

**AN ANDROID APPLICATION FOR THE PROVISION OF AGRICULTURAL
INFORMATION TO FARMERS AND COMMUNITY**

A CASE OF LWERU PARISH IN BUIKWE DISTRICT

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ABSTRACT:

The generation of this is intended to show whatever that was covered in the field of research that took place between the months of December 2012 and January 2013. It shows the different areas in which skills were acquired. It also seeks to show how the acquisition of these skills benefited a person who took research, the challenges that were met and solutions used. In our research we covered mobile development platform, deployment of android application

This still comprises of Microsoft.NET compact framework of the development environment

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LIST OF ABBREVIATIONS & ACRONYMS

| | |
|------------|--|
| <i>AEZ</i> | <i>Agro-Ecological Zoning</i> |
| <i>GPS</i> | <i>Global Positioning System</i> |
| <i>ICT</i> | <i>Information and Communications Technology</i> |
| <i>SDK</i> | <i>Software Development Kit</i> |

CHAPTER ONE

INTRODUCTION

1.0 Introduction

AN Android Application project researcher developed a mobile application that provides necessary Agricultural Information to the farmers and the community. The Information provided with this application will include Agro- Ecological Zones, Pest Control, Crops Farming Tips, Fisheries tips, Animal Husbandly tips, and after harvest activities like storage and packaging.

The mobile application can allow users to record their harvest, predict hunger according to food harvest and food consumption, request and order for farming tools, receive news and notifications from farmers associations or Government, and provide Statistical Information from crops produced.

1.1 Background

Mobile computing is one of the fast growing fields in ICT that targets in improving life by providing Information that helps improving people way of living in one way or another. There are so many fields that mobile application can be used. Some of the areas include Entertainment and Social, Education, Health, Business, and Agriculture.

Mobile application can play a major role in increasing agricultural production. Using mobile apps, farmers can get Information that is related to crops growing, maintaining, harvesting, storage, preservation, treatment, transport, labour and marketing.

mobile apps, challenges encountered after harvesting include: storage, preservation, treatment, transport, packing, labour and marketing can be reduced.

1.2 Statement of the Problem

According to Mr. Lulya one of the prominent farmers in Iweru community Lack of simple, reliable, affordable, and easy ways for accessing the agricultural Information is the major problem that leads to researcher conducting this project.

1.3 Objectives of the study

To gather necessary requirements that could be used to design and develop the mobile application that can assist farmers and community in agricultural activities.

To design a mobile application that could provide Information to farmers and can help families to predict hunger by calculating food consumption.

To develop the application by considering all the necessary features obtained in the design phase.

To test the application features i.e. (ability to display Agro-Ecological Zones using Map, ability to predict hunger, and provide statistical data)

To implement the application in live environment. To publish the application to the market places.

1.3.1 General Objective:

To develop an android application that provides information to the farmers

1.3.2 Specific Objectives

- I. To gather necessary requirements that could be used to design and develop the mobile application that can assist farmers and community in agricultural activities.
- II. To design a mobile application that could provide Information to farmers and can help families to predict hunger by calculating food consumption.
- III. To develop the application by considering all the necessary features obtained in the design phase.

1.4 Scope of the Project

1.4.1 Geographical Scope

The geographical coverage of this application was divided into the following categories

The Agro Ecological Zones – The first version of this application covered Buganda region (Mukono, Wakiso, Masaka, Lugazi and Kiboga)

People from these districts could get the Agro Ecological Information of their areas using this application either online or offline.

The next version of this application included other districts such as Pallisa, Kisoro, Jinja, Mbale and other districts in Uganda,

1.4.2 System Scope

The system scope was defined by the application with the following features:

Ability to show Agro-Ecological Zones using a Map, to provide Natural ways to control pest in farms, to provide modern farming tips in crops growing and maintenance, animal husbandry, and fisheries, to record harvest and provide statistical information of the harvest, to predict hunger according to the food harvest and consumption, to send orders for farming tools as well as receiving news and notifications from farmers associations, farming market seller and Government, to provide after harvest Information concern storage, preservation, treatment, transport, packing, labor and marketing.

1.5 Significance of the Study

Mobile applications are triggering a fundamental shift in the way people experience computing and use mobile phones. Ten years ago, people "went to the computer" to perform tasks and access the Internet and they used cell phones only to make calls. Today, smart phones let users carry computing.

The significance of this study was as follow:

- I. It could help farmers cultivate crops that are suitable to their agro-ecological zones hence increase crops production.
- II. It could help farmers control pest using natural ways.
- III. It could help farmers grow and maintain crops in a modern way.
- IV. It could help farmers record their harvest and view the statistical chart of their harvest to see if their production is increasing or decreasing.
- V. It could help families predict hunger by calculating the food harvested and food consumption.
- VI. It could help farmers manage after harvest activities in a good way so as to increase value of their products.

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

An Android mobile application that provides necessary Information to the farmers and the community. The Information provided with this application include Agro- Ecological Zones, Pest Control, Crops Farming Tips, Fisheries tips, and Animal Husbandly tips .the application allow users to record their harvest, predict hunger according to food harvest and food consumption, request and order for farming tools, receive news and notifications from farmers associations or Government, and provide Statistical Information from crops produced.

2.1 Review of Relevant Papers

some of the Agriculture Mobile applications Projects related to the android application for the provision of farmers information

2.1.1 Crop Trak Project

According to (Hopkins, 2012) iCropTrak was named a Top 10 New Product Award winner for 2012 at the World Ag Expo, the iCropTrak is a multi-user software solution that runs in the field with or without Internet connectivity. It allows users to take advantage of geographic data, the GPS technology in the iPad, the larger screen size and touch interaction. ICrop Trak gives users an opportunity to deploy data collection templates for functions as diverse as food safety inspections, field spray management, employee timesheets and more.

2.1.2 Comparison of iCrop Trak and Farming Projects

| iCropTrak Project | Farming Instructor Project |
|--|--|
| Run with or without Internet connectivity | Farming Instructor also have some features that can run with or without Internet connectivity |
| Use geographic data | Use geographic data (Agro Ecological Zones) |
| Use GPS technology | Use GPS technology |
| The app is for iPad only | Farming Instructor app is for Android (all phones that run android OS) |
| Users can deploy data collection templates for functions as diverse as food safety inspections, field spray management, employee timesheets and more | Users can view Agro Ecological zones, view modern farming tips, estimate food consumption, view pest control tips, and record harvest. |

Table 2.1 showing Comparison of iCropTrak and Farming Instructor Projects

2.1.3 Farm Manager Project

According to (Hopkins, 2012) The Farm Manager app allows farmers to record cropping, livestock, and machinery procedures, and access this information with ease. Users can record full history of crops from when they are sown through to harvested; record chemical and fertilizer use, including type, rate, and date applied; and keep track of machinery maintenance.

2.1.4 Comparison of Farm Manager and Farming Instructor Projects

| Farm Manager Project | Farming Instructor Project |
|---|--|
| Allows farmers to record cropping, livestock, and machinery procedures, and access this information with ease | Users can view Agro Ecological zones, view modern farming tips, estimate food consumption, view pest control tips, and record harvest. |
| The app is for <i>iPhone, iPad, iPod Touch</i> | The app is for Android. |

| Farm Manager Project | Farming Instructor Project |
|---|--|
| Allows farmers to record cropping, livestock, and machinery procedures, and access this information with ease | Users can view Agro Ecological zones, view modern farming tips, estimate food consumption, view pest control tips, and record harvest. |
| The app is for <i>iPhone, iPad, iPod Touch</i> | The app is for Android. |

Table 2.2 showing Comparison of Farm Manager and Farming Instructor Projects

2.1.5 Farm PAD Project

According to (Hopkins, 2012) this app from Tap Logic allows users to enter farm records, equipment service logs, spray records and take notes or pictures. You can also draw field boundaries with GPS or by hand. Sync to your Web account where you can print reports, review history and draw and print field maps.

2.1.6 Comparison of Farm PAD and Farming Projects

| FarmPAD Project | Farming Instructor Project |
|---|--|
| Allows users to enter farm records, equipment service logs, spray records and take notes or pictures. | Users can view Agro Ecological zones, view modern farming tips, estimate food consumption, view pest control tips, and record harvest. |
| This app is for <i>Android, iPhone, iPad</i> | This app is for Android |

Table 2.3 showing Comparison of FarmPAD and Farming Instructor Projects

2.2 Android Platform

Android is a software stack for mobile devices that includes an operating system, middleware and key applications. The Android SDK provides the tools and APIs necessary to begin developing applications on the Android platform using the Java programming language. Android dev environment features

- I. Application framework enabling reuse and replacement of components
- II. Dalvik virtual machine optimized for mobile devices
- III. Integrated browser based on the open source Weskit engine
- IV. Optimized graphics powered by a custom 2D graphics library; 3D graphics based on the OpenGL ES 1.0 specification
- V. (hardware acceleration optional)
- VI. SQLite for structured data storage
- VII. Media support for common audio, video, and still image formats
- VIII. (MPEG4, H.264, MP3, AAC, AMR, JPG, PNG, GIF)
- IX. GSM Telephony (hardware dependent)
- X. Bluetooth, EDGE, 3G, and Wi-Fi (hardware dependent)
- XI. Camera, GPS, compass, and accelerometer (hardware dependent)
- XII. Rich development environment including a device emulator, tools for debugging,
- XIII. memory and performance profiling, and a plug-in for the Eclipse IDE

2.3 General Android Architecture

Android is a software stack for mobile devices that includes an operating system, middleware and key applications

General Android Architecture Adopted From (Lri, 2011

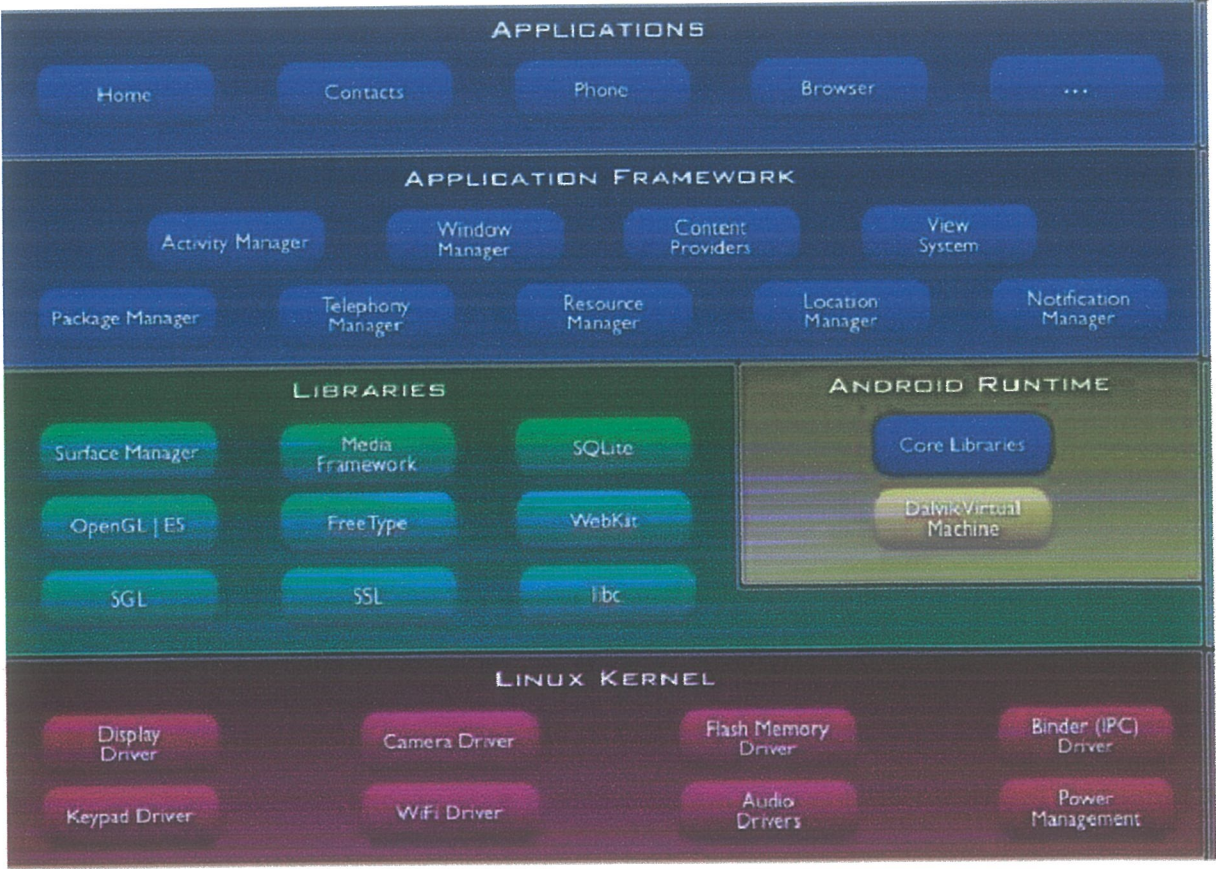


Figure 2.1 showing the general android architecture adopted from (LRI, 2011)

2.3.1 Features and their Roles

View System - Used to build an application, including lists, grids, text boxes, buttons, and embedded web browser

Content Provider - Enabling applications to access data from other applications or to share their own data

Resource Manager - Providing access to non-code resources (localized strings, graphics, and layout files)

Notification Manager - Enabling all applications to display customer alerts in the status bar

Activity Manager - Managing the lifecycle of applications and providing a common navigation backstack

2.4 Deployment of Android Application

This is an example of UML deployment diagram which shows deployment of an application to Android.

Android is a software stack for mobile devices that includes an operating system, middleware and key applications. Android relies on Linux OS for core system services such as security, memory management, process management, network stack, and driver model. The Linux kernel also acts as an abstraction layer between the hardware and the rest of the software stack.

Android applications are written in Java. Android SDK tools compile and package the code along with any required data and resource files into Android application **archive file** having .apk suffix. The .apk file represents one Android application to be deployed to the

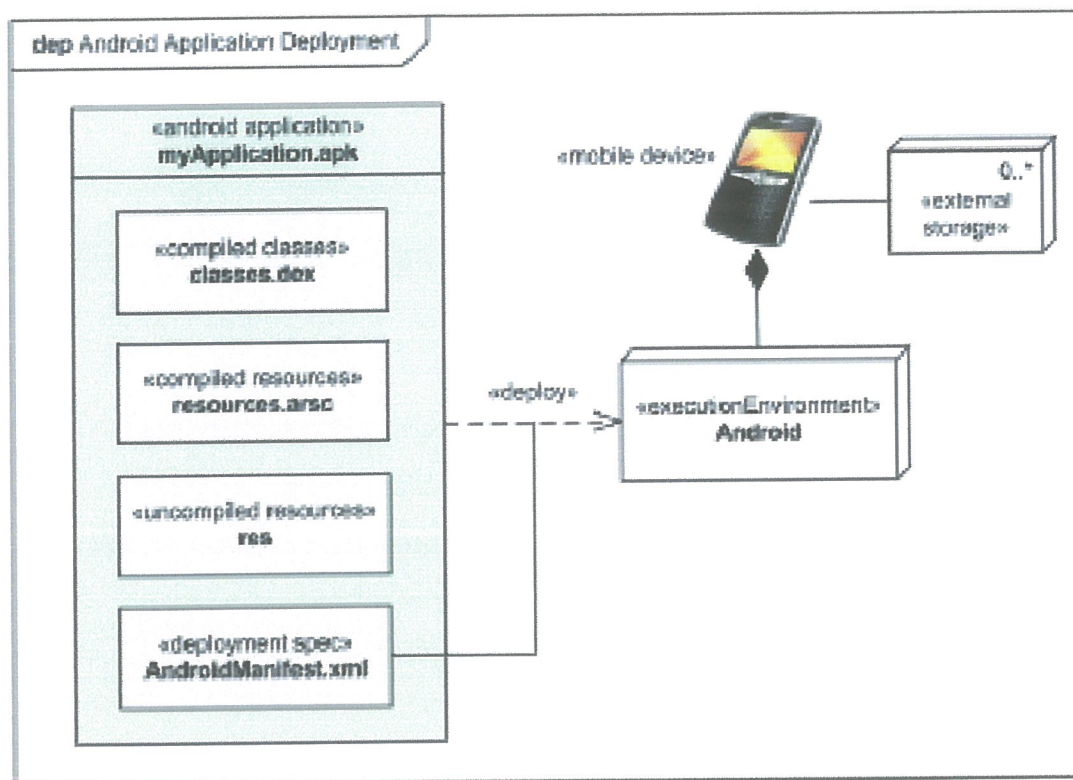


Figure 2.2 showing the deployment of Android Application adopted from (Hruby, 2011)

2.5 Future of Android

According to (Android OS, 2012) the year 2011 saw Android grow to become a force to reckon within the smartphone OS market. Android phones have claimed over 40% of the world market share in 2011. The dominance of Android is due to Ease of development availability of android devices at cheaper prices.

Android phones seem to have taken 2010 by storm! The Android OS may have been slow in the uptake in 2008, but now it seems to be living to the expectation as iPhone's prime nemesis. It is able to go head to head with iPhone features as more and more handsets on the market are using Android OS.

2.6 Other Mobile Development Platforms

2.6.1 JME

Java Platform, Micro Edition (Java ME), also known as J2ME, was developed by Sun Microsystems. It is a subset of the Java platform aimed at mobile devices. (Keogh, 2003).

From (Sun Mobile Device Technology, 2007), Java Platform, Micro Edition (Java ME) is a "collection of technologies and specifications that are designed for different parts of the small device." It is essentially a subset of Java APIs for development of applications on mobile devices with limited resources, such as cell phones.

Java ME has a particularly high market penetration; according to (Carlos Morales, 2007), approximately 68% of mobile phones are Java ME-capable, which equates to more than 350 million Java ME-capable mobile devices worldwide. Until now Java ME has been considered the de facto for mobile application development due to this high market penetration and relative maturity of the platform.

2.6.2 Microsoft .NET Compact Framework

According to (Paul Yao, 2004) Microsoft .NET Compact Framework (.NET CF) is a version of .NET Framework which is developed for launching applications on Windows CE-based devices such as PDA, mobile phones, etc. .NET Compact Framework uses the libraries similar to the full version of .NET Framework; however it has special sets of libraries for mobile devices (for example, Windows CE Input Panel).

Mobile application development with .NET Compact Framework can be performed in Visual Studio .NET 2003, in Visual Studio 2005 and Visual Studio 2008, on C# or Visual Basic .NET. As a result, mobile app programmers can develop highly productive special applications for mobile devices.

The Compact Framework platform (Version 2.0) simplifies mobile application development. And the mobile applications developed on its base are even more functional. Since software developers can use the same tools and classes for mobile application development which they use for the development of other applications with the control code, more of them will be able to master the development of powerful mobile applications.

2.7 Comparison of the Development Environments

The following table compares the Development Environment for mobile application basing on the following criteria (audience, market share, and developer platform, tool cost, getting started kit, debugging and testing, optimization)

| Developing environme | Market Share | Developer Platform | Tool cost | SDK and IDE | Debuggin g | Usability |
|------------------------------|--|----------------------------|--------------|---------------------------------|---------------------|------------------|
| Android | Leader in Market | Platform free | Free | Android SDK & | Android Emulator | Very Friendly |
| Microsoft .NET Compact | Little share (new in the market) | Strictly run on windows | Not free | Visual Studio, 2008, 2010 | Emulator | Normal |
| J2ME | Average share. | Platform free | Free | JDK (Eclipse / | J2ME Emulator | Normal |

Table 2.4 showing the comparison of the Development Environments

2.7.1 Comparing the Final Product

Comparing the performance of the final products can be done in a range of ways depending on the type of application (Marcus, 2011).

To benchmark the performance of each platform, an application that solves the same problem using the same general algorithm should be developed for each platform. Using these two applications, it is possible to test the performance in a number of ways, including:

□ *Lines of code*

The total number of lines will indicate the amount of coding effort that was required to develop the project.

□ *Speed*

The total time taken for the application to load or perform any requested action will indicate the overall speed performance of the application.

□ *Controls*

Which controls are available to the user to determine how easy it is to navigate or control a mobile application. This will have significant affects on the overall application experience. The control set can be limited by the platform, example some platform only allowing two “soft buttons” to be used, or by the device itself.

□ *Ease of use*

If an app is difficult to use, understand, or navigate, this immediately has a

negative effect on the user's experience. Ease of use also applies to the development environment and process.

These tests should be conducted on the same mobile device, and under similar and possible conditions. This resulted in the most useful quantitative comparison data. Comparisons of tcontrols and ease of use resulted in qualitative comparison data, which can have major ramifications on the overall experience offered to the user by the application

2.7.2 Use Case for Farming application

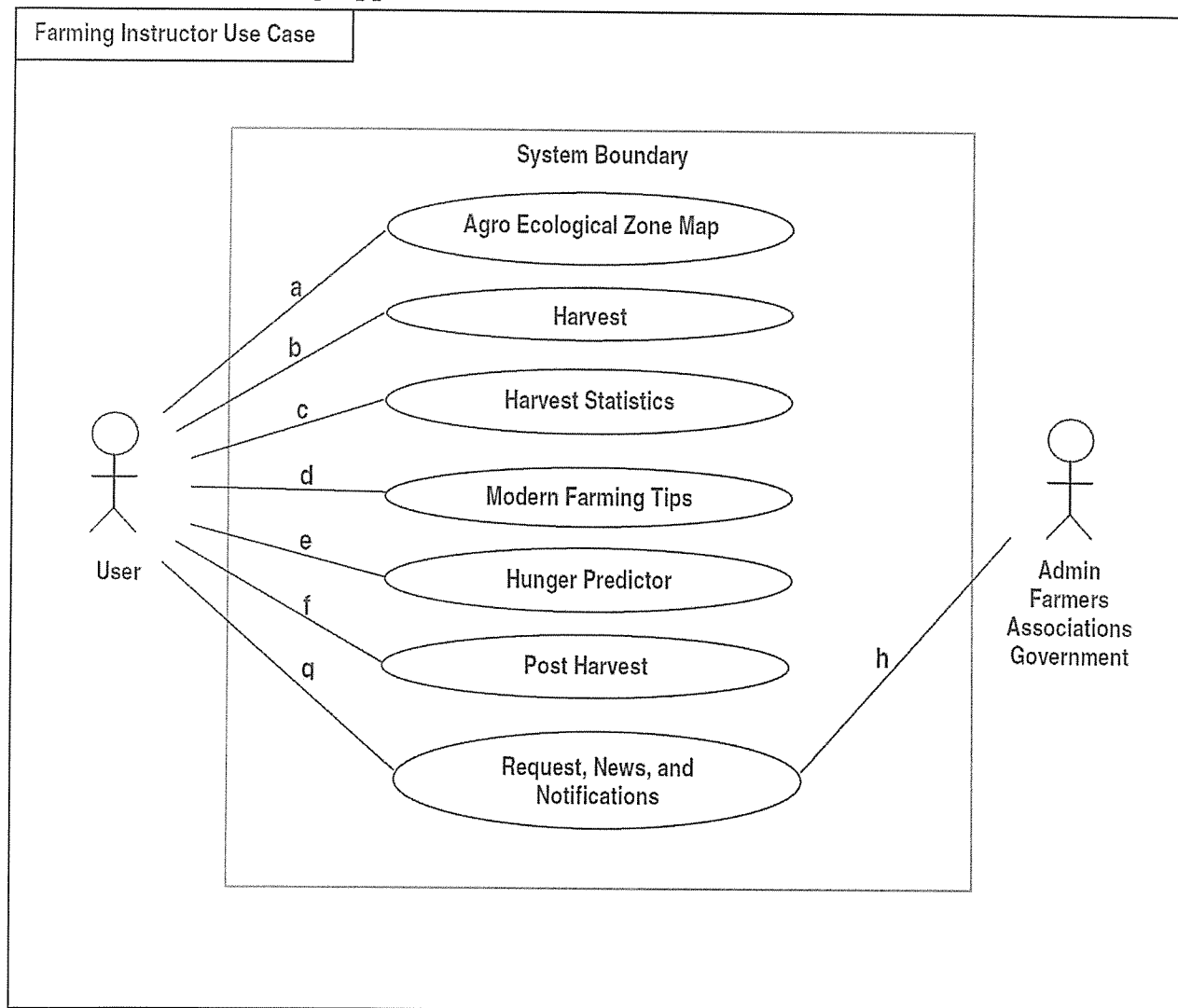


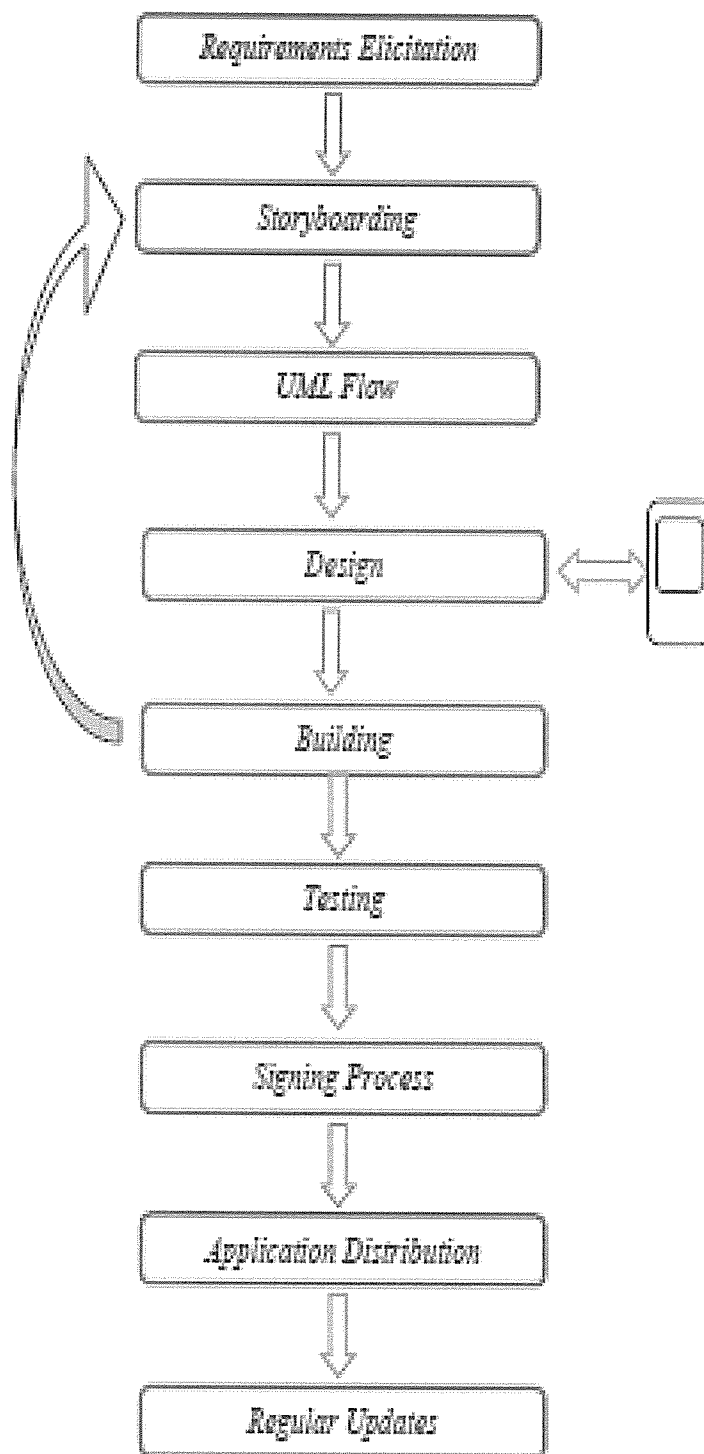
Figure 3.3 showing the Farming Application Use Case Diagram

Use Case Diagram Association roles

| | |
|----|--|
| a. | User view Agro Ecological zone map |
| b. | User record Harvest |
| c. | User view harvest statistics |
| d. | User view modern farming tips |
| e. | User calculate the harvest food consumption (predict hunger) |
| f. | User view the post harvest tips for packaging, storage etc. |
| g. | User request and order for farming tools |
| h. | Admin respond, provide news to users |

Table 2.1 Showing the association roles from the Farming Use Case Diagram

2.8 showing Mobile Application Development Methodology V3 adapted from Mobinex,
Mobile Application Development Methodology V3



Mobile Application Development Methodology Version three.

CHAPTER THREE

METHODOLOGY

3.0 Introduction

Methodology is a set or system of methods, principles, and rules for regulating a given discipline or is a procedure, technique, or way of doing something, especially in accordance with a definite plan. In the ICT field there are number of methodologies that can be used to manage projects. These methodologies can be categorized as Non Agile Methodology example Waterfall Model and Agile Methodology.

3.1 Data Collection Techniques

We used the following Data collection techniques as to gather the information.

3.1.1 Self Administered Questionnaires

Primarily, self administered questionnaires was used because of their nature of use of one time data collecting device on the variable of interest each item on the questionnaire will be developed to cover the specific objectives research questions and hypotheses under our study.

3.1.2 Observation Method,

Researchers adopted this method especially when viewing the current situation of the system as well as see what exactly took place in the field

3.1.3 Interviewing Method

we have chosen this methods because its mouth to mouth method asking questions and getting immediate response from the correspondents. and we believe that this method will enable us get accurate information during our study.

In this project researcher used Mobile Application Development Methodology V3 to develop the application.

3.2 Mobile Application Development Methodology V3

According to (Mobinex, 2011) Mobile Application Development Methodology V3 is intended to be used as a guide for the developing mobile applications.

Mobile Application Development Methodology V3 has the agile methodology features.

Developers who build mobile applications are challenged with their own unique array of complexities.

Unlike traditional client-server and web-based software development shops, mobile developers are faced with very strict boundaries (memory, screen size, input devices, etc.), short application lifecycles, and extreme usability requirements. These are in addition to the inherent environmental volatility previously referred to.

Given such constraints and challenges, mobile application developers have had to become very quick on their feet in dealing with all of the variables in the development and deployment lifecycle.

As a result, most have transitioned to an extensive use of emulators, test automation, automated deployment processes, and shorter development cycles.

The use of Mobile Application Development Methodology V3 eased some of the development burden.

3.3 Requirements Elicitation

When you want to develop a new application, you first should determine how this application will be used. You should define the user scenarios and also user groups should be determined if needed. In this project the researcher will use this phase to determine the application requirement from users who may wish to use this application.

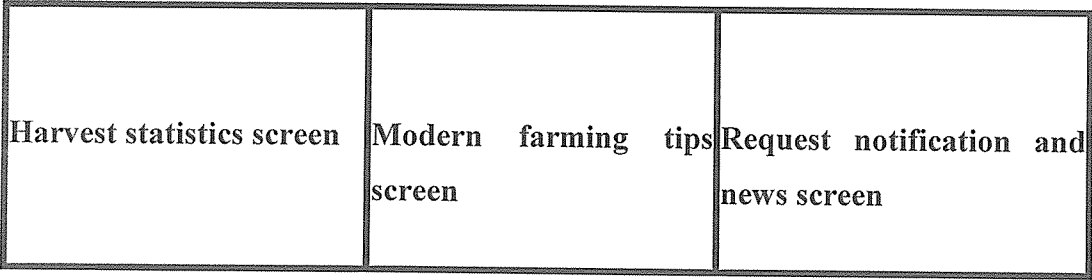
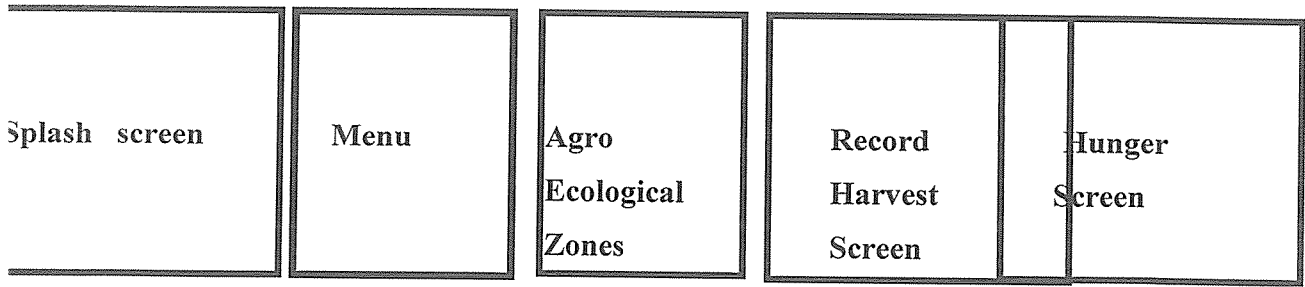
Most of these requirements will be obtained through Observation and brainstorming sessions as requirement elicitation techniques.

usable to the whole team; including the developer, designer, project manager and any other 3rd party, who is involved in the project.

In this project, researcher will use storyboarding to come up with the logic and meaning fully navigation between screens of the pages.

The following is the illustrations of the screen navigation:

Figure 3.2.2 Showing the Farming Screen Navigator



3.4 Research Design

In this phase researcher designed the architecture of the application that was used to build the application. The design of this application was according to the features obtained in the requirements elicitation phase.

3.5 Application Building

In this phase, researcher started the coding of the application by considering the Architecture design of the application.

3.6 Application Testing

During application building, some components of the application was tested alone to see if they are functioning as intended. Also after integrating the components, the entire app will be tested to see if it still running without any problem.

3.7 Signing Process

Signing is the process of encoding a digital certificate into an application and enables you to Use more specific and protected features of devices.

The certificate identifies the origin of the application by including the information on the publisher ID used during the signing process. Because the application origin is known, once an application is signed, it can use more sophisticated and protected features of the platform. An application whose origin is unknown – for example, one which has not been signed - will not be able to access this secured functionality and may not even install it on the device, depending on the security settings installed by the manufacturer. The purpose of this document is to describe the signing process in different mobile platforms such as Symbian, Java ME, Blackberry and Android. However, different brands and/or models of devices, independent of their Operating Systems, are not the subject of this document.

Before beginning an application signing process, it must be approved and verified by the developer company that the application is tested and meets the certain criteria such as functionality, visuality and/or usability. For example, the application should meet the consistency criteria as much as possible, in order to be distributed to mobile clients.

8 Application Distribution

From the test results, if no redevelopment is required, the application was distributed. The Ready application shall be put on the project site as well as in some marketplaces.

3.9 Regular Updates

Update is one of the most important processes during the mobile application development

Update Process of M-Vigour application can be divided into two:

- I. Contents / Functions Update
- II. User Interface (UI) Update

3.10 Limitations of the study

The following limitations were faced while carrying out the research exercise.

- I. Financial resource constraints because of being students we didn't have enough finance to effectively carryout the study.
- II. Time constraints due to other relatively demanding issues such as reading for tests, presentations and final exams.
- III. Slow response and non response from some of the respondents since some of them claimed to be busy and other ones were not available at all.
- IV. Denial of access to some of the information which the claimed to be confidential to the organization.

3.2 Conclusion

In this chapter, mobile application development methodology to be used was explained and actions to be taken in each phase was explained

4.1 Database (Physical Design)

4.1.1 Physical Database Design

As one of the core elements of an Androd Application For farmers’ information, the system had to be designed in a meticulous systematic manner. This process started at the analysis phase of the project. From the analysis, the researcher was able to identify the necessary databases and tables required for the database and the associated field names, format and length of each table. After careful analysis of the user requirements.

4.1.2 Data relationships

Data relationships show how the information or data are related between each other. For the tables to work together, relationships have to be established In the design of Androd Application For farmers’ information, the data relationships were established during the process of the logical data design. There are mainly four kinds of relationships One to One, One to Many, Many to Many, Many to One

4.2 Data dictionary

gpsinfo

Table comments: gpsinfo

| Column | Type | Null | Default | Comments |
|-------------|--------------|------|---------|----------|
| id | int(11) | No | | |
| longitude | varchar(20) | No | | |
| latitude | varchar(20) | No | | |
| title | varchar(50) | No | | |
| description | varchar(100) | No | | |

Indexes

| Keyname | Type | Unique | Packed | Column | Cardinality | Collation | Null | Comment |
|---------|-------|--------|--------|--------|-------------|-----------|------|---------|
| PRIMARY | BTREE | Yes | No | Id | 3 | A | No | |

Introduction

Table comments: production

| Column | Type | Null | Default | Comments |
|------------------|--------------|------|---------|----------|
| id | int(11) | No | | |
| product | varchar(50) | No | | |
| description | varchar(300) | No | | |
| quantity | int(11) | No | | |
| year | int(11) | No | | |
| consumption_rate | int(11) | No | | |
| manager | varchar(20) | No | | |
| farmerName | varchar(30) | No | | |
| lt_tm_stmp | varchar(15) | No | | |

Indexes

| Keyname | Type | Unique | Packed | Column | Cardinality | Collation | Null | Comment |
|---------|-------|--------|--------|--------|-------------|-----------|------|---------|
| PRIMARY | BTREE | Yes | No | Id | 2 | A | No | |

tipinfo

Table comments: tipinfo

| Column | Type | Null | Default | Comments |
|------------|--------------|------|---------|----------|
| id | int(11) | No | | |
| title | varchar(100) | No | | |
| tip | varchar(500) | No | | |
| category | varchar(25) | No | | |
| lt_tm_stmp | varchar(25) | No | | |

Indexes

| Keyname | Type | Unique | Packed | Column | Cardinality | Collation | Null | Comment |
|---------|-------|--------|--------|--------|-------------|-----------|------|---------|
| PRIMARY | BTREE | Yes | No | Id | 8 | A | No | |

tools

Table comments: tools

| Column | Type | Null | Default | Comments |
|---------|--------------|------|---------|----------|
| id | int(11) | No | | |
| item | varchar(100) | No | | |
| type | varchar(150) | No | | |
| firm | varchar(50) | No | | |
| address | varchar(50) | No | | |
| contact | varchar(20) | No | | |

Indexes

| Keyname | Type | Unique | Packed | Column | Cardinality | Collation | Null | Comment |
|---------|-------|--------|--------|--------|-------------|-----------|------|---------|
| PRIMARY | BTREE | Yes | No | Id | 5 | A | No | |

1.3 Database Design

The system is relation database that analyses facts about the real world using Entity-Relation Modeling design.

1.4 Conceptual schema

In the development of a conceptual schema, relationships and attributes were determined through system analysis by identifying nouns and noun-phrases and objectives that had an existence in their own right. Considering verbs and verb-expressions in the system analysis explicitly identified relationships. Most of the relationships were binary with only a few that were recursive. Furthermore, the multiplicity of each of the relationships was determined. Identified attributes were assigned meaningful names in addition to ascertaining whether they were either candidate key or primary key. An Android Application For farmers' information database designed keeps track of entities such as production details and their corresponding relationships, cardinalities, candidate and primary key attributes.

1.5 Logical schema

Removing features that could not be represented directly in the relational database developed the logical data model. This involved mapping these features on to a set of relations. The relational schema was validated using the rules of Normalization to ensure it was structurally correct. In addition, the logical data model was validated to ensure that it supported the transactions in the system requirement specification. The developed logical data model includes all the required entities, attributes, and relationships that represent system information and define system rules. The system rules were mainly the integrity constraints imposed to protect the database from becoming inconsistent. Four types of integrity constraints were

considered: required data (some attributes must always contain a value that is not null), attribute domain constraints (every attribute has a domain that is a set of values that are legal), entity integrity (primary key of an entity cannot hold nulls), and referential integrity (a foreign key links each child relation on the parent relation containing the matching candidate key value).

CHAPTER FIVE

SYSTEM IMPLEMENTATION

0 Introduction

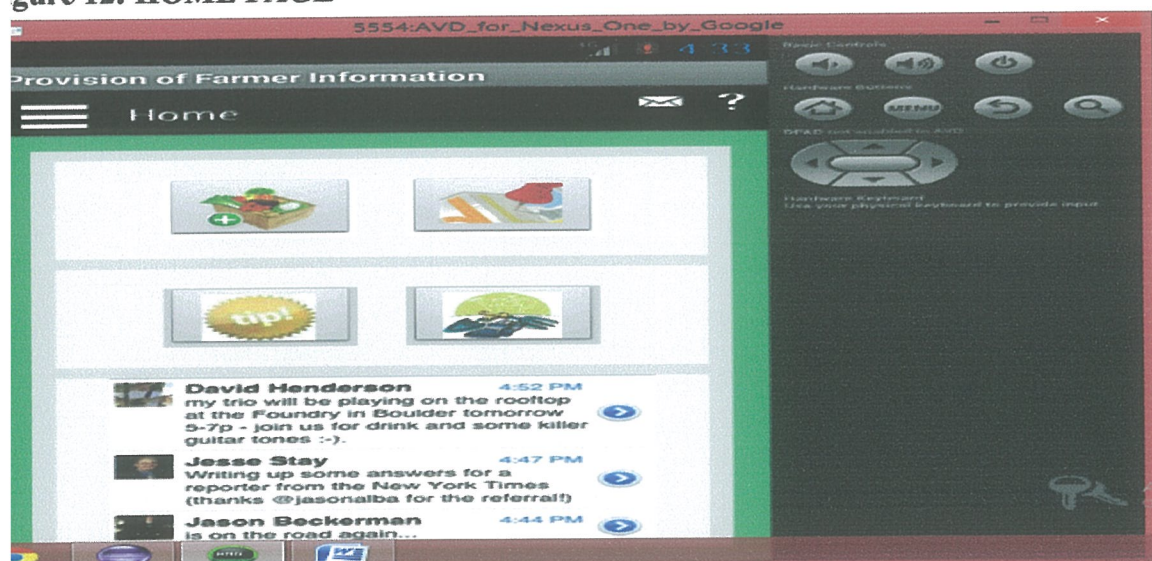
1 User Interface designs

Login Form

The login form below is the first page a person accessing the system sees. It is used to gain access to the system resources and determines the privilege level, based on the user type, only authorized users are allowed to access the system, the authorized user can be a Farmers or an administrator of the system.

FORMS AND REPORTS LAYOUTS

Figure 12: HOME PAGE



roduction Statistics Page

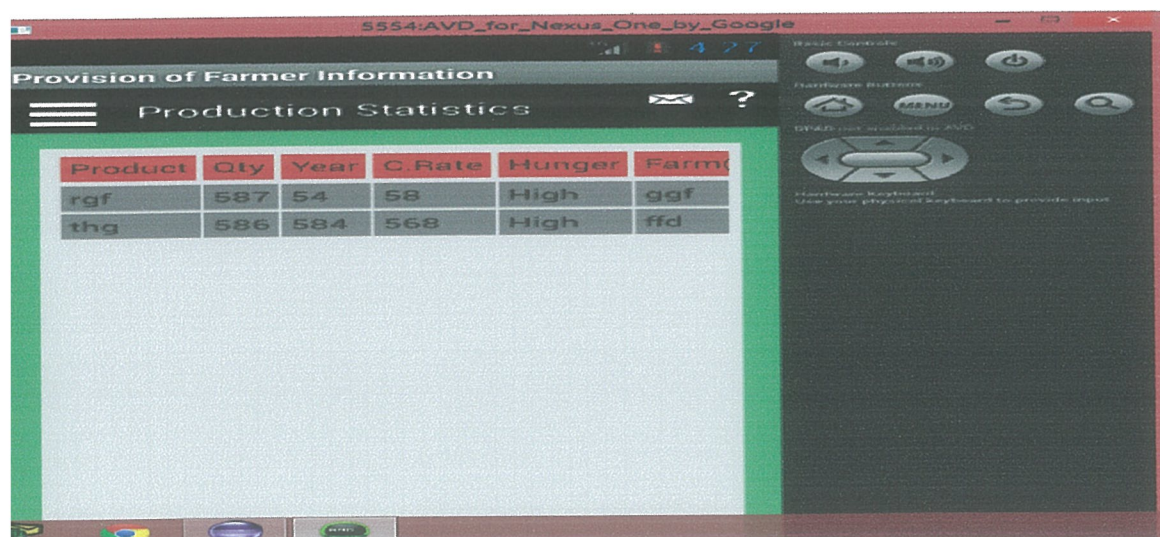


Figure 11: Login interface

user form

Therefore there is need to first register for new users.

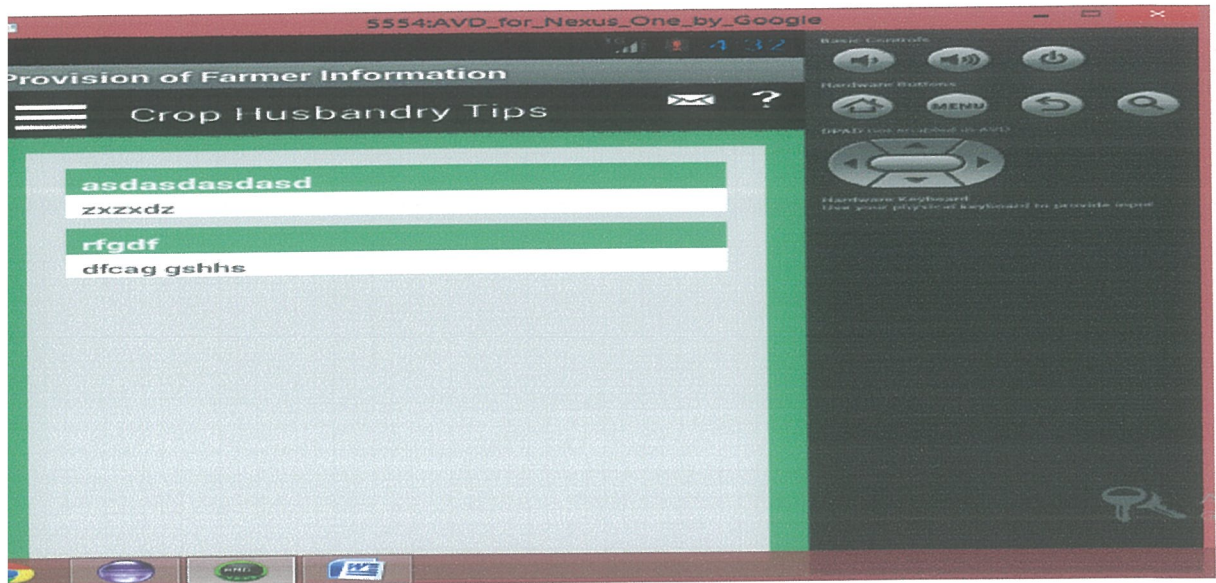
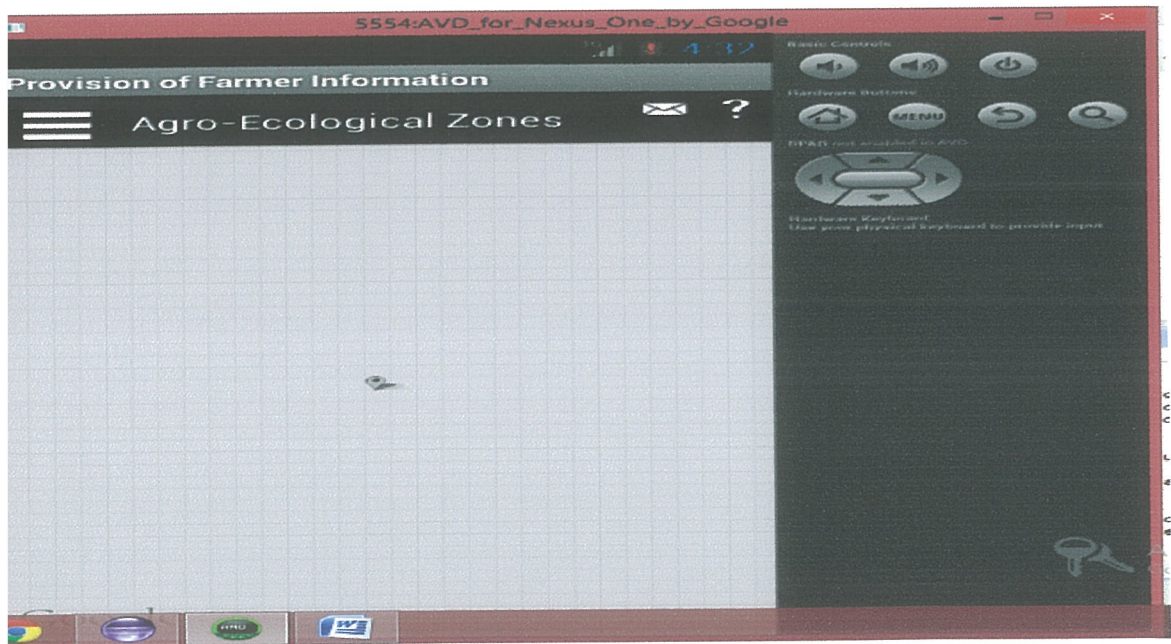


Figure 13: User registration interface

After registration you can continue or logout and come back later

Figure 14: Ecological zone



User page

This is where authorized users (Farmers), with this account they can send their application forms,

view available services and view the shortlisted.

Farmers were required to fill in the form correctly, without false information; warning is indicated for those who would wish to submit false information which leads to penalties, data validation into the form.

INTERFACES
Registration form

The screenshot shows an Android emulator window titled "5554:AVD_for_Nexus_One_by_Google". The app interface is titled "Farm Production Register". It contains several text input fields: "Item Produced", "Item Description", "Quantity Produced (Kgs):", "Year:", "Average Consumption Rate(Kgs) - Monthly:", and "Farmer Name:". Below these fields is a "Create Product" button. On the right side of the screen, there is a virtual control panel with buttons for "Basic Controls" (volume, power), "Hardware Buttons" (home, menu, back, search), and "DPAD not enabled in AVD". At the bottom of the emulator, the standard Android taskbar is visible with icons for the home screen, app drawer, and several installed applications.

Form for map

The screenshot shows the same Android emulator window, but the app interface is now titled "Map-Marking the Farm". It contains text input fields for "Longitude Coordinates:", "Latitude Coordinates:", "Title:", and "Location Description:". Below these fields are two buttons: "Get Coordinates" and "Submit Location Info". The virtual control panel and the bottom taskbar are identical to the previous screenshot.

Tools requisition form
New tips

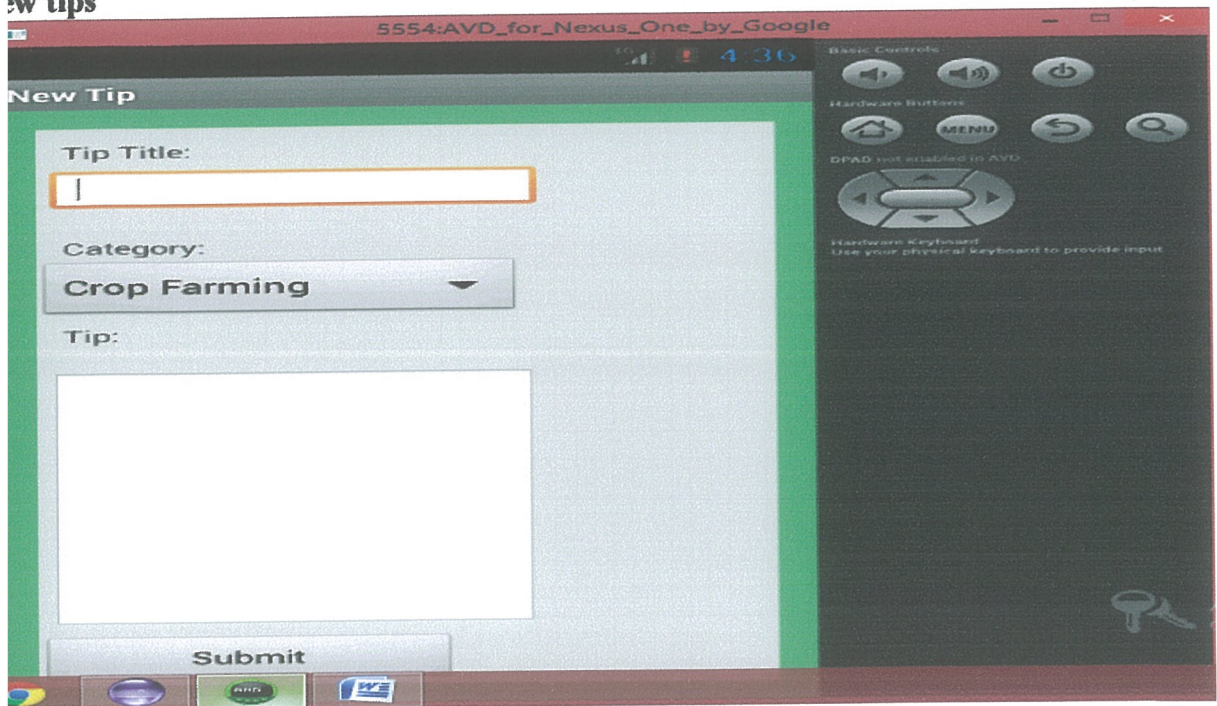


Figure 17: User input interface

Data Outputs: After the data is entered into the system, it is processed and Farmers are informed, if farmers can access information, his data is stored and can be retrieved at any time using the search functionality.

Data Reports

The report can be viewed online or downloaded by the administrator, this functionality enables to give a manual back up.

5 System implementation

This involves procedures used to implement the user interface and the database. The database design was converted into the actual database using Mysql database management system application and Android was used to implement the user interface and connect to the database, and running code was developed to evaluate the tenant's records management information system. The application was tested in the sample field to eliminate any bugs that may not have been identified at the time of development.

6 System testing

Testing of an Android application for provision of farmer information was done to identify errors. The first step is to detect errors and obtain clean compilation. The next step is to eliminate logical errors; System testing was also done to make sure that the results of the system meet the system requirements specifications. Testing involved subjecting the system to all the functional

specification followed by observation of the system behaviors. This was done to avoid the system run with bugs or errors that would be dangerous to the Android Application For farmers' information.

5.7 Validations

Validation rules were set, which limited access and ensured that the values entries allowed in the field were correct thus established a measure on data integrity.

Input and Data Validation

For each data element, a proper domain was defined and the constraints were implemented to ensure validity and consistency of date. Validation rules were implemented to enforce proper entry in addition to the well-defined data types and sizes.

Entity Integrity and Referential Integrity

Items related to particular entities were identified using primary keys that are unique. Null values were accepted by the system.

Security Requirements

Security was ensured in the system by authenticating the user, to avoid unauthorized access, Usernames and passwords are created by different users and the administrator given a unique password.

CHAPTER SIX

DISCUSSION, RECOMMENDATION AND CONCLUSION

5.0 Discussion

The discussion of the project involves what was achieved as a result of implementing the research project. Therefore, the system developed has achieved the following;

- A Farmers are able to fill in the form and submit which was previously not in place.
- The system is able to organize to authorize the administrators to manage Farmers details which was never before
- The system minimized the drawback of data redundancy, thus improved flexibility of Android Application For farmers' information.

However, the system developed had limitations and these are;

- The time used in the development of the system was limited, which hindered the implementation of all desirable aspects in the project.
- Some of the documents needed for analysis were official and did not require being taken out rather studied and analyzed in the respective offices.
- 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

5.1 Recommendation

There is need to backup the data entered in a hard copy through printing daily entrants and backup in a file. Also there is a need to ensure that there is full time strong internet especially for administrator because the system will be busy. Before the details are put into full use, it should be tested in the sample field to eliminate any bugs that may not have been identified at the time of development.

If opportunity allows, the features that have not been implemented but were originally desired can be implemented in order to improve the reliability, efficiency and user friendliness of the system.

5.2 Conclusion

Through this study, records an online university Farmers admission system for Kampala International University has been developed.

Upon testing, it is shown that it is able to meet the set of system specifications.

The project is “an Android application for provision of farmers information” which was designed and implemented with the ability to do the following;

- Gives details on farmers details , productions details

- Allows administrative, officers to update, add and delete records in the database.

Further researchers can expand this study and add new technology design features for the system to other companies.

5.3 Problems Encountered

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

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 use of Internet Cafes which were costly and their slow internet speeds that made it hard to download books and journals.

Wide project scope

Defining the project scope was quite a challenge. This is because the system was meant to be designed for the entire area of study. However with a view to the limited amount of time available for the project, the scope had to be narrowed down to one section of the study area.

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, the researcher 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 to the design of the system.

Programming skills

Learning Android and MySQL requires considerable practice for one to gain the programming skills. With limited knowledge and ability, the programming progress was rather slow and this limited the number of functionalities that the researcher could implement into the system.

Unanticipated Expenditure

Also the researcher was met with a few financial constraints as a result of unanticipated expenditure. In order to cater for the slow internet speeds in the Cafes, the researcher 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 for the researcher.

5.4 Future Research

As well as addressing the limitations presented above, there is scope for work to further the functionality and usefulness of this project. The researcher therefore made the following recommendations for future enhancements to the system.

Widening the scope

Given the limited amount of time given to the developer, the project's scope was rather limited. The scope can further be widened to include all the other departments to make a more integrated comprehensive system.

5.5 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. 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 farmers in terms of increased overall productivity, performance and efficient production process for the farmers.

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