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Forewarner for Agricultural Variety of Pest Attacks (AGROTIS)

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ABSTRACT: India is the World's largest producer of many vegetables and fruits and second largest producer of wheat and rice, which are the food staples of majority of the world's population. The agricultural sector occupies a vital position in the overall economy of the country. Thus, a variety of industries rely heavily on it. Annual crop losses due to pests and diseases amount to 40,000 - 50,000 crores and a fall of 20-30% in the overall production. The most common problem that the farmers generally face is the pest attack on different varieties of crops. In order to resolve this problem, a system can be introduced which informs the farmers in advance and help them get remedial measures for the same. Farmers can directly dial the Toll-Free number and choose their language and zone. Later, the farmers get the warning messages on their mobile phones in their local languages. Prediction is done using data from past occurrences of pest attacks. The real time expert advice is also provided to the farmers for remedial measures through Kisan Call Centre. This does not guarantee complete prevention of pest attacks however ,it does help farmers get an estimate of when their crops need to be safeguarded the most.

KEYWORDS: Agriculture, Optimised, Cost Effective, Pests.

I. INTRODUCTION

India is the World's largest producer of many vegetables and fruits and second largest producer of wheat and rice, which are the food staples of majority of the world's population^[1]. Agriculture is considered as one of the major means in rural and urban areas in India. As technology grows there are more possibilities for agriculture to grow too^[2]. During the period of growing of crops there are many obstacles faced by the farmers. One of the major problem is the occurrence of pest attack.

In order to resolve this problem, we introduce a system which helps the farmers to get forewarning and remedial measures for the same. This system makes the farmers to enrol themselves in two ways. Either they can directly visit the portal and enrol with their details or they can just dial the Toll-Free number and choose their language and location. Later, the farmers get the warning messages on their mobile phones. To make it convenient for the farmers to understand, the warning message is sent in their local languages. The early warning of insect pest attacks is based on data from systems over the years which monitor atmospheric conditions such as rainfall, temperature and previous occurrences of disease/pest attack which in turn can be used for prediction modelling. Based on this data, the prediction for the upcoming years is done and the forewarning is sent accordingly. The real time expert advice is also provided to the farmers for remedial measures when required.

II. LITERATURE REVIEW

In this modern world where everyone has started to use smartphones in both rural and urban areas. The major population in India uses smartphone equipped with internet. In agriculture, there are more technologies used. In the process of agriculture, the main problems faced by the farmers is the pest attack. For pest attack analysis there is a system for predicting the time when the attack was happened^[2].

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The existing system allows the farmers to enrol themselves in the system and only the warning is given for the pest attack. Like this after having some experiences with the current prevailing system we now are able to site out some of the defects underlying within it. Some of them are:-

- Pest attack has become a main cause of wastage of crops and farmer's hard work goes waste.
- With the existing forewarning platforms, the farmers will be able to protect the pest attacks by knowing only the durations of the attack.
- Also the existing system allows the user for warning in foreign languages only.

III. PROPOSEDSYSTEM

The aim of our proposed system is to provide an application platform for sending warning messages regarding the pest attack in a prior manner. The pest attack's season will be retrieved from the past attack information. Agrotis is a Web Application that works with the current emerging technology of database retrieval and storage. It is primarily developed on the eclipse J2EE platform which comprises of HTML .The application backend runs on java servlet.

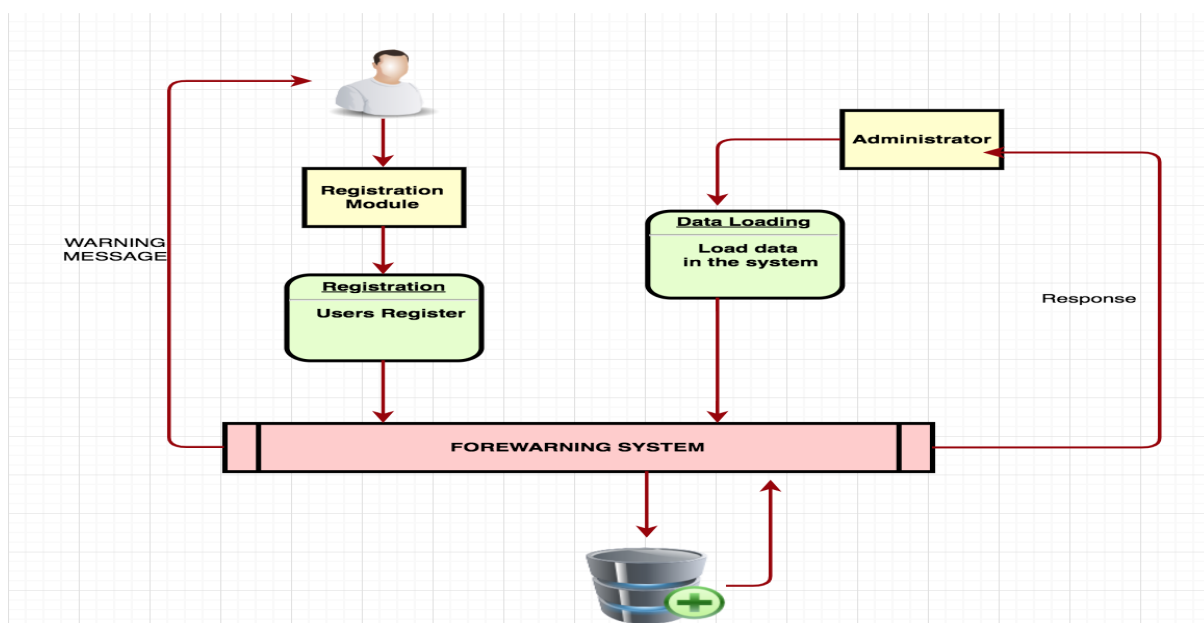


FIGURE 1: ARCHITECTURE DIAGRAM

Hence by using our proposed system farmers based on their region can register. The proposed system is built on the latest technologies and is based on services and API's for communication.

The farmers can register in the website and once they have registered an acknowledgement is produced through an E-mail and SMS as well. After the registration process the farmers are allowed to login into the site and they can use it according to their needs.

IV. IMPLEMENTATION

The implementation of our project is done using Java, HTML, XML and MySQL. The primary modules in the project are Login module, Registration module, Web Portal, Maintenance module. Each module has been divided into separate pages and components. Each page imports several components together and interacts with the backend database using services and routes.

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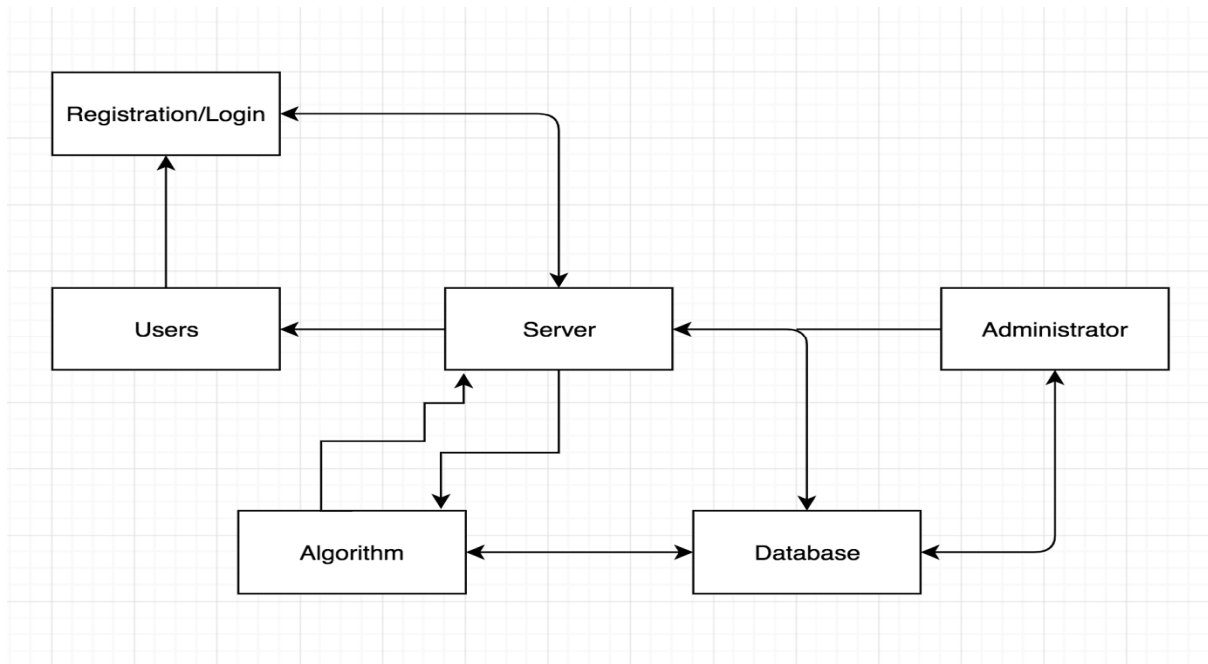


FIGURE 2: BLOCK DIAGRAM

When a farmer wants for a forewarning for his crops, the farmer has to first register in the application, and then he can login using his credentials. At the home screen of the application the user can view all the regions in India. The farmers can then call the toll-free number and clear their doubts on what pesticide to use on their crops and how to prevent pest attacks in the specified season.

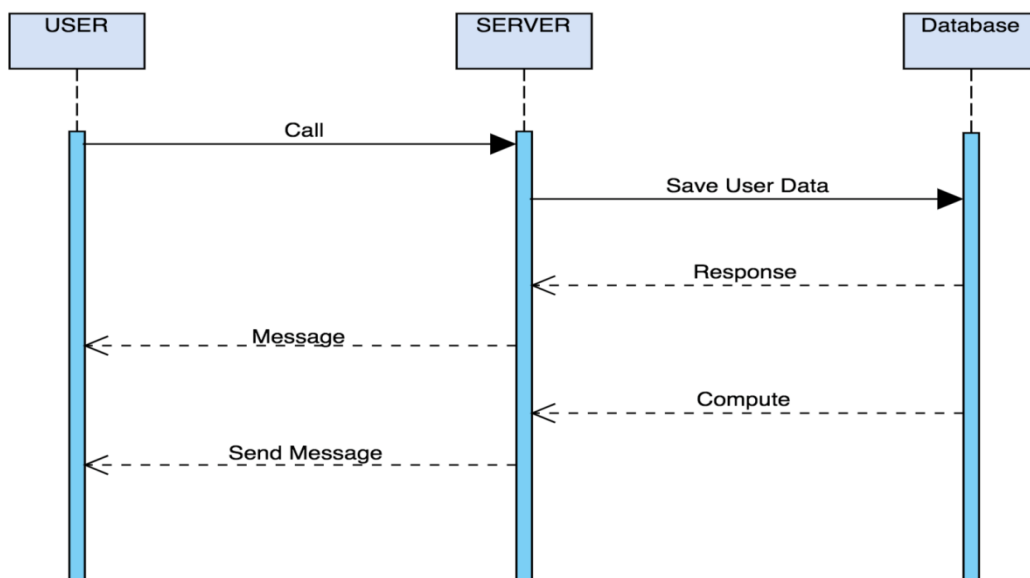


FIGURE 3: SEQUENCE DIAGRAM

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The farmers can also view the information of pest attack which was occurred in the past. A forewarning message will be sent to the farmers based on the past information.

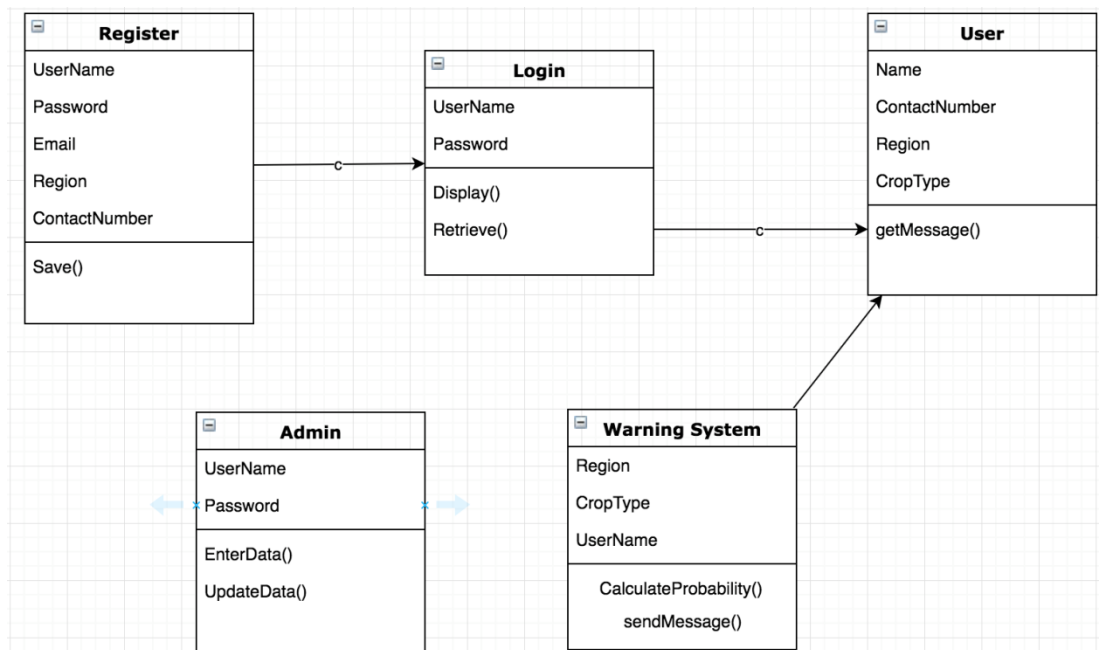


FIGURE 4: CLASS DIAGRAM

The warning system works by retrieving the data like region, crop type, user name and also calculates the probability of the occurrences of the pest attack in past years. After calculating the accurate forewarning message is sent in the same month which was been predicted by the probabilistic analysis. The farmers get benefited by using the appropriate pesticide for the type of crop that they have cropped.

V. RESULTS

We have used a simple design, the farmers feels comfortable in the registration process. For back-end we have used tomcat server which is open source along with MySql for data storage. The front-end is designed using Html, Css and Javascript.

FIGURE 5: REGISTRATION PAGE

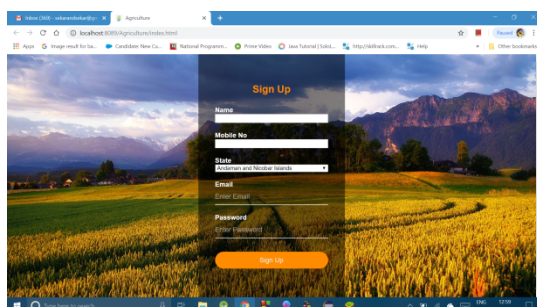
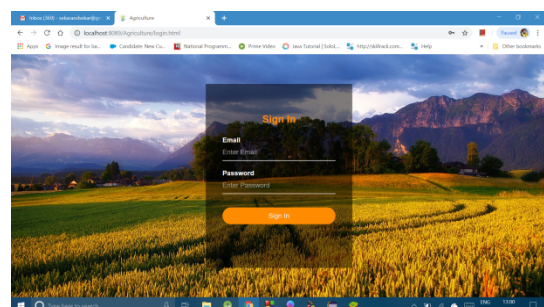


FIGURE 6: USER DASHBOARD PAGE





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When the user first visits the portal, the farmer has to either login if they already have an account, or else register first. If the farmer has already signed up then the system will redirect to the page .

FIGURE 7: USER ACKNOWLEDGEMENT MAIL

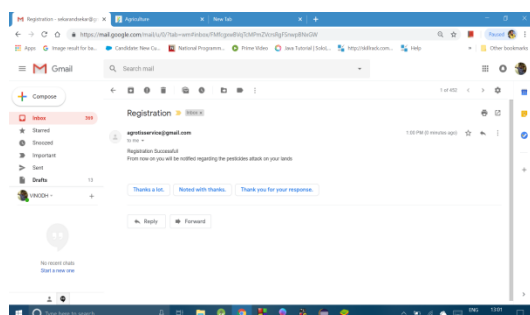
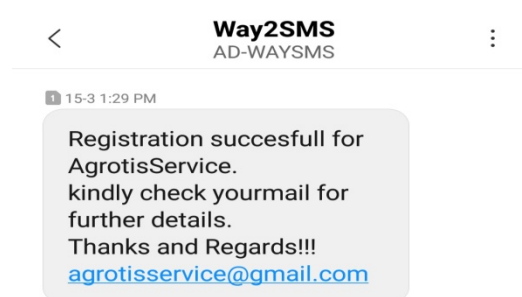


FIGURE 8: USER ACKNOWLEDGEMENT MESSAGE



After logging in, the farmer will be getting an acknowledgement saying that the registration was successful for agrotis service. Once the message and e-mail is generated the farmer is eligible to get response from the forewarning system service (Agrotis service). The farmers can enclose the details of the crop type, wanted pesticides in their regional languages. The farmers gets enabled with a simple regional language application which provides information related to pest attacks on the crops of their region.

VI. CONCLUSION

The trend towards agriculture makes the farmers to develop their style where there must be a high enabled security for the quality of their crops. The wholesaler checks the quality of crops before purchasing it from the farmers. To ensure that the harvest to be a fulfilled one, the farmers must use a system which ensures that the pesticides used for the pests is appropriate for the crop type. The forewarning is provided according to the past pest attacks. The system provides the apt pesticide for the crop type mentioned by the farmers, which makes them feel easier to buy the pesticides for their crops. The pests are the major malfunctioning factor for the crops. Naturally, the crops get spoiled because of some pests. Agriculture is one of the very essentials every nation in this world needs. This would in one way protect agriculture and in other way make the life of a farmer a little easier.

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