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# **Artificial Intelligence based Agricultural Chatbot and Virtual Assistant for Delivery of Harvested Crop**

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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

## **I. 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..

## **II. LITERATURE SURVEY**

There are many online web portals as well as android applications which are based on similar idea. But most of them end up adding sellers as one of the intermediates which again starts the indirect selling chain of supply of the products . For example if we consider :

- 1. Big basket (Online Shopping web portal):** On this website, the products available are of different variety and may also differ in quality but most of them are from wholesalers or retailers, etc. Addition of intermediates to the selling process again decreases the profit margin window for the farmers and increasing the intermediates to gain a high profit.
- 2. MyRML(Online Mobile Application):** In this application, the products are from different areas, locations, and states but most of the products were either having some specific brands or belonged to a number of the wholesalers and



retailers. because of which things again go towards the favor of the intermediate although the food is also of excellent quality. Most of the users of the application faced language problem and there are some features which are not easily accessed by users.

**Paper Title: AI Based Farmer's Assistance Chatbot**

Meal Names in Food Recordings this paper, we propose a method for compressing a meal name into a shorter representation. First, we collect similar in this paper, Food Log is a multimedia recording tool for producing food records for many individuals. In one year of operation, Food Log has produced more than one million food records for meals eaten by users. We found nearly 70,000 unique food records among these data. In analyzing them, one of the challenges are to extract meal categories from such many records. In meal names using a k-nearest neighbor search. Next, we construct a word graph to model the relationship between the meal names and items in the database. We select representative words by identifying minimal paths in the word graph. Finally, we obtain a few words that represent categorical information about the original meal name. We applied the method to data in food records for both Food Log and the Rakuten Recipe database.

**Paper Title: Agriculture TalkBot Using AI**

Artificial Intelligence and Machine Learning are driving IT industry to new landscape. This system "The TalkBot" overcomes this problem and provides farmers the better opportunity to obtain the desired information and to scale up with upcoming market trends and technologies in a user friendly manner. TalkBot is actually a chatbot, which is a virtual conversational assistant, through which the users can communicate with the bot as if they are conversing with humans. The focus is on developing the bot in a more intellectual way, that it can even recognize not so well grammatically defined sentences, misspelled words, incomplete phrases, etc.,. This can help people to converse easily with the bot, since this system uses the Natural Language Processing technique to parse the user queries, identify the key words, match them with Knowledge Base and respond with the accurate results. To make the responses more understandable, the responses are generated using classification algorithms and produce non textual responses so that it can be easily perceived by the users. Bot also has an ability to provide voice oriented responses using text to speech techniques..

**Paper Title: Artificial Intelligence based Agricultural Chatbot and Virtual Assistant for Delivery of Harvested Crops**

The integration of artificial intelligence (AI) in agriculture has the potential to revolutionize the industry, making it more efficient, sustainable, and productive. AI can be used to analyze data from various sources, such as satellite imagery, drones, and sensors, to provide farmers with valuable insights. It helps in optimizing irrigation, fertilization, and pesticide application by identifying areas of the field that require attention. AI algorithms can also predict crop yield, disease outbreaks, and recommend optimal planting and harvesting times. AI-powered systems can monitor crops and livestock through computer vision techniques and sensor data analysis. This enables early detection of plant diseases, nutrient deficiencies, or pest infestations. Livestock monitoring can include facial recognition to identify individual animals, behavior analysis to detect signs of illness or distress, and automated feeding systems. In developing countries like India, the rapid spread of mobile internet technology is offering a vital role in economic growth, social empowerment, and grass roots creativity. Every harvested crop needs to be transported. Transportation is one of the important factors for a farmer's success. Transport that is well-managed is effective in transporting farm resources and harvested products as quickly as possible. So we are going to develop an android application for farmers and transport service providers. By this, we can pool the farmers according to their requirements.

**Paper Title: Virtual Fruits Market – An Application for Farmer**

India is one of the world's biggest producers of fruits and vegetables but its share in the global horticulture market is insignificant. So ,The aim behind developing this app is to give India's huge farming community a fair and consistent price for their produce. Using this android based app "Virtual Fruits Market", will help some of the farmers to overcome this problem. Using this app farmers can directly connect with the end users and supply the product directly to them. This will increase the profit of the farmers and also end users can get good quality product in less price as they will directly buy from farmers.

### III. PROPOSED SYSTEM

The main purpose of this Application is to build a platform that will help farmers from Indian villages to sell their products to different cities. Farmers can sell their products like paddy, vegetables, and fruits according to their respective prices. With the help of this Application it is easy for the farmer to sell products without more effort they should upload the number of items they want to sell and the price of those items. People who want to buy these will check the details and buy them by ordering that items and there will be an online transaction between them. This portal is also used for customers can order the product online as there is direct contact with farmers there are no extra charges for items which customers have to pay for dealers to buy product and quantity also more and good while compared to buy from dealers. Using this application, the customers can buy the Product items using the internet by sitting at home. An online portal for agribusiness projects is an application, developed for farmers and Customers. It is an Android-based application that gives an idea to the farmers on how to use e-farming to sell their products online. Farmers can open this site and register with it, then sell their products online, view current prices, and check crop grades, via government scheme links. The customer can communicate with farmers. And also we are providing the Agricultural students have to make internship and submit to their college. The Customer can directly buy the products from the Farmer. The website will also provide market-wise, and commodity-wise reports to the farmer in an interactive way. The government will put forward new schemes for the farmers. Compensation will be provided for the farmers in case of any loss to production due to some natural calamities. The unique interface will be provided for applying and viewing the schemes Farmers.

### IV. HAVESINE ALGORITHM

The **Haversine formula** is a mathematical formula used to calculate the shortest distance between two points on the surface of a sphere, given their latitude and longitude. It is widely used in navigation and geospatial applications to determine the "as-the-crow-flies" distance between two geographic locations.

#### Haversine Formula

The Haversine formula is used to calculate the shortest distance between two points on the surface of a sphere, given their latitude and longitude. It is commonly applied in navigation and geospatial computations. Below are the details of the formula and how it is applied.

#### Haversine Formula

The formula calculates the great-circle distance between two points:

$$a = \sin^2(\Delta\phi / 2) + \cos(\phi_1) \times \cos(\phi_2) \times \sin^2(\Delta\lambda / 2)$$
$$c = 2 \times \text{atan2}(\sqrt{a}, \sqrt{1-a})$$
$$d = R \times c$$

#### Where:

$\phi_1, \phi_2$ : Latitudes of the two points in radians.  
 $\lambda_1, \lambda_2$ : Longitudes of the two points in radians.  
 $\Delta\phi = \phi_2 - \phi_1$ : Difference in latitudes (in radians).  
 $\Delta\lambda = \lambda_2 - \lambda_1$ : Difference in longitudes (in radians).  
R: Radius of the Earth (mean radius = 6,371 km).  
d: Distance between the two points.

#### Steps to Calculate:

1. Convert the latitude and longitude from degrees to radians:  
 $\text{radians} = \text{degrees} \times \pi / 180$
2. Compute the differences in latitudes ( $\Delta\phi$ ) and longitudes ( $\Delta\lambda$ ).
3. Calculate 'a' using the formula:  
 $a = \sin^2(\Delta\phi / 2) + \cos(\phi_1) \times \cos(\phi_2) \times \sin^2(\Delta\lambda / 2)$
4. Compute 'c'  
 $c = 2 \times \text{atan2}(\sqrt{a}, \sqrt{1-a})$

5. Multiply by Earth's radius (R) to get the distance:

$$d = R \times c$$

#### Example:

Find the distance between two points:

Point 1: Latitude = 52.2297, Longitude = 21.0122 (Warsaw)

Point 2: Latitude = 41.8919, Longitude = 12.5113 (Rome)

Steps:

1. Convert to radians:

$$\phi_1 = 52.2297 \times \pi / 180, \lambda_1 = 21.0122 \times \pi / 180$$

$$\phi_2 = 41.8919 \times \pi / 180, \lambda_2 = 12.5113 \times \pi / 180$$

2. Compute  $\Delta\phi$  and  $\Delta\lambda$ :

$$\Delta\phi = \phi_2 - \phi_1$$

$$\Delta\lambda = \lambda_2 - \lambda_1$$

3. Apply the formula for 'a', 'c', and 'd'.

The calculated distance is approximately 1,316 km.

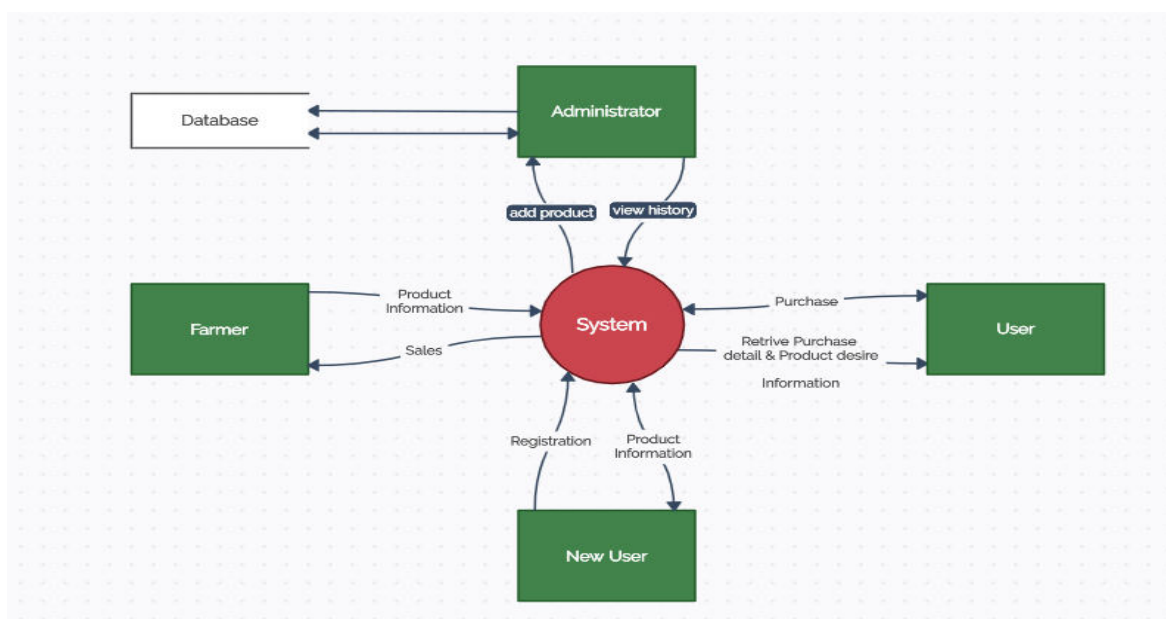


Figure 1. System Architecture diagram of the setup

#### V. SCOPE

- To Enable farmers to directly connect with buyers, reducing dependency on middlemen.
- To Provide fair pricing by increasing market access and competition.
- To Offer real-time price information to help farmers make informed decisions.
- To Sell crop on online platform also arrange transport as per shortest distance calculation using haversine.

#### VI. CONCLUSION

The project speaks about the project which will help the farmers to sell the products directly without intermediates. In this, we have used some simple database and mic option to record the details of the products of farmers. We have implemented phone call option, login, as additional features to the system to make this application more user-friendly.

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