

An Android Based E-Commerce Application for Farmers

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Abstract: We have developed a mobile application for farmers, which will help them to sell their products directly to the consumers through this application. This mobile application helps the farmers sell as well as buy products through its easy and convenient interface. Farmers face a lot of challenges when it comes to selling their products and therefore the primary goal of our app is to provide a means for farmers to market their commodities at fair prices. Updated market prices and filters are also provided in the application to make it more convenient and efficient for farmers. This system has a simple interface that also provides certain filters that lets the consumer choose from a large variety of products from which they can select and purchase products according to their requirements. The main objective of this application is to take into concern the needs of the farmers as well as the buyers and fulfil their requirements accordingly. The fast and updated delivery system is one of the priorities of our android application.

Keywords: Intermediaries, Economy, Market Pricing, Retailers, Agriculture Industry.

1. INTRODUCTION

India is a country whose economy largely depends upon agriculture in other words we can say that farmers are the spine of India. The economic welfare of India heavily depends upon the development of agriculture. There have been many advancements in agricultural technologies worldwide but in India, most farmers are completely unaware of the market rates of their commodities. The farmers struggle in getting the correct price for their products and goods due to the lack of information about the actual rates of the products and a lot of time they fail to sell their products in time due to which they undergo a heavy loss.

Farmers take the help of intermediaries to sell their products in the market. The farmers do not get enough wages for their products due to the involvement of the intermediaries. The involvement of the intermediaries makes farmers lose a huge share of their income. Due to this, the farmers undergo heavy loss while the middleman makes the most of it.

As Android is the fastest growing mobile operating system in today's world, Android smartphones are becoming more accessible due to being cost effective. That is why we are making our application natively in android. Our application is solely aimed at the development of farmers and agricultural businesses through smartphones, and it commits to make selling and buying agriculturally based products, simple and appropriate.

2. METHODOLOGY

In this chapter, we present some basic ideas behind the making of our app and how they are utilized in our research work. The used methods are shortly presented and discussed. We propose to use a native application that will be built in Kotlin language specifically for the Android operating system since 95.7% of people in India use Android devices according to stat-counter. Agricultural commodities are traded in the market at the district level, the government sets support prices to stabilize the prices, but the market prices are dynamic [1].

The design of our mobile application is established on a client-server model where the user operating the gadget is designated as the client and the server used is Firebase. Firebase is a Backend-as-a-Service (Baas) and is a NoSQL database program.

Figure 1 shows the functioning of the application. This application is aimed to have a user-friendly interface so that the end user can have the best experience of the app. The application provides the user with a basic Firebase authentication using an Email link.

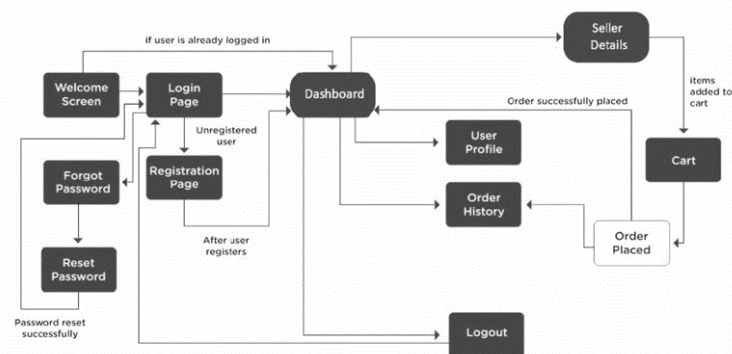


Figure.1. System Flowchart

3. RESULTS

3.1 Authentication

It will verify the identity of a user and will be used by the server to know who is accessing the information. The application will provide basic authentication services such as Google login and Email-password login.

3.1.1 User Login

This feature will grant the users to log into the system by entering their usernames and passwords in the respective fields after the completion of the registration part. If the user enters invalid credentials, they will not be allowed to gain access to the system.

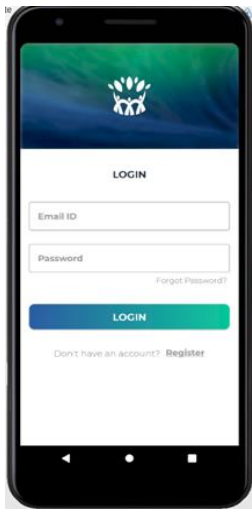


Figure.2. Login Screen

3.1.2 New user registration

A new user will have to click on the Register button to get signed up and take advantage of the application as shown in Figure 3 by providing the necessary details such as the first name, last name, email, etc.

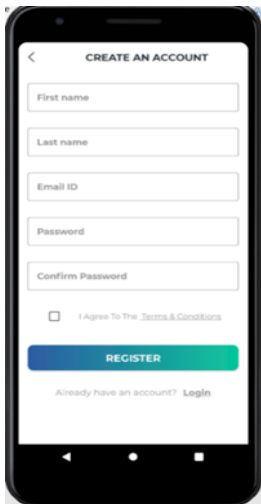


Figure.3. Login Screen

3.1.2.1 Functional requirement

The system should authenticate and confirm the details provided by the user during the signup process.

3.1.3 Account recovery

If the user needs help resetting the password, they can click the forgot password button and enter the email address with which they registered to get the reset password link as presented in Figure 4.



Figure.4. Forgot password screen

3.2 Product details and dashboard

Users will be able to upload the product details with real images which will be stored in the Firebase storage, and they will also be able to provide the fundamental details about their goods such as the title, cost, description, and stock availability. After uploading the image of the product, the user can see the edit option to change the image that was uploaded previously. Once the product is submitted, the user can see their product on the dashboard screen. The user will also have the option to remove an undesired product.

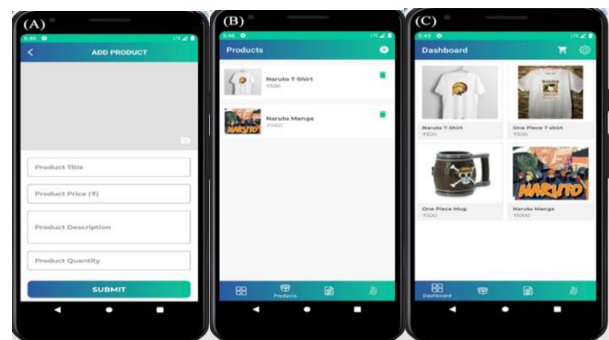


Figure. 5. (A) Add product screen, (B) Previously added products, (C) Dashboard screen.

3.3 Shopping cart and orders

After choosing the desirable products from the dashboard screen, the user can add them to the shopping cart by clicking the Add to Cart option where the cart will display the names of the added products with their respective prices and the total

amount at the bottom of the screen and then the user can advance to the checkout screen. Before advancing to the checkout screen the user will also have the option to edit or delete the current items in the cart. After proceeding to the checkout screen, the user will have to add an address to fulfil the delivery requirements. After placing an order, the user can visit the orders screen to see the order ID, date, and status as well as the shipping address and the receipt. The seller can also check the products sold in the sold products screen.

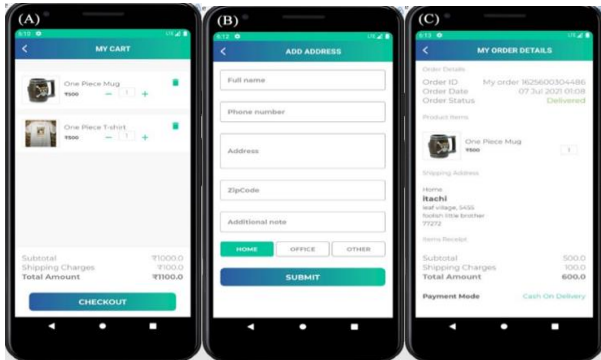


Figure. 6. (A) Shopping cart, (B) Add address screen, (C) My orders screen.

3.4 Database server

Database servers are used to store and manage databases that are stored on the server and to provide data access for authorized users [2]. It uses real-time processing techniques to handle the workloads. For our application, we will use Cloud Firestore which is a NoSQL database that our android application can access directly via native SDKs.

It is designed for very large, structured data. It can handle a larger workload. It stores your data in documents. Cloud Firestore also provides offline support for the app so one can read and write data without Internet connectivity.

In Cloud Firestore you can store data in form of collections which act as containers and are used to organize data. In our application, the collection will be named as products and users for which we will assign the documents with unique ID's and then the data will be stored following the ID.

3.5 Cloud functions and cloud storage

Firestore cloud functions is a serverless framework and helps us run the backend code automatically which saves a lot of time. Certain events get triggered by the features of Firestore and also due to the various HTTPS requests made by the client.

Cloud storage lets you store an incredible amount of data online rather than storing it on your computer. It securely saves the data and stores user-generated content such as pictures, videos, etc. This function will let the application store the pictures of the product uploaded or the display picture of the user to the cloud.

3.6 Analytics

Firestore analytics automatically captures key events such as active users, daily user engagement, top screens, revenue, retention reports, demographics, etc. Google Analytics for Firestore provides a vast array of charts, tables and graphs containing information covering not only the way in which users interact with the app, but also details about the users themselves [3]. The Android APIs will provide all the data to

the user in a summarized manner so that the user can easily decipher through the graphs.

Firestore is a platform developed by Google and is free to use with certain limits.

It is a cloud-based application, and it can work individually as well as when implemented together which gives better performance. Sharing data and analytics between Firestore components make them integrated and ideal to be used in conjunction.

It will provide the admin with the top user property value, top location, best app version in form of a map, the conversion events, and will give more information on custom definitions.

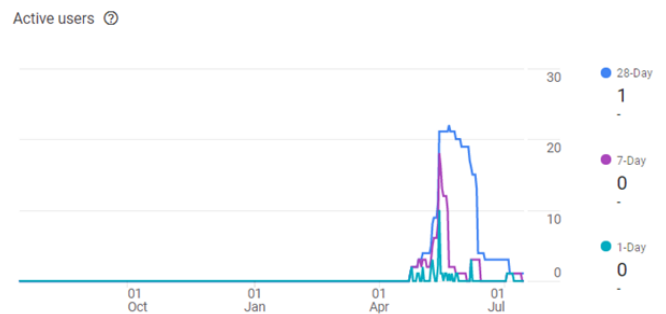


Figure. 7. Number of active users per day.

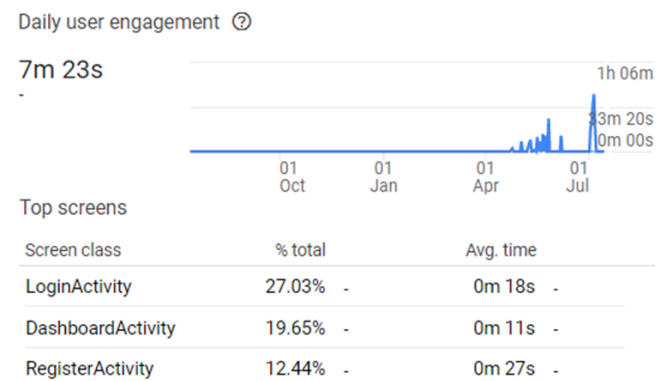


Figure. 8. Shows average daily engagement with a graph displaying trends for the time period selected.

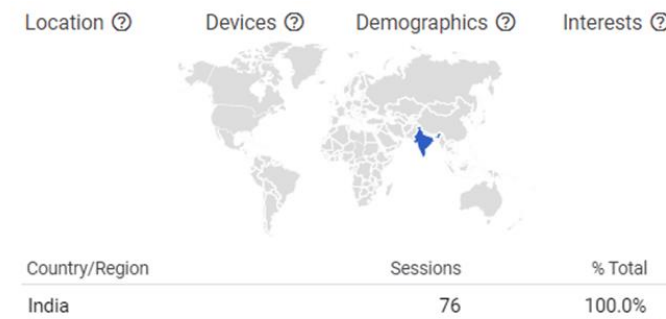


Figure. 9. Percentage of sessions from each of the top countries.

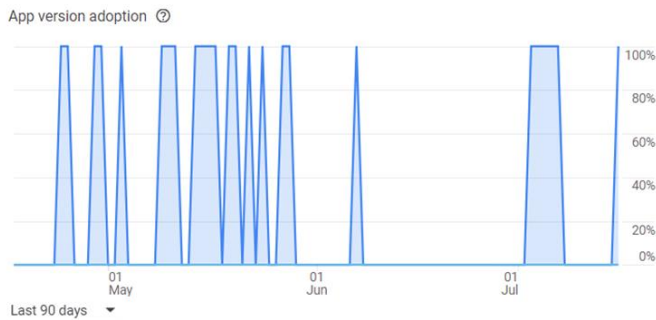


Figure. 10. Graph shows the % of active users for each app version in the past 90 days.

4. DISCUSSION

Currently, the deals are done physically as there exists no centralized platform for trading goods. There is very little connectivity between the farmers and the retailers as well as the agricultural department. Furthermore, the existing system prevents farmers from getting the most out of their products. Intermediaries are hired by the agriculture department to supply them with essential goods. Such operation leads to the use of a large amount of manpower and time, which includes human errors as well.

A variety of smartphone apps have been developed to make agricultural business easier for farmers, retailers, and buyers. There is a variety of mobile app that has been developed for easy agricultural business for farmers as well as retailers or buyers. Several mobile applications have been developed to provide farmers with information on agricultural enhancements.

Here, various research papers and Mobile applications have been discussed related to the agriculture sector.

4.1 Mahafarm

This paper talks about emerging technologies in the field of agriculture in India. It discusses the use of information and communication technology (ICT) in agriculture, which is a new field that focuses on improving agricultural development in rural India.

4.2 E-agro android application

E-Agro Android Program is a software application aimed at assisting farmers in their long-term development. Many times, farmers are perplexed when it comes to choosing a fertilizer, pesticides, and the best time to perform specific farming tasks.

4.3 Bigbasket

India's first comprehensive online megastore, bigbasket.com, brings a whopping 20000+ products with more than 1000 brands, to over 4 million happy customers [4]. We were able to find practically everything we needed in a single store. Every category has a large choice of possibilities offered at reasonable rates. Products are purchased from vendors and stored in large-scale warehouses or tiny go-downs, from which customers' orders are fulfilled.

5. CONCLUSION

We proposed a stable system that will help the food processing industry which includes farmers as well as users to get the most out of their products. Considering the previous works, the focus of the paper is to define a new concept to allow the farmers to sell their products directly to the consumers and for the industry to reap the benefits. Through this application, farmers can maximize their profits since they will not earn from the distributors who quote their stock prices. This application is a medium that helps farmers to market their goods to customers directly, bypassing any intermediaries that might cause farmers to lower their prices.

The application is an excellent trading platform for the agricultural market. Farmers and retailers can use this platform to acquire and sell their products at competitive pricing. The application strikes a balance in the agricultural trading infrastructure by removing the intermediaries that are involved in the trading between the farmers and the retailers. Moreover, this new idea of online trading for agricultural products that the system represents will enhance the agricultural market.

6. REFERENCES

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