

# Digital Market : E-Commerce Application For Farmers

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**Abstract:** The term digital market means a platform that is dedicated to integrate farmer, Merchant/Markets, government and end user and thereby bridge the gap between them. It also let everyone to be updated with the changing market scenario. Indian farmers faced many challenges and one of them 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 the market conditions. The study of flourishing crops and products in current market under agriculture sector is very necessary in order to obtain good price .Since it is not feasible to reach all merchant physically for farmers as it consume much time and efforts wherein our farmers has limited amount of time. Also traditionally, methodologies implemented by farmer created limited access to client (merchants) enabling less options to sell the crop product in the market. So by introducing new marketing method wherein farmer can sell his crop or product at each layer of marketing chain (merchants, markets or directly to end user) along with multiple options becomes necessary. Also there was no transparency from government's point of view wherein the selling of crop at minimum base price was not traceable ultimately, which was not fulfilling the changing demands .Thus the platform and modern techniques will help to sell the crops at different layers of marketing chain providing multiple options (market, merchant or end user) wherein one will be able to explore and do analysis of current market situation with the help of KNN algorithm as nearest neighbor search for better decision making and Haversine algorithm for the purpose of latitude, longitude check using GPS system to sell or purchase the crops.The technology used is the mobile-based android application for farmers ,users and merchant access and web-based java application for providing access to government along with common database system that facilitates storing of data like SQL and PHP for connectivity .Thus in a nutshell the government can set rules and regulation e.g.:-minimum price for minimum quality of crop/product (Hamibhav), resolve the

launched complaints, handle the overhead raised prices with the help of system data and load balancing technique. The system also provides complaint box to launch complaint for farmers.The setbacks that the system faces is about tracking transportation record in a dynamic way .

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**Keywords:** Hamibhav, GPS, KNN, Haversine, nearest neighbor search, load balancing, Market analysis, transparency

## I. INTRODUCTION

After yielding crop/product farmer has a limited amount of time to find out nearest market, current stock details & to determine which market will be more profitable for his crop. The study of market situation takes a lot of time. In traditional marketing scheme, farmers had limited option for selling their crops/product due to which they cannot optimize their crop profit at optimum level. When government set minimum price for maximum quality of crop/product, it's quite difficult to set and implement such rules and regulations. It is difficult for government to handle overhead raised price due less availability of stocks in markets as well as fill up the necessity of crop/product in the market. Because government do not have necessary data to predict such conditions before facing actual problem & figure out possible solutions. Thus it becomes necessary to establish such system which will help to resolve farmer's problem time to time using digital platform

and technologies in order to remain updated with changing requirements.

## II. LITERATURE SURVEY

This[1] paper proposes that as India is being Associate in nursing agriculture and that country remained victimized by adopting ancient ways for recommendations of agriculture. Presently recommendations for farmers supports mere one to one interaction between farmers and completely different specialists having different recommendations which will provide information about farmer's victimization past agricultural activities that facilitate mining of information & ideas. The market trend may be united with it to supply optimized results from recommender. The paper proposes the utilization of information mining to supply recommendations to farmers for crops, crop rotation and identification of acceptable plan food. The system may be employed by farmers on internet and golem primarily based on mobile devices.

With the evolution of internet 2.0[2], ICT has become the first that deal with citizenry. There's a niche between the farmers and therefore the data of agricultural specialists. ICT will fill the gap between farmers and therefore the specialists. During this paper, we've projected a linguistics internet based mostly designed to get agricultural recommendations, mistreatment special knowledge and agricultural data bases. Our cognitive content acts as a site skilled and can send recommendations to the farmers supporting climate conditions and geographic knowledge. We have shown experimental results as an area of implementation of our projected design. A farmer sends question to the query engine that induces information for a selected crop. Question could also be associated with GIS knowledge, crop cognitive content. The results of the question is displayed on a mobile device.

In[3] this paper author propose that India is admired as associate degree agricultural country, where the recommendations are given by ancient strategies. Also recommendations for farmer's supports communication between farmers & completely different specialists[2] having different style of recommendations. Recommendation will be provided to farmer's victimization past agricultural activities' knowledge. The application provides recommendations to farmers for identification of acceptable plant food and crop. This system will be employed by farmer's mechanical man based mostly on mobile devices. The application will be used for increasing the crop yield. Conjointly the suggested fertilizers will be purchased from the location. Suggestions provided are often purchased fertilizers in combination and thereby given to the user.

This paper presents[4] the highest ten data processing algorithms known by the IEEE International Conference on data processing (ICDM) in Gregorian calendar month 2006: C4.5, k-Means, SVM, Apriori, EM, Page Rank, AdaBoost, KNN, Naive Thomas Bayes, and CART. These high ten algorithms are among the foremost potent data processing algorithms within the analyst is community. With every rule, we offer an outline of the rule, discuss the impact of the rule, and review current and more analysis on the rule. These ten algorithms cowl classification.

Mobile devices[5] are used extensively by the individuals for communication, music, diversion, web and social networking. There's a scarcity of applications, which might be very helpful for the professionals to enhance their operating capabilities. Although mobile phones are utilized by individuals living in rural areas, however there are hardly any relevant applications for them to enhance their productivity. During this paper, we've planned and enforced a system for farmers which might be operated on their mobile phones. The system is developed for victimization service that is destined for design (SOA) using spatial knowledge method and mental object. The mental object is maintained within the sort of ontologies. The system fills the gap between farmers and agricultural consultants. A farmer will give inputs associated with crops being cultivated and site specific data to induce specific suggestions, alerts and proposals to enhance productivity. It'll generate victimization for mental object. Whenever a farmer observes some abnormal behavior for crops or climate, the system is ready to get recommendations supports inputs provided. We've resolved a number of queries as a neighborhood of on-going work and results are displayed on angled primarily based mobile devices for demonstration of the system.

## III. PROPOSED SYSTEM

System is providing platform such as android app and website app at government level wherein farmer can sell his crop products at different layer of marketing chain (market, merchant or end user) with multiple option. This platform will help farmers to find out nearest markets, its current stock details and its demand for particular product within less time & with less effort. This analysis will thereby help to determine which market will be more profitable for his crop/product. Here we are providing a complaint box for farmers to launch complaint, e.g. :- suppose any merchant offers less price than the government's specified price for minimum quality of crop/product then farmers can directly launch complaint against him via the complaint box. This complaint will be

registered in government's database so that government can take action on it.

Government module has the authority to set minimum price for minimum quality of crop/product (Hamibhav) as well as to set and update different rules and regulations time to time. In some cases, we observe overhead raised price of food product due less availability of stock in market. This price can be 2 to 4 times greater than actual price. It affects common people budget and daily life as well. With the help of the market details government can predict such conditions before facing the actual problem. This will give a little more time to figure out possible solutions for such conditions. Load balancing technique can help to share load balance between different markets so that shortage of particular product can be reduced. This will help us to handle the overhead price of crop/product due to less availability in the market. This platform can accommodate traditional marketing method as well as modern marketing methods.

This web based application will provide the information like market detail, list of merchants ,list of farmers ,list of end users , list of complaints etc. This will leads to a better management for government.

#### IV.MATHEMATICAL MODELLING

Let S be the solution perspective of the given problem such that,

$S = \{s, e, x, y, DD, NDD, Fme, cpucorecnt, failure, success,\}$

S - s be the initial state

X - x be the input of the system.

Y - y be the output of the system.

Fme - be the main algorithm resulting into outcome y.

DD - The DD be the deterministic data, it help identifying the customer Validation record.

NDD - NDD be the non-deterministic data of the system to be solved. These being computing function or CPU time or ALU time complexity.

CPUcorecnt - is the no of core of the CPU.

Success- desired output is generated.

Failure -Desired output not generated, forced exit due to system error.

In our problem statement:

Admin (A)

Farmer (F)

Merchant (M)

Grains →

G → The set of available grains globally.

For each G there is least price Pr.

Farmer→

F – GFr→set of grains available for sale.

F → will put images, quality, & prices of all grains from set GFr.

F has a location with lat. Long. – Lf.

Merchant→

M → GMp → set of grains of demand from merchant or market.

Location for merchant Lm.

Step 1→

Exploring merchants from nearby location →

Lf fetched from database from lat. Long.

Find nearest M from comparing with each Lm.

Input Set:

1)Username={

(Farmer:cropinformation,price),(Merchant:crop price)}

2)Password

2 variables:

1)Farmer expected price

2)Merchant offered price

3)Government declared price

Processing Set :

Execution={Searching module}

->nearestplace

->input

->current location

->latitude and longitude check

Similarly it will be done by merchant.

On customer side :

→Check out the grain requirements (it is stand-alone module)

→Independent approach

Resources :

→Government declared price

→Area Name

→Crop Information

Output Set:

->explore the nearest merchant

->list displayed to farmers as output

Outcome analysis:

Let Fme be a function that perform the core function in the problem to be executed successfully..

Fme- y1 -> x1

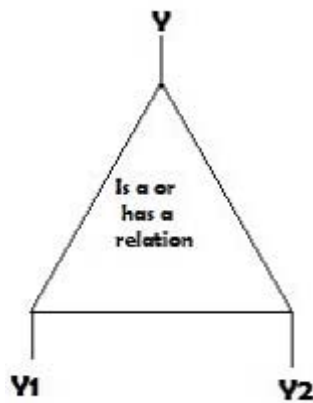


Fig. Output

Feasibility Assessment:-

What are the P, NP, NP-Complete and NP-Hard problems?

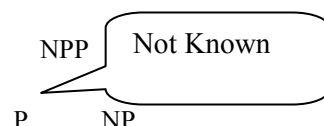
**P Problems:** Problems are the set of problem which have deterministic polynomial time algorithm. Deterministic means it uses only one processor for the single task .

As we observe many farmers are getting good quality grains but this farmers cannot find a good price for the grains while selling into market. It is difficult for farmer to explore new market places .in some areas farmers are unaware of the price rates declared by the government for each grains this leads to a profitless deal with merchant.

**NP Problems:** - NP Problems are the set of problems which have non-deterministic polynomial time algorithms. A formal definition for the same is given below –

The class of decision problems that can be solved in polynomial time by non-deterministic algorithms is called the NP-Class.

As we are proposing farmer merchant system in which farmer upload its grain with picture and merchant as per their requirement find farmer so government manage and try to help farmer to get good deal and help merchant to get result as per the requirement.



**NP – Complete:-** A NP-Complete problem is one which belongs to the NP-class and which has a surprising property .Every problem in NP-Class can be reduces to this problem in polynomial time on a deterministic machine.

A formal definition for the same is given below, A decision problem D is said to the NP-Complete if,

→ 1. If it belongs to NP-Class.

→ 2. Every problem in the NP-Class is polynomially reducible to D.

One could immediately conclude that if a deterministic polynomial time algorithm is found for an NP-Complete problem then every problem in NP class can be solved in deterministic polynomial time. There are a number of interesting real world problem which belongs to the NP-Complete class. The traveling salesman problem (TSP), Printed Circuit Bound (PCB) problem are examples of NP-Complete problems.

**NP-Hard:-** A problem P is said to be a NP-hard problem if any problem (not necessarily in NP) is polynomially reducible to P. NP-Hard problems are basically the optimization version of the problems in NP-Complete class. The NP-Hard problem are not mere yes/no problems.They are the problems where, we need to find the optimal solution.“Our proposed system goes under the category of P-Class because we used only one processor for one task so it satisfy the condition of deterministic and all the algorithms having the polynomial time complexity  $O(n)$ .so it falls under P-Class”.In our proposed system we are going to give inputs in unary notation, then the input size is S.Note that the reassembly problem can be solved in some time  $P(s)$  for some polynomial  $P ( )$  so the complexity of our algorithm  $O (p(n))$  i.e.  $O(n)$ .

## V. SYSTEM DESIGN

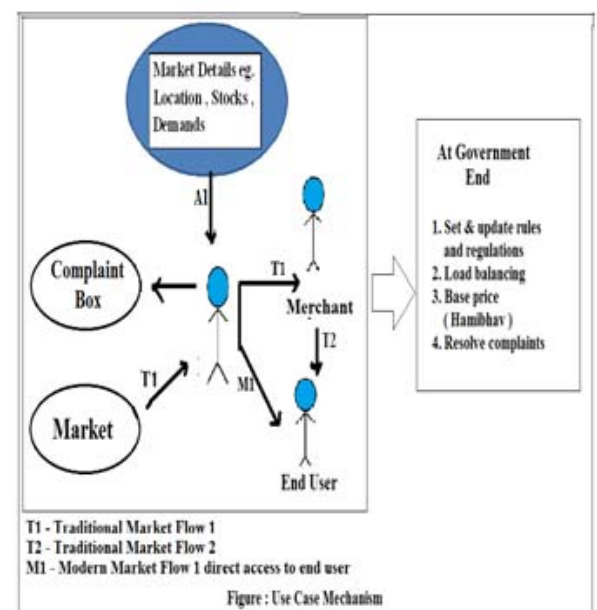


Fig. 1 Use case Mechanism

Figure (a) explanation:Farmer, merchant and end user are integrated through system as shown in above figure (a) wherein we have system design of use case, a database with market details such location, current market stock details that is available for farmers is shown which will reduce the time and effort taken by them and enable them to be updated with the current market situation. It will help in prediction of profitable market.

We have provided here multiple options i.e. market, merchant and end user for respective farmer. There are two ways in which farmers can sell his crop/product: Firstly he can sell his crop to merchant and then merchant will sell this crop to end user (as shown in the diagram through T1 and T2) and secondly he can sell his crop/product direct to market or end user (shown in the figure (a) with notation M1). A complaint box is provided for launching complaint and resolve farmer's problem. This complaint will be registered in government's database so that government can take appropriate action to resolve complaints.

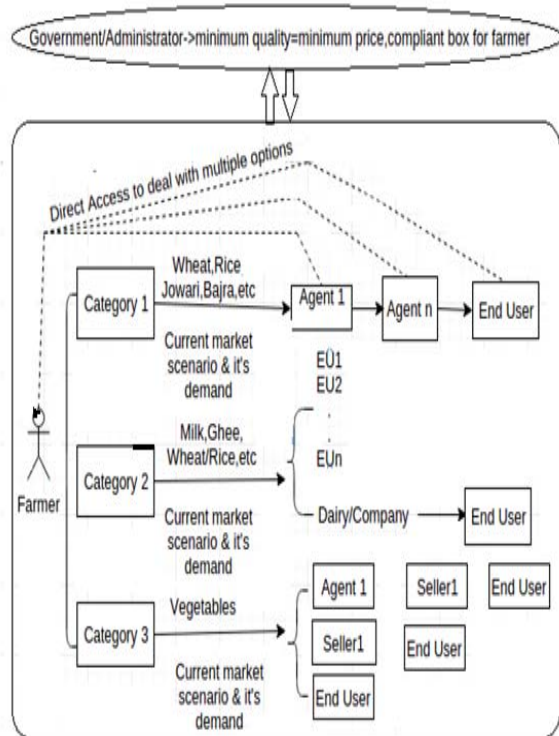


Fig. 2 Data Flow Mechanism

Figure (b)Explanation : Itdescribes the actual mechanism of entire process which indicates marketing flow scenario.“Mechanism of Digital Market Flow”, provides multiple options at each layer as well as it integrates the traditional and modern marketing methods and flow together

therebyit shows that how we can achieve the objectives of being updated as per different crops/product availability and multiple options provided at different layers. In the diagram we can see traditional way as well modern ways of selling. Modern way of selling provide direct access to end users, markets by improving and eliminating the intermediate agents.

On the other hand,“Government module” will control all the system by setting in updating rules and regulations time to time for better management .Government can set minimum price for minimum quality of crop /products and thereby resolve complaints. It also handles overhead raised prices with load balancing technique. Predict different problems with the help of market details (i.e. due to overhead raising of price due to shortage of supply).

Here is the benefits that farmer as well as user will be able to use analysis of market location, stock details and its demand within less time and with less effort .Crop profit can be optimized to maximum level due to multiple options, modern marketing methods and market analysis details that is available for the study .Government module has the authority to set the minimum price for minimum quality of products/crop. Government can set and update the rules and regulations time to time for better and effective management. Government can predict overhead price raised problem before facing the actual problem with the help of market details so that they can take actions to find out solution .Government can apply load balancing technique as current market details is available which will cause to reduce these overhead prices due to less availability in the stocks in the market. Any merchant trying to cheat the farmer will ultimately lead to launch a complaint against him via the complaint box in the system provided.limitation and challenges faced previously:

- After yielding crop/product farmer has limited amount of time to study nearest markets, finding out which market will be more profitable for selling his crop/product.
- Another limitation of traditional marketing method wherein farmers had limited access to clients (Merchants/markets) and thereby getting limited options to sell their crops/products.
- In this entire process, government has very loose control as well as no existence of transparency in the process was visible from Government's point of view.

- (Hamibav)-In case government set the minimum price/base price for better quality of crop/product, there was no such system which will help to implement these rule and regulation in well define manner.
- Load balancing technique: It observed that when particular product is available in less amount of stock then its price can be raised up to 2-4 times more that it's actual price which cause bad effect on common peoples' life. There is no such platform wherein government can control these raised prices and fill the demand for particular crop/product in respective market.

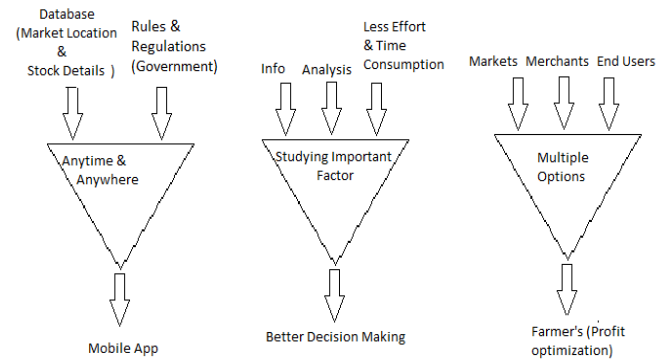


Figure :Output Analysis

Fig. 3 Output Analysis

## VI. EXPERIMENTAL RESULTS

- Merchant's information will also be maintained.
- Efficiency and ease of searching will be increased.
- Accounting process is used systematically.
- List of merchant to the farmers according to their requirements.
- Stocks details of markets will be maintained.
- Quality products will be supplied.
- Launching complaint becomes easy and simple for farmers.
- Fetching market details from app anywhere and at anytime

Thus, the Government will have full authority and control over the system for analyzing the data and make improvement in the current system. The goal is to explore new market places for farmers in current market scenario declared by the government and get the good quality grains at good price and we would be able to maintain successful stock maintenance and accounting process management in a systematic way, display list of merchant to the farmers according to their requirements.

Explanation of Output Analysis :In above figure gives possible outcome for the given input. This figure shows that how above model is influencing different people's life and in what manner.

The people getting affected are:

- Customer / End user
- Merchant/Retailer
- Farmer
- Government
- Market Flow

And the risk that is found as negative impact on system outcomes are:

- Resource availability
- Scalability
- Efficiency

There is dependency in the operation that provide the status between farmer ,merchant and users wherein user's username and password will be stored in database leading to login system. Also the input user id act as valid user which gets stored in cloud thereby loading the information through sql queries that fetch data and store in cloud via web pages to get overall data. The entire working/operation depicts respective valid user wherein government will see farmer claim and updates regarding data, merchant will see minimum price and post the status as well as explore the nearest location and on the other hand farmer will explore nearest location, accept/reject request status and claim the price for crops.

## VII. CONCLUSION

Analysis of Market location, stock details and its demand can be done within less time and with less effort.Crop profit can be optimized to maximum level due to multiple options, modern marketing methods and market analysis details that is available for the study.Government module has the authority

to set the minimum price for minimum quality of product/crop. Government can set and update the rules and regulation time to time for better and effective management. Government can predict overhead price raise problem before facing the actual problem with the help of market details so that they can take action to find out solutions. Government can apply load balancing technique as current market details is available which will cause to reduce these overhead prices due to less availability in the stocks in the market. Any merchant trying to cheat the farmer will ultimately lead to launching of complaint against him via the complaint box in the system provided. With the help of this system, farmer can optimize his crop profit and launch complaint. Government can set minimum price for minimum quality of crop/product. Government can set and update rules and regulations time to time for better and effective management. Government can deal with different problem with the help of market details and load balancing technique.

#### **ACKNOWLEDGMENT**

Authors thanks to Principal & Management of Dr. D. Y. Patil Institute of Engineering Management & Research ,Akurdi, Pune.

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