Implementation of IOTs in Agriculture Industry in China

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The ambition of the IOT implementation in China agriculture industry

- The existing domestic greenhouse planting modes are as follows:
- Crop growth environment relies mainly on farmers' personal experience or sensory experience rather than precise and reliable quantitative data, thus successful experience of planting is not easy to be summarized and replicated
- Ambition and solution:
- Rural economy have been the most attractive issues in the world.
- IOT Regarded as one of the most promising technology for propelling agriculture, farming, fishing and poultry industry, to reduce cost and enhance rural labour efficiency significantly.
IOT Farming Market Overview

➢ The development of China's agriculture has been from manual agriculture to mechanical agriculture, and then to smart agriculture.

➢ The application of the IOT make great contribution to the development of China modern agriculture and intelligent agriculture

➢ Intelligent, network and data processing become the main features of a new round of China agricultural infrastructure

Farming wireless weather station applied--low cost and maintenance
The structure and principle of the IoT agriculture

- **Alarm management**
  - data center

- **Remote control**
  - Adapter gateway

- **Expert system**
  - Identity management

- **Mobile network**
- **The fixed network**

- **Internet**

- **Facilities**
- **Sensors**

- **Gateway**

- **Controller**
- **Collector**

- **Personalized portal**
- **Common service platform**
- **Communication service + information operations**
- **The convergence of fixed and mobile Internet capabilities**
- **Standardization of the underlying sensor and controller interface, support hierarchical domain networking**
1. IOT wireless sensing layer

In the sensing WSN layer, all environment parameters will be acquired in real time including living conditions such as temperature, humidity, light condition, ammonia gas density and sensor measure equipment working status and location. All those parameters and data are detected and collected by sensor network system. The sensor network used to collect data and physical parameters, radio frequency devices, sensors, mobile terminals, WSN equipment.
IOT application in china farming
Intelligent agriculture surveillance

Realtime surveillance

Information analysis

Fault alarming analysis

Remote devices control

Decision & policy support

Sensor layer
Transmission layer
Processing layer
Application layer
The expenses of Infrastructures of the IOT green-house with an area of 2,000 square meters: 15076.6 dollars. The annual cost of system operation and maintenance: 1809.2 dollars.

**Advantages**

Through measuring related parameters by the IOT scheme, water resource can be saved significantly by accurate irrigation.

Saving human resource expenses, i.e, reducing one management staff and one worker.

Measuring mixed rate of integrated soil chemical fertilizer and water. Compared to conventional method, the farm IOT scheme can reduce waste of chemical fertilizer as well as soil pollution dramatically.

Improve green house live rate and reduce growth period as well as improve product volume significantly.

Improve the efficiency and reduce labor intensity, managers don't need to keep for a long time on the farm, at home or abroad on holiday can be managed.

**Saving expenses**

Compared to conventional irrigation, the IOT scheme can save water resource up to 67%.

Saving human resource expenses of 758.8 dollars annually. Human cost can be recycled within 3 years.

Saving chemical fertilizer expenses 452.3 dollars and increase fertilizer utilization rate up to 40% annually.

Farm live rate can be improved from 20% to 80%. growth period reduced up to 30%, production volume improved one or more times, respectively.

It can recover the construction investment costs, realize earnings in a year.
IOT: various farming scenarios benefits

01 farmers
realtime acquired data of farming & disaster alarming

02 farming consultants
Analysis on acquired data & make valuable decision

03 farming finance
Farming investment & insurance surveillance according to data and analysis

04 local government
Rural marketing policy decision support
Farming analysis & major functionality

1. Real-time data:
   Agricultural field, i.e. temperature, humidity, light, soil moisture data network is passed to the data processing system for intelligence analysis and processing;

2. Real-time surveillance
   Users can watch anytime and anywhere through mobile terminal, i.e. PAD, handset or laptop to agriculture field actual images, remote monitoring of crop growth process

Real-time data and video to make managers more at ease.
Farming analysis & major functionality

- **3. Data storage**
  
  Based on historical data can be stored, form a knowledge base, at any time in processing and query;

- **4. Data analysis**
  
  System through the intuitive form to when the data chart and spatial distribution, which can provide daily, monthly and other review as well as analysis.
Farming analysis & major functionality

5. Remote control

Users can at any time, anywhere, by any Internet terminal can be implemented to the agricultural field devices of all kinds of remote control switch;

6. Intelligent decision

Platform system has self learning ability, according to expert system, user database, user settings, intelligent control on farm equipment.
THANK YOU!