

BD KISAN: An Android Based Mobile Application

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This Report Presented in Partial Fulfilment of the Requirement for the
Degree of Bachelor of Science in Computer Science & Engineering.

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May, 2019

APPROVAL

This Project titled “**BD Kisan: An Android Based Mobile Application**”, submitted by **Nadim Hossain Shaon**, ID No: **151-15-5407** 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 **2nd May 2019**.

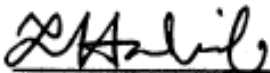
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I hereby declare that, this project has been done by me under the supervisor of **Anup Majumdar, Lecturer, Department of Computer Science and Engineering, Daffodil International University**. I also declare that neither this project nor any part of this project has been submitted elsewhere for award of any degree or diploma.

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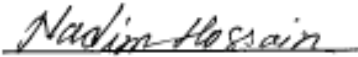


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ACKNOWLEDGEMENT

First I express my heartiest thanks and gratefulness to almighty God for his divine blessing makes us possible to complete the final year project successfully.

I really grateful and wish our profound our indebtedness to **Anup Majumdar, Lecturer, Department of CSE**, Daffodil International University, Dhaka. Deep knowledge and keen interest of our supervisor in the field of Android Mobile Application Development to carry out this project. His endless patience, scholarly guidance, continual encouragement, constant and energetic supervision, constructive criticism, valuable advice, reading many interior draft and correcting them at all stage have made it possible to complete the project.

I would like to express my heartiest gratitude to the almighty Allah and Dr. Syed Akhter Hossain, Professor and Head, Department of CSE, Daffodil International University, Dhaka, for his kind help to finish my project and also to the other faculty member and the staff of CSE department of Daffodil International University.

I would like to thank my course mate in Daffodil International University, who help me to complete the work.

Finally, I must acknowledge with due respect the constant support and patients of my parents.

ABSTRACT

With the development of time and information technology, it has become more easy to use mobile apps for our daily works. The technology becomes more advanced to our agriculture also. This project “BD Kisan” an Android based mobile application is developed for the great support for our farmer those who are new at farming. They will have proper guideline to solve the critical problem. User can know the cultivation process for the desired crops. They can fight from the crops disease that hamper the crops. The application has a use friendly user interface. This application is in Bengali Language. So those who can read Bengali, it is easy to understand. The project is developed with the help of Android Studio and Firebase has been used as the core database for the application. With this application, I hope the people will be much benefitted. They don't have to use traditional way to cultivate or panic for the crops disease.

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CHAPTER 1

INTRODUCTION

1.1 Introduction

This application will help to the farmers by providing the relevant information like a overall information about specific crops production, crops protection and all relevant agriculture services in Bengali language.

1.2 Motivation

Agriculture is the largest sector in our country. Our largest part of GDP comes from Agricultural sector. 16% of country's GDP comprises the total labor force of 63% as of estimated in 2018. But our agricultural sector is the most neglected and it's system is backdated. As we are in the vision of 2020 to digitalize our country, it is must to develop our agriculture also. So it's the time to take a proper steps to look after towards our farmers, our agriculture. We have that, our most of farmers still follows the traditional ways for production the crops. So most of them don't know about our new technologies. So, our Application is for the most of this farmer to know the new technique a scientific way to produce more crops and protect from diseases. When the Idea becomes in my mind I thought about our farmers those who are new to agriculture specially our young generation to introduce our agriculture. And this Application is in Bengali Language so it is also helpful those illiterate farmers who can only read.

1.3 Objective

My application has such basic features like –

- A short intro on crops
- Cultivation method
- It's diseases
- It's remedies and
- Pesticides list

As a user, every farmer can choose any individual crops like seed, vegetables or lentils seeds and its different varieties. After that, user can see a short information on his desire crops and our apps will show an ideal cultivation method of this crops. And then, there will be a list of all possible list of diseases and apps will show the remedies and suggest a pesticides list of it. There will be a help desk of Government site through that user can ask any relative agricultural problems.

1.4 Expected Outcome

This apps basically for the new farmers that's our young generation. Because, the upcoming farmers have to use the technologies to bring a new era of agriculture. And from this application our farmers can gather all information about crops. And they can learn about the cultivation process and protect from any kind of diseases. And that the key to grow more food for our country. Our farmers are losses every year for ignorance about cultivation and protection of his crops. This application can help to produce more crops and reduce its cost of production.

And I believe that our Government take a proper steps to the agricultural sector. And by spreading this kind of service to the farmers in all over country, it can change the future of farmers as well as our country.

CHAPTER 2

BACKGROUND

2.1 Introduction

My application is a farmer based mobile application and it gives you a lot of information on agriculture. For developing this android application I use Android Studio and Firebase. The most important things in this app is the information. If I want to complete the whole project I have to gather a lot of information. I have to study more and more about our agriculture or related topic to gather information. I also discuss the problem and explanation. It also helps that person who read the paper.

2.2 Related Work

This project is made on the basis of some application but those are not same as mine. Some examples are, Krisoker Janala[1], Pesticides Prescriber[2], Krisi Somossa o Somadhan[3], Shaksobji chas o Porichorja[4], Fosoler rog balai o protikar[5]. Here are the front views of their apps:



Figure 2.1: Krisoker Janala

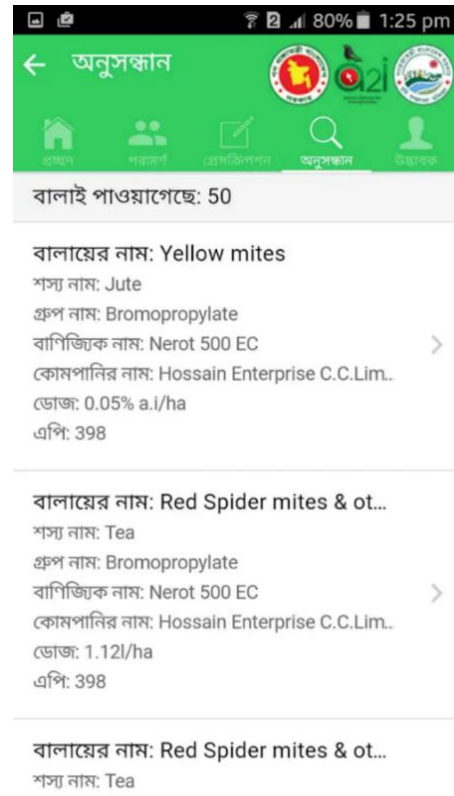


Figure 2.2: Pesticides Prescriber

2.2.1: Krisoker Janala

This is the most successful application in Bangladesh. Basically government approved this application. But it has some limitations. This application is user friendly but all features are not included.

2.2.2: Pesticides Prescriber

This application is also another government project. But it can only the pesticides. Not all the features that have been included.



Figure 2.3: Krihi somossya

2.2.3: Krihi somossya

Krihi Somossya is another mobile application. It gives only the problems of crops to the user. Other information is missing here.

2.2.4: Shak Sobji chas

Shak-sobji chas is another mobile application that only gives the information of vegetables only. It gives the cultivation process of vegetables, not the other information that we needed.



Figure 2.4: Shak Sobji chas

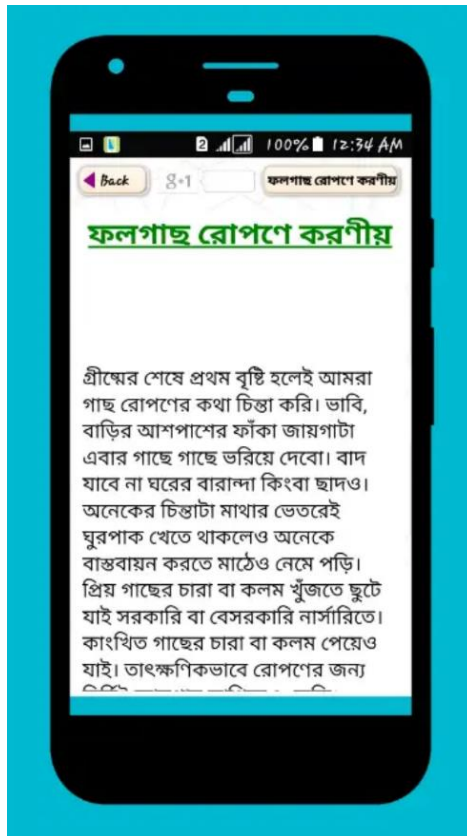


Figure 2.5: Fosoler Rog Balai o Protikar

2.2.5: Fosoler Rog Balai o Protikar

Here it is another application that have all kind of information like cultivation method, diseases, but the information is limited.

2.3 Comparative Studies

The other applications are helpful for specific type of information, these are not fully helpful. My project gives a full package of information those are very helpful. If I compared to other applications, some gives you only the cultivation process of crops, some gives you diseases of crops, some gives you remedies of specific crops or some gives you the pesticides of it. So, my application gives whole package like, crops information, diseases, remedies and pesticides also. So, there is no doubt that this application will provide the best need of a farmer or user. My system is fully controlled by an admin but in future I have a plan to implement user efficiency for more improvement.

2.4 Scope of Problem

There were lots of problem to complete this project. Some problems are solved or some were too difficult to cope with. After a hard work finally most of problems are solved to make a proper system for our user. To complete a project, a single man it is quit tuff cope up with time schedule. Perfect time schedule applying is much harder than I thought. And the data wasn't so reliable. So, it gives me an extra trouble or effort to collect data.

2.5 Challenges

To provide our farmer or user a best solution that could help I face some challenges. Take look those challenges:

- UI design and the feature
- Accurate data collection
- Giving all relative information
- An user friendly process
- To introduce the application to user
- Time scheduling
- Lack of experiences

CHAPTER 3

REQUIREMENT SPECIFICATION

3.1 Business Process Modeling

Business Process Model (BPM) is a kind of tool that for building a flow diagram. It creates a model that gives a demo the appropriate flow of data from the start to end. Basically every engineering projects process by a Business Process Model and it can boost up the work speed for developing or implementing the project. A Business Process Model is always flexible the project to the user and to the developer.

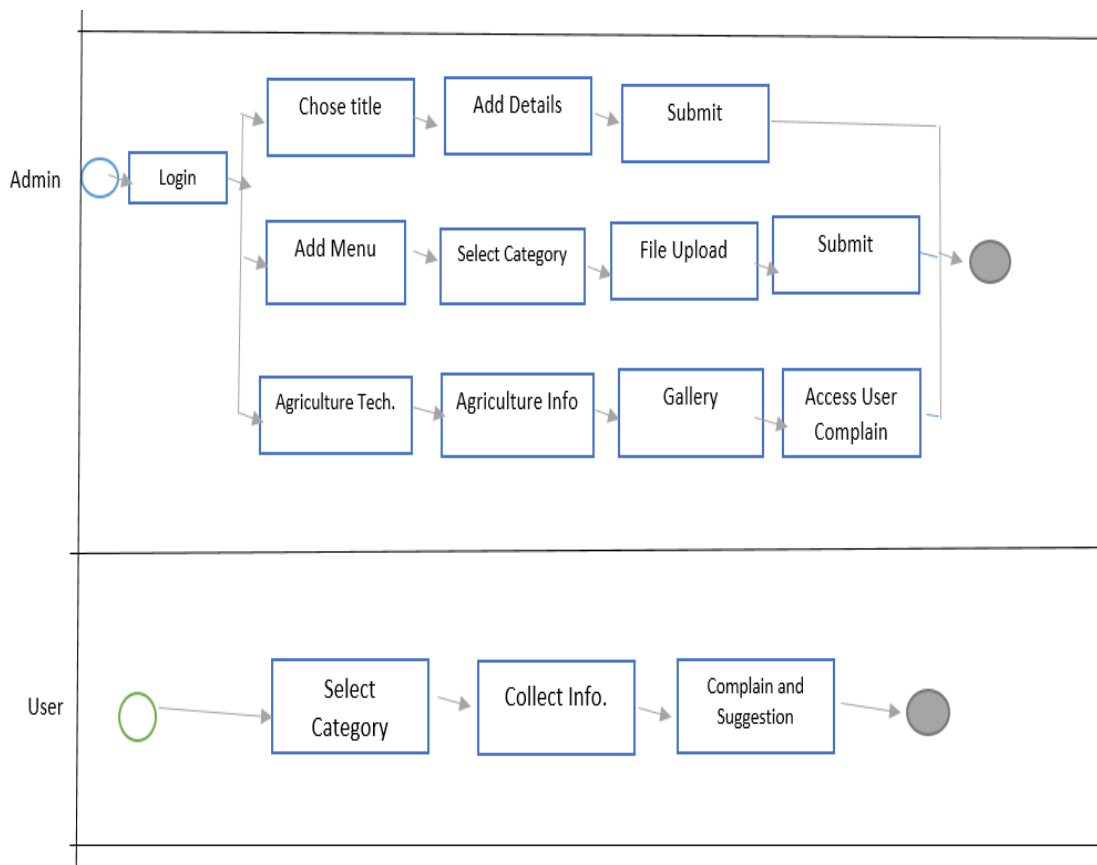


Figure 3.1: Business Processing Model

3.2 Requirement Collection & Analysis

The first steps is requirement collection and analysis of developing an application. Without the requirement of a project, a clear information can't be given, and it is very important for doing the work for a smooth project. Otherwise in the midway the project work can go messy for not to analyzed correctly. An internal activities that's the application software can perform it's called functional requirements. Functional requirement like admin, login. So, for a successful project requirement collection and analysis it is must.

3.2.1 Functional Requirement

Functional requirement can be called as an internal activities of an application can perform. It's like, an Admin panel, in a login section that only admin can access to it another is the Dashboard for maintaining admin profile. Dashboard contains lot of portion like crops types there is an option to choose more crops types. In future there will be an option like comment on a question, admin replay, notice board and added with fisheries and livestock part. And there will be a portion on application like help center to call the government help center.

3.2.2 Non-functional Requirement

The non-functional requirement defines performance issue of the application and how much the application can be efficient. It also defines the behavior of an application.

Non-functional requirement help to be more efficient that means it could load quickly, operate smoothly and this is create an application more efficient.

3.2.3 Feasibility Study

To develop an application feasibility is the most important part. From the analysis this application get the exact requirements for developing. I found that this application is how much different and helpful for the farmers. For developing the application in future I will add the different features like call center, suggestion and several parts.

3.3 Use Case Modeling and Description

A use case is a list of actions that defines the interaction between actor and system to achieve a goal. As per Unified Modeling Language the user is called an actor which can be either a human or another external system.[7] In this application the users (farmers, local people) and the admins will be the actor and the system will provide all the information of crops.

3.3.1 Registration Module

Previously user has been registered as admin. User has normally provided a username or verified e-mail and a password for prove their identity. This is known as logging in. Only the admin can develop or update the system. After login the system admin can successfully enter the system otherwise he can't enter the system.

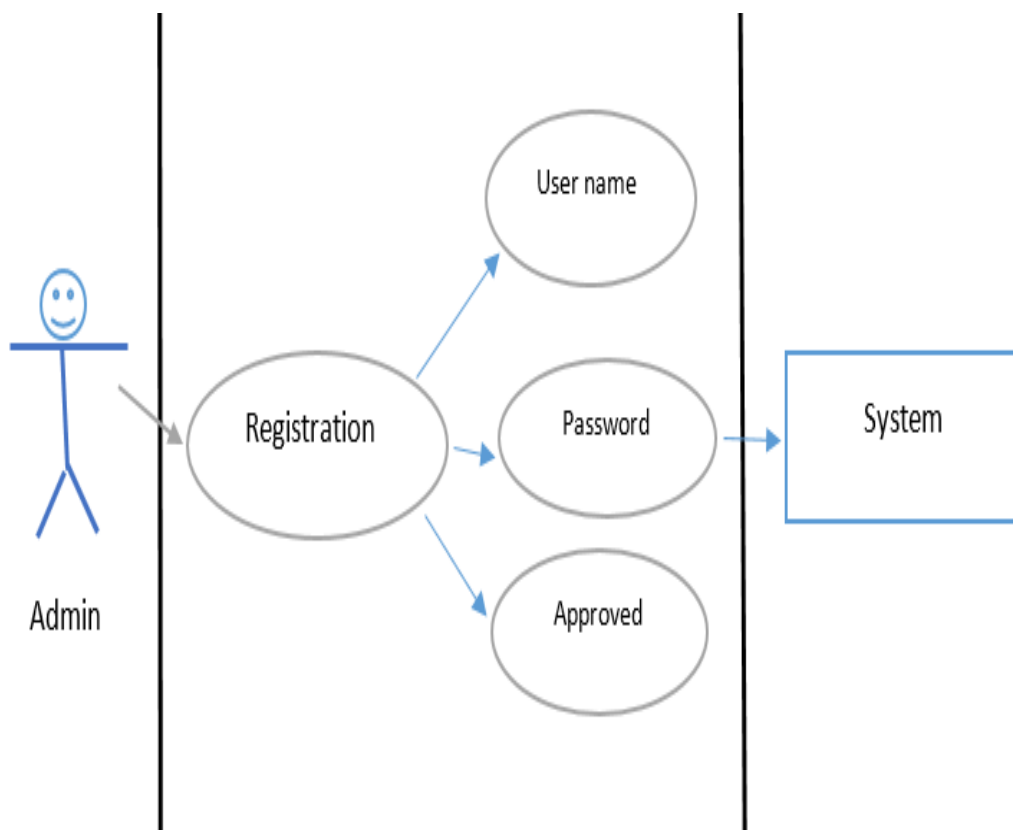


Figure 3.2: Use case diagram- Admin

Use case Description:

Primary Actor: Admin

Precondition: Internet Connection

Entry Condition: Click Approved button

Event Flow: Give the name and Password

Exit Condition: Click the back arrow button

3.3.2 Login Module

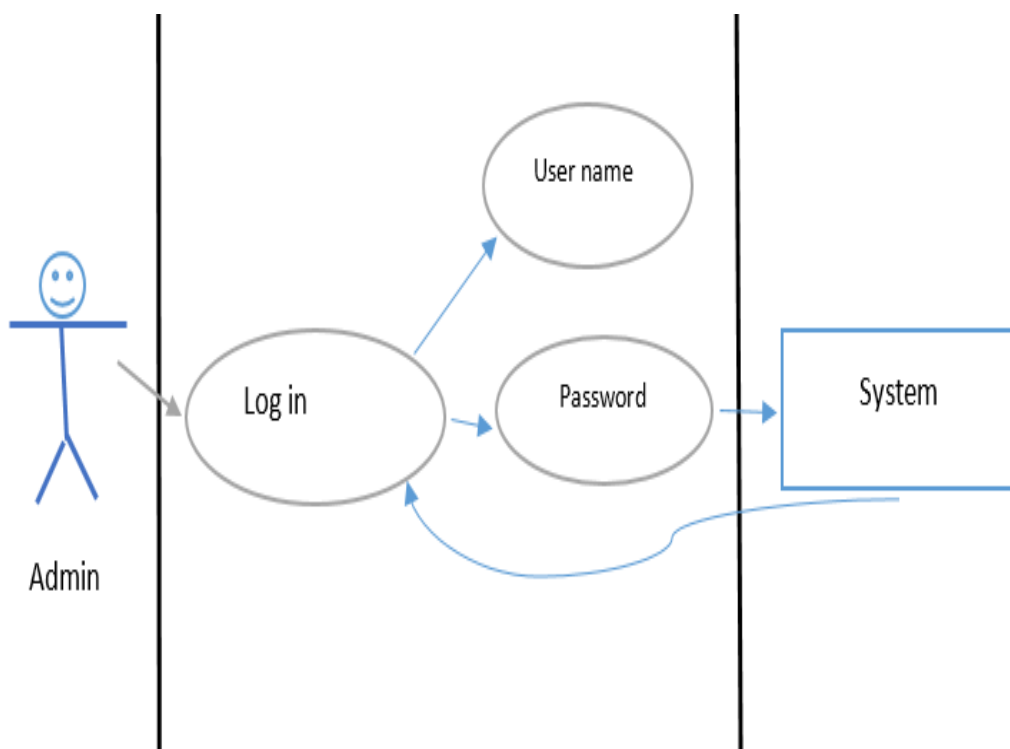


Figure 3.3: Use case of Admin login

Use case Description:

Primary Actor: Admin

Precondition: Internet Connection

Entry Condition: Click Login Button

Event Flow: Give the name and Password

Exit Condition: Click the back arrow button

3.3.3 User Module

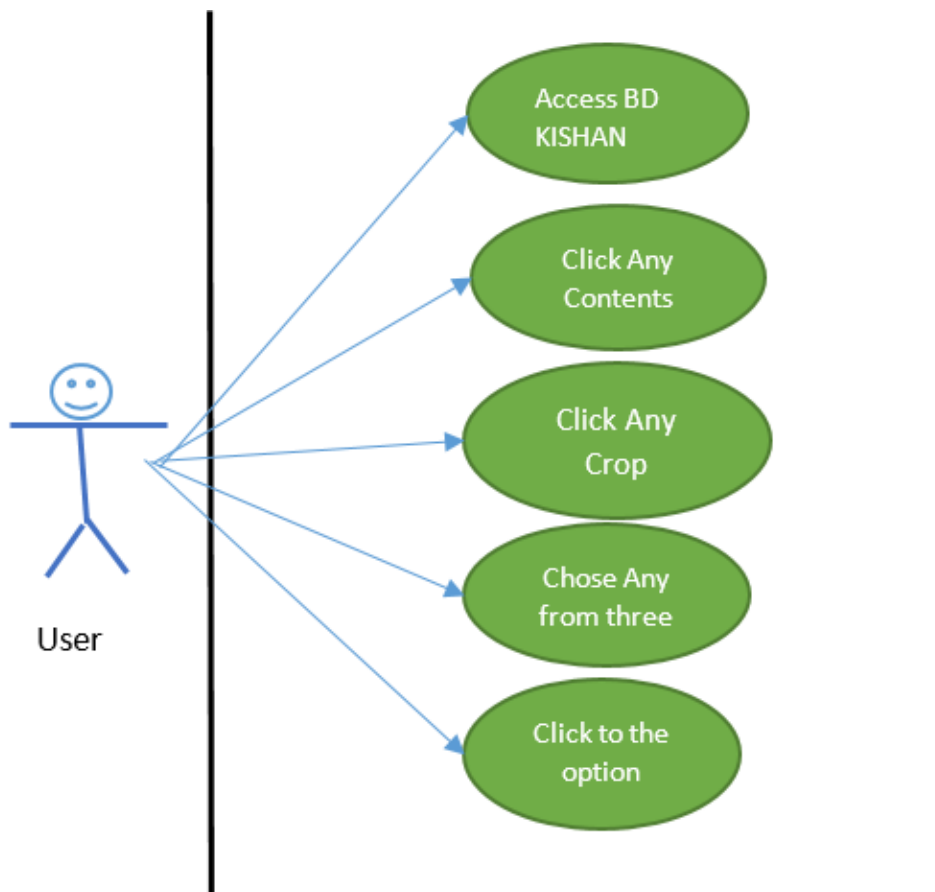


Figure 3.4: Use case of User

Use case Description:

Primary Actor: User

Precondition: Internet Connection

Entry Condition: Click Enter button

Exit Condition: Click the cross button

3.4 Logical Data Model

Logical data model can be called a process that is used to define the needed support the BPM. It also describes the data in details but without the physical implemented in database. Logical data model is like the called entity that is Relationship with attribute. It can be said that the logical structure of a database is illustrated by the ER diagram and it goes very deep in data model.

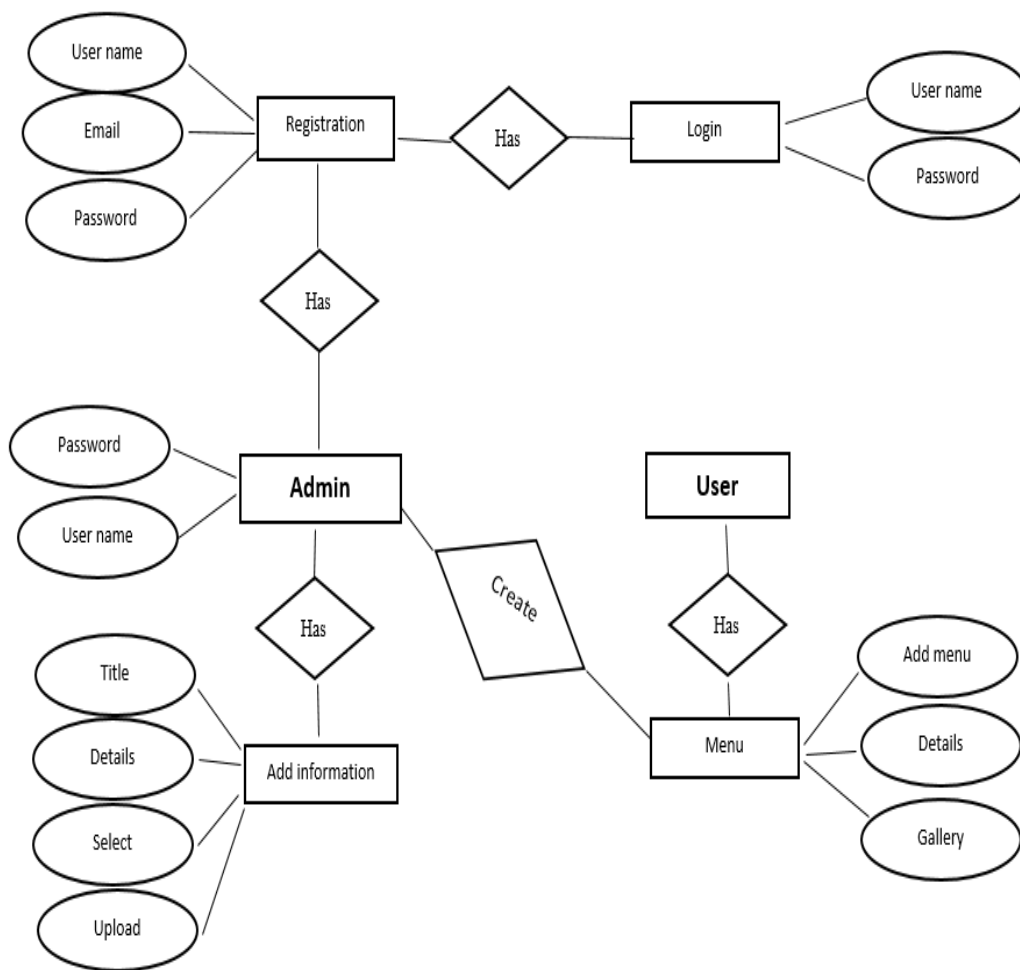


Figure 3.5: ER diagram

3.5 Design Requirements

For every system the front end and back end design play a vital role to run smoothly. And these are some requirements:

Efficiency: The application must be lightweight that means the system design should be arranged. And keep in mind that the performance will be differ for different devices. So, the system should built such a way that it could run all the device without lagging or delay.

Compatible to various Android version: There has been a lots of developed android SDK versions. The current SDK running in the market is PIE which has been released on August 6, 2018[8]. And this application has been developed to its latest version.

User Friendly: This application is made to be user friendly interface. User can easily find their expected information.

- In my application, there is an authentication for admin.
- Admin can add, update the information.
- There will be two types of user.
- The information is in Bengali language for better understanding the features.
- This application run any android device without lag or delay.

CHAPTER 4

DESIGN SPECIFICATION

In the part of Design Specification shows the development process or how the system being done. This part is a detailed document that providing the information about the project that a developers will meet. A structure of a system is made in this part [9]. Now I provide the Front End and Back End design of my application those are used tools in my developed application.

4.1 Front-end Design

The latest version of Android Studio (3.2.2) has been used to develop the application. The front end of the application BD KISHAN is developed in this version of Android Studio. My main moto is that the user get user friendly interface to use the application. Here are the demo of my application-



Figure 4.1: Splash Screen



Figure 4.2: Option Menu



Figure 4.3: Choose your Crop

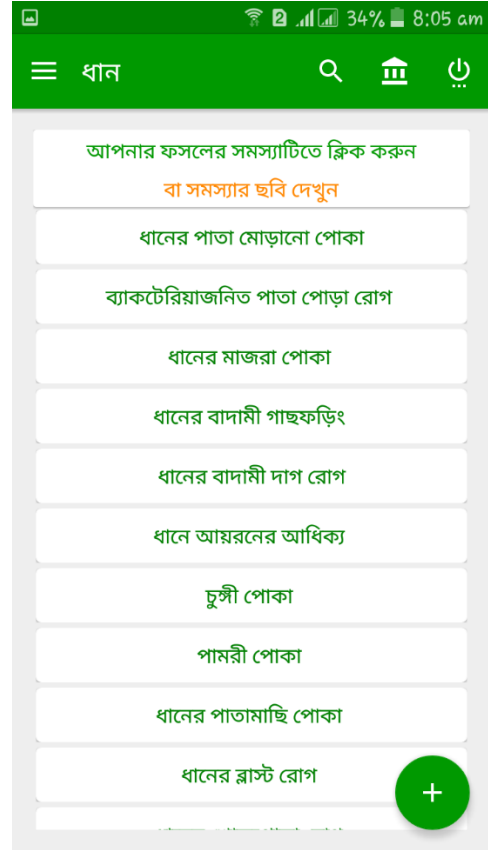


Figure 4.4: Click the Problem

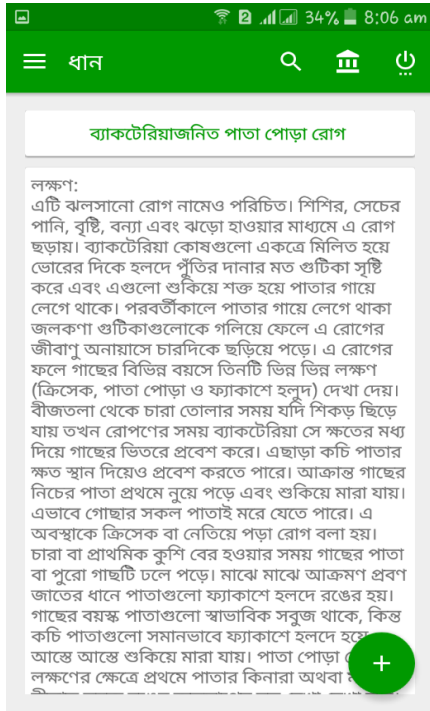


Figure 4.5: Details of the disease

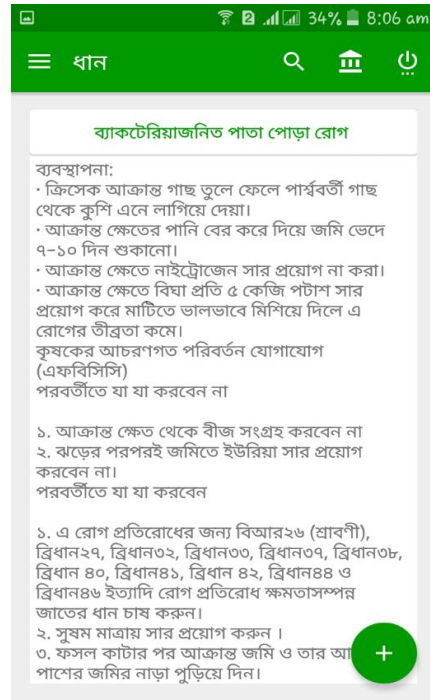


Figure 4.6: Details the remedies

Here, the figure 4.1.1 is the Splash screen. After the splash screen the main activity page will come. The figure 4.1.2 is the option menu, where all the crops type and fisheries and livestock option can be seen. After choosing the type of crop the next page will show some option of crops Figure 4.1.3. Then the Figure 4.1.4 will show the list of the problems. The problems will specify the disease of the chosen crop that we found. The Figure 4.1.5 will show the details of the chosen problem it shows the disease. After that if we scroll down the remedies and suggestive pesticides will come in the Figure 4.1.6.

4.2 Back-end Design

From all over the back-end design is the hard part and most important. How every single part of the logical part will done is made in this design part. How the application work or it behave and how it will be represented to the user that's all aspects depends on this section. The language, the database, the security and the authentication all other settings are related to the back-end design. For my development I used the core language XML and Java. Firebase has been used to represent the data which is a real time database [10].

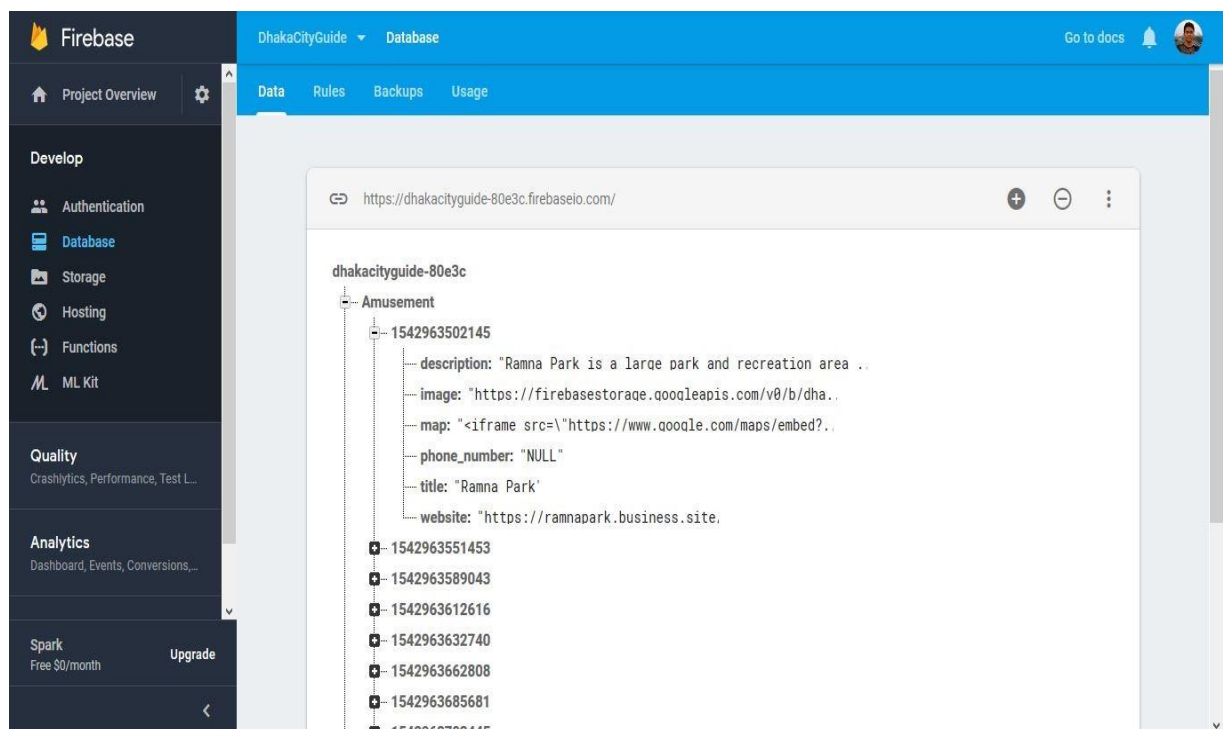


Figure 4.7: Database page on Firebase

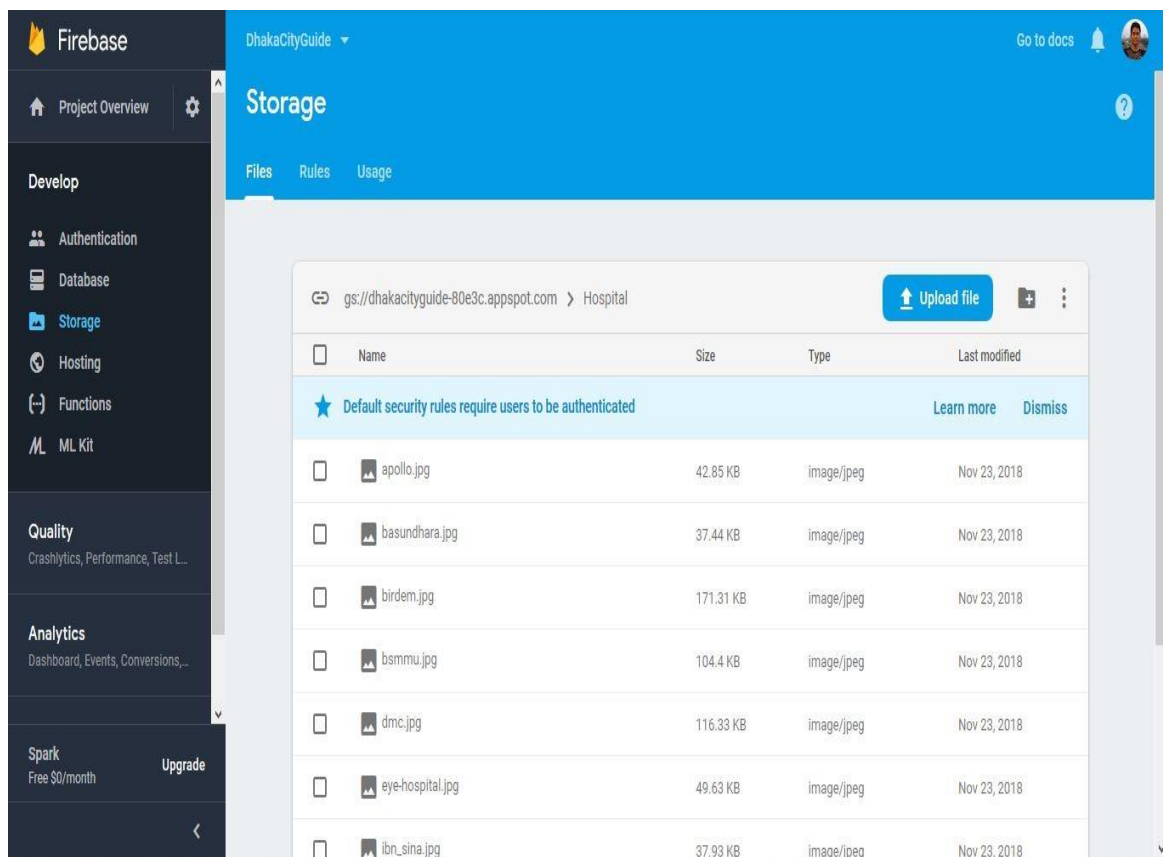


Figure 4.8: Categorized storage page on database

4.3 Interaction Design and UX

Interaction design can be called as IxD that is interactive designing of digital product, environments, systems, and services. And while the digital side of the statement is correct and interaction design is useful to creating physical products [11]. This design is the interaction between a user and a system. It also helpful to find out the issue that are stored and processed for better experience. Interaction design often like designing products, systems services and environment. While the digital side of this statement is true the interaction design is also useful to create the design. Creating physical products and exploring the system is the interaction between system and user. If the faces some issue in stored data and processing, Interaction design helps to find out and process it.

Interaction design is the key to success for getting better rate. So, this part is so important in a project. After complete the project I asked some people and my course

mate to define it they appreciate it and asked some suggestion. They personally recommended that to add some features like user complain, call center. They said that the interface are quite friendly but it also to be improve. After all they satisfied to my effort and they will recommended the application with others.

4.4 Implementation of Requirements

This project is made by android studio along with Java and XML coding, the project BD KISAN designed by Adobe Photoshop and Illustrator for UI design. And for data management used MS Excel for the database. This project is store in the online so that the real time database included, so the active internet connection must needed.

CHAPTER 5

IMPLEMENTATION AND TESTING

5.1 Implementation of Database

In the phase of implementation the DBMS have to install the required device. Optimizing the database the best hardware and software. And it create a local data in the database, it will implement and optimize the application to it link. Database design is the process of producing a detailed data model of a database. This data model contains all the needed logical and physical design choices. A data definition language is a physical storage parameters needed to generate a design, which can then be used to create a database. A database usually a fundamental component of the information system, especially in business modelling design system. A fully attribute data model contains detailed attributes for each entity. Thus database design is the part of system development. To retrieving the data a new database is created to store data. A physical storage parameter needed for create a database. In a definition it can be said to as a physical storage parameter that's need to create. A database design is the part of system development. A good design starts with a list of the data that everyone want to include in all database and what to be able to do with the database later on. Without firebase this can all be written in their language. Database design is a process of producing a detailed data model. Thus database design is the part of development and it's a kind of information system like business modelling system. A good database design start with a good amount a list of data flow. So, for a database contains two essential settings like-

Primary key: - This field is unique for all application records.

Foreign key: - A set of relationship between table parts.

I use two types of table in my database for this system, that's are-

Admin table: - Here the admin user name, email, password and information of login stored.

Menu table: - In this table Fisheries, livestock, seed crops, fruits, flowers, vegetables data are stored.

5.2 Implementation of Front-end Design

A user obviously impressed for a front end design. When a good design appears, user feel eager to that application. For making a good impression the front end design should simple and user friendly. User impressed when a front-end design is good. The impression is the last impression. But the main challenge is to make application more attractive. Another problem is each of them come in different size. I make the application user friendly so that user visiting from different mobile or tablet will face no difficulties to see the application and have good user experience. So, I have to ensure taste of different people and make it comfortable to understand.

5.3 Implementation of Interactions

For make the application more interactive, response UI has been used and we know the individual buttons are better for mass user and it is better than text. For that I should have use the call button and a visiting web site that has already previously made. But for lacking of time I couldn't implement it. But in future I obviously make it done.

5.4 Testing Implementation

For testing a system is another level of the software testing where a complete software is tested and the purpose of testing the software is to evaluate the compatibility and smoothness of the application. For development a software it must. By proper testing the problems or bugs can be identified and can fix the issue. So I tested my application "BD KISAN" so many times by different users. Here is the test case evaluation is given below:

Table 5.1: Test case Evaluation

SL.	Test Case	Input	Expected Outcome	Obtained Outcome	Pass/Fail	Testing Data
1	Login	Login for Admin	Successfully Login	Successfully Login	Pass	22/3/2019
2	Add new Information	Data input as entry	New data added successfully	New data added successfully	Pass	22/3/2019
3	Interface	Different types of Android	All supported	All supported	Pass	22/3/2019
4	SDK	Run on version from 11 to 29	All supported	All supported	Pass	22/3/2019
5	Data Store and Load	Data load through JSON	Data load	Data load	Pass	22/3/2019
6	ANR	Responding on varies device	Responding low	Responding low	Pass	22/3/2019
7	Admin Logout	Click on log out button	Logged out successfully	Logged out Successfully	Pass	22/3/2019

5.5 Test Results and Reports

The result of the testing of the application are gathered together to prepare the best report. The report describes the reflection of the testing formally. It records the data obtained from the evaluation of the application and help to overcome the problems. It is a great help to achieve the objectives of the development project.

There are various types of testing like:

- UI Interaction
- Usability
- Functionality
- Regression
- Security
- Performance
- Localization
- Scalability

After completing all types of testing it's finally ready to launch so that at the time of end we can achieve the result as the benefit of useable testing:

- System is easier to use
- Easy to use for new users for this system
- Better UI for interaction
- Better quality of my application

CHAPTER 6

CONCLUSION AND FUTURE SCOPE

6.1 Discussion and Conclusion

At last, it was great enjoyment to finish such a great project. In the time of developing this application I have learned so many things that will be helpful for my future aspects of life. And it is a great satisfaction to build up such a project that will be very helpful to our farmers as well as our new generation of farmers. It is a honor to dedicate the application to the common people. I believe our farmers will get a great benefit by using this application.

All thanks goes to Allah for blessing me to complete this project. I also cordially thank my supervisor for help me and give the extra facility to finish the work. And I also deeply indebted to the authority to give me an opportunity to prove myself.

6.2 Limitation

The main limitation of my project is login Admin. Only user can call to the help center. I can't entry all data right now in my application.

6.3 Scope for Further Developments

This application is in beta version. The upcoming version will be a full package of features. The application features added with lots of information like call center, visiting web site etc. So here are some future development is given below:

- Can be developed for iOS platform
- The database will be more precisely
- Fisheries, livestock sector already added but the information will be add
- Fruits, flowers, vegetables information will be added
- Help center like call center, asking question features will be added
- Additional features can be added to the app
- Giving ratings, giving suggestions will be added

- The admin section can be developed to make it easy access
- User login features can be added in future.

Appendices

Appendix A: Project Reflection

The purpose of this appendix is to provide an introduction to Project reflection. This project was very challenging for me.

I enjoyed to develop it. I understand many things in the time of developing. I constantly developing my ideas. It was fascinating just how I completed my project in a short time. The time seemed to fly. So I got to managed to help along the way towards the endpoints of having a sustained policy.

Table A1: Comparison of feedback and Usability

SL No.	Name	Feedback
1	Krisoker Janla	-Overall good -Very useful
2	Pesticides Prescriber	-Thanks for this application -Very useful
3	Krishi Somossa o Somadhan	Overall good -Useful and essential
4	Bd Kisan	-User Friendly -Easy to use -Useful and essential

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