TAPSHIP

A PROJECT REPORT

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ABSTRACT

In the survey we studied prevailing agricultural marketing system in India and identify the problems and inefficiencies. We propose that the government APMC's wholesale market called the Mandi should be transformed into an electronic marketplace (exchange) for agricultural produce. An important function of the electronic exchange is to match the supply of the farmer's produce with the demand from the wholesalers and retailers. We present a mixed integer programming model that the electronic exchange needs to solve in an iterative way to optimally match buyers with sellers. We present a stylized case study to illustrate the functioning of such a Mandi exchange. We believe such a Mandi exchange will have a translational impact on agricultural trading, particularly in India.

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INTRODUCTION

A dvancement and transformation of the Indian Logistics Ecosystem can be brought by introducing trending technologies like Machine Learning, Cyber Security, etc. to this ecosystem. In present time, Farmers of our country faces a lot of difficulty in transferring their goods like crop, fertilizers, seeds etc. and sell them to get proper price. Hence, there is a need of more effective and efficient system through which they can transfer their shipment to the new location and sell it.

In present day scenario, the logistics system lacks a communication gap between the customer and the manager of the vehicle. So, there is requirement to fulfil this communication gap. The main aim of our project is to make life easier for them by the use of Machine Learning, Cyber Security and Web Technology to build an Effective Online Platform for Freight Management. It ensures that the right products get to the right places in the right timeframe and at the right price.

Every Year, news headlines are filled with suicides of farmers because they are been conned in market. So, to save the precious lives of our farmers, we need an effective way to transport the shipment which became the motivation for our project. This Motivation led us to innovate an efficient way to stop the conning happening in transportation field. Our product involves the whole transportation solution which involves transportation of any type of shipment. Hence, as a solution to this extreme problem, we introduce our Product called 'TapShip'. The main motive of our product is to provide an interface which will act as a mediator between the person who want to ship the goods and the owner of the vehicle.

Chapter 2

LITERATURE REVIEW

The Agriculture sector is one of the most important sectors of our country. Recently, there are some developments done in this field like developing the transporting and tracking management systems with the help of greedy like algorithms and resource augmentation analysis which is one of the useful algorithmic analysis techniques, but till date there is no efficient effort has been made in this area to solve the problem. There is a strong requirement for a one-stop solution for this problem. [1]

There are many problems that farmers face during transportation of their crops. Like, not getting the correct price or getting conned in agriculture market, no proper communication between the transport delivery person and the farmer, etc. There has been various application made to solve the problem but they were not very efficient. Due to this COVID-19 pandemic, condition of farmers has got worse in agriculture market. We know that Food supply chains connect heavily dependent producers and consumers throughout the globe, often with just-in-time delivery. Many of these critical supply chains have been disrupted, or are threatened to be disrupted, by the COVID-19 pandemic. [2]

There are several nuances of India's agriculture and marketing system that bear on farmers' choice of market channels and producer prices. First, Indian agriculture is dominated by smallholders, mostly engaged in subsistence production. Accessing transportation and communication networks involves fixed costs and this discourages smallholder farmers from participating in remunerative markets that are often located at a distance from the farm-gate. Second, farmer-trader relations in informal settings are often based on mutual trust, and generally involve tied transactions involving credit, input, and output markets. Such tied transactions influence choice of market channels, and hence the producer prices. Third, India's agricultural price policy provides for procurement of some commodities at the government-set minimum support prices (MSP); intended to create

incentives for farmers to adopt yield-enhancing technologies and agronomic practices. The benefits of MSP, however, are directly proportional to the marketed surplus, and thus it benefits larger farmers more. [3] But, the smallholder farmers because of the poor transport and communication networks or alternatively higher cost of accessing transportation and information are more dependent on informal channels, comprising local traders and input dealers for sale of their produce, and receive prices significantly below MSP. Further, those selling in the regulated markets also receive prices lower than MSP. Larger and better-informed farmers sell most of their produce to government agencies and licensed traders in the regulated markets at better price terms. The econometric results show both transportation and information are associated with better price realization by the farmers, with the effect of information on producer prices being comparatively strong. Access to roads itself when combined with reduction in asymmetry in information between buyers and sellers has the biggest impact.

In Present, Indian farmers faces many challenges. We know that, the Technological innovation and competition have forced farmers to adopt supply chain mode to manage their supply, production and sale. Hence, there is a requirement of an Agriculture Product Supply Chain. An Agriculture Product Supply Chain is the system of organizations, people, technology, activities, information and resources involved in moving agricultures product from supplier to customer. [4] One more big challenge for farmers is that to get a good profit for the efforts and investment that they had put in. There exist different reasons like season limitation, crop life due to which farmer get very limited amount of time to study and get profit for the efforts they had put. We know that it is not feasible to reach all merchant/consumers physically for farmers as it consumes much time and efforts wherein our farmers have limited amount of time. Also, traditionally, methodologies implemented by farmer created limited access to client/consumers (merchants) enabling less options to sell the crop product in the market. So, by introducing a new marketing method (application) wherein farmer can sell his crop or product at each layer of marketing chain (consumers, markets or directly to end user) with having option to set the minimum price by his own choice. [5]

The issues we discussed that are associated with farmers and selling their crops in agriculture market are not good for the farmers of our country. Hence, we as a team

started thinking of an innovative idea/solution for this problem. After discussion we came to conclusion that we should introduce five modules in agriculture product supply chain information sharing system. The Modules are Portal Website, Order Management Subsystem, Transportation Management Subsystem, Warehouse Management Subsystem and Interface System. All of the Subsystems and the Database Management System are integrated in the information sharing system.

The basic idea is that both Farmers and consumers login to the application and search for their needs. Farmers can sell their crops by entering the details of the product, and the location details of the farmer who sells their product. Consumers can search for the crop and they get farmers who will be available. Our application helps to connect farmers and consumers. Both customers and farmers get more benefits through our application. The prediction analyses of our app predict with the help of price detail of crop for farmers of the previous year. Also, farmers get different options to sell their products in their locations that reduce transportation costs. In India, most of the farmers are coming from a backward community and with low literacy. Multiple languages support and the user-friendly nature of our application make it more useful for farmers. [6]

In our application, we will make use of Time Series data which is experimental data taken at different points in time (usually evenly spaced, like once a day). It just because a series of events have a time element that does not automatically make it a time series, such as crop prices in a particular date, which randomly spaced and not a time series. This data converts to time series by using point process. Our model predicts the probability of a crop that has the highest price based on the previous year dataset. Forecasting is a process of making predictions of the future based on past and present data. The common method of Prediction is the ARIMA model, which stands for Auto Regressive Integrated Moving Average. [6]

MOTIVATION AND BACKGROUND STUDY

3.1 Problem Statements

- Developing an application software which help the farmers to become independent while selling their crops in agriculture market.
- Make use of trending technologies to get customers direct deals from farmers and a reliable transport service along with user friendly platform.
- Developing a solution for drivers to get them deals in seamless period of time along with easy payment service.

3.2 Drawbacks in Existing System

- **Distress sale:** Most Indian farmers are extremely poor and have no capacity to wait for a better pricing on their produce in the absence of proper credit facilities. Farmers often have to go for distress sales of their output to the village moneylenders or merchants at very poor rates.

- **Lack of market intelligence:** Indian farmers are not always aware of the ruling prices of their produce in big markets. Hence, they have to accept low prices for their produce as offered by the middlemen or traders.

- **Lack of poor transportation:** Farmers cannot reach the markets due to poor transportation facilities. This leads to them not being able to sell their produce. Thus, they prefer to sell their produce in the villages.

- **Intermediaries:** A large number of intermediaries or middle men exists between the final market and the farmer. All these middlemen claim a good amount of the goods and money and therefore, reduce the returns of the cultivators.

- **Unregulated markets:** Huge number of markets adopt various malpractices. Prevalence of these false weights and lack of grading and standardization of products in village markets in India are always going against the interest of ignorant, small and poor farmers.

3.3 Objectives

- To give opportunity for farmers to decide the minimum price of shipment and also give equal opportunities to customers including APMCs, government agencies, etc. and truck drivers throughout the country.
- Providing an infrastructure to customer and driver to directly communicate regarding transportation requirements.
- Providing opportunity to all truck drivers to make offers for all available shipments.
- Make easy payments and more secure transport service for both farmers and drivers.

3.4 Background Study

The brief background theory behind our basic idea is that both Farmers and consumers login to the application and search for their needs. Farmers can sell their crops by entering the details of the product, and the location details of the farmer who sells their product. Consumers can search for the crop and they get farmers who will be available. Our application helps to connect farmers and consumers. Both customers and farmers get more benefits through our application. The prediction analyses of our app predict with the help of price detail of crop for farmers of the previous year. Also, farmers get different options to sell their products in their locations that reduce transportation costs. In India, most of the farmers are coming from a backward community and with low literacy. Multiple languages support and the user-friendly nature of our application make it more useful for farmers.
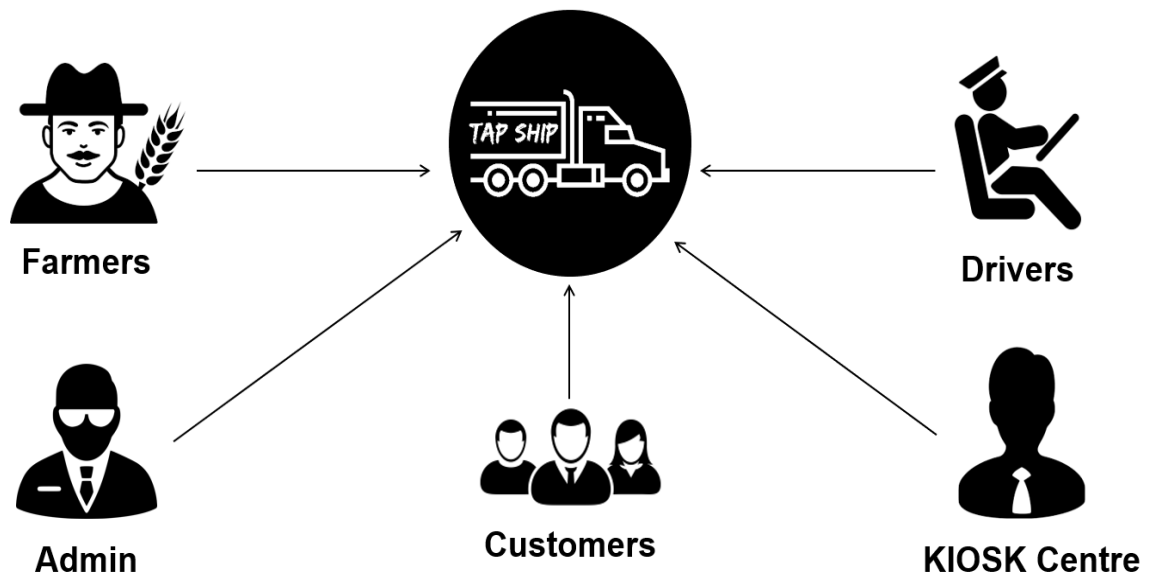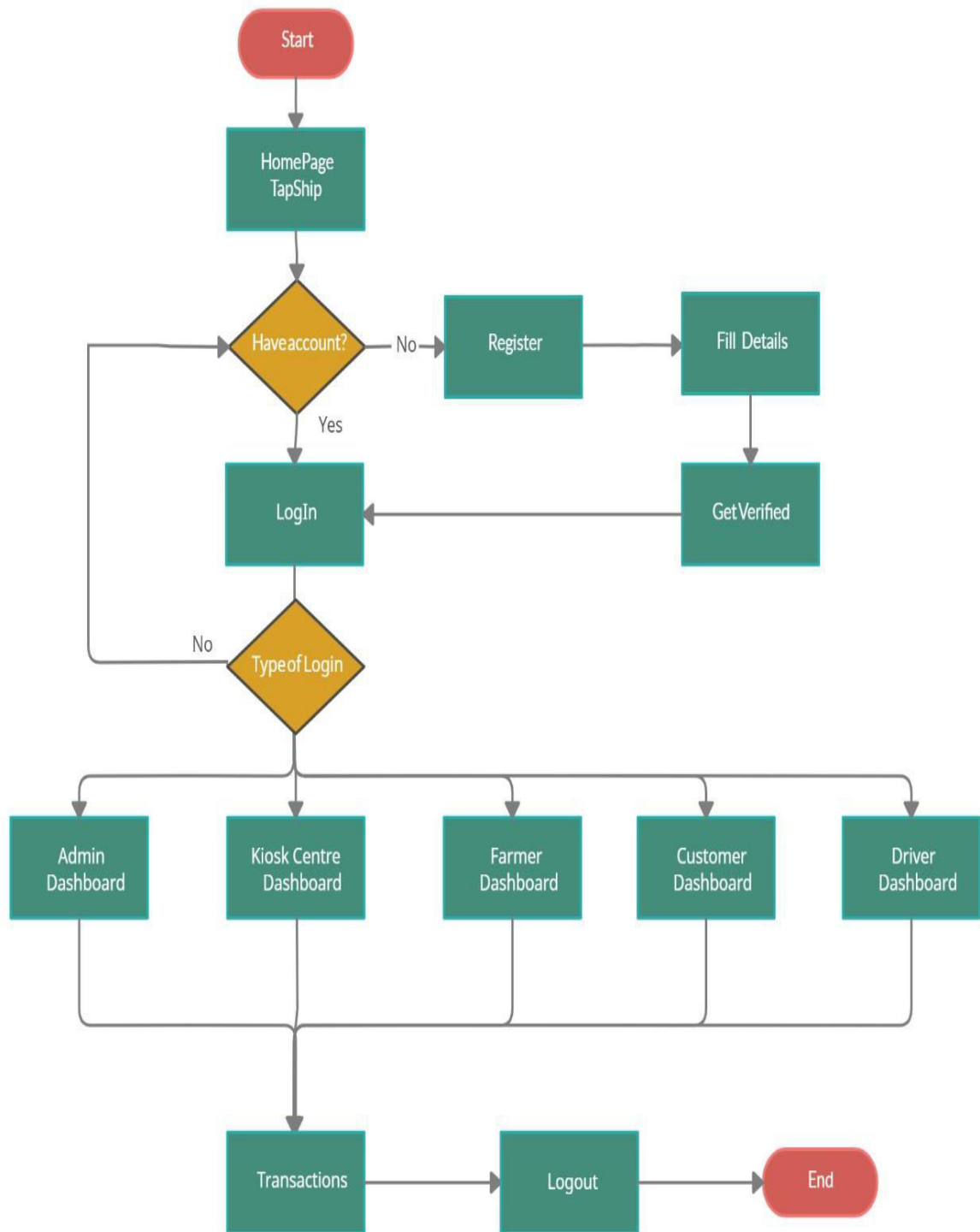
SYSTEM DESIGN

Fig: 4.1 Key Players

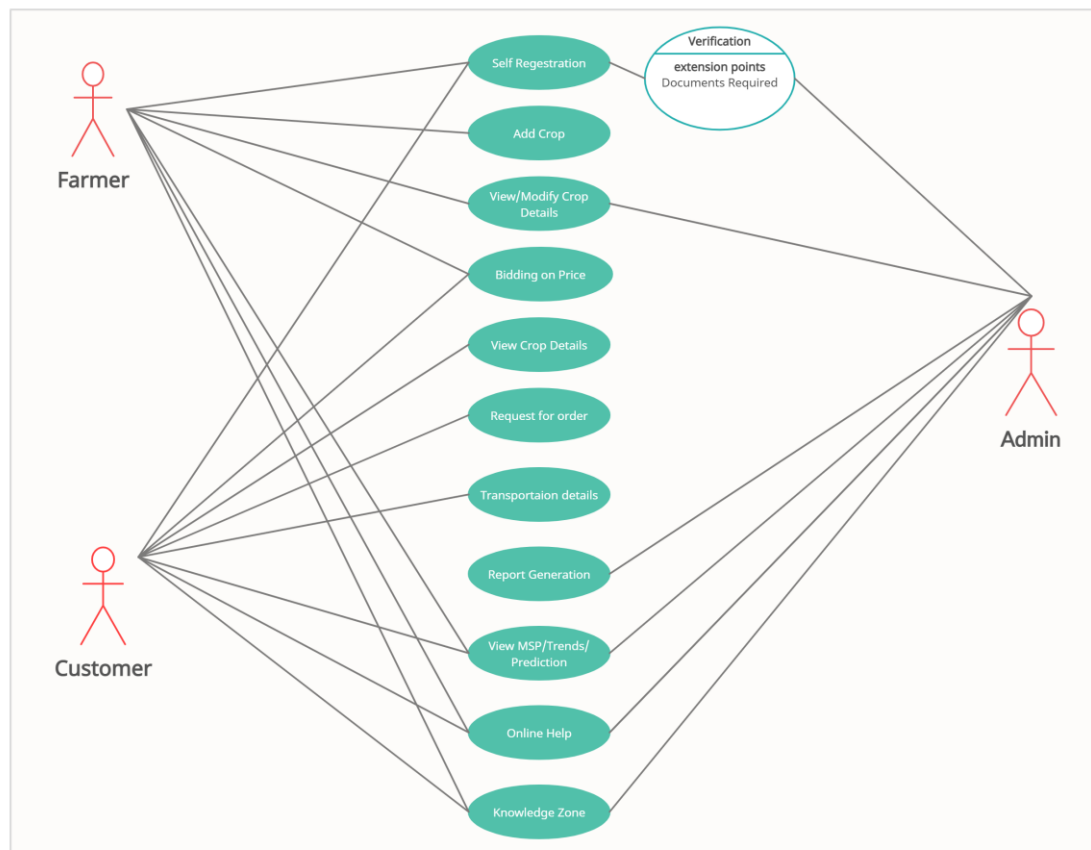Fig: 4.2 Flow Diagram

Fig: 4.3 Use-Case Diagram of Farmer-Driver
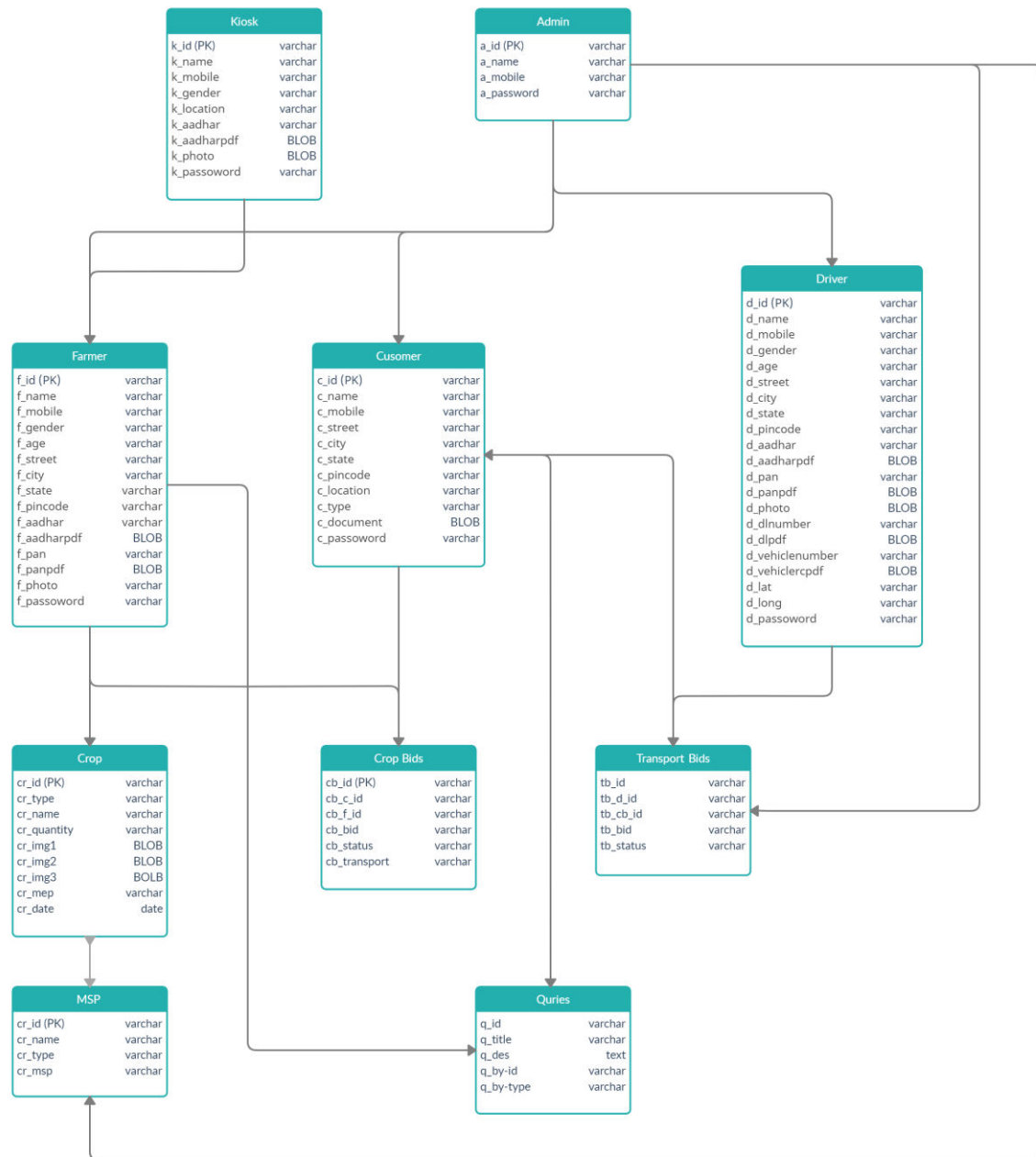

Fig: 4.4 Use-Case Diagram of Farmer-Customer
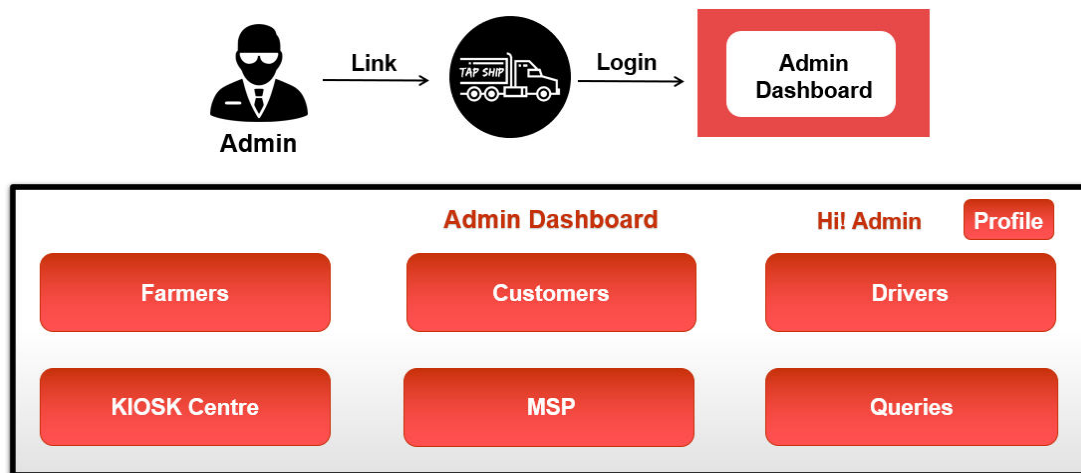
Fig: 4.5 Schema Diagram

4.1 Admin

Fig: 4.1.1 Admin Dashboard

1. Manage Users

- Farmer can verify Farmer, Customer and Drivers account and also they have power to unverify it in special case
- Farmer can also add KIOSK centres who will help farmers at Panchayat Office

2. View Details

- Admin is able to see all the details and transcation related to any type of customer.
- They can only view the details and they can't change it.

3. MSP

- Admin can manage the data related to MSP.
- he can update the data regularly to the platform

4. Quries

- Admin can see quries raised by farmers, customer and drivers.
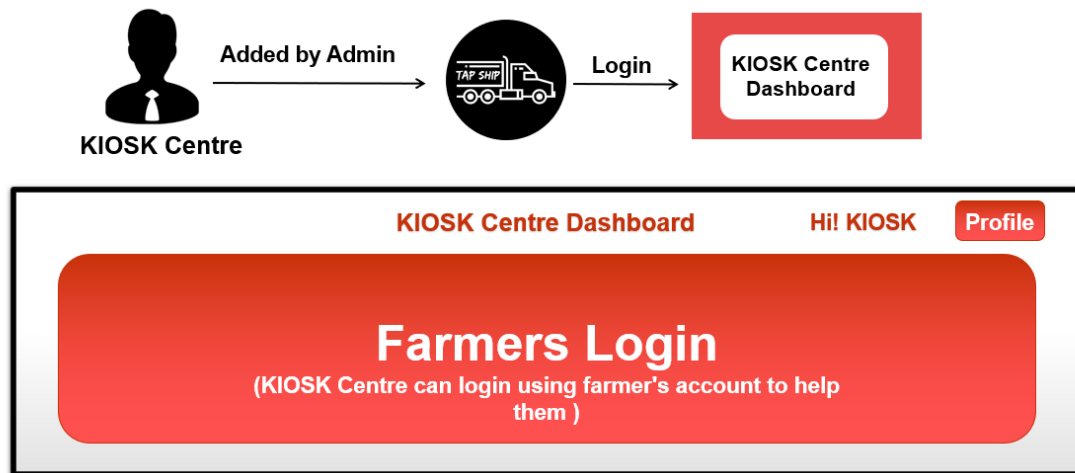- He can solve those problems and also provide expert advice to them.

4.2 KIOSK Centere

Fig: 4.2.1 Kiosk Centre Working

1. Why we have KIOSK centre?

    *   Persons from KIOSK centre are the special ones who sits at panchayat office.

    *   All farmers are not able to use our platform as there are some barriers like literacy and technical knowledge.

    *   To help out them, we have KIOSK centres who will work at panchayat office and farmer can take there help to use the platform

2. How KIOSK centre will help?

    *   Designated person from KIOSK centre will first login to their account and after that they have to login with the farmers account whom they are helping.

    *   Farmer's login will be 2-step secure with password and OTP.

    *   Once, the designated person from KIOSK centre has login into farmers account, he can add the details to the portal.

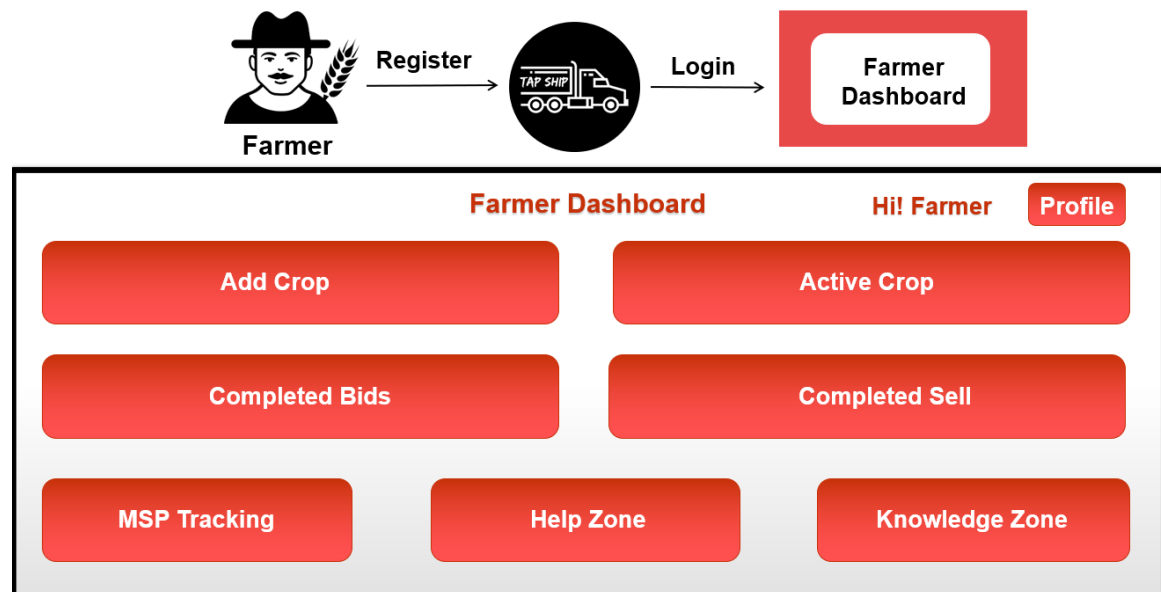   *   Now, he can help the farmer to select the best deal for their crop.

4.3 Farmer

Fig: 4.3.1 Farmer Dashboard

Fig: 4.3.2 Farmer Attributes

- After sign up, the new user will be unverified initially i.e. whenever user tries to login, user will get pending status to wait until his/her account gets verified.

- Note: The Admin can see all the farmers requests to create the new account and verify the details of the farmer.

- Once farmer's account is verified, then he/she can login to the platform.

- **Step 2:** Log In
  - ➢ There are 2 ways to login:
    1. User will login by himself or herself.
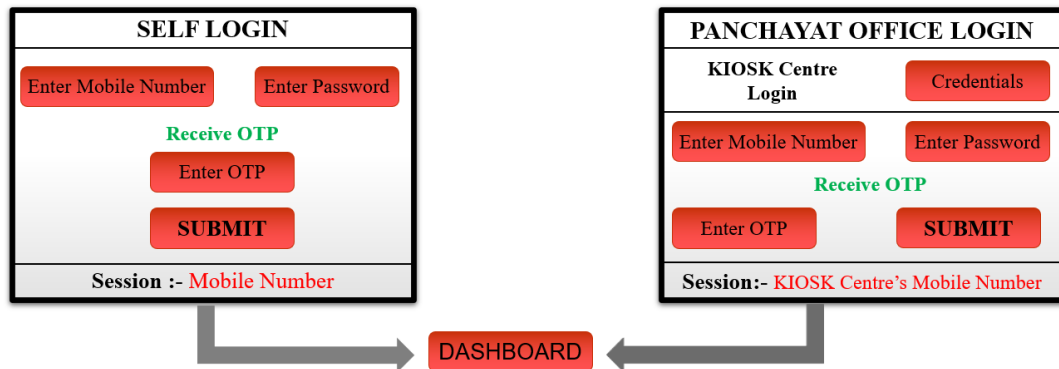   2. User will login through the help provided by KIOSK Centre at Panchayat office.

Fig: 4.3.3 Farmer Login

DASHBOARD has following options:

- Add crop

- Active Crop

- Completed Bids

- Completed Sell

- MSP Tracking

- Help Zone

- Knowledge Zone

1. Add Crop

- Select crop type from below fields

Fig: 4.3.4 Crop Attributes

- Select crop name from drop down menu.

- Enter quantity of crop.

- Give 3 good photos of crop.

- Enter Minimum Expected Price (MEP) of crop.

- Enter Availability Date of crop.

2. Active Crop

- Newly added crop will get status as active bid.

- Farmer can edit details of crop and also delete the crop details.

- Farmer will be able to see all the bids made by customers and their details.

- Farmer can confirm the bid from a customer and close the active bid which will result in status to be set as unactive.

3. Completed Bids

- Once bid is confirmed and status is set as unactive then farmers can see the complete details of the deal here in this section.

Farmer can also see:

- Payment status of the deal.

- Transport Medium and its details like live location of driver.

- Whether the crop has reached to the customer or not.

- Farmer can also print the details of deal in PDF Form.

4. Completed Sell

- In this section, Farmer can see all successful sold crop and payment status.

- Farmer can also print the details of deal in PDF Form.

5. MSP Tracking

- Farmer can select crop details and get a report on post Minimum Selling Price (MSP).

- Farmer can also see graphs of post trends.

- Also, future MSP can be predicted for the crop using various algorithms.

6. Help Zone

- Farmers can submit their question and ask for advice from experts.

7. Knowledge Zone

- Farmers can read tips and knowledgeable articles to improve their productivity.
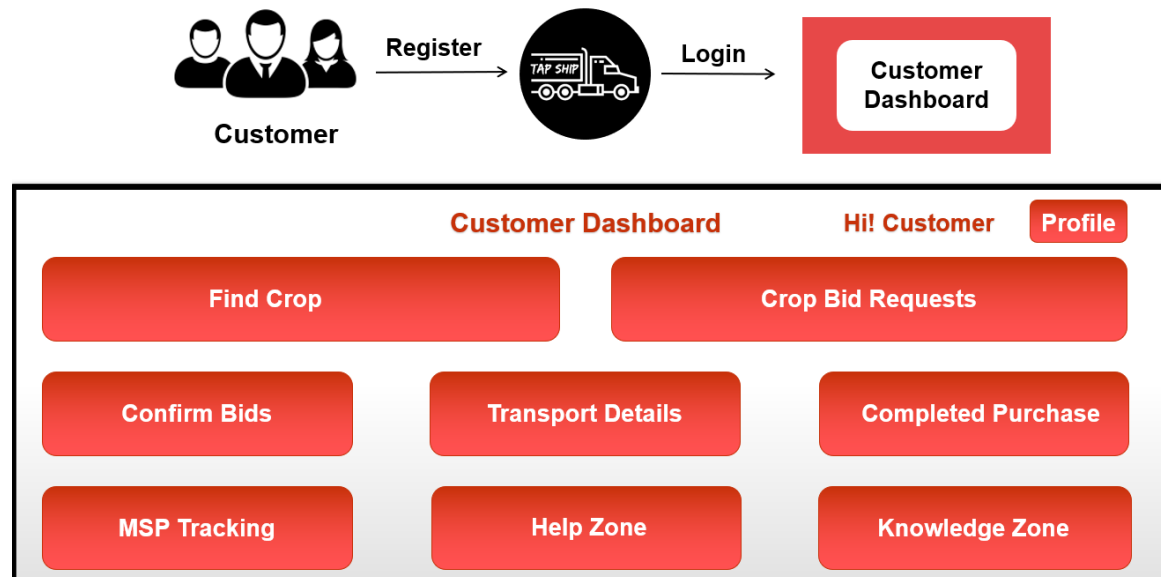
4.4 Customer

Fig: 4.4.1 Customer Dashboard

- **Step 1:** Sign Up

Fig: 4.4.2 Customer Attributes

- After sign up, the new user will be unverified initially i.e. whenever user tries to login, user will get warning to wait until his/her account gets verified.

- Note: The Admin can see all the requests from customers to create the new account and verify the details of the customer.

- Once, the account is verified, the customers can login into their account with their individual credentials.

- **Step 2:** Log In

• **DASHBOARD** has following options:
1. Find Crop
2. Crop Bid Requests
3. Confirm Bids
4. Transport Details
5. Completed Purchase
6. MSP Tracking
7. Help Zone
8. Knowledge Zone

Fig: 4.4.3 Customer Login

1. Find Crop

- Customers will be able to filter the crop(s) as per their requirement(s).
- They can view details about any specific crop.
- After seeing details, if they are interested then they can go ahead and make an offer or bid for the same.

Note: They will not be allowed to make a bid less than the price decided by the farmer.

- They will be shown the highest bid for the crop on the same portal as per the current status.
- They will be allowed to edit their bid details until the bid is active for particular crop or they could even withdraw their bid.

2. Crop Bid Requests

- If customer make any bid for crop, he/she will be able to see details of that bid and crop in this section. He/she can even modify or withdraw the bid.
- Bid will be visible in this section until any response from the farmer doesn't arrive.
- Customers could also see rejected bids and move them to history.

3. Confirm Bids

- The customer will be able to see the confirmed bid/deal in this section if farmer shows any interest in his/her bid and confirm the bid/deal.

- Once the deal is confirmed, customers will have to inform that whether they need a transportation service from TapShip or they can do the transportation on their own.

- If customers choose to carry transportation on their own then they will have to provide all details about vehicle and driver.

4. Transport Details

- If customers choose to carry transportation on their own then details filled by customer will be updated in this section.

- Else, drivers who are already registered and connected with TapShip will bid for the deal.

- Customers can see all the bids from various drivers and select the best one.

- Once, the driver and vehicle is confirmed then all the transportation details will be shared with the farmer.

- As soon as the Transportation of crop is completed successfully, customer should update platform and farmers about the same here and complete the payments for farmers and drivers respectively.

5. Completed Purchase

- In this section, Customer can see all successful bids after transportation is completed.

- He/she can also see all rejected bids.

- Customer can also print the details of deal in PDF Form.

6. MSP Tracking

- Customer can select crop details and get a report on post Minimum Selling Price (MSP).

- Customer can also see graphs of post trends.

- Also, future MSP can be predicted for the crop using various algorithms.

7. Help Zone

- Customers can submit their question and ask for advice from experts.

8. Knowledge Zone

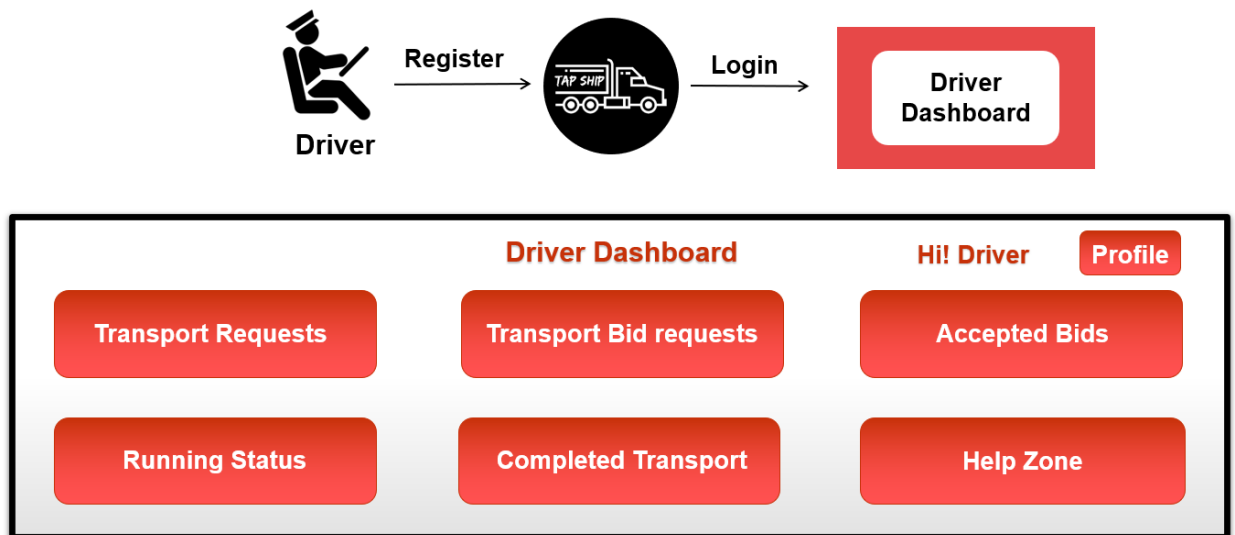- Customers can read tips and knowledgeable articles to improve their productivity.

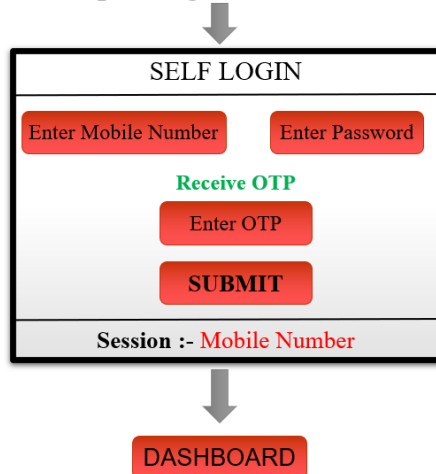## 4.5 Driver

Fig: 4.5.1 Driver Dashboard

Fig: 4.5.2 Driver Attributes

- After sign up, the new driver's account will be unverified initially i.e. whenever user tries to login, user will get warning to wait until his/her account gets verified.

Note: Admin can see the requests from driver to create a new account and verify their accounts.

- Once, the account is verified, the drivers can login into their account with their individual credentials.

- **Step 2:** Log In

- **DASHBOARD** has following options:
    1. Transport Requests
    2. Transport Bid requests
    3. Accepted Bids
    4. Running Status
    5. Completed Transport
    6. Help Zone

Fig: 4.5.3 Driver Login

1. Transport Requests

- If a customer opt for a third party transportation service then the request will be shown to drivers.

- The drivers will get a recommendation for deals based on their location and they can also filter the results.

- If the driver likes the deal and is interested then, he can go ahead and make a bid to the transport.

2. Transport Bid requests

- Once, the driver has made the bid then, they can see the details of that bid in this section and they can also modify and withdraw the bid.

- Driver can also see rejected bids and move them to history.

3. Accepted Bids

- If customers shows interest in any of the bid then, they can confirm from their side and driver can see the details in this section.

- Drivers can now accept that deal from customer and will get all the details for transportation.

4. Running Status

- In this section, the driver can give updates about shipment like whether the shipment has been picked from the farmer or is on the way or reached to the customer, etc.

- Driver's live location will also be visible to both farmer and customer.

- Once, driver has reached to the customer's place then it will go to the next step.

5. Completed Transport

- Drivers can see details regarding their past deals and also view the payment status of the deals.

- They can also track rejected bids.

6. Help Zone

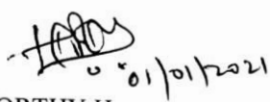- Drivers can submit their question and ask for advice from experts.

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