AICTE-ECI-ISTE Chhatra Vishwakarma Awards

"Empowerment of Villages through Technologies "

PROJECT SUMMARY

Submit your Innovation Proposal plan in maximum of 5 pages including chart and graphs.

Project Name: Farm-Suite – An All in One Mobile App platform that supports farmer

Team Name: Insights!

Team Lead & Members:
1. **YATHEENDRA PRAVAN K.M. (Team Lead)**
2. **VENKATESH PRASAD R (Team Member)**
3. **VENKATESH N (Team Member)**
4. **HARINI S (Team Member)**

Mentors name: Mrs. Priya Vijay

Institute Name & Address: Rajalakshmi Engineering College, Rajalakshmi Nagar, Thandalam, Chennai - 602105

Sub-Theme: Agriculture & Food

A. **Title of the Innovation Proposal: Farm-Suite – An All in One Mobile App platform that supports farmer**

B. **Project Description:**

> **Explain about the Problem/Development Challenge/ Market Need/ Opportunity identified and how big the problem is.**
>
> A K SRIVASTAVA Dy. Director General National Sample Survey Office Min. of Statistics and Programme Implementation, Government of India (source: http://www.fao.org /fileadmin/ templates/ess/documents/meetings_and_workshops/APCAS23/documents_OCT10/APCAS-10-23_ -Agri-census_India.pdf) says agriculture contributes 27% to GDP and provides employment to 70% of population while agriculture covering 50% of country's geographical area. As per Registrar General of India & Census report 2011(source:https://www.quora.com/How-many-farmers-or-agriculturists-are-there-in-India-and-how-many-are-interested-to-work-in-agricultural-throughout-India, http://www.indiaspend.com/special-reports/how-many-farmers-does-india) the total farmers or cultivators population of India is 118.7 million (2011) & 144.3 million agricultural workers/laborers which consists 31.55 or total rural population. Total cultivators in rural areas have declined from 40% in 2001 to 33% in 2011. Gender-wise, females have moved away more sharply than their male counterparts from being cultivators. From the table below, it is clear that total cultivators in rural areas have declined from 40% in 2001 to 33% in 2011. Gender-wise, females

have moved away more sharply than their male counterparts from being cultivators. Their percentage has fallen from 37% in 2001 to 29% in 2011.

	2001			2011		
	Male	Female	Total	Male	Female	Total
Rural	42	37.1	40.2	35.2	28.8	33
Urban	2.5	4.1	2.8	2.7	3.1	2.8
Total	31.1	32.9	31.7	24.9	24	24.6

(Source: http://www.indiaspend.com/special-reports/how-many-farmers-does-india)

Even though many schemes are introduced by government to improvise the living needs of our farmers, the percentage declines due to various factors like labour issues, flood/drought, low productivity, suitable crop for the weather condition, low farm price etc. There is also a lack of knowledge among farmers based on these factors as well as the schemes government has to support farmers. These schemes and solution to the issues are well handled through government official websites and mobile apps but there is no one such app which covers all the problems and provide solution to them about all government schemes, intimate climatic conditions, teach proper crop selection and fertilizers, supply demand mapping analysis and target market analysis that need to be addressed in native language. All the mobile apps are supporting either text or voice which will not suit for ignorant/blind farmers

Explain about Innovation of Solution that you are proposing and want to develop to address the Problem/ Development Challenge/ Market Need/ Opportunity Identified

Farm-Suite is an end-to-end functional suite that encompasses of services and modules to enhance the productivity of the farmer to a greater extent. The salient provisions or modules of the application are multitude;

- Firstly, **an awareness simulator that aims at issuing real time notifications of any beneficial scheme** and announcements for the farmer put forth by the government.
- Secondly, **a profit escalator proffers precise recommendations for the crop to be sown to maximize the profit** are propounded, based upon the deployment of predictive models trained over mammoth amount of crop and farming related data collected over a period of time, in addition to contemplations about the features/conditions of the farm.
- Further **support is extended till the harvest by periodically suggesting the kind of fertilizers** to be used, **weather predictions to plan in advance and other farming assistance**.
- The application employs **video analytics mechanism through a deep learning model which brings in painstaking attention to details about the farm constituents, mainly for the purpose of identifying the crop disease, soil condition** and accordingly **suggesting prophylactic techniques in order to ameliorate the condition of the crops**.
- The application **suggests target market area and employment place** using supply demand analysis and target market analysis
- All these services that the application is equipped with are made easily procurable to the farmers, through the application's **native language support in both text as well as voice**.

Explain the technology and Intellectual property right component involved in your proposed innovative solutions in the process of developing the technology prototype.

Digital Agriculture which makes use of Information and Communication Technology (ICT) to support the transmission of localized information and services working towards making farming socially, economically and environmentally sustainable. This also led to the rise and development of mobile apps which are helping existing government schemes, and other agriculture-based information to reach farmers in rural India. **This system will depend upon the sensor data gathered using the IoT infrastructure, along with the use of accurate prediction algorithms, the results of which are communicated to the farmers using an appropriate mobile app user interface the system would consist of. Analysis and extraction from collected data would take place in the server of the system**. The technology what we use to build the application are

Awareness Simulator:

Creating awareness amongst farmers who may find it difficult to visit government sites to know about the latest schemes and services announced by the government for the welfare of the farmers. This module scrapes all those government sites for the data, converts it to the native regional language of the farmer, and displays it as a notification in the mobile device in real time. This module also uses the text-to-speech api provided by Google to make sure the announcements can be heard as well, thereby increasing the usability.

Profit Escalator:

The farmer/any helper needs to input information such as the size of the farm, previous crop that has been sown, soil condition and such data will be used to predict the best suitable crop. Along with the crop combination, the profit he would gain will also be predicted and is suggested to the farmer using polynomial regression.

Farm Maintenance:

This module is where the farmer needs to take a video of the farm or the tractor. The video in the server side will be processed to identify leaves, soil condition and various tractor implements. Once the frames have been identified they will be used as an input to predict for any crop disease prevailing in the crop using CNN, soil condition monitoring and as well as implement wear monitoring using Template matching and Contour detection. Along with these, fertilisers that can be used to protect the farm for the suggested crop are also recommended. Weather data based predictions are also provided to the farmer to make him plan in advance using IOT.
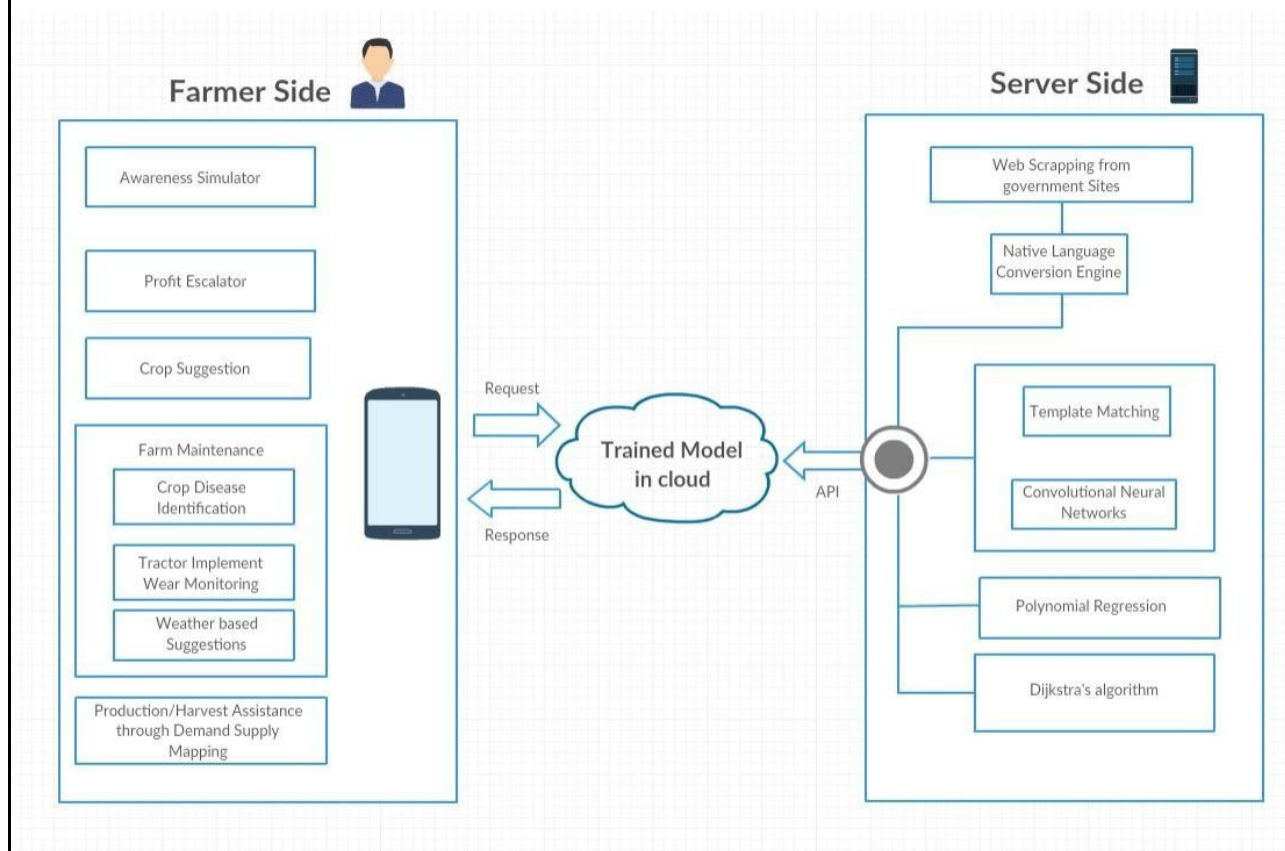
Demand Supply Mapping:

When the harvest period is approaching the data that has been collected from the farmers side is used and coherent buyers for his produce is mapped. This done using dijkstra algorithm to find the shortest path between the demand and supply and thereby reducing the transport and miscellaneous cost for the farmer. The rate is decided based on government standards thereby eliminating the middleman completely and maximising the profit.

Explain about target beneficiary group and size of market for your innovation and quantify kind of immediate benefit (Output), long term benefit (Outcome and impact it will create once will be adopted by them

- The target beneficiary groups are farmers who are considered as 70% employment generation people as said in problem identification.
- The app will be developed in Hindi and Tamil and so that major states of India can be benefited through our product.
- The product can be immediately put in Google play store as it is developed using android environment so that any farmer can use it using their smart phone.
- The product can be used by the farmers at any time in long duration as weather report is considered then and there in real situation using sensors and weather API.
- As the suitable crop to be shown for the region is identified and target market is suggested for each season and region, it will increase the productivity and improve the living status of the farmer and will give them confidence to live through and avoid farmer suicides.

Highlight the delivery model on how you will implement or take the innovation to market or target beneficiary.

The delivery model will be a mobile application named "Farm-suite" which can be downloaded from Google Play Store. The delivery model diagram is given below as architecture diagram with menu and modules what we are going to have in the app.

Team Capability & Competency

Role of each member

Team Member	Role (Contribution towards F-Suite)
Yatheendra Pravan K M	Implementing Machine Learning algorithms, Developing Mobile Application, Client-server architecture configuration
Venkatesh Prasad R	Data Analysis, Client-server architecture configuration
Harini S	Data Analysis, Mobile Application Development
Venkatesh N	Video Creation, UI Design, End-to-End Designing
Priya Vijay	Mentor

Strength of Team

The team members and mentor have actively participated and won many hackathons and published papers in various journals and international conferences based on machine learning, Mobile App development and IOT jointly and separately on their own. Yatheendra Pravan K M is a Machine

Learning Enthusiast who developed many mobile apps for our college. Venkatesh Prasad R is an aspiring Data Scientist with a NanoDegree from Udacity on Data Analytics to his credit. Harini S has novice level knowledge in the field of Machine Learning been part of a Summer school on Data Science. Venkatesh N completed the many designing courses and is proficient in photoshop illustrator and many other designing tools. Mentor Priya Vijay guided many UG and PG projects and mentored Smart India Hackathon 2017 and won first prize under ISRO category and KPIT Innovation award under MIB in 2018 Smart India Hackathon.
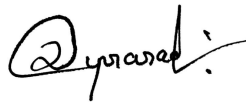
C. Conclusion

System aims to contribute towards the Smart Agriculture by providing the farmer with results of efficient analysis and prediction, done using the processing of real time data. Thereby enabling and assisting the farmers to implement suitable methodologies contributing towards good quality production as well as maximising the yield, hence benefitting from it. This system will depend upon the sensor data gathered using the IoT infrastructure, along with the use of accurate prediction algorithms, the results of which are communicated to the farmers using an appropriate Mobile App user interface.
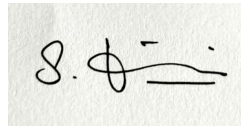
Signature:

| (Team Leader) | (Team Member 01) | (Team Member 02) | (Team Member 03) |

Declaration: *I hereby declare that all the above information furnished herein by the team is true to the best of my knowledge. I understand and accept that our application for the contest may be cancelled in case the above declaration is found to be false.*

(Priya Vijay)

Date: 16/08/18
Place: chennai