A Study on the Operating Model of Internet + QQ Farm

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Abstract   The "Internet + QQ farm" creative agriculture presented in this paper is the innovation based on the currently booming reality QQ farm, aimed at reducing cost, improving efficiency and optimizing human and material resource elements. It can make Internet provide technical support for intelligence-based life, leisure, entertainment, with good prospects for development.

Key words   Internet + QQ farm, Leisure agriculture, Creative agriculture, Operating model

1 Introduction

With the rapid economic and social growth and development of Internet technology, the idea of "Internet +" has brought good opportunities for the development of modern agriculture. In this paper, the "Internet + QQ farm" creative agriculture presented in this paper is the innovation based on the currently booming reality QQ farm, aimed at addressing people's gradually increasing demand on life quality with constant economic and social development. Meanwhile, it can also alleviate the work and life pressure for modern people who have the need for planting experience on the farm in their spare time. In the process of applying Internet technology to QQ farm and drawing on the modern Internet consumption patterns, the innovative integrated Internet system achieves the automated control of agricultural production, harvesting, distribution and sale, involving environmental condition monitoring and control for plant production, pest and disease monitoring, harvesting and distribution and marketing of surplus agricultural products, aimed at reducing cost, improving efficiency and optimizing human and material resource elements and making Internet provide technical support for intelligence-based life, leisure and entertainment.

2 Development overview

In recent years, with the development of modern urban agriculture, the real QQ farm is mushrooming, and the main mode of operation is that enterprises provide land and customers lease land. The customers and managers are jointly responsible for co-management, and this mode has some limitations. At the same time, the current research mode of modern agriculture is mainly concentrated in the combination of production area and Internet of things and use of modern intelligent technology to monitor the environmental conditions of plant growth. The Internet-based e-business model in the field of circulation changes the traditional circulation model of agricultural products. However, these forms have some limitations and the QQ farm management mode needs customers' regular or irregular on-the-spot management and harvest or entrusts the on-the-spot management staff with management and harvest. There are also some limitations in the current research model of modern agriculture. Only the environmental conditions of plant growth are monitored. In large-scale cultivation, we can not always observe the growth of crops and can not timely predict the plant diseases and pests, causing damage to some crops due to certain sudden causes and resulting in irreparable losses. Meanwhile, the rural network infrastructure is not solid and communications facilities are weak, seriously restricting the spread of the Internet in agriculture and blocking "Internet + agriculture". Therefore, it is necessary to perform the SWOT analysis on "Internet + modern agriculture" and start from the source of agricultural production to establish a series of agricultural production environmental condition monitoring, regulation and control systems, and agricultural product harvesting and supply monitoring and management systems. This idea makes improvement on the original QQ farm, and moves QQ farm from the field to network, enabling people to control the production and supply of agricultural products by Internet operation, and reducing considerable manpower and material resources, with certain market prospects.

3 Research content

3.1 Planting   The companies can divide the QQ farm plots in a predetermined unit and carry out RFID encoding on each unit to determine the location information. Customers can use computer or mobile phone to determine planting program, and the terminal feeds the information back to the field staff so as to achieve individual planting plan on each small unit.

3.2 Greenhouse automatic control system   (ⅰ) Natural ventilation system. The greenhouse is equipped with electric window system, and customers can view the indoor environment parameter changes through the terminal. The customers or on-site management staff can use the system to control automatic opening or clos-

ing ventilation window, so as to achieve the purpose of cooling the greenhouse. (ii) Inside and outside shading system. The inside shading system is designed to help to block sunlight in summer and help to reduce the heat loss and control the humidity in winter. At the same time, despite the ventilation system, the summer greenhouse temperature adjustment is still an urgent problem to be solved. Customers can view the indoor environment parameter changes through the terminal, and customers or on-site management staff use the system to control inside and outside shading system to block the sun radiation, use the black and white two-color shading net and automatically adjust the shading net according to changes in indoor temperature. (iii) Fan and pad cooling system. The advantage of the system is that when both the natural ventilation system and shading system can not effectively achieve unsatisfactory environment adjustment, the fan and pad system can be used to adjust the temperature. (iv) Internal supplementary lighting system. In order to meet the requirements of plants for light, a supplementary lighting system including rectifiers, triggers and lamps is designed to meet the needs of plant for growth and development. This technique is designed to collect images, analyze the plant growth status and plant diseases and pests through plant image. (v) UAV technology. This technique is designed to collect images, analyze the plant growth status and plant diseases and pests through plant image. Based on the image information, it can be used to analyze the abnormal situation of the plant and provide feasible solutions. (vi) Smart car technology. By setting the given inspection route, this technology can be used to collect the image data about plant growth. At the same time, due to the existence of air flow during the UAV flight process, it may lead to some errors in the image acquisition. The combination of smart car technology and UAV technology will increase the accuracy of video and image data. (vii) Artificial fog system. The design advantage of the system is to achieve cooling, humidification and automatic spraying based on changes in indoor environmental parameters, and also achieve pesticide spraying and epidemic prevention. At the same time, it can effectively control the occurrence of pests and diseases and automatically control fertilizer. The system design makes up for the defects of fan and pad system such as large noise and uneven cooling. (viii) Carbon dioxide generator. The system is designed to increase the concentration of carbon dioxide in the environment by burning natural gas or chemical reaction, to improve plant photosynthetic efficiency, promote plant flowering, increase sugar and a variety of vitamins in agricultural products, improve yield and reduce morbidity. The system can automatically control the working status of the carbon dioxide generator according to the change of indoor environment parameters.

3.3 Harvesting and distribution system The on-site management staff and customers are responsible for the crop maintenance and management that can be carried out by on-site or remote way. Customers can use computers or mobile phones to monitor the maturity of agricultural products, and employ the RFID encoding information to feed back the harvest information and distribution in-

formation to the on-site management staff. The on-site management staff perform harvest and distribution by according to the information feedback. By establishing computer or mobile terminal sale system, the agricultural products can also be sold by the terminal. This "Internet +" project idea requires the use of computer or mobile phone to conduct full control over environmental conditions in greenhouse, scientifically and rationally allocate natural ventilation system, external shading system, internal insulation curtain shading system, fan and pad cooling system, lighting system, artificial fog system, carbon dioxide generator, unmanned aerial vehicle, intelligent car and other devices to meet the greenhouse environmental control requirements. The advanced feature is to set up the front-end video capture camera on intelligent cars, unmanned aerial vehicles and other equipments for video capture on plant image. Meanwhile, the Internet of things is used to set up inspection routes and associated plant location number and transmit the collected images to the remote video analysis equipment through the Internet technology for initial judgment of plant growth state. The information is sent to the mobile terminal or computer of management staff. Meanwhile, the plant abnormal information is compared with the pest disease database and plant vegetative growth database to provide a decision-making basis for the conservation personnel who conduct analysis and judgment and use water and fertilizer integration equipment for precise water and fertilizer control and drug disposal. Relying on the system, we can achieve high-frequency, large-scale, efficient and timely detection and disposal of plant diseases and pests in conditions of reducing human resource. At the same time, the plant growth informa-
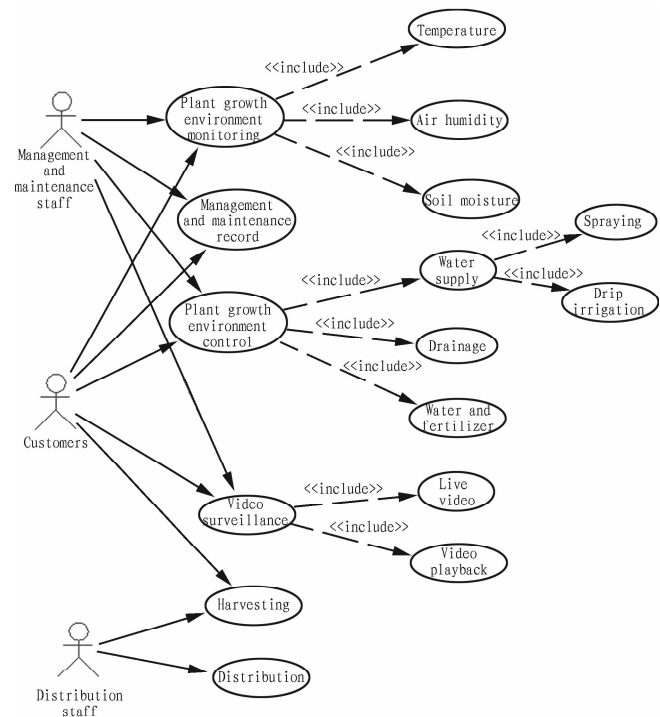

Fig. 1 System design flow chart

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tion is viewed by computer or mobile terminal through the Internet. Through the terminal control of greenhouse automation equipment, the remote automatic cultivation and management can be conducted. At the same time, the information related to disease and harvest is sent to on-site management and harvest staff for on-site management, harvest and distribution.

4 System design flow chart
The system design flow chartcan be shown in Fig. 1.

5 Conclusions
Leisure agriculture is a kind of high quality and efficient new form of modern agriculture, which can promote the interaction between urban and rural areas, realize the complementary of urban and rural areas and promote the economic development of suburbs. It is an effective form to realize agricultural modernization. Urban citizens can not only experience the rural production mode on the farm, but also experience the rural way of life and local rural culture. As a senior form of leisure agriculture, the public farm is still in its infancy, and we should play the leading role of government. At the same time, it is necessary to innovate upon the public farm with different models and different themes adapting to the local market in different regional context. The " Internet + QQ farm" creative agriculture presented in this paper is the innovation based on the currently booming reality QQ farm, aimed at reducing cost, improving efficiency and optimizing human and material resource elements. It can make Internet provide technical support for intelligence-based life, leisure, entertainment, with good prospects for development.