

# Development Of Farm Management In Modern World

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**Abstract:** Smart farming is a relatively new concept, but its becoming important factor for the agriculture as a way to rise productivity through technology. Our system is addressed to farmers and other actors involved in forming Operations. Such as rural service companies and banks. The system is working in two levels, locals and Cloud. First of all it must be deployed on forms local wireless network and secondly it uses the Cloud Resources and flexibility to offer even more complex services.

**Keywords:** Cloud Resource, Operations, farmers, Cloud, Companies.

## I. INTRODUCTION

The agriculture sector is a continuous development, and lately there is an increasing shift from the traditional to small agriculture where the idea of connecting devices decision systems and uses is crucial. The use of cloud computing is also adding to this fields by enabling complex data analyses, seemingly infinity resources and the ability to correlate in real time data received from multiple source.

## II. ALGORITHMS

### 1] Naive- Bayes classification Algorithm:

In machine learning we are often interested in selecting the best hypothesis (h) given data (d).

In a classification problem, our hypothesis (h) may be the class to assign for a new data instance (d).

One of the easiest ways of selecting the most probable hypothesis given the data that we have that we can use as our prior knowledge about the problem. Bayes' Theorem provides a way that we can calculate the probability of a hypothesis given our prior knowledge.

Bayes' Theorem is stated as:

$$P(h|d) = (P(d|h) * P(h)) / P(d)$$

Where

- $P(h|d)$  is the probability of hypothesis h given the data d. This is called the posterior probability.
- $P(d|h)$  is the probability of data d given that the hypothesis h was true.
- $P(h)$  is the probability of hypothesis h being true (regardless of the data). This is called the prior probability of h.  $P(d)$  is the probability of the data (regardless of the hypothesis).

You can see that we are interested in calculating the posterior probability of  $P(h|d)$  from the prior probability  $p(h)$  with  $P(D)$  and  $P(d|h)$ .

After calculating the posterior probability for a number of different hypotheses, you can select the hypothesis with the highest probability. This is the maximum probable hypothesis and may formally be called the maximum a posteriori (MAP) hypothesis.

This can be written as:

$$MAP(h) = \max(P(h|d))$$

or

$$MAP(h) = \max((P(d|h) * P(h)) / P(d))$$

or

$$MAP(h) = \max(P(d|h) * P(h))$$



The  $P(d)$  is a normalizing term which allows us to calculate the probability. We can drop it when we are interested in the most probable hypothesis as it is constant and only used to normalize.

Back to classification, if we have an even number of instances in each class in our training data, then the probability of each class (e.g.  $P(h)$ ) will be equal. Again, this would be a constant term in our equation and we could drop it so that we end up with:

$$MAP(h) = \max(P(d|h))$$

This is a useful exercise, because when reading up further on Naive Bayes you may see all of these forms of the theorem.

## 2] Application of Naive- Bayes Algorithm

Naive Bayes is a simple and easy to implement algorithm. Due to its simplicity, this algorithm might outperform more complex models when the data set isn't large enough. You can try it whenever you don't need the actual probabilities for each class, but only to know which is the most likely.

A classical use case for Naive Bayes is document classification: Determining whether a given (text) document corresponds to one or more categories. In the text case, the features used might be the presence or absence of key words. I've worked in automatic document classification this past year and Naive Bayes does indeed work as long as the categories are kept simple. However, it performs poorly on sentiment analysis, since the words used are not as relevant as the order in which they're written.

## III DESIGN OF THE MODEL

**1] Use-case diagram:** A use case diagram is a graphic depiction of the interaction among the elements of a system. A use case is used in system analysis to identify, clarify and organize system requirements.

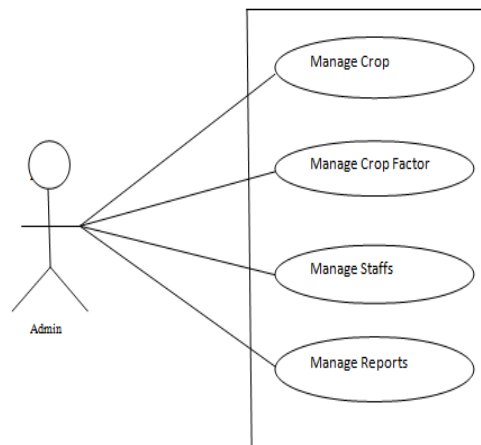


Figure - 1: use case diagram of Admin

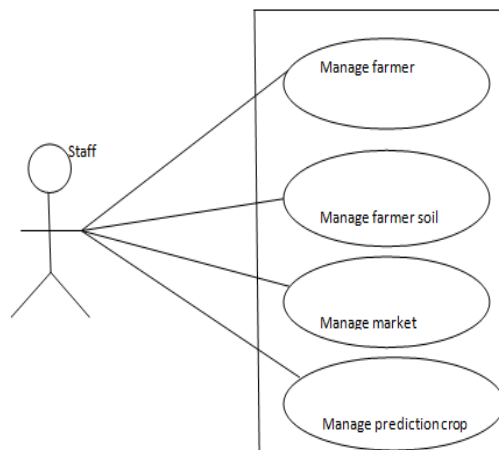


Figure - 2: use case diagram of staff

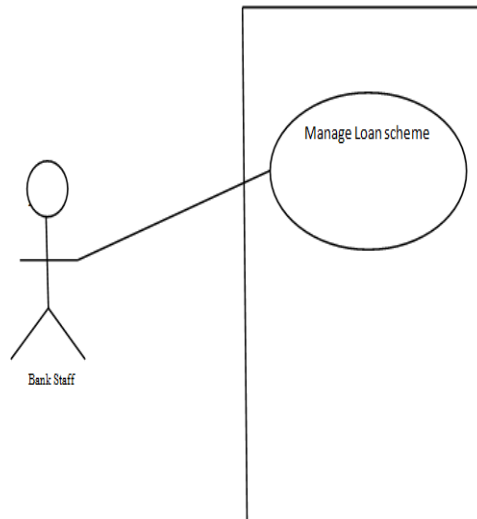


Figure - 3:use case diagram of bank staff

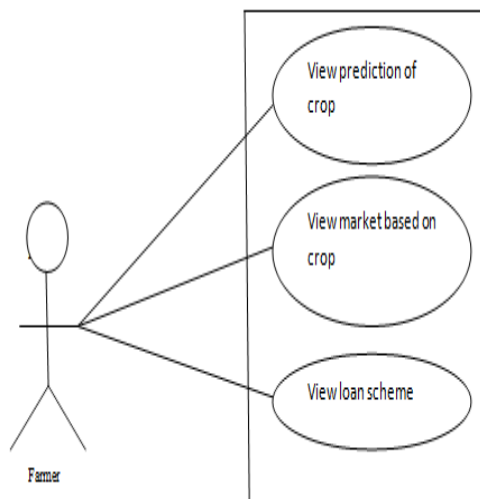


Figure - 4:use case diagram of Farm

**2]Control flow diagram:**The control flow diagram (CFD) is a diagram to describe the control flow of a business process or review control flow diagram ever developed in the 1950s and are widely used in multiple engineering discipliner.

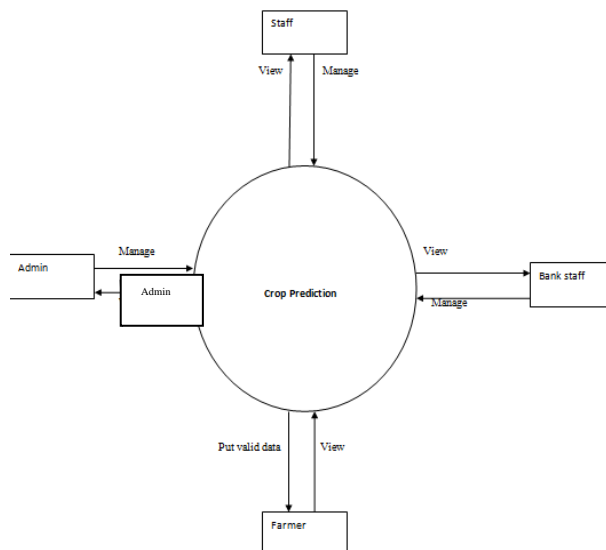


Figure – 5:Controlflow diagram of Crop Prediction



3] **Data Flow Diagram:** It is a graphical representation of the flow of data through an information system, modeling its process aspects. A DFD is often used as a preliminary step to create an overview of the system without going into great details.

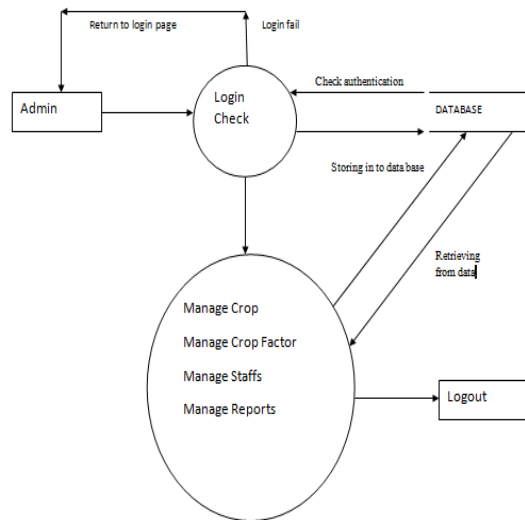


Figure - 1: data flow diagram of Admin

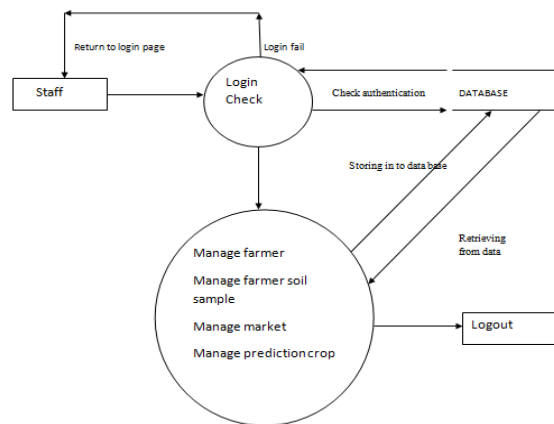


Figure - 2: data flow diagram of Staff

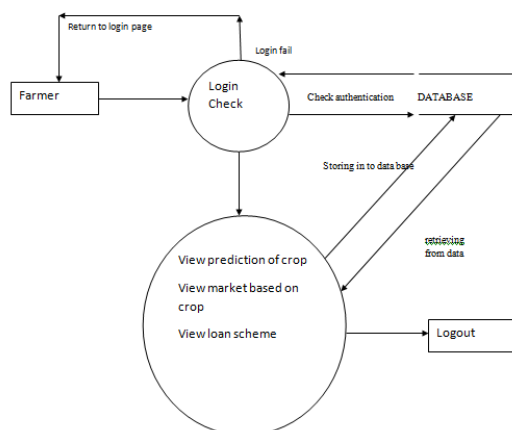


Figure- 3: data flow diagram of Farmer

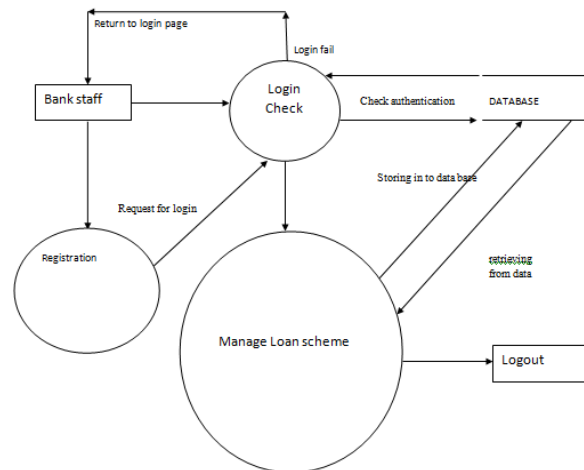


Figure - 4: data flow diagram of bank staff

**4] Crop prediction DBsheme:** It formulates all the constraints that are to be applied on the data. The database schema defines its entities and the relationship among them. It contains a descriptive details of the database which can be depicted by means of scheme diagram.

#### IV. ACTORS

The system contains four modules.

- 1] Admin
- 2] Staff
- 3] Farmer
- 4] Bank staff

**1] Admin:** Admin will be the system administrator who keeps the record of the user. Firstly admin will login into the system by entering his user id and password then He will add the crop types and crops And add crop factors like N, Phos. He should maintain the reports. Then he can logout the system.

**2] Staff:** Firstly the staff login into the system Then the farmer who has to put his details for the crop prediction he should be registered with the company. Then the farmer which is collected by the staff is checked by the third parties in the laboratory and then the soil sample detail is put by the staff. Then the best crop which he can grow to provide good yield is predicted like fruits, nuts, roots etc. The staff has to check the price of different market which are near the former through which he can get good profit. Then the report is provided to the farmer.

**3] Bankstaff:** The bank staff has to register initially with the website. After registration he has to login into the system. The bank staff has to manage crop loan schemes provided by public, private, co-operative bank. Which gives loan to the former at low interest. Then he can logout the system.

**4] Farmer:** Login into the system. View prediction of crop. View markets based on crop. View loans based on banks with rate of interest. Then he can logout the system.

#### V. EXISTING SYSTEM

Integrated cloud framework for farm management is about information technology and the knowledge of crop growth is of great significance for the research on the scientific management of crop cultivation. The difficulty of the farm management is how to precisely acquire the knowledge models of crop growth and other major aspects of farm.

#### VI. PROPOSED SYSTEM

We intend to complete the development stage this project and deployed it in real life farms. We will also validate the model the real data received from sensors, as well as users accessing the higher level services.



## VII. METHODOLOGY USED

- 1] **Data Analysis:** Since we consider that the input data is obtained from various sensors deployed throughout the farm. All the data is composed of the value of the sensors, marked with a timestamp. Operations which can be implemented at the level of the cloud system can include year-by-year statics for various parameters.
- 2] **Prediction based on historical data and many others:** Our proposed solution makes times series Predictions based on historical data and many others Our proposed solution makes time series prediction .There are two types of output generates Short-term prediction and long-term prediction.
- 3] **Data Access Manager:** As part of the proposed architecture The Data Access Manager will intermediate all communication between the local farm computing system And the cloud components. This leads to certain challenges regarding access control. We need to ensure that all the users, administrators or farm owners will not be able to access unauthorized data. Access Control Lists do not correspond with our requirements since ACLs are difficult to manage in an architecture Conclusion and future scope.

## VIII. CONCLUSIONS AND FUTURE WORK

1] **Conclusion and Future Work:** In this article we proposed a multi-layer architecture in the context of IoT applied for a Smart Farming environment. Our solution offers compose services executed on two different type of platforms: in the cloud, or on a mobile platform. The solution also offers interoperability with external services, such as weather and map services, and services specific to the local administration. We also considered that a large number of users may access our platform, As most of the data from the farm level is sensitive, it is important that each type of users should have different access rights to the system's resources and services. This led to the definition of the proposed access control model. As future work, we intend to complete the development stage for this project and to deploy it in real-life farms. We will also validate the model with real data received from sensors, as well as users accessing the higher level services.

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