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## Smart Krushi

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*Abstract: Now-a-days E-Agriculture is an emerging field focusing on the enhancement of agricultural and rural development through improved information and communication processes. E-Agriculture involves the conceptualization, design, development, evaluation and application of innovative ways to use information and communication technologies (IT) in the rural domain, with a primary focus on agriculture. India is well known for a 'Krishipradhan' country. Mobile communications technology can be used for transmitting voice, data, and services in the developing world. Mobile applications provide the most affordable ways for millions of people to access information, markets, finance, and governance systems previously unavailable to them. There are various systems available in day today life that performs activity which is helpful to farmers. The system 'Agro Supply Chain' will be available on mobile phones, which was designed for farmers to help them stay on track, avoid troubles, manage their expenses in cultivation. Sugarcane production area is used for sugar refinery, and it is very important for enhancing the quality of sugarcane and increasing the sugar yields. This model addressed, on the whole, harvest operation and transportation. The database consisting of harvesting schedule, history data and first come first serves strategy. This model is totally depend on farmer applications having shared and non-shared members, they can also able to add manipulation on seeds directed by block office which is having capability to give authorized access to farmers like login, approve/disapprove, view request page under admin.*

*Keywords: Mobile telephony; harvesting; affordable; sugar refinery; tropical; infrastructure.*

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## I. INTRODUCTION

Maharashtra is one of the leading states in sugar and sugarcane production in India. Sugarcane industry in Maharashtra is second largest agro based industry as well as most popular economic sector in India. Agriculture may be termed as an integrated system technique for controlling the growth and harvesting as well. It is an uncomplicated endeavor comprising of technical and practical processes that helps in the maintenance of the ecological balance. The rapid growth of mobile telephony and the recent introduction of mobile enabled information services provide a means to overcome existing information asymmetry use of mobile devices is very common by everyone, including the farmers. Introduction of Information and Communication Technologies (ICT) has seen a keen role in daily life of farmers. Earlier, farmers used to depend on clouds for rains were looking into the Cloud Computing for their solutions towards cultivation of better Crops in modern agricultural world. The conventional methods used by the farmers, particularly in India, are very slow and unreliable. The increasing penetration of mobile networks and handsets in India therefore present an opportunity to make useful information more widely available. This

could help agricultural markets operate more efficiently, and overcome some of the other challenges faced by this sector. E-Agriculture is an emerging field focusing on the enhancement of agricultural and rural development through improved information and communication processes. India is the second largest producer of sugar cane. On the domestic front the Indian sugar industry has a turnover of Rupees 700 billion per annum. There are 553 installed sugar mills in the country with a production capacity of 180 lakh MT of sugar. About 60% of these mills are in co-operative sector, 35% of the total are in the private sector and rest in to public sector. Almost 75% of the sugar available in the open market is consumed by bulk consumers like bakeries, candy makers, sweet makers and soft drink manufacturers. The main phases of the agriculture industry are crop cultivation, water and pest management, harvesting, post-harvest handling, quality management. Sugar cane is perennial grass and thrives well in tropical and frost-free warm temperature areas. It requires high temperatures, plenty of sunlight, large quantities of water, fertile soils, and good drainage. In which, all the stakeholders of agriculture industry requires information and knowledge about all these phases to manage them efficiently.

## II. EXISTING SYSTEM

It involves information and communication technology in agriculture which can be utilized for providing accurate and timely relevant information and services to the farmers. In which krushi ville mobile app provides different agriculture commodities, weather forecast update, agriculture updates.<sup>[1]</sup> It presents simulation model to evaluate the sugarcane supply system to mills. It adequately assess the relation of fright, the lead time feet of trucks and discount.<sup>[2]</sup> It introduce sugarcane planting and metrological database this can prove metrological service, production decision making guidance for sugarcane growers.<sup>[3]</sup> It is useful for designing frame of sugarcane harvester which are based on virtual prototype technology for building integrated environment of product development for collaboration and serialized design of sugarcane harvester.<sup>[8]</sup> For enhancing the quality of sugarcane and increasing the sugarcane the sugarcane yield sugarcane production area is imported. It introduce comprehensive, e-client, three dimensional farm management information service platform for sugarcane farmers.<sup>[9]</sup>

### A. Middleware Architecture

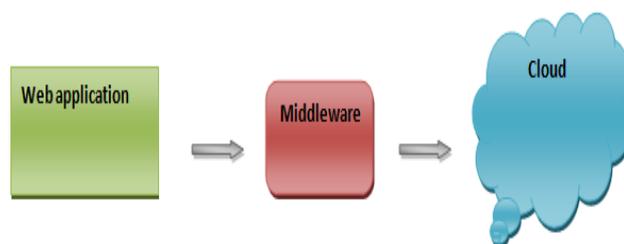


Fig1. Middleware Architecture

The system 'Smart Krushi' can be based on Middleware Architecture as well as Cloud Computing. It is a kind of Internet based computing that provides shared processing resources and data to computers and other devices. For accessing information client can send request to the server through the android application. In which security can be maintained by providing authentication technique. The server can act as a database which can store all the information as well as request. The request would be for harvesting, for payment, for more information. The server will do the scheduling of the harvesting request. At the time of harvesting Pre-calendaring can be achieved. Middleware is the software that connects software components or enterprise applications. Middleware is the software layer that place between the operating system and the applications on each side of a distributed computer network. It supports complex, distributed business software applications. Middleware includes Web servers, application servers, content management systems for application development and delivery. It is the network of networks in which all the requests and services are delivered over a network. The server provides high-end, computing-intensive services to the client on demand. These services can include applications access, storage, file sharing, printer access and/or direct access to the server's raw computing power. It works when the client computer sends requests to the server over the

network connection, which is then processed and delivered to the client. A server can manage several clients simultaneously, whereas one client can be connected to several servers at a time.

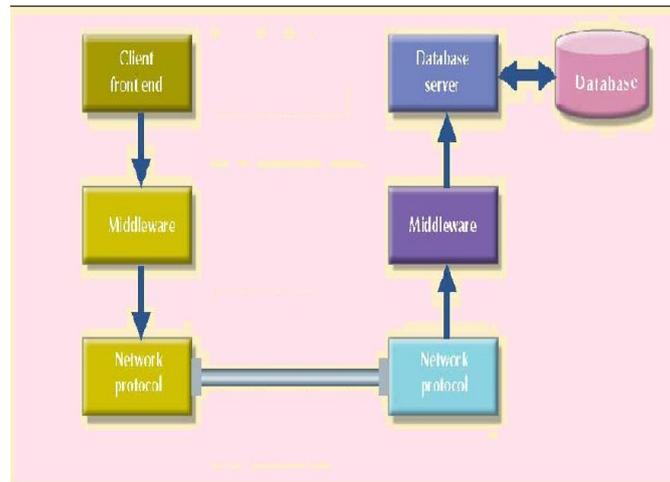


Fig2. Interaction between middleware architecture

In which database middleware can be used this can enables applications for communicating one or more local or remote databases. Database middleware does not allow for two way communication between servers and clients. Servers cannot initiate contact with clients; they can send only respond when asked. The discussion of database middleware is broken into various parts such as directory, metadata, access services. In which,

- Front end application interfaces with the middleware application.
- The program makes generic SQL requests that are translated to the specific database server by the middleware layer.
- The middleware then sends SQL request to the server through the network.

### III. PROPOSED SYSTEM

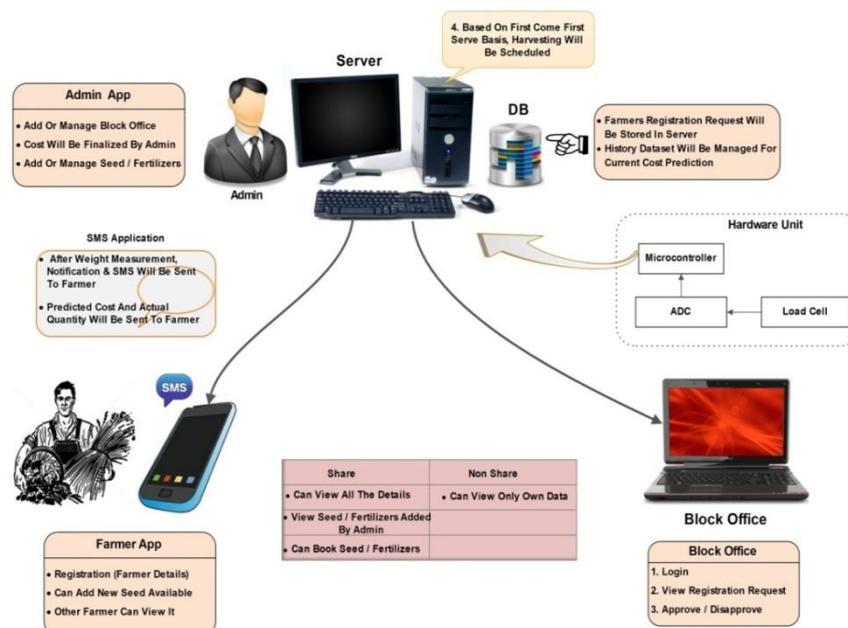


Fig3. System Architecture

Mobile communications technology has quickly become the world's most common way of transmitting voice, data, and services in the developing world. Given this drastic change, mobile applications hold significant potential for advancing development in agricultural industries and rural development. In previous system notification and cost prediction technique are not implemented. Now days the farmers have to contact the sugar factory and book the date for scheduling process. In the

proposed system the farmer can contact directly through the mobile application. We proposed the android as well as web application for farmer in which the farmer can easily get the all information related to sugarcane and its updates from sugar factory by on click through the application. In which multiple block officers are available for maintaining respective region or field. Admin has an authority to control all the system. For security purpose authentication can be provided. Using valid username and password multiple users can access the system. All the history data can be stored on database.

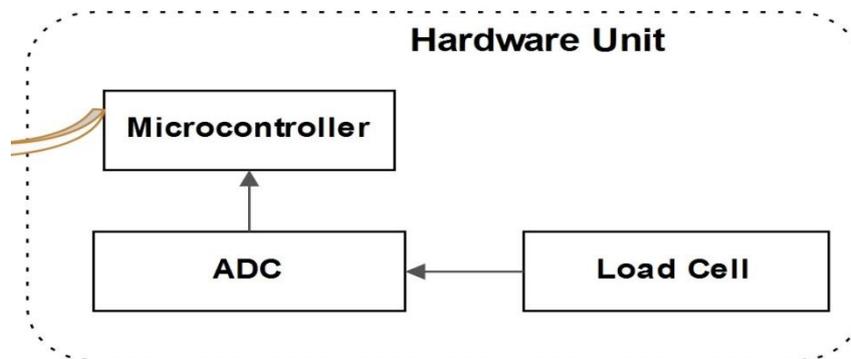


Fig4.Hardware Unit

In that load cells can be used for calculating the weight of sugarcane. A load cell is a transducer that is used to convert a force into electrical signal whose magnitude is directly proportional to the force being measured. There are various type of load cell in which we can used double bending beam load cell it is best fit for many measuring tasks. The single bending beam is rarely used in load cells, because it requires special measures to ensure a constant load application point . Bending beams offer high strain levels at relatively low forces, which makes them ideal for low capacity load cells. Transformer is a static device which transforms power from one circuit to another without changing its frequency but may be in different voltage level. In which Step-up transformer can be used. Its secondary voltage is greater than its primary voltage. After harvesting of sugarcane all the information including weight of product, predicted cost can be sent on users mobile. It reduces the manually work. Load cells are mechanical devices used to convert weight or force into electrical signals. The electronic signal can be a voltage change, frequency change. When force applied in a specific manner, a load cell produces an output signal that is proportional to the applied force. In this paper we can use Naive Bayes algorithm for cost prediction. The major function of the System is to provide agricultural related information and payment related notification to farmer.

### Modules of the System

1. Admin
  - a. Add/Remove Block Office.
  - b. Cost Prediction.
  - c. Send Seed and Fertilizers information.
  - d. Control all system.
2. Block Office
  - a. Log In.
  - b. Approve/Disapprove request of farmers.
  - c. View registration.
3. Database
  - a. History data for prediction.

- b. Scheduling.
  - c. Stores Farmers data
4. Farmer Application
    - a. Add new seed.
    - b. View seed.
    - c. Share Holder/Non share holder.

#### B. Relevant mathematical model

- Set Theory :

Let  $s$  (be a main set of)  $\equiv \{SDB, LDB, C, A, S, MR, AO\}$

where,

SDB is the copy of the server database. This database is responsible for storing user information related to cloud interactions. (Elaborate..)

LDB is a set of local database that a user owns. It consists of data tables having data items related to the products and their sales transactions. (Elaborate..)

C is a set of all clients using the server database and mining services from the server. And  $(c_1, c_2, c_3, \dots, c_n) \in C$ . (elaborate..)

A is a set of algorithms applied on the input data to get mining results. (Elaborate..)

S is the server component of the system. The server is responsible for registering, authenticating and providing associations to the end user. (Elaborate..)

MR is a set of mining rules that are applied on the input dataset provided by the client from his LDB. And  $(mr_1, mr_2, mr_3, \dots, mr_n) \in MR$  (elaborate..)

AO is a set of associations that are extracted from the input and a form the output of the system. (Elaborate..)

- Functionalities :

$SDB' = RegisterUser(uid, password, fullname, address, country, contact, email);$

$password = SHA1(input\_password);$

$U = AuthenticateUser(uid, password, SDB');$

$LDB1 = ManageProducts(pid, product\ name, cost);$

$LDB2 = ManageBilling(transactions, items);$

$LDB = LDB1 + LDB2$

$ED(Encoded\ data) = EncodeTransactions(LDB2, EncodingAlgorithm(EA));$

$UPLOAD(ED);$

$AO = Apply\ Mining(ED);$

$Results = Decode(Download(AO));$

#### IV. GOALS AND OBJECTIVES

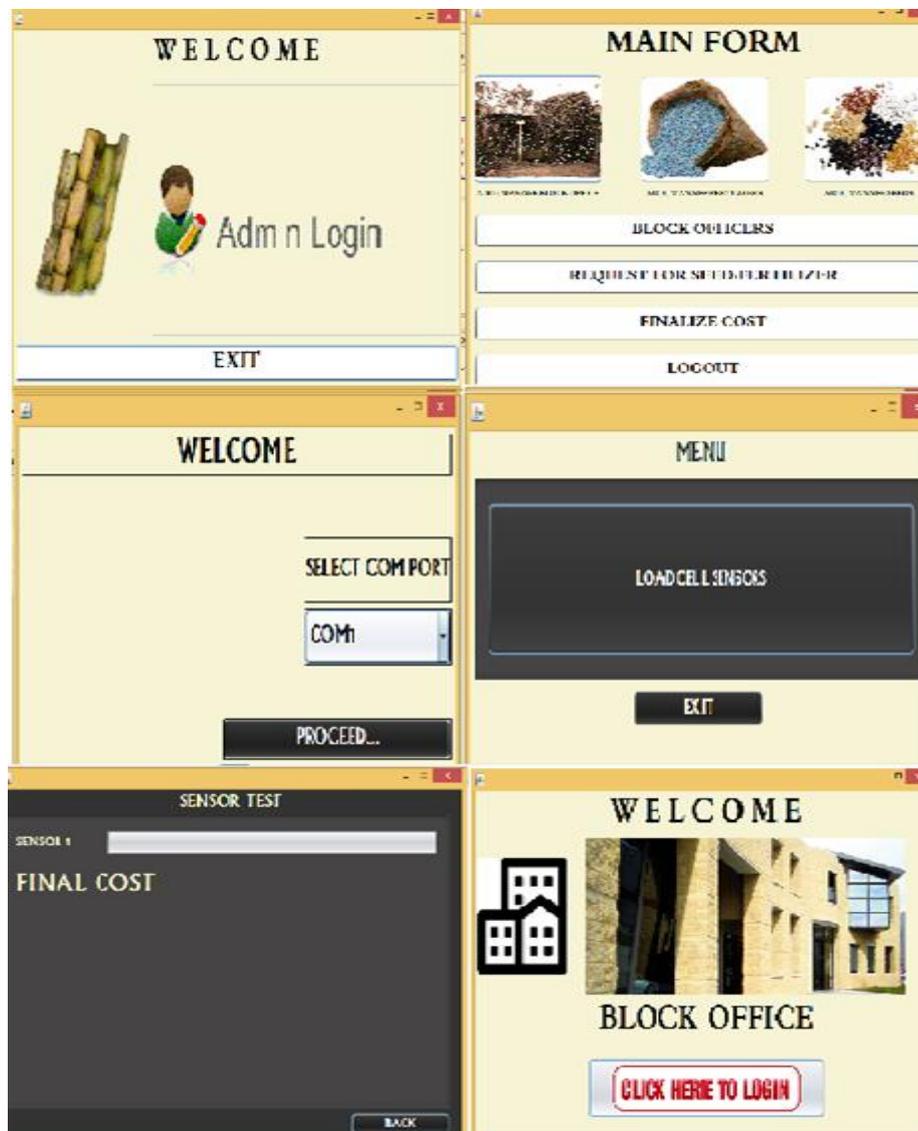
There are following goals and objectives for the Smart Krushi System. After measurement of sugarcane the notification will be get on farmers mobile.

- i. Easy to handle.
- ii. Communication time gets reduced.
- iii. Cost prediction can be done.

#### V. CONCLUSION

The application “Smart Krushi” helpful for the sugarcane growers and the sugar factory by addressing the key problems of the getting information of schedule harvesting from the sugar factory. This application will predict the rate of the sugarcane. Now day the farmer must meet the block officer of the sugar factory and take the schedule for harvesting. By using the Smart Krushi application the farmer can directly access the harvesting date and time on the mobile. The farmer can also get the notifications as well as payment information on the mobile phone. This application is also beneficial to maintaining the records or information about the farmers. The sugar factory managed all things in java application such as harvesting scheduling is based on First Come First Serve (FCFS) operation and availability of the workers and Block officer. This application also gives the news and updates related to sugar factory.

#### VI. SYSTEM OVERVIEW



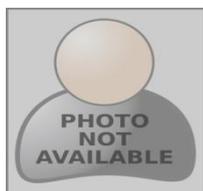
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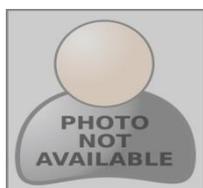
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