Smart farming technique using Internet of things

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Abstract—**In India the farmers uses traditional methods for farming which is highly dependent on there past experience of crops cultivation but now a days there has been drastic change in ecological and geographical condition due to various causes like global warming, rise in sea level etc. the consequences of these causes produces uncertainity in weather conditions causes irregular rain fall by considering these cases we are developing these device which constantly monitor the soil and unprecedented weather behaviour which will notify the farmer in real time so that profitable decisions can be taken by avoiding the risk factors. . The main purpose of these projects is to provide a farmer a new generation device that can be use in agriculture field over any electronics device using Transmission Control and Internet Protocol through any smart phone or Internet operating device. The technology implemented for this purpose is Internet Of Things. The microprocessor that we use here is Raspberry Pi that will include all different types of sensors in cooperated. This device will operate in farming place where it can sense data from agriculture like soil quality, Water Level in soil, fertility, Humidity and temperature that requires crop to grow at specific time period it will analyze data that is received from agricultural area and give farmer a statistical data that will help farmers to solve their crop cultivation.**

Index list : Internet of things, RaspberryPi, Precision Agriculture, cloud computing

I. INTRODUCTION

Smart farming for precision agriculture is based on IOT and Monitoring agriculture which is accessible through the main frame Internet Infrastructure using web application [4] . The server response system will be integrated with the strong database support in order to process the response or feedback obtained from device. This project will reduce the gap between customizable electronics devices and programming application or softwares since because of these project electronic devices can be programmed, interfaced and Monitored with any other Object Oriented Languages like Java and Web based language like HTML, PHP etc [5] .

New innovative IoT applications are addressing these issues and increasing the quality, quantity, sustainability and cost effectiveness of agricultural production. Today's large and local farms can, for example, leverage IoT to remotely monitor sensors that can detect soil moisture, crop growth and livestock feed levels, remotely manage and control their smart connected harvesters and irrigation equipment, and utilize prediction logics and analytics to quickly analyze operational data combined with 3rd party information, such as weather services, to provide new insights and improve decision making.

II. EXISTING SYSTEM

A. ThingWorx IoT Platform for Smart Agriculture

The Internet of Things (IoT) is transforming the agriculture industry and enabling farmers to contend with the enormous challenges they face ThingWorx [1] provides the first purpose built IoT platform designed to meet the unique needs of today's connected world. As the leading IoT platform, ThingWorx delivers the security and scalability to handle millions of daily transactions. With ThingWorx you can deliver powerful, new smart agriculture IoT solutions in a fraction of the time of other approaches. The *ThingWorx IoT Platform* helps farmers to Easily collect and manage the explosion of data from sensors, cloud services such as weather or maps, connected equipment and existing systems it quickly

build and bring to market new innovative IoT applications at 10 times the speed of other approaches with our rapid application development environment and drag and drop mashup builder. It has Leverage big data and analytics to provide new insights and recommendations to aid in better decision-making. It Enable farmers to easily visualize data and take action on insights and recommendations.

B. FarmMap

FarmMap is the precicision irrigation optimization system [2] which comes with comprehensive sensor package sensors measure soil, plant and environmental variables to accurately measure water stress. its advanced predictive algorithms deliver real-time irrigation actions. The The FarmMap system instructs the farmer precisely when to irrigate, hence directing the farmer to use the exact amount of water crops need. this system remotely monitors your field so farmer don't have to go thereand check. Get the best data delivered to its customers, without taking manual soil moisture and pressure bomb readings. It allow the farmer to take the pulse of his farm with a single glance.The FarmMap dashboard highlights the problem areas on farm. its prediction engines will warn the farmer about upcoming irrigation needs a week in advance. Map the soil contours of your farm .its high granularity soil sensing array can help farmer to identify percolation differences across different soil types in your fields. farmers can operate their farm from their smartphone this system provides farmer notification service farmers Receive important notifications on the go from our smartphone app, or via text message.

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C. Kaa Intelligent farming system

For farmers and growers, the Internet of Things has opened up extremely productive ways to cultivate soil and raise livestock with the use of cheap, easy-to-install sensors and an abundance of insightful data they offer. [3] Prospering on this prolific build-up of the Internet of Things in agriculture, smart farming applications are gaining ground with the promise to deliver 24/7 visibility into soil and crop health, machinery in use, storage conditions, animal behavior, and energy consumption level.The Kaa open-source IoT Platform is a crucial middleware technology that allows walking safely into the agriculture IoT field. By tying together different sensors, connected devices, and farming facilities, Kaa streamlines the development of smart farming systems to the maximum degree possible. Kaa is perfectly applicable for single-purpose smart farming products - such as smart metering devices, livestock trackers, or failure prediction systems - as well as for multi-device solutions, among which are resource mapping and farming produce analytics solutions. Kaa is feature-rich and, as an open-source platform, grants full access to its modules for any necessary modifications, extensions, or integrations. Out of the box, Kaa already provides a set of ready-to-use components for a quick start with smart farming applications.

III. PROPOSED SYSTEM

In the proposed system is based on precision agriculture which uses Internet of thing with concept of smart farming and digitization to yield high precision crop control and felicitate Intelligent farming techniques. This system will consist of soil, temperature, weather sensors which will provide abundance of insightful data and with the help of prediction logic the status of the crops and envoinmental conditions will be evaluated and the report will be provided to the farmer.

A. Acquisition of data and Evaluation of farm status

The Acquisition of data is the important step in this process where the system will the sensors will read the fundamental parameters of the environment like soil, weather, moisture etc Now the data acquired from sensor will be provided to microprocessor. The microprocessor that we use here is Raspberry Pi that will include all different types of sensors in cooperated. This device will operate in farming place where it can sense data from agriculture like soil quality, Water Level in soil, fertility, Humidity and temperature that requires crop to grow at specific time period it will analyze data that is received from agricultural area the analysis of data acquired from sensors will be used in prediction logics in order to evaluate the status of farm. and give farmer a statistical data that will help farmers to yield good crops.
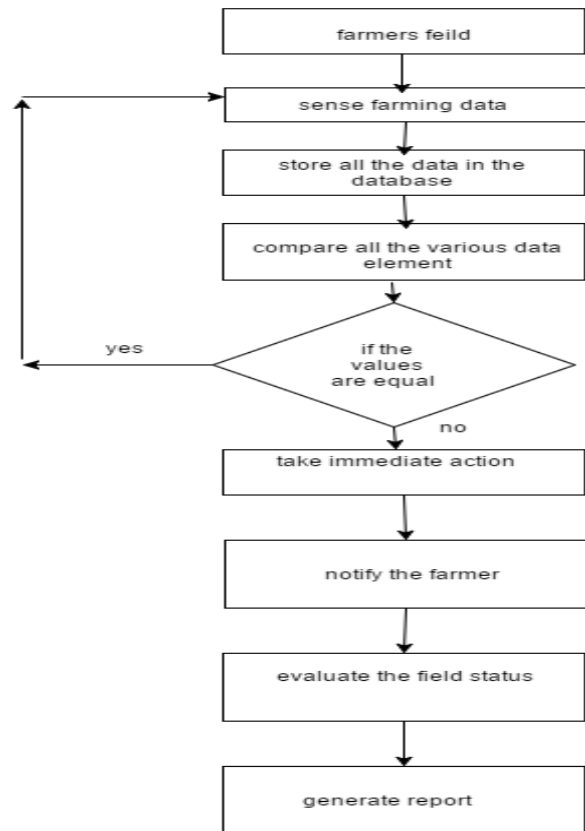

fig 1. Flow chart of the proposed system

IV. CONCLUSION

Despite being a newer concept in the field, there has been a tremendous popularity in the agricultural circuits about the benefits of smart farming and the applicability of IoT. It has been looked upon as a hope to encourage innovation in agriculture with "connected farms" speculated to be the future of farming considering the Indian perspective . IoT could be utilized to make the best out of our agricultural potential.

V. REFERENCES

[1] L. Donney, Smart, Connected Applications Maximize Agricultural Business Performance, Boston, MA 02108: Blue Hill Research.

[2] "farmx.co," Skydeck, [Online]. Available: http://kit.farmx.co/. [Accessed 21 1 2017].

[3] "kaa IoT platform," CyberVision, 6 3 2014. [Online]. Available: https://www.kaaproject.org/agriculture/. [Accessed 21 1 2017].

[4] V. Ovidiu, Internet of Thing - From Research and Innovation to Market Deployment, 922,Alborg, Denmark: River Publisher.

[5] S. Richard , Unix Network Programming, 24th Street Avenue, Chicago, USA: Wright Publishers, 2001.