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## A Novel Approach for Farm Management Using Cloud Computing

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**ABSTRACT:** It is important to optimize cultivation management to improve agriculture. Agricultural work has been primarily managed based on the intuition and experience of skilled farmers. We propose a new framework for managing the precision agriculture using ICT Tools. Cloud computing technology is used efficiently to address the needs of various stakeholders in the agriculture field.

**KEYWORDS:** ICT Tools, Precision Agriculture, Cloud computing.

### I. INTRODUCTION

Precision agriculture [1] is aimed at systematically optimizing farming management. Cultivation management requires records of agricultural work and analyses based on the records to manage agricultural work, e.g., to know exactly how much fertilizer and pesticide is used and control production costs. Although records written on paper have been used for cultivation management, it is difficult to analyze much of this data.

Communication is important in the field because workplaces for farmers in agricultural corporations are often separated by distance. A system of cultivation management should help farmers refer to their work plans and enter field data in realtime. It is also important for the system to be accessed from anywhere.

The system should also help farmers at farms and offices share their plans and data, and analyze the collected data to make agriculture more efficient.

Moreover, it is also important for the system to be less expensive and affordable to enable cost-effective agriculture. A web-based system with smartphone applications and web browsers is considered to be one of the best models to satisfy these requirements. Smartphone applications can help information to be collected from farms. A cloud system would help farmers share collected data and access them from anywhere. Farmers at the office could use this information to do some useful things to increase productivity.

Integrated pest management (IPM) is a way to prevent pest risks for long term using effective methods. Storing this information as ontology is the best option, as it then can be used by number of automated systems in agricultural field. We describe automated method for construction of IPM ontology as web ontology language document and explain how it can be made available to farmers as an IOT application.

Excessive use of pesticides on crops increases risk not only to human health but also to environment. Farmers do not have information about precise application of pesticides and it causes harmful effect on other organisms including human.

IPM provides guidelines on when pest management action is needed and how to use a pest management tools.

One of the best options to spread IPM techniques to farmers at all levels is through internet and mobile applications. A Semantic Web technology is a way to achieve machine interpretable meanings for IoT data. In semantic web, knowledge is represented in meaningful way as ontology.

Internet of Thing is the future of internet, of smart devices, of embedded systems and of nations.

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Links do not provide complete delivery, they are binary they may exist or may not. Services are simple data without any format.

C. Research of real-time image acquisition system based on ARM 7 for agricultural environmental monitoring.

Authors: Jiezhong, aicheng li, jianlongli, qi yang, chengcheng gang.

It is mainly based on internet of things for the development of agriculture. To solve the problems of video acquisition, image acquisition, they use ARM S3C44B0X processor. They transplant uclinux and uboot. They implemented object examination algorithm using background difference based on software platform. It has small volume, low cost, good expansion, multi functional and low power consumption. The system realized the functions of real-time video acquisition and processing. They are combined with GPS and other sensors. We cannot generate read and write as many times when it is set on 32bit. The FLASH interface circuit, data is not continuous when read-in but regular intervals.

D. A study of prediction requirements in real time control of wave energy converters.

Authors: Francesco Fusco and John v Ringwood.

This technology helps in predicting excitation force. It helps to transfer power from ocean to system. The reactive control or complex-conjugate control, specifies the conditions under which the system is always in resonance with the wave force. We consider single floating body to move in one degree of freedom.

## II. RELATED WORK

Precision agriculture is aimed at optimizing farming management and it requires records of agricultural work.

Farmers conventionally write records on paper but it is difficult and tedious to check past agricultural-work data and control the cost of agricultural products.

Cultivation management requires records of agricultural work and analyses based on the records to manage agricultural work to know exactly how much fertilizer and pesticide is used and control production costs.

Excessive use of pesticides on crops increases risk not only to human health but also to environment.

Farmers do not have information about precise application of pesticides and it causes harmful effect on other organisms including human.

## III. PROPOSED WORK

A system of cultivation and cost management, iFarm is proposed, which was developed to support efficient farming. Excessive use of pesticides on crops increases risk not only to human health but also to environment. Farmers do not have information about precise application of pesticides and it causes harmful effect on other organisms including human.

IPM provides guidelines on when pest management action is needed and how to use a pest management tools.

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## IV. LITERATURE SURVEY

The different works carried out in this domain are as follows.

A. A new parameters optimization method for screw conveyor based on PSO.

Authors: Jianghui Cai and Wenjun Meng.

Particle swarm optimization (PSO) is a population based technique. They are used to transport bulk materials for short distances. They are used in many bulk materials applications in industries ranging from industrial minerals, agriculture, pharmaceuticals, chemicals, pigments, plastics, cement, sand, salt and food processing. PSO uses genetic algorithms. They use fitness value which keeps track of best solution. This fitness value is called pbest, and another value is called best.

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Parameters chosen is very complex. It is very difficult to arrive at optimal solution. This technique is not easy and quick but it is efficient. The problems arise are surging and unsteady flow rates, metering and dosing. They require high start-up and excessive power.

B. Service entity model for internet of things.

Authors: Abdelouahidzakriti and zouhairguennoun.

It provides model for internet of things. We connected pc's and servers to build Internet. It is mainly based on 'service' concept but can bind peer models like 'object' concept. The devices in this concept are not unique but they are divided in fragments. Many entities are using internet like Internet Protocol (IP). It is a real paradigm which requires long term research for both academics and industries. Depending of their coverage per unit: like wide area network (WAN), metropolitan area network (MAN), local area network (LAN), personal area network (PAN), and most recently body area network (BAN).

## V. SYSTEM ARCHITECTURE

The system consists of three sub-systems: a smartphone application, a cloud server, and a Web browser. Farmers in the field can check information on work plans and send field reports to the office using a smart phone application. All data are stored on the cloud server and can be accessed everywhere from farms and offices. A Web browser is used to manage field and work schedules and control costs. The browser can be used on a smartphone, a tablet, or a personal computer depending on the situations and usability requirements. Costs are controlled and cultivation is managed with the browser with the data stored on the server.

## VI. CONCLUSION

Cultivation management system is developed to help the small farmers using ICT tools. Cloud Computing is used to manage the data efficiently. Integrated Pest management techniques are used to reduce the usage of pesticides with increased crop yield.

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