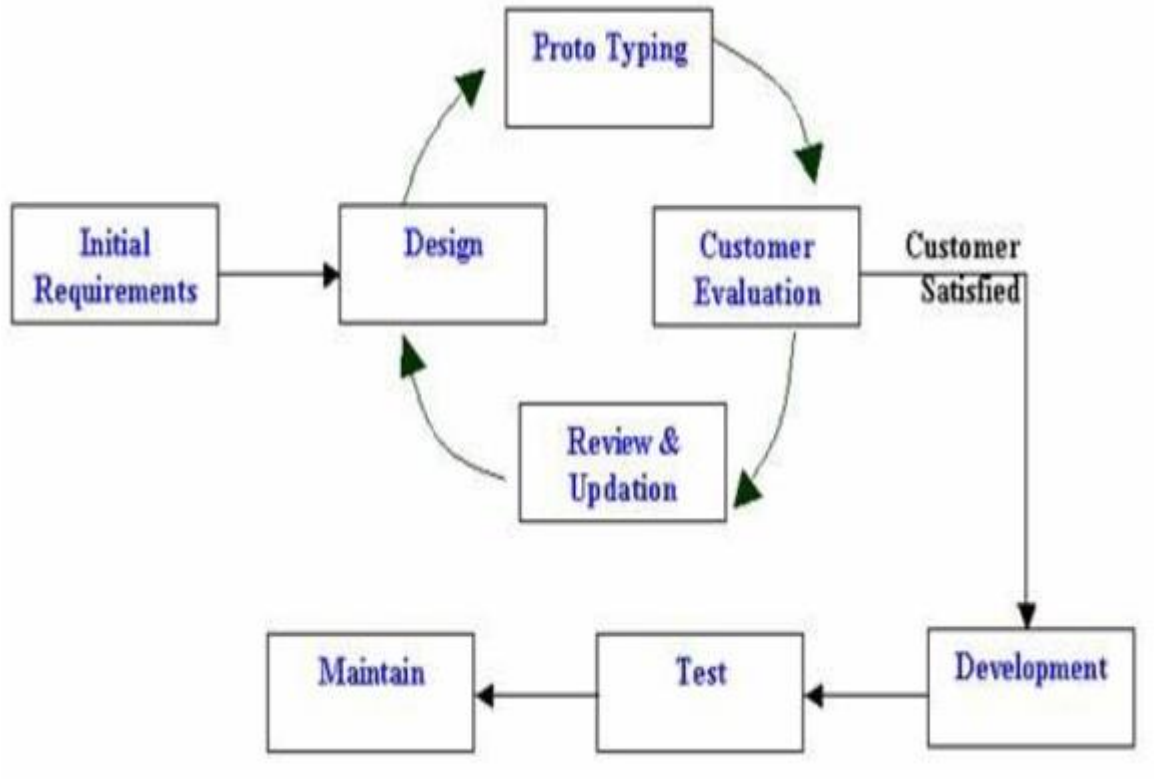


Figure 3. 1 Prototype Model

3.3 System Development Methodology

This research used software prototyping in the development of the system. Software prototyping is the rapid development of a system. It is therefore able to understand the user requirements at a very early age and one can get feedback from the users that will aid one in building the final project after collecting all the information that is needed which also helps in better understanding of the project at hand. It also supports system testing and user training where the users can interact with the system and find out the capabilities of the system at an early stage and give their opinions on it. It also reduces the risk of the system failing because the prototypes are reviewed after short periods of time. This will therefore enable the project to get all the feedback needed as the prototypes keep on being built to build a

very good final project at the end. (Meiryani, 2019)

3.3.1 Basic requirement specification

This step only involves knowing the basic requirements of the system itself. It does not involve a lot of things because one does not have to worry about the complexity of the system itself. What falls under this step is how the system looks, the colors incorporated in it and how things flow which is the very basic things of the system. The system tells the basic requirements it needs before the prototyping of the system begins. (Jacob, 2012)

3.3.2 Developing the initial prototype.

This step is now whereby the basic requirements are put together to come up with different interfaces which might not necessarily work the same way they will when the actual system is created at the end. Although the prototype will give an impression of how the main system will look though it will not be the same. This prototype is built so that it can be able to be reviewed to help in building the final project. The project will therefore be able to create prototype for testing how the automation of the dairy processes will be done. (Jacob, 2012)

3.3.3 Review of the prototype

The prototype that has been created is therefore presented to the users and the important shareholders of this system. It is first tested by them to see how it will work when the main product is developed and given to the public itself. It will enable them to find where there might be gaps in the system and they will be able to rectify it earlier as opposed to when the final product is given to the users and the important shareholders at once. The system will therefore be given to the farmers

to sample it on a small set of data to tell if it will be more beneficial than the manual one and to also add their views on how they would like the system to look like. (Jacob, 2012)

3.3.4 Revise and enhance the prototype.

The reviews that the customer has regarding the system are looked at and negotiations happen with the customer based on other factors such as the price and the time. Once they have come to an agreement then another prototype is also created and presented until when the user will be satisfied with the outcome of the system. After the customer is satisfied with the final product then the final system is now created which helps to make it more efficient after all those prototypes that were done before. The system will therefore be nearly complete as when the last prototype is done it will almost look like the main project. (Jacob, 2012)

3.4 Requirement Analysis

They include the functional and non- functional requirements for the system. Functional requirements refer to the functionality and services that will be provided by the system for it to function as intended. Non-functional requirements describe how well the system supports the functional requirements.

3.5 System analysis and design

3.5.1 Class diagram

They provide a structural view of systems. They identify the classes that are there, how they will interrelate and how the different classes interact with each other. (Kalinga, 2017)

3.5.2 Database schema

It is a logical structure of the database. It shows the relationship between different

sets of information depending on the type of information that is has which can either generate a logical database schema or a physical database schema. (Kalinga, 2017)

3.5.3 Sequence diagram

They are interaction diagrams that detail how the operations are carried out. They model the routine interactions between the parts that make up the system. They model high level interaction between active objects contained in the system. (Kalinga, 2017)

3.5.4 Use case diagram

They are a requirements analysis concept that shows the system's actions from the point of view of the user of the system. It shows the interactions the user will have with the system itself. It captures the requirements of the system itself. (Kalinga, 2017)

3.6 Development tools

The IDE that will be used will be android studio as the system will be an android application therefore it will be efficient to use. The programming language that will be used will be Java as this will help to integrate the functions well into the website itself. The database that will be used to store the data will be Firebase because it is a real time database that allows data to be synchronized and stored in the cloud.

3.7 Testing

3.7.1 System Testing

It is done to prove that the system requirements specification does not meet the system implementation. It is usually one of the first things to be processed as all that is required is the requirement specification which is available very early in the project development. Test cases are designed to be able to guide one in simulating the end user environment as realistically as possible. The proposed system will test the

system based on its usability, security and the performance. (Oladimeji, 2007)

3.7.2 Unit Testing

It is the smallest piece of software that can be tested. It seeks to find out if the functional specification if fulfilled in the implementation. This test is usually performed by developers which helps in understanding the system functional specification. It helps to provide confidence in the quality of the system using the test itself. The proposed system intends to use this testing by testing it with fellow colleagues to get immediate feedback on it. (Oladimeji, 2007)

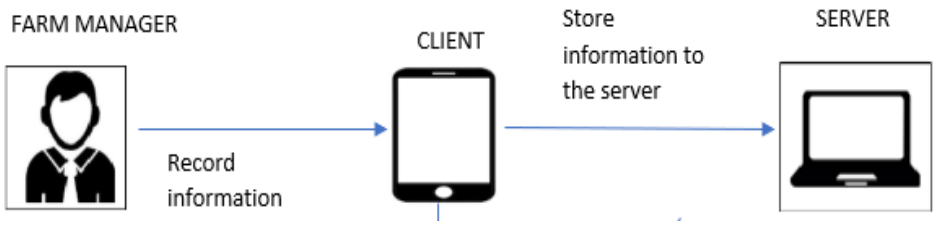
3.8 Domain of Execution

The system is mobile based as making the project into an android application is much easier to be able to record different farm processes and it also helps to access data from the database faster. There is also an administration panel which will make it easier for the administrator to access the system without having to undergo a long process.

3.9 Proposed Modules and System Architecture

The proposed system will have the following modules:

I. Administration panel
II. User panel
III. Reports

<table>
<tr><td>Frontend</td><td> 
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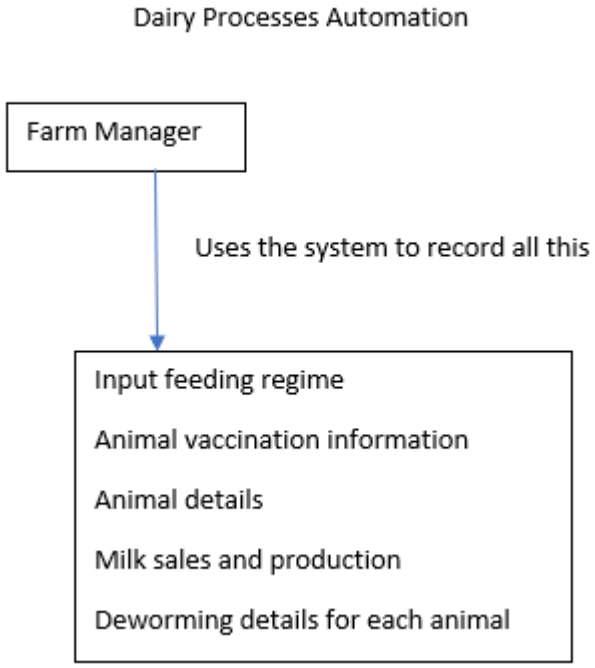
<tr><td>Logic</td><td> 
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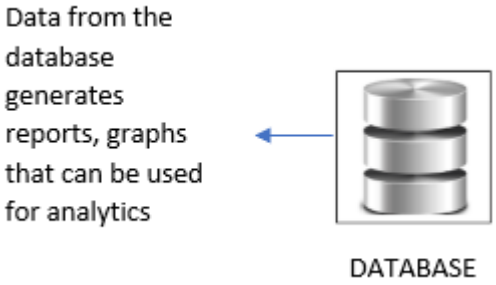
<tr><td>Database</td><td> 

Data that will be stored will be:
Animal details
Milk sales and production</td></tr>
</table>

Table 3. 1 System Architecture

In the front end that is what the farm manager sees. The logic is what happens in that system which is inputting the feeding regime of the animals, animal details and milk sales and production. The database is where all the information is stored.

CHAPTER 4: System analysis and Design

4.1 Introduction

This chapter reviews the components of the system and how they interact with each other to accomplish the set objectives. It also focuses on the requirements of the system both functional and non-functional, system analysis diagrams which include the use case and sequence diagrams and design diagrams which will be the entity relationship diagram, database schema and class diagram.

4.2 System Requirements

They are the resources required to be accessible to the system for it to complete the required tasks efficiently and meet the set objectives.

4.2.1 Functional Requirements

Authentication

A login page filters out the trusted and the untrusted parties from interacting with the system. A functioning log in page is necessary to filter out the data from the public.

Administrative functions

This refers to only the farm owners having the privileges to some of the data in the system.

Reporting

The system should be able to generate reports for the farm owners to enable them to plan better.

4.2.2 Non – Functional Requirements

Performance

The system should be able to perform the tasks at a certain speed to ensure tasks are completed efficiently.

Accuracy

The data collected should be collected accurately to give correct results thus promoting efficiency.

Usability

The system should not be complicated such that it requires constant challenges with its use.

Reliability

The system should be available at any time and the information should be up to date and accurate.

Security

The system should ensure that the data is secure from and intrusion and damage.

4.3 System analysis diagrams

These are the diagrams that are used to ensure that all the components of the system work efficiently to accomplish their purpose.

4.3.1 Use case diagram

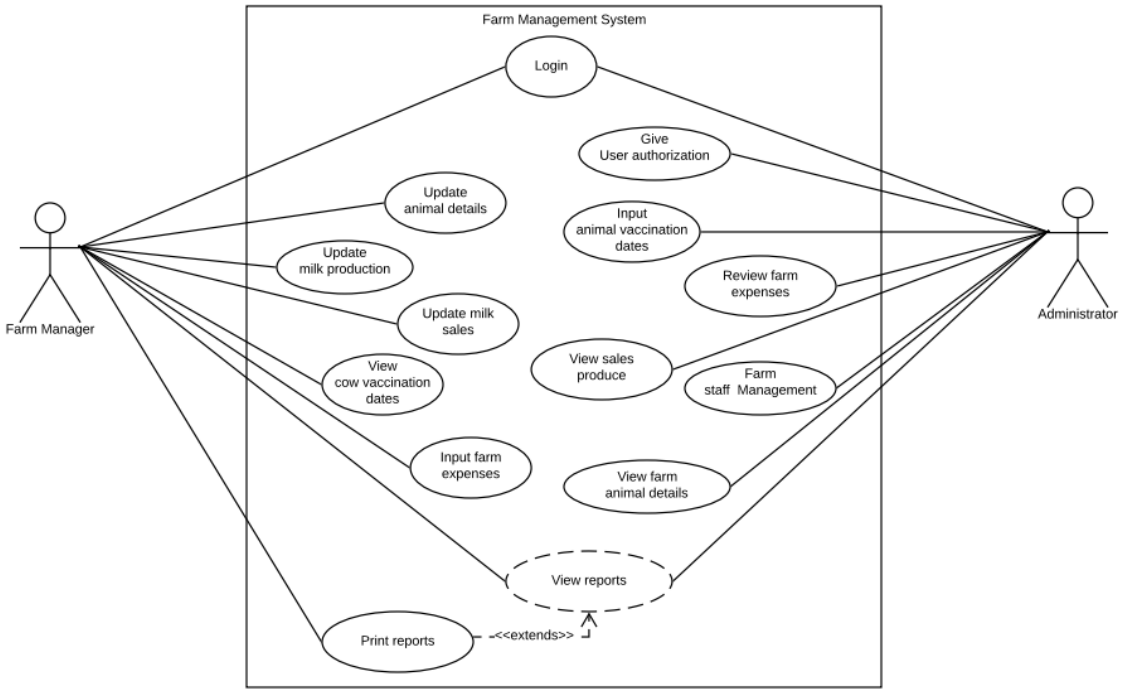


Figure 4.1 Use Case Diagram

In the use case diagram, the different transactions done by both the farm manager and administrator are defined. The manager can input farm expenses, update milk production and sales. The administrator can add managers into the system since

they are the ones able to give authorization to their farm managers. The administrator is also able to print reports for their farms.

4.3.2 Sequence diagram

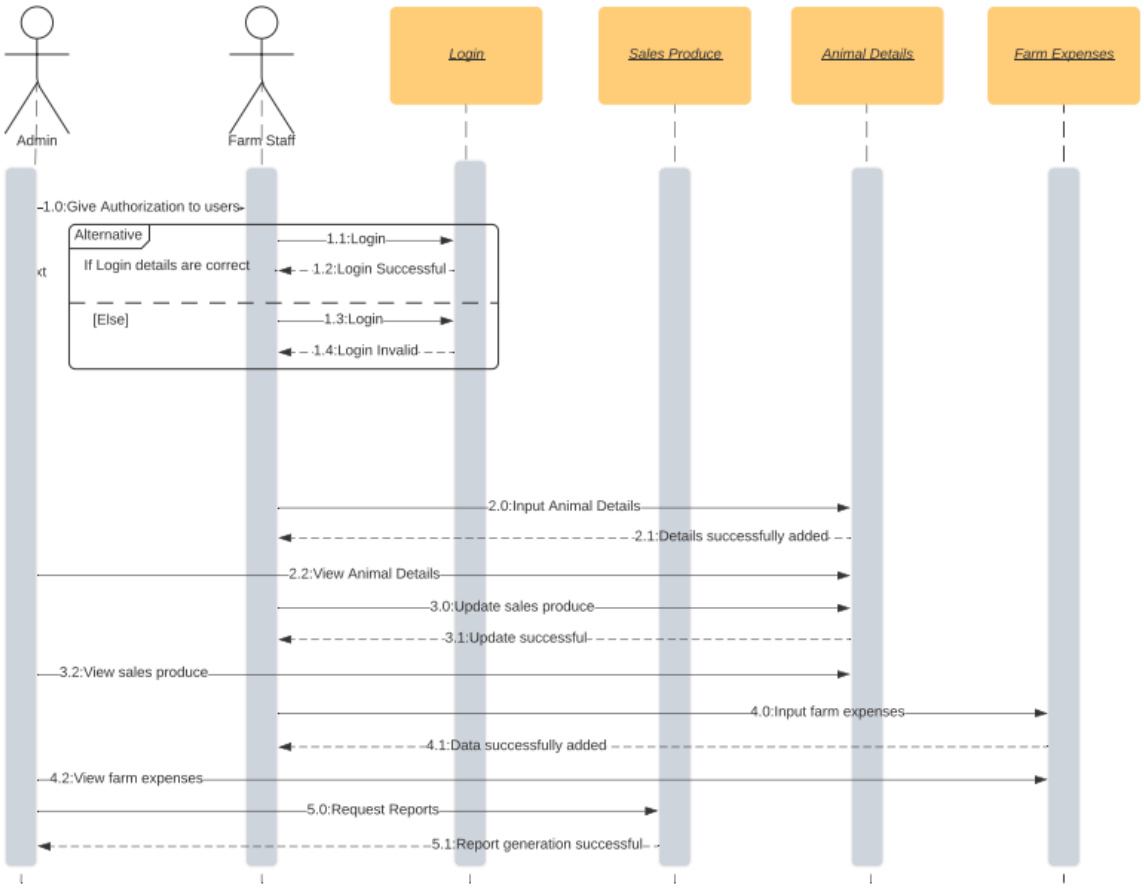


Figure 4.2 Sequence Diagram

The sequence diagram explains the whole process that happens in the farm.

4.4 System design diagrams

These diagrams are a visual model of the system used to show system components and how they interact with each other.

4.4.1 Entity relationship diagram

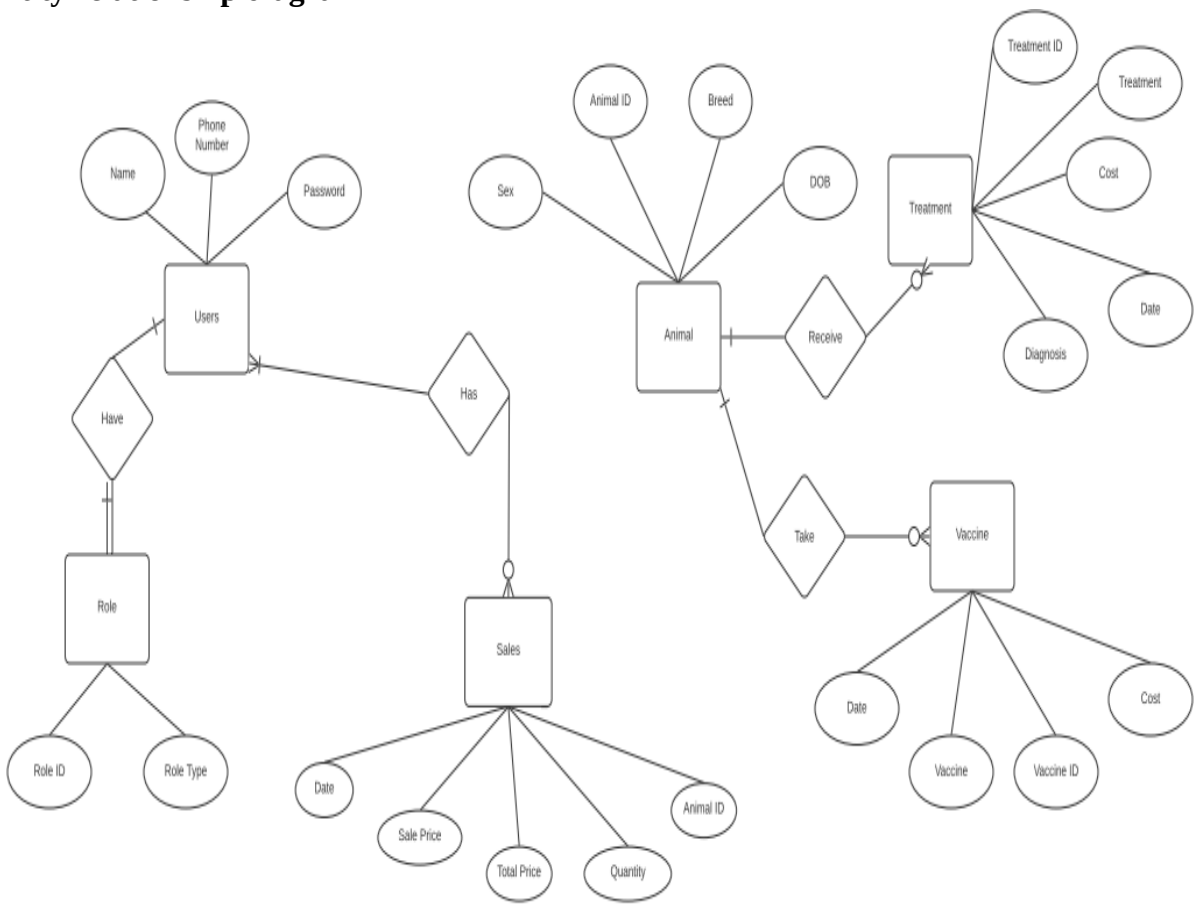


Figure 4.3 Entity relationship diagram

4.4.2 Database schema

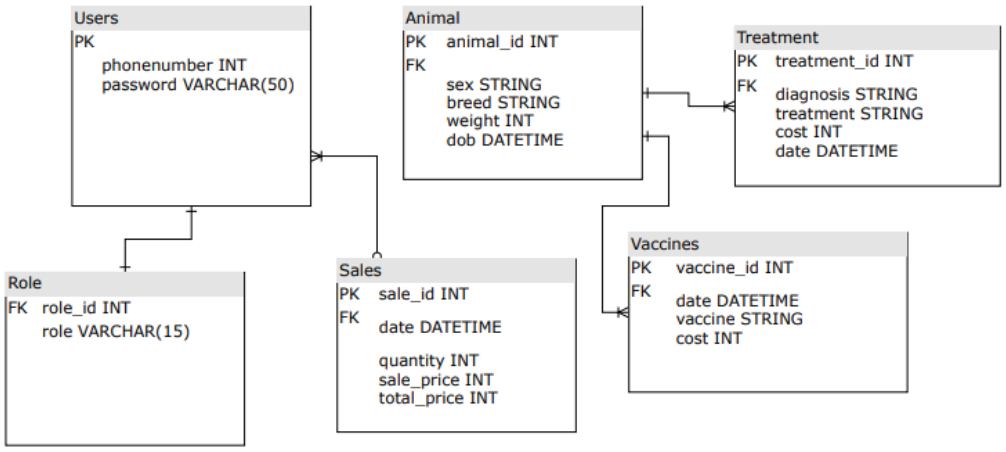


Figure 4.4 Database Schema

The database schema shows the data that is stored in the database.

4.4.3 Class diagram

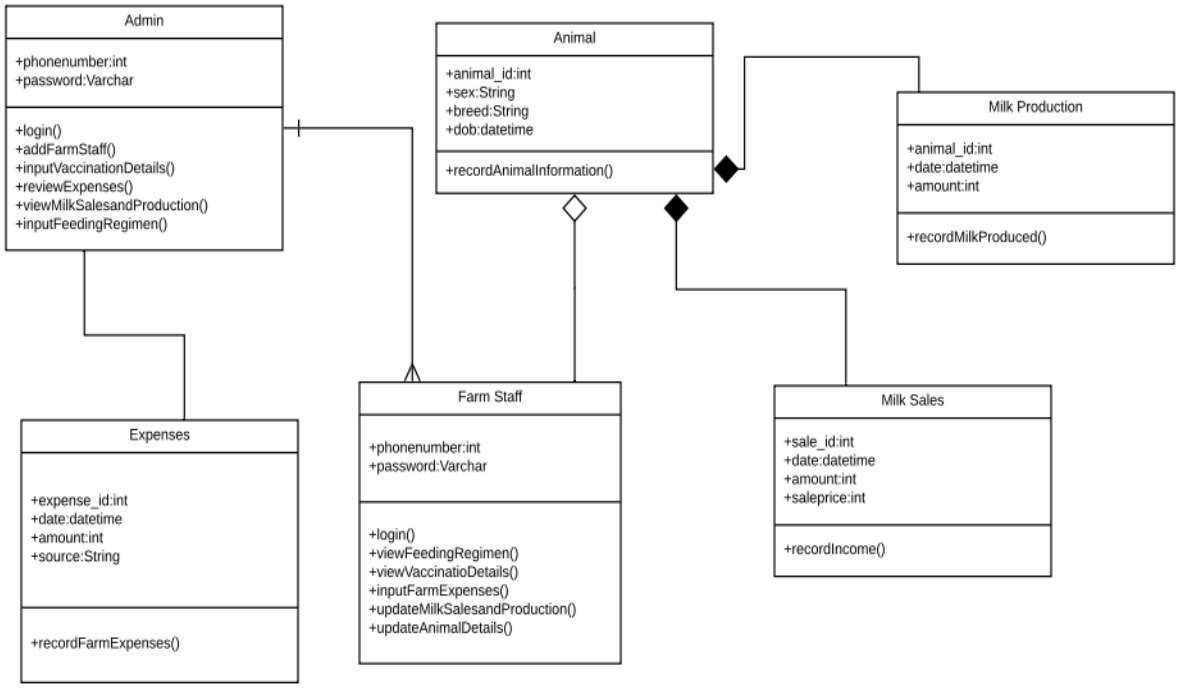


Figure 4.5 Class Diagram

The class diagram shows what each module in the system will be able to do.

Chapter 5: System implementation and testing

5.1 Introduction

System implementation is the practical application of a system in the environment that it was meant to work in. Testing involves reviewing system components to ensure that they work effectively and ensuring that the system meets the objectives out. The chapter discusses the hardware and software specifications that are required for the system to function well., it also contains descriptions of the tests carried out for the system, their results and what they mean for the system.

5.2 Test environment

It is the hardware specifications that the developer has used to ensure that the developed system performs to its best standards and runs successfully and the server-side specifications that are required so that the functional and non-functional requirements are met.

5.2.1 Hardware specifications

The system requires a smartphone with a stable internet connection to store the data in the database safely. Once the data is saved it can be viewed without an internet connection. The hardware specification used to develop the system:

Hardware	Properties
Machinery	The machine used to run the system was a **HP PROBOOK** 640
Memory	The Memory that was used to run the system was **4.00GB**
Processor	The processor that was used while running the system was an **Intel(R) Core (TM) i5-4200M CPU 2.50 GHz x64 based processor**

Table 5.1 Hardware Specifications

5.2.2 Software specifications

The users require to have a working phone number so that they can receive a password to authenticate their accounts and login into the system.

The software specifications used while developing the system:

Software	Properties
Operating system	The operating system that was used to run this system was **Windows 10.**
System Type	The operation system that was used to run this system was **Windows 10.**
Application	The application used to make the system was Android **Studio.**

Table 5.2 Software Specifications

5.3 Description of testing

This section reviews the testing paradigms used, the results of the test and what they mean for the system. The test cases include:

TestID	Related requirement	Inspection check	Precondition	Test Data	Priority
T1	FRQ1	Is the system able to authenticate the users?	The different users should enter their given passwords to be access the system	Phone: 0799823340 Password: 12345678	High
T2	FRQ2	Does the system give administrators certain privileges?	The administrator can add a manager	Name: Levy Phone: 0745678456	High
T3	FRQ3	Does the system generate reports?	The system should have enough data to generate reports	AnimalID: 1 Milk Yield: 100l	High
T4	NFRQ1	Does the system update records immediately?	The updates information should be inputted and saved.	The data has been updated successfully.	High
T5	NFRQ2	Does the system ensure correct data collection?	The details to be put have fields that are clearly marked	Data has been successful entered.	High

T6	NFRQ3	Is the system easy to use?	The user should be able to understand the application in the terms they are used to	Terms used are for the farm.	High
T7	NFRQ4	Does the system have up to date records?	The system is updated daily	Data has been added	High
T8	NFRQ5	How does the system ensure the data is safe?	One can only use the application with the password provided.	Login successful	High

Table 5.3 Test Cases

5.4 Test Results

This are the results from testing the working system:

Test case	Description	Test data	Result	Verdict
1	Check response when the valid phone number and password are entered	0799823340 12345678	User logged in	Pass
2	Check the response when valid phone number and wrong password are entered	0799823340 24354678	User not logged in. Error message displayed	Pass
3	Check whether administrator can create new managers	Enter new manager from the administrator panel	User is created and saved in the database	Pass
4	Check whether animal records can be saved	Data in animal records table	Records for animals are displayed	Pass
5	Check whether data reflects on the administrator panel when entered in the manager panel	Enter data in the manager panel	Data reflects on the administrator panel	Pass
6	Check whether the data can be updated	Enter updated data in the system	Data has been updated successfully	Pass
7	Check whether the system can generate a report	Generate animal milk yield records	Report successfully generated	Pass

Table 5.4 Test Results

Chapter 6: Conclusions, recommendations, future works

6.1 Conclusion

In conclusion the project ensures farm owners can manage their farms even when they are far away and ensuring that their records are safe and up to date. It also generates reports for them to be able to plan better for the future and know where exactly to improve.

6.2 Recommendations

For better results it is recommended that the system be accessed through a smart phone that can be able to connect to the internet for ease of use.

6.3 Future works

Despite this research aiming to solve the problems farm owners experience in their own farms not all the areas were addressed due to the scope of the project. The system could be improved by also being able to export the data from the database. The system could also integrate USSD for those who are not able to access a smartphone.

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Appendix A : Timeline of Activities

	Task Name	Start	Finish
1	Requirement Specification	08/05/20	08/08/20
2	Developing Prototype	08/09/20	08/26/20
3	Review of Prototype	08/27/20	08/30/20
4	Revise and enhance prototype	08/31/20	09/07/20
5	Developing final system	09/08/20	10/03/20
6	Review of the final system	10/04/20	10/10/20
7	Revise and enhance the final system	10/11/20	10/20/20
8	Introducing the final system	10/21/20	10/23/20
9	Testing the final system	10/24/20	10/28/20
10	System Maintenance	10/29/20	11/02/20

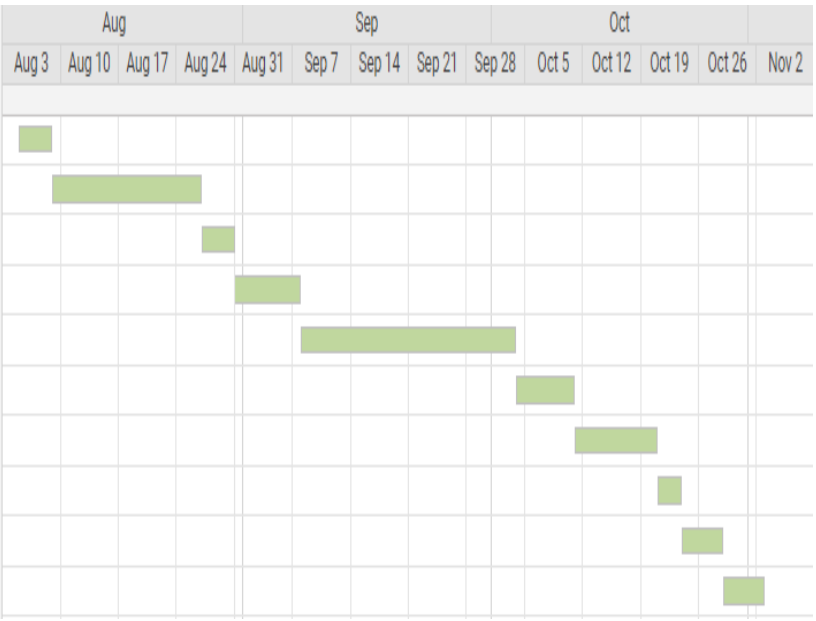


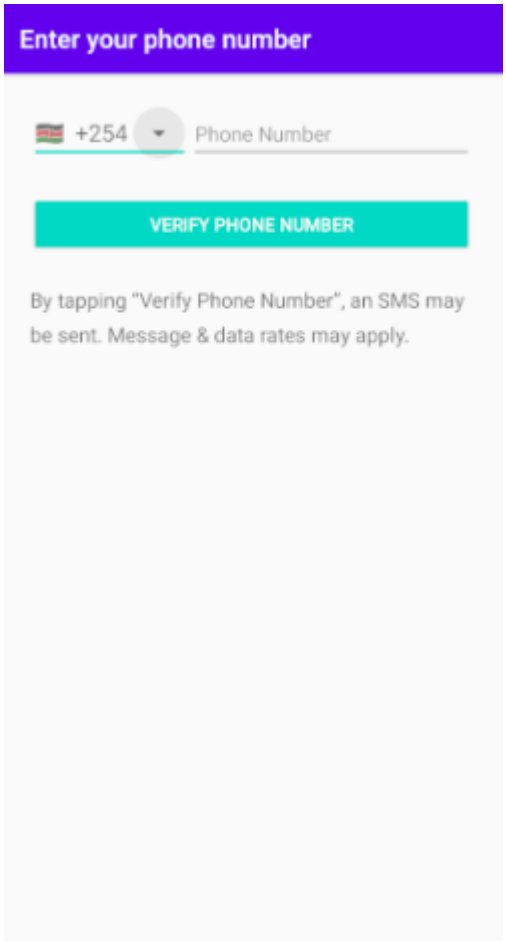
Figure A. 1 Gantt Chart

Appendix B: User Manual

Farm Owner App

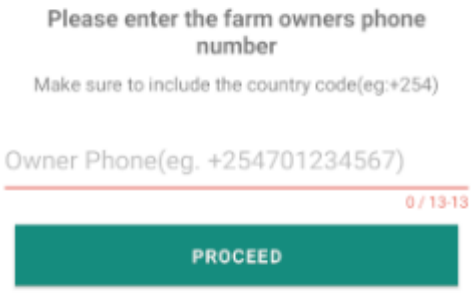
This is the first page the farm owner sees when they enter the app.

Farm Owner Sign Up page

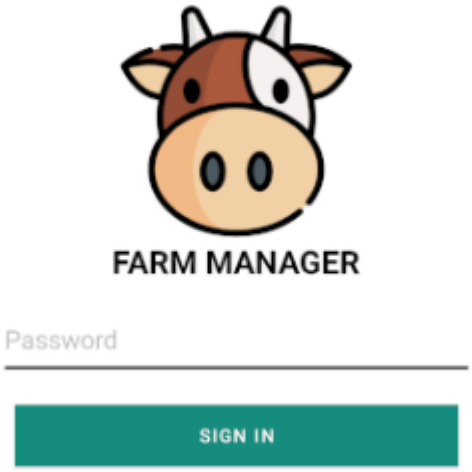


This is the login page for the farm owner where they must sign up using only their phone numbers where each different number will have their own page so their data is private to them and the farm managers only.

Farm Manager Log In

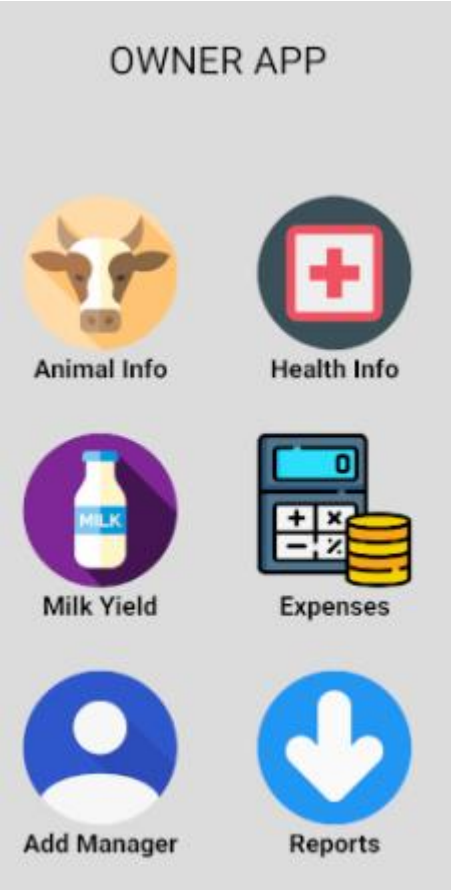


This is where the farm managers log in. They first must enter their owners phone number and enter the given password next.



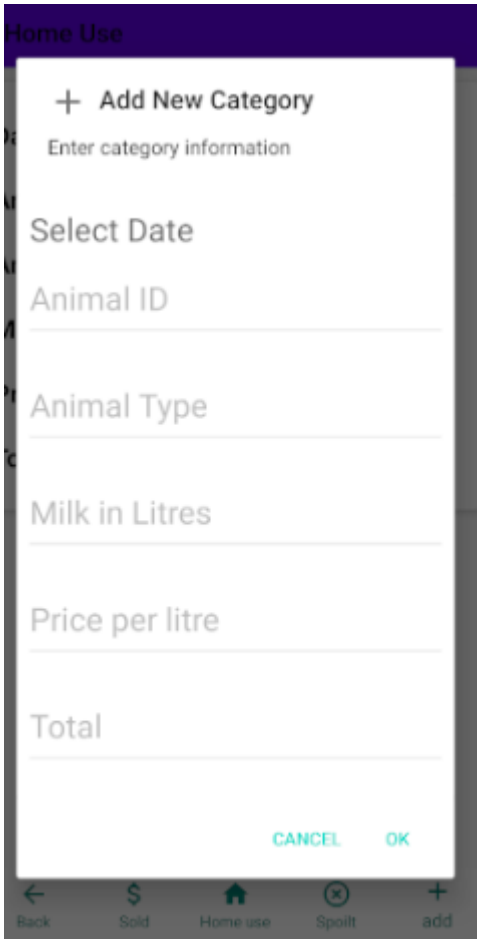
On this page they enter the password given by their owners that they will be using each time they want to login.

Farm Owner Home Page



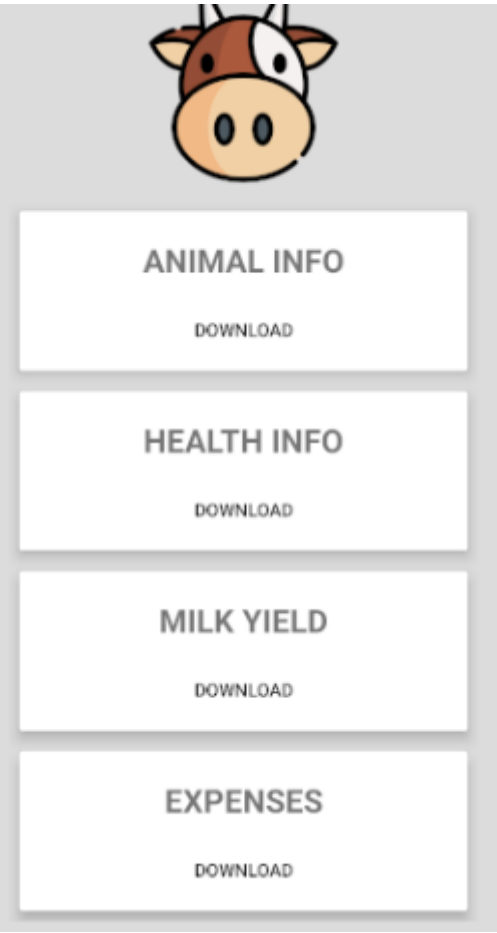
Here they will be able to click on the different tabs they wish to work on. They have more functionalities like adding the managers and viewing the reports.

Milk Yield Tab



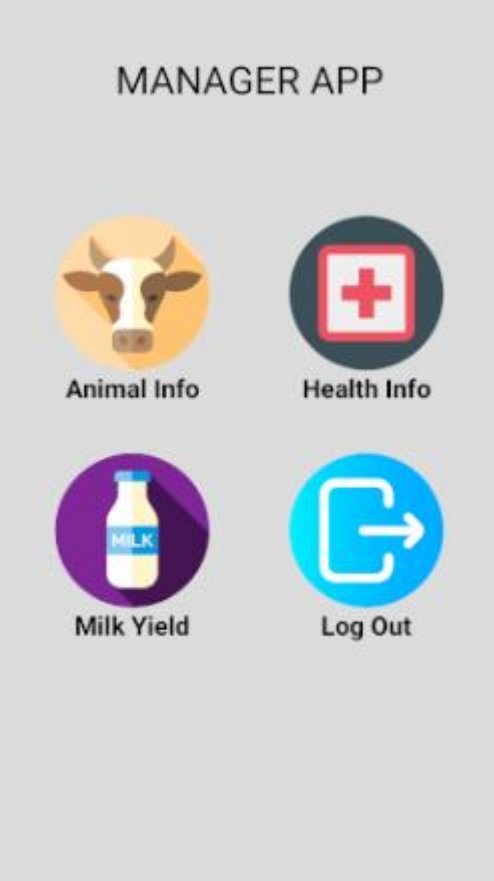
This is both visible on the manager and farm owner app.

Reports Tab



The farm owner can download the different reports they might need.

Farm Manager Home Page



The farm manager has less tabs but is still able to update the farm details that will be visible on the farm owner side.