

ANDROID APPLICATION FOR CROP CULTIVATION FOR BANGLADESHI FARMERS

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Degree of Bachelor of Science in Computer Science and Engineering

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APPROVAL

This Project titled “**ANDROID APPLICATION FOR CROP CULTIVATION FOR BANGLADESHI FARMERS**”, submitted By Jarin Sikder Juthe, ID No: 152-15-5911 and Tania Azade, ID No: 151-15-5002 to the Department of Computer Science and Engineering, Daffodil International University has been accepted as satisfactory for the partial fulfillment of the requirements for the degree of B.Sc. in Computer Science and Engineering and approved as to its style and contents. The presentation has been held on May 2, 2019.

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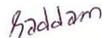
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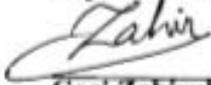
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DECLARATION

We hereby declare that, this project has been done by us under the supervision of Mr. Gazi Zahirul Islam, Assistant Professor of Department of Computer Science and Engineering, Daffodil International University, in partial fulfillment of the requirements for the degree of Bachelor of Science in Computer Science and Engineering. We are declaring this report is my original work. We ensure that neither this report nor any part has been submitted elsewhere for the award of any degree.

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ABSTRACT

This project is on agriculture based that build on Bangla language. Agriculture is the largest employment sector in Bangladesh. This agricultural application provides the information on crops, production details and new methods of cultivation for their user. The main features of our application provides all information is included here for users, they can use it and get facilities from anywhere about fertilizer, land availability, diseases, suitability, soil concentration for the corresponding crops, video tutorial etc. In our application we use sql lite database and also used ORM (object-relational mapping) and ROOM is one of them. Gradle was used to build tools for the system and Java was used for the back end.

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CHAPTER 1

INTRODUCTION

1.1 Introduction

Bangladesh is an agricultural country. The performance of this sector has an overwhelming impact on major macroeconomic objectives.

The most important sector of Bangladeshi economy is depends on agriculture. The land of Bangladesh is very fertile and plain and that's why many people are interest to farming. In Bangladesh the primary crops are rice and jute. Wheat is assuming more importance. In our country tea is grown in the northeast but we know that Bangladesh is not a rich country so that it is not possible to spend enough money at any time for any sector that's why many problems and limitation in the sector of our agriculture.

For this reason, we have developed an android app to assist deferent users as Planters, investors and Farmers. It is an agricultural information app for the main crops of Bangladesh mainly rice, vegetable, fruits and various spices. Information in a preferred format. This provide easy to access. And all information is given in and this is the main objective of this proposal. Bangla and also english.

To make this project, we have studied related work of android application. We also have analysis about agriculture and environment in Bangladesh. Technically, we have learned JAVA, XML, OOP by doing this project.[4]

1.2 Motivation

In Bangladesh government trained our farmer for better utilize of soil and crops. But in our countries farmers are so poor. They works hard in all day. And after finished work they don't want to go training center. And In this time many people of our countries, make a vegetable or fruits garden in their own roof. For lacking of proper knowledge sometimes they cannot grow a healthy garden. In this time our modern people do not like to read of books. It is very hard to find and time consuming. But on the other country, they have their own app for gain knowledge about agriculture.

So we have built an android based mobile application with all information of agriculture in Bangladesh especially about Crops, Fruit, and Treatment and Horticulture method. It is very easy to use for all type of people. Our agricultural app fulfill above requirements. So we have chosen android platform to develop our project and we think our application will be helpful to make a proper agricultural country.

1.3 Objectives

- A. Developing a user friendly agricultural app that will be helpful for Agriculture Interested People.
- B. Mainly focus on crops, fruits, vegetables and treatments.
- C. Our app provide all the information for the Planters, treatment and Utilization.
- D. A proper guide line for planters to grow up a healthy garden or agricultural land.
- E. Monitoring and trained the farmer.

1.4 Expected Outcome

Our project is to develop an android application to develop the agricultural system in our country. Individual users can use it easily. To use this app, do not required to be registered. User just open the application. They can see the option of apps which is about Production methods, Treatment methods, Rooftop Methods, Horticulture method and YouTube Tutorials. To know about any type they should click that option. Then they see the types of this option that they want to know. They choose one type by click. And see the all information about that topic. This all information is listed. When they click one information they can see the details of this information. They also can back very easily to know another topic.

1.5 Report Layout

This report is divided into five chapters. The chapters are summarized below:

- (i) Chapter one covers an introduction of our project Agricultural app along with the motivation behind this work. Objectives, expected output are also included here.
- (ii) Chapter two covers the background review and some previous similar works with comparative studies and challenges of our project.
- (iii) Chapter three is mainly highlighted on the described business process model and use case design with design requirement of the project.

- (iv) Chapter four is design specification of front-end and back-end design with our implementation requirements.
- (v) Chapter five is based on the implementation with the details of the testing of our project.
- (vi) Chapter six which is the last one consists of conclusion and future possibilities of our project work.

CHAPTER 2

BACKGROUND

2.1 Introduction

Agriculture is contributing 19.6 percent to the national GDP and remains one of the most important sectors in the economy of Bangladesh and for 63 percent of the population providing employment. And agriculture is dependent on mainly the weather. In the World Bank, the Bangladesh's 61.2 percent land is arable of the total land area. Usually farms are very small due to people heavily increasing population, inheritance and unwieldy ownership of land. The 3 main crops of Bangladesh are rice, jute, and tea that have dominated agricultural exports for decades. Although the rice is grown for consumption almost entirely. Here jute and tea are the earners for main export. On the other side Bangladeshi farmers produce cotton, sugarcane, tobacco, and various types of vegetables and fruits for the domestic market. In 1.9 million metric tons rice and wheat output our country when it was in 1999. For problem of population of our country continues to place a severe burden. To increase productive capacity and also creating a healthy food is so deficit. We focus especially of wheat. Nowadays foreign assistance also change and this chance also take commercial imports. Unemployment problem is one of the serious problems for agriculture in our country. And a growing concern for Bangladesh's agricultural sector will be its ability to absorb additional manpower. [1]

Rice, jute, wheat and fruit are one of the primary crops in our country. And also rice and wheat are important main crops of Bangladesh and also another some countries. Due to the expansion of irrigation networks, some wheat producers have switched to cultivation of maize which is used mostly as poultry feed. With 28.8 million metric tons produced in July–June. Bangladesh's principal crop is rice. By comparison, wheat output in 2005–2006 was 9 million metric tons. In productive is population pressure continues to place a severe burden on. It is creating a food deficit in the country.

Bangladesh is the fourth largest country in the world for crop producing country. The insecticides not only represent an environmental threat. Our country's significant expenditure to poor rice farmers. The Bangladesh Rice Research Institute is working with various NGOs and international organizations to reduce insecticide use in rice. [3]

Wheat is not a traditional crop in Bangladesh. But it also accounts for the great bulk of imported food grains, exceeding 1 million tons annually and going higher than 1.8 million tons in FY 1984, FY 1985, and FY 1987. The great bulk of the imported wheat is financed

under aid programs of the United States, the European Economic Community, and the World Food Program.

Food grains are cultivated primarily for subsistence. Only a small percentage of total production makes its way into commercial channels. On the other Bangladeshi food crops are grown chiefly for the domestic market. They also include potatoes and sweet potatoes with a combined record production of 1.9 million tons in FY 1984 oilseeds with an annual average production of 250,000 tons. Fruits like bananas, jackfruit, mangoes, and pineapples estimates of sugarcane production put annual production at more than 7 million tons per year, most of it processed into a coarse, unrefined sugar known and sold domestically. [4]

2.2 Related Works

There are a few number of application and website available regarding this concept. We have study on these application and website. Here, we talk about the most useful application and website and similar to our application.

Yara Image IT:

Yara ImageIT is an android application that build based on farming. It designed for rating percentage of nitrogen in a crop. It also give solution about nitrogen recommendation based problems that detected by photographs of the crop. This app works for that reason while farmer should apply nitrogen. It showing the user how much nitrogen he/she should be apply to grow a healthy crops. ImageIT provides also fertilizer recommendations with Yara preferred product and also can contact information of the closest Yara office by using this app. The app turns a farmer's smartphone camera into a high-tech crop nutrient tester. ImageIT can understand how much nitrogen should be apply based on leaf cover. This application is built on by comprehensive image analysis that also use classifies leaf pixels. It can filters noisy areas and counts leaf pixels. It used being an advanced agricultural tool. This app is easy to use. And it also so flexible in terms of technical requirements. The app is so insensitive for its camera. It works with low resolution images where a file size as small as 50 – 200 KB. In poor signal areas ImageIT can store images in fact it also can capture picture on offline. It send the picture that it captured before connected internet. [9]



Fig.2.1: User Interface of Yara ImageIT Application.

MyAgriGuru:

MyAgriGuru is a Agriculture apps that made in English and Hindi. It specifically built for Indian based on their environment so that they can cultivate properly. And its design also suitable for Indian farmers. It also make sure to know about largest agricultural technology. Its work is to help the farmers in their journey to more than better and innovative farming while increase their incomes.. It also give techniques for that reason they can able to raise healthy crops. And also in turn contribute to a healthy living.

Crop: This app helps farmers to understand about the crops problem and also help to know about information's. The main features of this Agriculture app is crops. It give the result of the seed to pest management to the weather conditions and also to be healthy. The price of seeds feature takes care of it all. Farmers can capture their crops picture and also send their own crop images to MyAgriGuru. It make a speedy resolution by agriculture experts. In this app also added to farmers success stories that increase another farmer as well as the latest technologies.

AgriBuzz: AgriBuzz is an app that is a unique chat feature in an open platform. It will benefit the Indian kisan immensely. Every user of the applications can ask questions and also doubts which in turn will be answered by the other members of the agriculture community. With this feature, members of this app can be sure that every question asked by them will be resolved quickly and satisfactorily.

Market Price: From this application the farmer can get the right price of crops that he desearv for the hard-work put in by him/her. They can also knowing about the market price so that they can compare trends of a particular crop. At the same time they also make the right call about the harvest price. The app also easy to use. [8]



Fig: Picture of MyAgriGuru Application





Fig.2.2: User Interface of MyAgriGuru

Fasal Salah:

Fasal Salah is an application that is about agriculture advisory and path breaking. This application is the first time provides real-time location specific, weather based agriculture advising and crop specific across India.

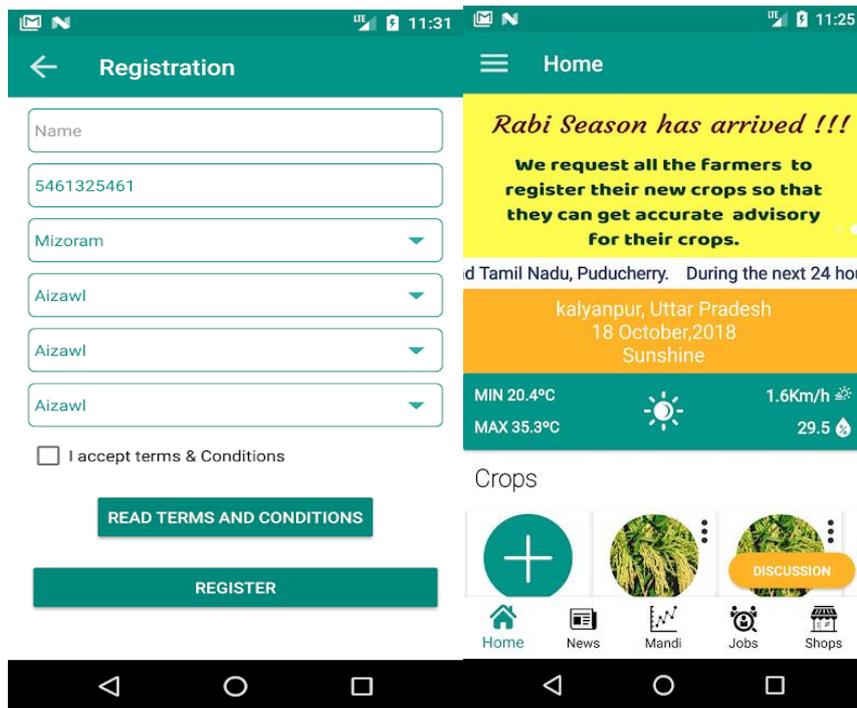
It is so very helpful for the Indian farmers. This app has special features for rural farmers who may be semi-literate. Fasal Salah advisories are made in Hindi, English and regional language.

1. Krishi Salah: This app gives advice to farmer and this is one of the main point of this app. Crop Advisories are not available any time and they demand a huge amount taka for advice. This applications give farmers advice and also including alerts on adverse weather events, pests, diseases, and management practices according to real-time weather condition at the village level.

2. Weather information: It is the main important factor for crop growing. In this applications provides weather forecast of five days at village level that involves several parameters like temperature, rainfall, wind speed and relative humidity. Advisory covers 600,000 villages across India for nearly all major crops and vegetables.

3. Mandi/Market Prices: Fasal Salah can help any people to buy crops with cheap rate.

4. Audio advisory: An advisor always work there to help people who are nonreader.
5. It also gives people latest news of cultivations like Inputs crops, varieties, fertilizers, pesticides in their area of operation. [10]



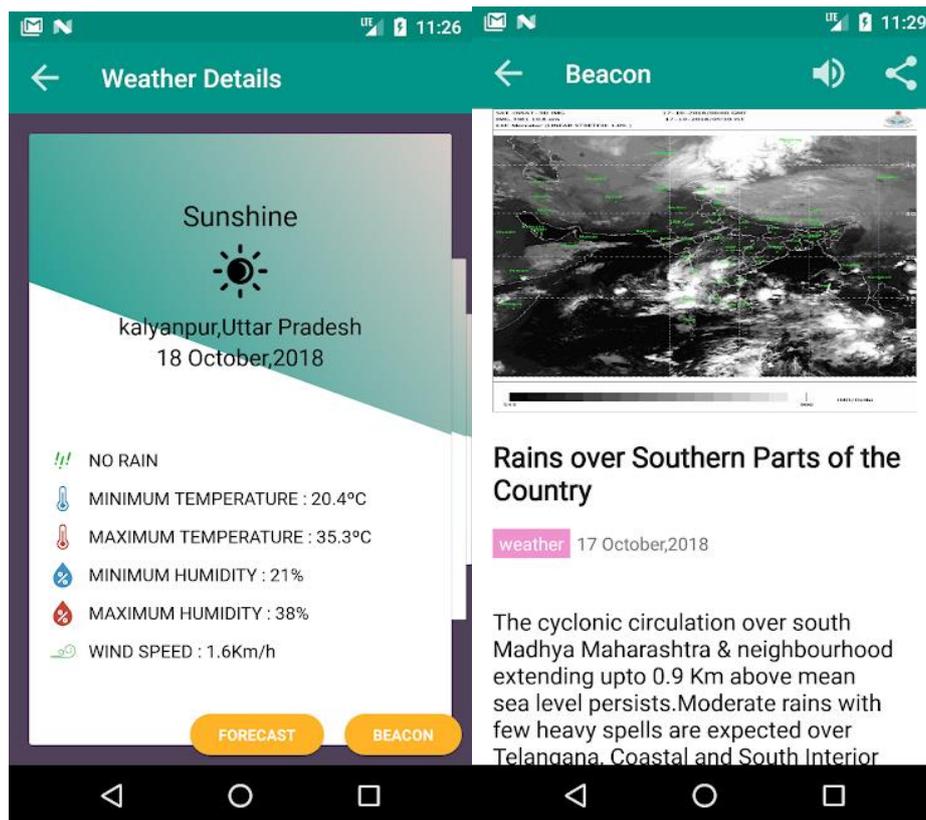


Fig.2.3: User Interface of Fasal Salah.

AGRISCIENCE KRISHI

AGRISCIENCE KRISHI is a mobile application. This application for farmers of Gujarat and Madhya Pradesh. In this application gives all information of agriculture in Hindi and Gujarati language and give information about new rates of almost all APMCs/Mandis of Gujarat and Madhya Pradesh. This app also updates the farmers about latest agriculture news of all over the globe. This app also provide details of land records.

KRISHI SAMACHAR- In this segment provided latest agriculture news from all over the world in simple Gujarati language. Farmer can get all major updates about farming from all over the world.

BAJARBHAV/MANDI RATE- This app provides daily market rates of almost all commodities and all APMCs/MANDIs of Gujarat and Madhya Pradesh. Farmer can see the market rate in zone wise APMC/MANDI list. Farmer can also customize the list and they also select five commodities and yard. This selected commodities price will display at the header of the app.

KRISHI GYAN- Here provide agriculture content and actionable information at every stage of crop cycle. Farmer can get crop wise details from pre-sowing to selling. In this segment also provide details of Government schemes for farmer.

KISAN SAFALGATHA- This app gives inspirational stories of successful farmers from all over India. In this segment provide progressive farmer's all details with photograph and contact details.

AGRISCIENCE TV- In this segment farmer can watch informative videos about agriculture. Make short and simple videos with high quality visuals and graphics.

7/12 UTARA- farmer can view agriculture land records of Gujarat and Madhya Pradesh like, 7/12 utara and 8/A thru our app. [11]



Fig.2.4: User Interface of AGRISCIENCE KRISHI

2.3 Comparative Study

We have studied some application and website regarding the concept of growing healthy food from agriculture. Most of them are developed for the people of India, South Africa, Gujarat and USA. But unfortunately there is no project in our country existing on this concept. So we have tried to focus on Bangladesh perspectives. 'Krishoker Bondhu' is doing the volunteering work to collect the information about agriculture of Bangladesh. Our main target is to establish a Bangla app that helpful for farmer and any type of people that easy to use for them. Some app developed for agricultural about environment, some are about nitrogen, some are about crop health and some are about processing about crops utilization. But there have no app that is collection of all information. And also have no Bangla app for Bangladeshi farmer.

2.4 Scope of the Problem

Our application have some special feature which make our application better than other existing project and solve the problems. Some special features of our application are:

- Phone number adding.
- No registration for a user.
- Established solution for agriculture.
- Easy to get knowledge about crop.
- Easy to confirm crop production method.
- User friendly UI design.
- Fast loading and high performance.
- Our app has both of Bangla and English.

2.5 Challenges

During different stages of this project we had to face a few challenges. We were able to successfully overcome those challenges. The challenges we faced were:

- Designing and implementing a user friendly and interactive user interface using XML was also challenging for us.
- We also faced challenge to make the project beneficiary for the agriculture. If the application is not beneficiary for them, they will not be interested to use it.
- Some other common challenges was deadline, Requirements analysis, Quality of Code, Performance and efficiency of system.

- We also face problem when we collect information about crop, soil and environment. It is so difficult to manage all information about agriculture. And we overcome this challenges.

CHAPTER 3

REQUIRMENTS SPECIFICATION

3.1 Business Process Model

Business process modeling (BPM) is an assimilation that is a process of business management & system engineering of an organization or enterprise. It describes the analytical representation of any organization and also enterprise. BPM helps to increase business quality and it also reduce business cost. Business process modeling can be changed or it can improved to get new business opportunities.

It is don't need to register by providing necessary information. Only to do install application in users mobile. Every user can easily contact through mobile number.

When any users open the app, they view the option of information. Methods are appears in 1st page. If they want to know crop production method, they have to click the picture. Then they can see the option of crop production. Then they chose the crop that they want to know about production method. And then they can see all of information about that crop. And all other options are running as like.

Only admin can contact the clint. If any people face problem they can contact by mail or phone call with the admins. [12]

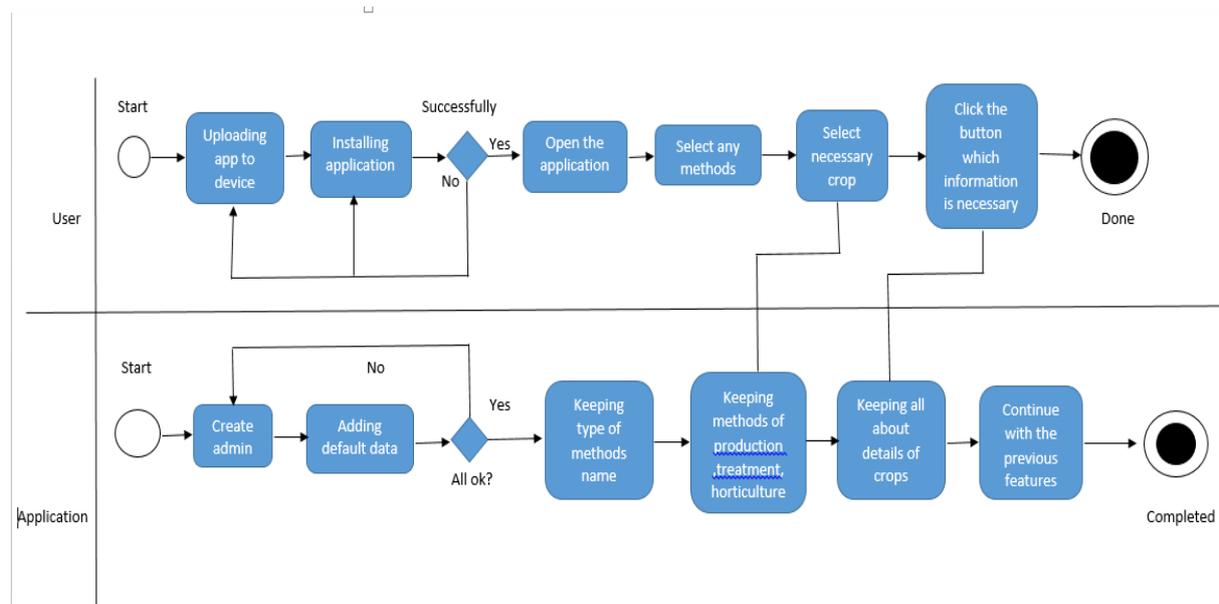


Fig.3.1: Business process model for user and Application

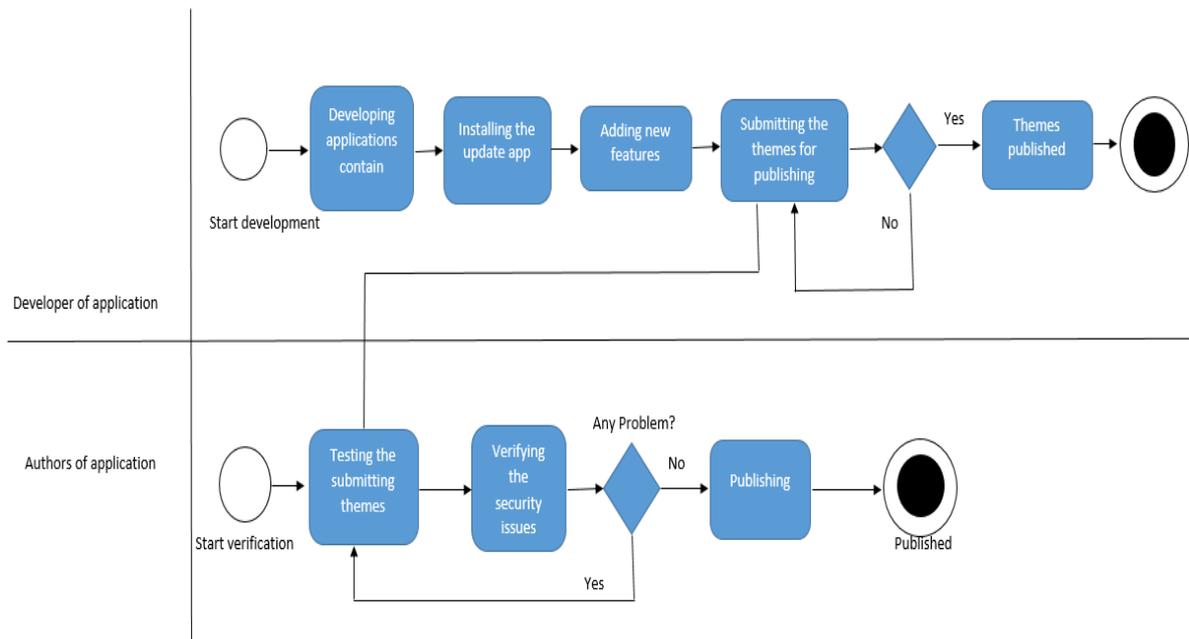


Fig.3.2: Business process model for developer and author

3.2 Requirement Collection and Analysis

At first we motivated for the problem by facing some problem, we decided that make our project by Android Studio. First, we decided to make a structure of the project from scratch to functional, then we will go for further features. The requirements were mainly-

- The Android Studio will be installable
- The Android Studio will be easily installable
- There will be a contact system to connect the admin panel
- It will be a well decorated rich admin panel
- It will be a system for managing users that would be managed by admin
- A video showing system
- A theme management system
- A option choose system
- Some themes development for the Android Studio

3.3 Use case Modelling and Description

In any application development system it is necessary to show the relationship between the user and the system. This user's interaction with the system can be shown easily by a Use Case

Diagram. It has the ability to identify different types of users of the system and the different use cases as well.

In other word it is a Unified Modeling Language (UML) that generally describes the set of actions that a system or systems should or can conduct in collaboration with one or more external users of the system, here the actions called as ‘use case’ and the system called actor. [11]

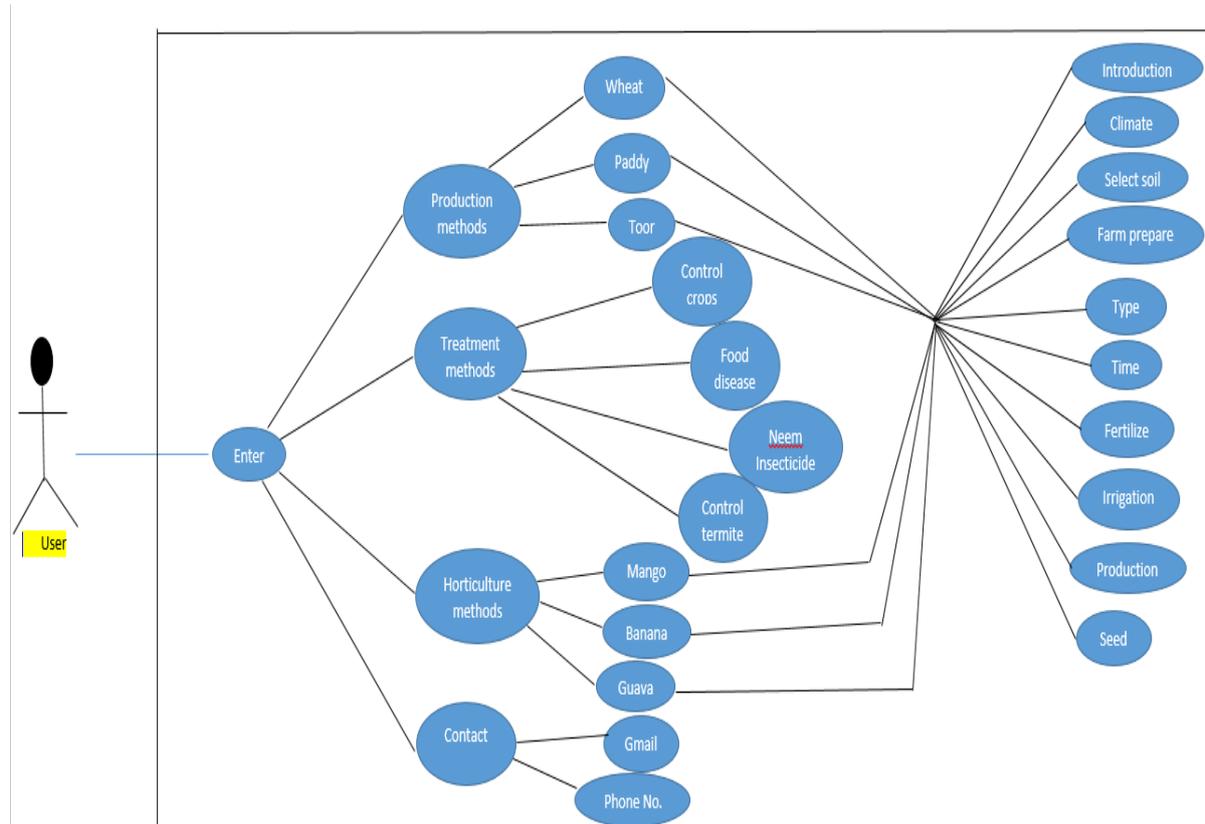


Fig.3.3: Use case diagram

Table 3.1: Description of Use Case of working with App

Use Case Name	Working With App
Primary Actor	User
Secondary Actor	Authors of Apps
Pre-Condition	User must download and install or store the app.
Description	User can access the menu, the media, the themes.

Post-Condition	If the action is successful then user will be shown all features and can gain knowledge also get all information's.
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Table3.2: Description of Use Case of developing Apps features

Use Case Name	Developing Apps features
Primary Actor	Developer of Apps
Secondary Actor	Authors of Apps
Pre-Condition	The developer should be creative and good at developing
Description	The developer must download application and then install, then developed

3.5 Design Requirement

Design requirement for user

- Able to install.
- User can access.
- View Front page.
- Able to see all the option of production by scrolling.
- See the name of crops or fruit by clicking the option.
- Can see the detail problem and information by click on the crop.
- Easily user can see description by clicking the method option.
- User can minimize description box.

Design requirement for contact

- Open another panel for contact.
- Able to contact with phone number.
- User can use email for contact.

CHAPTER 4

DESIGN SPECIFICATION

4.1 Front-end Design

- Installation the application design
- Contact panel interface design
- Methods management interface design
- Add scrolling design
- Crops name interface design
- Each crops description interface design
- Fruits name interface design
- Each fruits description interface design
- Problem solving interface design
- Media interface design
- Roof methods interface design
- Roof details interface design
- Maximize minimize design

Our project front-end has mainly designed by SQL lite database, ORM, Android Studio and XML.

Android Studio

- Its build system is flexible and Gradle-based
- A fast and feature-rich emulator
- A unified environment where you can develop for all Android devices
- Instant Run to push changes to your running app without building a new APK
- Code templates and GitHub integration to help you build common app features and import sample code
- Extensive testing tools and frameworks
- Lint tools to catch performance, usability, version compatibility, and other problems
- C++ and JDK support

Gradle

We were using Eclipse before using android to our development our work. We didn't know how to build our Android APK without using Eclipse.

We have to learn about all tool that does in the SDK if we can do the command line. Eclipse saved us all from these low level but important, fundamental details by giving us their own build system.

Gradle is also a **build system** like as Eclipse. It is the best features from other build systems. It also combines them. It is improved based off of their short comings. It is a **JVM based build system**, what that means is that you can write your own script in Java, which Android Studio makes use of. [11]

XML: Extensible Markup Language

Extensible Markup Language (XML) is a markup language that defines a set of rules for encoding documents in a format and that is both human readable and also machine readable. The W3C's Extensible Makeup Language 1.0 Specification and several other related specification by define XML. XML is a textual data format with strong support via Unicode for different human languages. And XML has come into common use of data over the internet.

We have use XML in our application. So that it is very easy to use and flexible text format. Our Buttons, layouts, text views, image views are designed by using XML. [12]

SVG: Scalable Vector Graphics

SVG is an XML-based vector image format that is two-dimensional graphics with support for interactivity and animation. The SVG specification is an open standard developed by the World Wide Web Consortium (W3C) since 1999. SVG images and their behaviors are defined in XML text files. This means that they can be searched, indexed, scripted, and compressed. As XML files, SVG images can be created and edited with any text editor, as well as with drawing software.

Adobe Photoshop:

Adobe Photoshop is a editing Systems for Windows. Adobe Photoshop published in 1988 by adobe system and it created by Thomas and John Knoll. It also is a raster graphics editor. When

it has become the de facto industry standard in raster graphics editing such that the word "photoshop" has become a verb as in "to Photoshop an image," "photoshopping" and "photoshop contest". Then Adobe distroy such use. It can compose and edit raster images in supports masks, multiple layers and alpha compositing and it also have several color models including CMYK,RGB, CIELAB, and duotone. Photoshop has support for graphic file formats but also uses its own PSD and PSB file formats which support all the aforementioned features. In addition to raster graphics, it has limited abilities to edit or render text, vector graphics (especially through clipping path), 3D graphics and video. Photoshop's feature set can be expanded by Photoshop plug-ins, programs developed. Photoshop distributed independently of Photoshop. It can run inside it and also offer new or enhanced features. [13]

SQLite Database

SQLite provides a relational database management system and it is a software library. Here the lite means light weight in terms of setup, required resource and database administration. SQLite also has the noticeable features like serverless, transactional, self-contained and zero-configuration. SQLite is a database that is opensource and stores data to a text file on a device. Android comes in with built in SQLite database implementation. SQLite supports all the relational database features. [16]

4.2 Back-end Design

The back-end design is basically how the server, application and database works, update and maintain. It is not visible to the end users. But it works to support the front-end of the application. So back-end design is most important part of a project.

We have used Java in our back-end design of our project. We also used firebase for real time data parsing.

Java:

Java is object oriented, concurrent, class-based, and also specifically designed for few implementation dependencies. Java is an application developers "write once, run anywhere" (WORA), meaning is compiled. Java code can use anywhere because it can run on all platforms. For this reason Java support without the need for recompilation. Java is mainly a general purpose computer programming language. Java applications can run on any Java virtual machine (JVM) this applications are typically compiled to bytecode and it regardless of computer architecture. In 2016, Java is one of the most popular programming languages in used

as particularly for client-server web applications. It reported 9 million of developers who are use this. Java was originally developed by James Gosling at Sun Microsystem. Java released in 1995 as a core component of Sun Microsystems' Java platform. The language derives much of its from C and C++. But Java has fewer problem than either of them. The latest version is Java 10, released on March 20, 2018. [14]

Android Api Label 26:

Android 8.0 (API level 26) introduces a variety of new features and capabilities for users and developers. This document highlights what's new for developers.

Make sure to also check out Android 8.0 Behavior Changes to learn about areas where platform changes may affect your apps. [11]

4.3 Interaction Design and UX

Interaction Design is an important component which is the giant umbrella of User Experience (UX) design and interaction design. UX is specifically which examines the interaction between a system and its user via an interface and it is a discipline. User experience (UX) design is provide meaningful and the process of creating products. And it also personally relevant experiences. It may also incorporate design focused on how information should be presented. It is such a system that is to enable the user for best understand of information. This is considered to be the discipline of “information design” too.

Our application is very user interactive. We have tried to make this application’s user interface very easy to understand and use. [12]

4.4 Implementation Requirements

To implement our android application project, we used different types of tools, attributes and components which are helped us to develop our android application project successfully. In Implementation requirements area, we discuss all those tools, attributes and components that we have used to develop our android application project and making attractive to the user.

4.4.1 Android Studio

Android Studio is the official integrated development environment (IDE) for Google's Android operating system. It built on JetBrains IntelliJ IDEA software and designed specifically for Android development. There are a lot of features of android studio as like that Gradle based build support, Android-specific refactoring and quick fixes, Lint tools to catch performance, usability, version compatibility and other problems. App-signing capabilities, Template-based wizards to create common Android designs and components. Android Virtual Device (Emulator) to run and debug apps in the Android studio. The best feature of android is supporting a number of programming languages. All these reason we utilize the Android Studio as our application integrated development environment (IDE). [15]

4.4.1.1 Basic Android Overview

Android is a comprehensive platform that means it is a complete software stack for a mobile device. It provides all the tools frameworks for developing mobile application simply. It also use to quickly and easily. We design our application with Extensible Markup Language, connection with Java Language in Android Studio. Android is also open source platform. Here developer can make any types of user interface which the developer needs to design his/her application. The developer can write any programming language for his/her application in android studio. So developer can easily develop different types of mobile application by use it for user interaction. [15]

4.2.1.1 The Emulator

An emulator is an Android Virtual Device (AVD). It represents a specific android device for emulating any types of android application or project. The developer can use an Android emulator. It is a target platform to run and test his/her Android applications on his/her Personal Computer (PC). By Using Android emulators is optional. We run our application in both our personal device and Android emulator too. The emulator runs the same code base as actual device. The emulator is so pretty for emulating android projects. [17]

4.4.3 Android SDK

Android development starts with Android SDK (Software Development Kit). Android SDK is a set of collection of development tools and used to develop and build of any kind of android application which is use for android platform. That means Android SDK is essential tools for

both developing and building any android application. We use Android SDK for both developing our android application and also testing our android application when need to run for seeing output. Minimum SDK version 16 (Android 4.1, Jelly bean) is required to run this application. [18]

4.4.5 Permissions Required

- Read and write access of external storage.
- Safely install the application.
- Picture access of external storage.

CHAPTER 5

IMPLEMENTATION AND TESTING

5.1 Implementation of Database

We did not use any database in our project. We Complete our projects design and outlook by using Android Studio.

5.2 Implementation of Front-end Design

It was really a big challenge to develop a gorgeous front-end design which will be attracted by the users. For interactive design we have always tried to make a simple and easier user interface design of our android application. Any user can easily understand the presentation of the information. We have used mainly Android Studio to design our front-end. User interface of some pages are attached below. In figure 5.1, we have attached the screenshot of the starting page of our application with the logo, application name, tagline a continue button. If anyone wants to enter the application, he or she has to click on the logo.



Fig5.1: A Screenshot of intro Activity

When user click the logo they can inter the apps. And they show different type of methods. They can read English and Bangla both. That is showing figure 5.2.

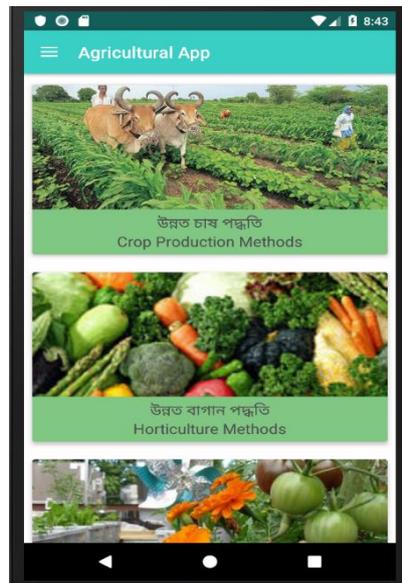


Fig 5.2: Front pages type of methods

After scrolling we can see another different type of methods. That's showing on Figure 5.3

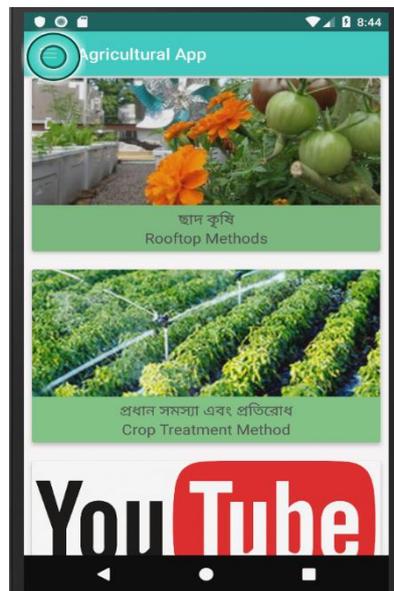


Fig 5.3: Front pages type of methods

And the last type of methods of this applications front page is showing fig.5.4. By clicking in the last option user can watch videos about different type of cultivation.

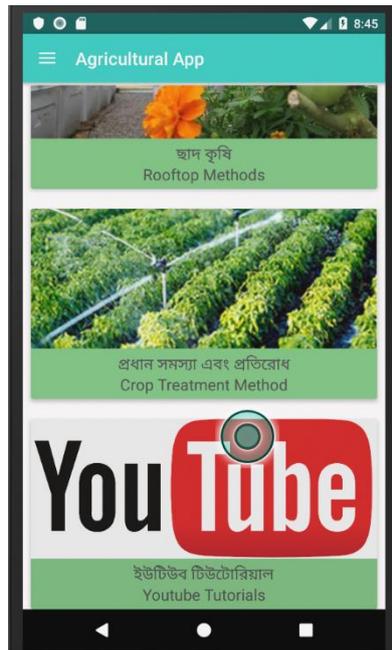


Fig.5.4:Front pages type of methods

Then people can choose any one type from the front page to know about that's types detail methods. When he/she click on the crop methods they can see next page showing Fig.5.5 that is the details of clicked crop.



Fig.5.5: Details of crops

When user scroll the screen they can see the fig.5.6. that is another type of methods of that crop.



Fig.5.7: Next methods of crops

And the If user back to the front page and choose `Horticulture Crops` then they can see another type of crops that showing in Fig.5.8.

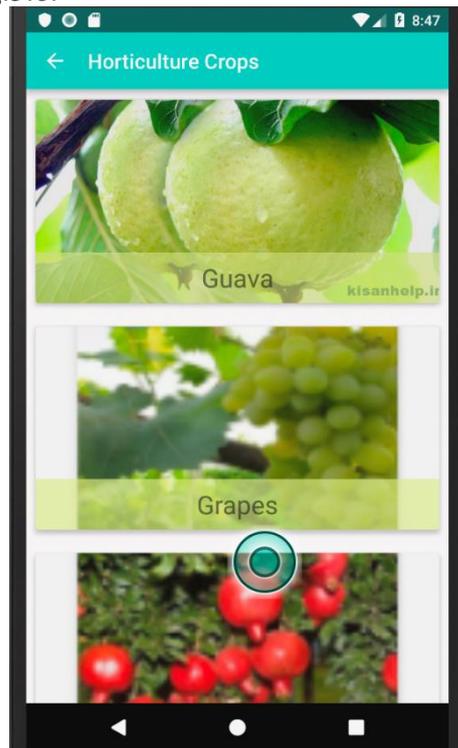


Fig.5.8: Different type of horticulture crops

When user scroll the page of Horticulture crops they can see another different type of crops. And all of things they can read in Bangla language. That is showing in Fig.5.9

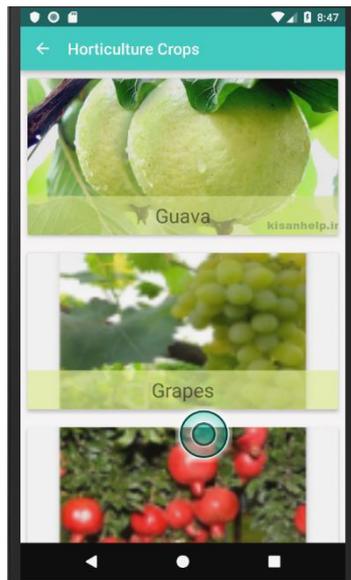


Fig.5.9: Different type of horticulture crops

After Again scrolling the page user can identify another crops like Fig.5.10.

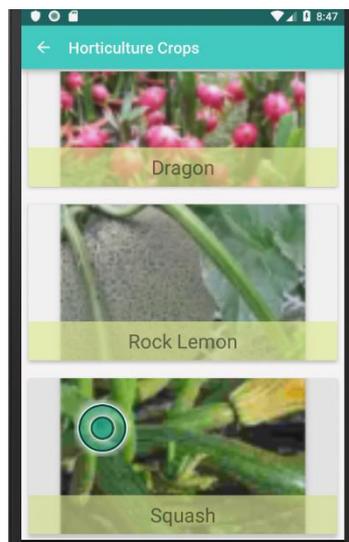


Fig.5.10: Different type of crops

Then the next button of front page is “Roof Agricultural Crops” that is Fig.5.11.

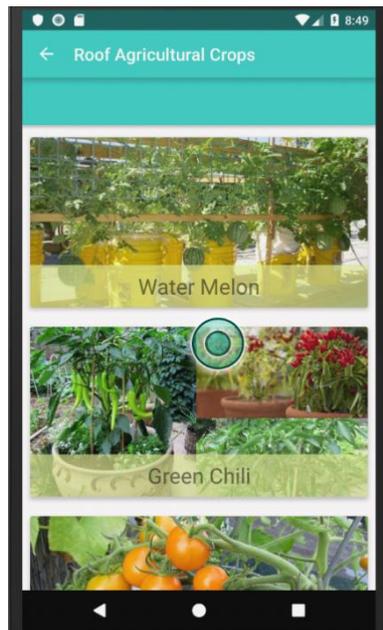


Fig.5.11: Types of Roof Agricultural Crops

This is another different types that is seen by scrolling the page of Roof Agricultural Crops . Here in Fig. 5.12 given the picture.



Fig.5.12: Another types of Roof Agricultural crops

When user want to know about crops detail just click any function. They can see all information about that topic. And they can know all about information about that crops by



this system.

Fig.5.13: Details about crops

Like this they also can see all about crops information by just one click. Shown fruits details in Fig.5.14.



Fig.5.14:Details of fruits

People can contact with author in any time with email or phone number. They can solution their problem in any time anywhere. And that is showing in figure 5.15

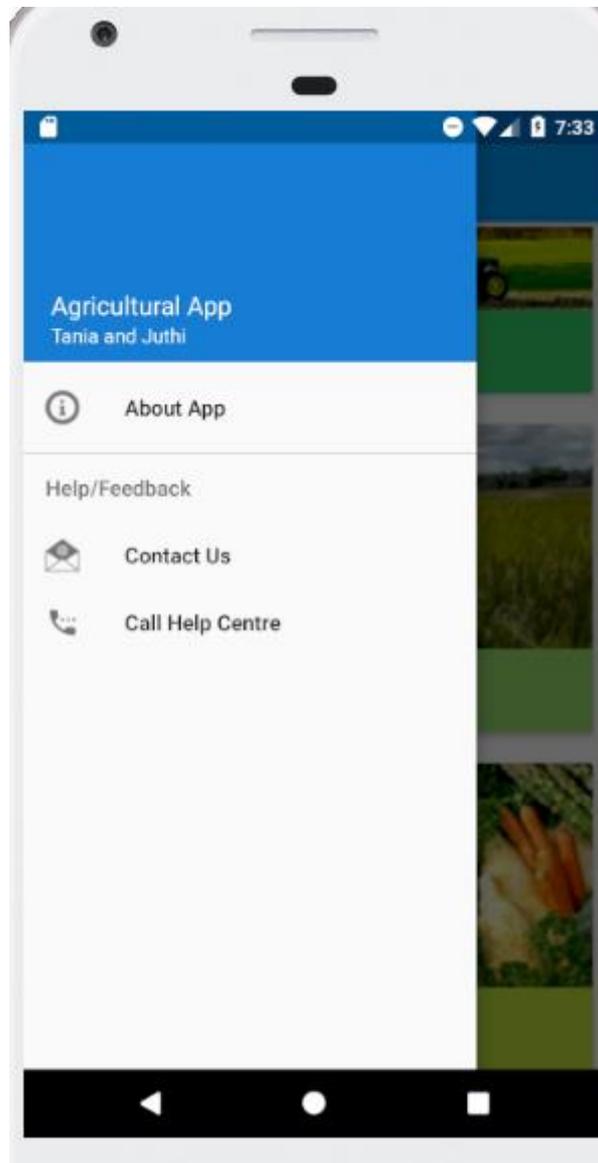


Fig: 5.15 contact

5.3 Implementation of Interaction

Our application is very user interactive. The presentation of information is easy to understand and easy to provide required information. We have discussed some of our key features how we make our application interactive design.

We have not used verification or sign up and login, which is easy to use app. User can easily use it because it made in totally Bangla. And we have also make it so that user don't need any internet. Because now a days all people have an android phone almost. But in the village our farmer cannot access app if we make it one line. Any people can take it and any time anywhere they use it easily. [2]

5.4 Testing Implementation

Testing of our project has been implemented. While developing each functions are working fine. For this case we can say unit testing is done. While some part of project developed we have tested the interactions between pages to pages. Intent to intent. As we don't have professional tester and all the requirements are arranged by us. So we know very well about the user requirements and we have write down the bullet points of user expectation and tested the expectation of users. So we can say each type of testing like unit testing, integration testing and acceptance testing done by our side. [3]

5.5 Test Results and Reports

Every project needs an output as a result. As per our testing experience we have found all expected results. Every user can use it and can communicate with admin by using phone number or Email. User can collect all information. They can watch video of cultivation that we add our app. People can use it in any place and any time without internet. Its all option will worked. So every user's requirement has been full filled.

CHAPTER 6

CONCLUSION AND FUTURE SCOPES

6.1 Conclusion

Agricultural app is one of the issues currently facing the planet as a whole. We should take necessary to proper fertilization, otherwise the people of the world will suffer from food scarcity. Nowadays healthy food is must needed for our everyday life. In this time our countries all people face unhealthy environment and also take unhealthy food. If they can produce their own vegetables on their roof they can lead a healthy and beautiful life. And our city also being greens by this type of roof gardening that also useful to make a healthy environment in our city life. If you can produce good crops Our country will developed very soon.

We have built “Krishoker Bondhu” which is an android application to a complete cultivation suggestion .We believe that our agriculture will be better for use this apps. And in city all people can make at least one small garden to follow this apps instruction. So our project can make a huge difference in the society by improving our agriculture. Our goal is to cultivate healthy food and to make our county greenly.

6.2 Future Scope

- Add notification system so that this app can alert farmer time to time to cultivate seeds. Also farmers don't forget give proper treatment and water timely.
- We also give some link of foreign countries website so that interested people can collect foreign seeds in Bangladesh.
- And also add those types of crops information so that they can easily cultivate foreign seeds in our country.

REFERENCES

- [1] Professor Peter Langridge, “Achieving Sustainable Cultivation of Wheat”, Available in one line: https://books.google.com.bd/books/about/Achieving_Sustainable_Cultivation_of_Whe.html?id=RvdtswEACA-AJ&source=kp_book_description&redir_esc=y, [Last access: December 2018].
- [2] Dr.Md.Akhtar Hossain Chowdhuri, “Tobe o Jomite Foler cash” Available one line: <https://www.rokomari.com/book/56862/tobe-o-jomita-fole-cha>, [Last access: April 2019].
- [3] Mizan Rahaman, “Fol Cash Baro Mash”. Available one line: https://www.rokomari.com/book/14658/adunik-paddhoatite-fole-cash-baromash?ref=rc1_p1_pr56862 [Last access: April 2019].
- [4] ”Agriculture in Bangladesh”, Wikipedia, Available one line: https://en.wikipedia.org/wiki/Agriculture_in_Bangladesh [Last access= March 2019]
- [5] ”Bangladesh Journal of Agricultural Research”, Wikipedia, Available online: <https://www.banglajol.info/index.php/BJAR>. [Last access: March 2019].
- [6] “AgroBangla.com. “ Wikipedia, Available online: <https://www.agrobangla.com/> [Last access: March 2019].
- [7] “Bangladesh bureau of statistics”; 28 edition. Wikipedia, Available online: <https://www.amazon.com/Year-book-Agricultural-Statistics-Bangladesh-2016-28th/dp/B075QBRN3T> [Last access: February 2019].
- [8] “MyAgriGuru application. Digital platform of farmer”. Wikipedia, Available online: <https://myagriguru.com/> [Last access: March 2019].
- [9] “YaraImageIT Application”. Wikipedia, Available online: <https://www.yara.fr/fertilisation/outils-et-services/yara-imageit/> [Last access: March 2019].
- [10] “Fasal Salah agricultural application”. Wikipedia, Available online: <https://play.google.com/store/apps/details?id=com.weathersys.agro&hl=en> [Last access: March 2019].
- [11] “Agriscience Krishi mobile application”. Wikipedia, Available online: <https://www.socialapphub.com/app/agriscience-krishi> [Last access: February 2019].
- [12] “XML”, Wikipedia, Available online: <https://en.wikipedia.org/wiki/XML>. [Last access: February 2019].
- [13] “Adobe Photoshop”, Wikipedia, Available online: https://en.wikipedia.org/wiki/Adobe_Photoshop. [Last access: January 2019].
- [14] “Java programming language”, Wikipedia, Available online: [https://en.wikipedia.org/wiki/Java_\(programming_language\)](https://en.wikipedia.org/wiki/Java_(programming_language)) [Last access: January 2019].
- [15] “Android studio”, Wikipedia, Available online: https://en.wikipedia.org/wiki/Android_Studio [Last access: March 2019].

[16] “Scalable Vector Graphics”, Wikipedia, Available online:
https://en.wikipedia.org/wiki/Scalable_Vector_Graphics [Last access: January 2019].

[17] ”SDK” , Wikipedia, Available one line: <https://www.google.com/search?client=firefox-b-d&q=SDK> [Last access: March 2019].