A Novel Approach for Integrated Farm Management System

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Abstract - *Farm management is the making and implementing of the decisions involved in organizing and operating a farm for maximum production and profit. A farmer must not only understand different methods of agricultural production, but also must be concerned with cost and returns. This research paper emphasizes a farm management method which uses IOT, Flutter, Web Development technologies to provide ease in overall farm management process. The implementation can be done by using sensors MQ-3 which is highly reactive to smoke, android application which provide details of supply chain management and cultivation management with the help of website. All details related to supply chain management process will be given in android application where farmers will benefit of selling crops produced with good price and IOT module will provide alert message for farmers in case of hazardous activity in the farm and cultivation management unit will help farmers to take best decision in production process.*

***Key Words*: IOT, nodeMCU, fire detection, supply chain management, cultivation management, flutter.**

1. LITERATURE SURVEY:

The agricultural sector continues to play a crucial role for development, especially in low-income countries where the sector is large both in terms of aggregate income and total labour force. Agriculture sector in India accounts for almost 60.00 per cent of aggregate employment in India. 97.00 per cent workers of agriculture hail from rural sector.

There are many challenges in this sector; the most difficult ones are institutional and economic. Often smallholders cannot internalize the benefit of their efficiency because of missing markets for insurance and credit, low education levels, limited market access and market information, and insecure property and usage rights.

1.1 Supply Chain Management in Indian Agriculture (Existing System):

"Supply chain means flow & movement of goods from the producers to the final consumers".

Supply Chain is a sequence of flows that aim to meet final customer requirements that take place within and between different stages along a continuum, from production to final consumption.

The Supply Chain not only includes the producer and its suppliers, but also, depending on the logistic flows, transporters, warehouses, retailers, and consumers themselves. In a broader sense, supply chains also includes, new product development, marketing, operations, distribution, finance and customer service. Basically, all of these stages leave the intrinsic characteristics of the product grown or produced untouched. The main processes are the handling, conditioned storing, packing, transportation and especially trading of these goods.

Issues Related to Agriculture Supply Chains:

- Products can be subject to quality decay because of an inadequate.
- Transmissions of price signals are weak leading to over and under production by farmers.
- Limited reach of farmers to reach mandis.
- Too many middle men in the supply chain, leading to artificial price rise and huge differences between the price farmer gets and final consumer pays.
- Presence of Asymmetric Information.
- Lack of storage facilities and infrastructure like warehouses leading to post harvest loses.

1.2 Farm Fire Management in Indian Agriculture (Existing System):

Farms are often set on fire intentionally by farmers to quickly clear off the field after harvesting, so that new cultivation can begin. A problem erupts when the fire becomes untamed and destroys the entire, or most of the flora and fauna of the region, hence severely affecting the ecological balance.

Natural Causes:

- Lightening
- Rubbing of dry sticks
- Friction due to rolling stones

Man- Made Causes:

- Shifting Cultivation
- Clearing Fields

- Tribal Traditions

The need of the hour is to design system which will regularly keep track of the state of the farm through data taken from sensors and to notify the farmer when needed to avoid any hazardous incidents in the future.

2. PROPOSED SYSTEM:

Now a day's farmers are facing many problems which is resulting in increased suicide rate of farmers. They have problems starting from protection of their farm to cost cutting done by middleman. The figures from year 2017 and 2018 shows us average of more than 10 suicides daily. The proposed system will help farmers in many ways to overcome different problems.

The prosed system is mainly distributed into three parts which are Supply Chain Management System, Cultivation Management, and Fire Alert System. Supply chain management system consists of two important services which are production unit, demand unit. Production unit will be controlled from farmer's end where farmer will get privilege to enter all production details. These details will help system recognise the actual timespan when crops will be ready to make their departure to market.

Demand unit will be controlled by trusted government body. This unit will keep their on eye on market situation and accordingly generate the demand or requirements. Depending on market requirement this unit will have right to set optimal price for every crop. Demand unit will mainly work as administrative body in this system. This unit will get access to warehouse details. After agreement from both ends i.e. from farmer side and from Demand unit a quotation will be released for crops. This system will ultimately help to stop all wrong activities done by middleman where farmers are forcefully made to sell their produce at very cost. This system will be designed using Flutter Application Development and Firebase Cloud.

Cultivation Management System will help farmers make accurate decision for crop production and planning. In Cultivation management system farmers have to provide available funds details to system. These details will be processed along with other parameters like environmental condition, previous data set. In the form of output this system will give best choice to farmer, so that farmer will get maximum yield.

Sensors and mobile application will be part of fire alert system. In farm we can place sensors which can detect smoke. These sensors will immediately send message to farm owner about this hazardous activity so than farm owner can make arrangement as early as possible at his best to have minimum loss due to this hazardous activity. The sensor used in this system is MQ-3 which is integrated with NodeMCU. NodeMCU has capability to send data to cloud. Firebase Cloud is used in this system. The real time data from smoke sensor will be sent to real time database of firebase cloud and this data will be fetched at farmer's mobile application. If real time data reading crosses threshold value which is nothing but an indication of hazardous activity then alert message will sent to farmer.

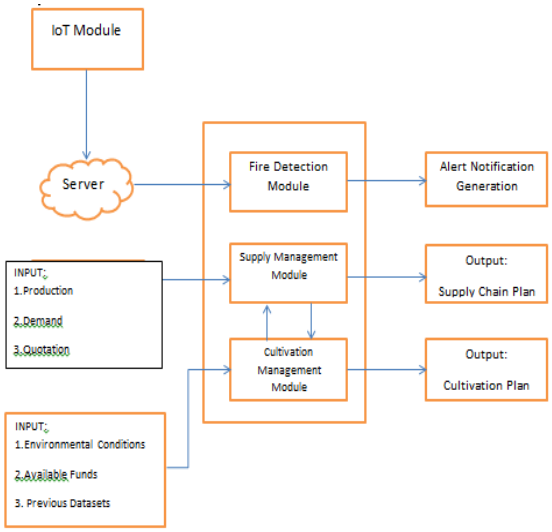

Fig -2: Architecture

3. MODULES DESCRIPTION:

Admin: Admin will login into the application with the default username and password and he can view the registered buyers and sellers and he can view the crops sold to buyers by farmers and the amount bid by the buyer and schedules the meeting as well as manages the meeting.

Farmer (Seller): Farmer or Buyer will register and login into the application using username and password given at the time of registration and he will enter the crop details and the minimum bid amount and after the bid closes he can accept the highest bid.

Buyer: Buyer will register and login into the application he can view the crops or search by crop name and bid the amount for crop after for a particular set amount of time the bit closes if the highest bid was on his name he can view the crops which he brought in the auction.

4. WORKING

1. The farmers and the buyers enter their login details.

2. This would include a cloud platform that would store the data of the registered users: farmers and customers.

3. The cloud platform will be a live cloud (Platform as a Service).

4. The farmer enters the crop details which include the quantity, base price and a deadline.

5. The buyer bids an amount higher than the base price for the crops he need.

6. The highest bidder gets away with the product after the admin schedules a meeting between the farmer and the buyer.

7. The payment is managed by the Admin (Controlling body).

8. Farmers get to know the actual demand in the market through the requests that customers post on the application.

5. CONCLUSION

This system can provide wonderful future for all the farmers throughout the country. The supply chain management system can help farmers to get best price for their crops without any scam. Fire alert system can help farmers to get alert notification. Cultivation management system helps farmers to take best decision for crop production. Different methods, different technologies, different output but ultimate goal is providing ease to farmer's life. Hence name of this project is A Novel Approach of Integrated Farm Management System.

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