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Study on Bee product quality control chain based on Agent

Yue E[1] YePing Zhu[1] YongSheng Cao[2]

[1] Research Institute of Agriculture Information, Chinese Academy of Agricultural Science,
Key Laboratory of Agri-information Service Technology, Ministry of Agriculture,
12, ZhongGuanCunNanDaJie,Beijing, China,100081
eyue@mail.caas.net.cn
[2]Institute of Crop Science, Chinese Academy of Agricultural Science,
12, ZhongGuanCunNanDaJie, Beijing, China,100081

Abstract. In China, the bee farms are only organized loosely, so human factor has a great impact on bee product quality (BPQ). At the same time, the quality control methods related to information and intelligence technology did not give a useful support on BPQ. As a result, it is not easy control BPQ during production process of bee products. Therefore, how to control BPQ safety effectively always is a hot topic in BPQ control research field.The BPQ control chain is proposed in this paper. BPQ control and emergency mechanism is designed based on Agent technology, and the Agent logical architecture, the data mapping and conversion model, work data flow are detailed. In the architecture, the mapping relationship of Agent and BPQ control objects and attributes is defined. The strategies of control BPQ are also proposed.

Key Word: Bee products, Agent, Coordination, BPQ control chain

1 Introduction

In China，Bees industry and bee products output is one of the traditional and the unique industry. At the same time, we should also be awareness of the dynamic and complex bee products industrial chain exist some adverse factors, directly or indirectly caused many problems of BPQ, and affect China's export of bee products and domestic market efficiency. For example, In 2002 the European Union and some

countries to our country to stop the honey sales into the trade barriers, to our country bee products caused a loss, affect the normal development of the our country bee products industrial. These events cause supervision departments of BPQ high attention concern (Zhao Jing, 2011).

One of the unquestionable the situation is: There are many influence factors about BPQ in China, include production factors, environmental factors, human factors and so on, directly led to the management control difficulties. From the perspective of industry, bee industry is information degree lowest industry in China, popularization of computer and network is still relatively low in bee production area and production enterprise, production process of data and files often lost or none at all. At the same time, in the BPQ control need to coordinate unit very much, operation and maintenance costs expensive. With China's bees industry quality improvement and the rapid development of modern information technology, we fully capable of using modern information technology to development of bee quality control system.

2 Bee products quality control

According to the BPQ control, because of a long chain of bee products, there are many influence factors of the BPQ, so BPQ safety management and control needs further research in China.

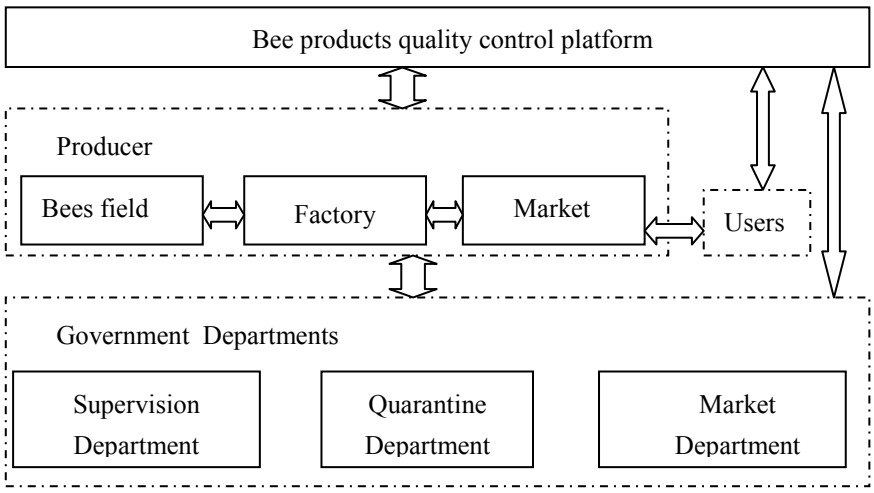

Fig.1. BPQ control platform

From the graph, we can look at: bee industrial chain structure is complex, the main link includes: production links (bee field), purchase link (acquisition business), processing link (factory) and sales link (supermarkets, shops), and so on. Each link has its own function, between each link on each other, form complex open, distributed system. The bee products production and consumption system tends to be complicated and internationalization, any link to appear BPQ problem caused by the quality and safety of bee problems and harm consumers. Complex structure and characteristics of the system produce great resistance about BPQ control problem solving.

The influence factors on the BPQ, also have technical, economic level, also have the exogenous factors or endogenous system of joint action. These factors are in different levels influence the quality of bee. Therefore, we must first have a clear understanding of factors influencing the quality of bee products, and then we can research the quality control system of bee products.

(1) From the point of view of breeding bees,, there are many feed materials in the process of the bees feeding, such as sugar and honey, the quality of the bee medicine, bees epidemic prevention, and related the hygiene of instruments, water quality, air quality, soil quality, keepers feeding technology skills and so on, all of this influence the quality and safety of bee products and harm consumers health.

(2) From the monitoring, Bee product quality control method and risk monitoring means of the government must improve in bee product quality control chain.

(3) From bee industrial chain observation, chain node is various. It included production links (bee field), purchase link (acquisition business), processing link (factory) and sales link (supermarkets, shops). In the whole bee industry chain, have linear nodes, also have mesh nodes, the whole process complex and coordinate and management difficult.

Through the in-depth analysis, it is found that bee products traceability system could realize the problems of product recall with modern information technology, but still has the following problems remain to be solved: the quality and safety of bee products risk analysis to be further strengthen, while an bee products harm accident, we must scientific evaluation and carry out emergency measures. Therefore, in view of the current BPQ control, it could risk diagnosis and security warning before the event, harm emergency when event occurs, and assessment after the event. This paper proposes the BPQ control based on Agent and spread of related research work.

3 Bee product quality control chain based on Agent

The BPQ control has the characteristics of complex, the quality safety emergency occurrence, development, change also has a certain dynamic, many event of evolution characteristics (Zhang Dong Ling, 2009). When a certain level or links occur BPQ events, it must affect other links different physical entity operation and production with the events associate and product a chain reaction. That is means the BPQ emergencies event are not completely isolated in the BPQ control chain, the event has direct contact and may have an impact with other links of BPQ control chain.

The BPQ control chain based on the Agent, according to the function is divided into quality monitoring layer, information analysis layer, emergency command layer, emergency directors and communication coordination of five levels.

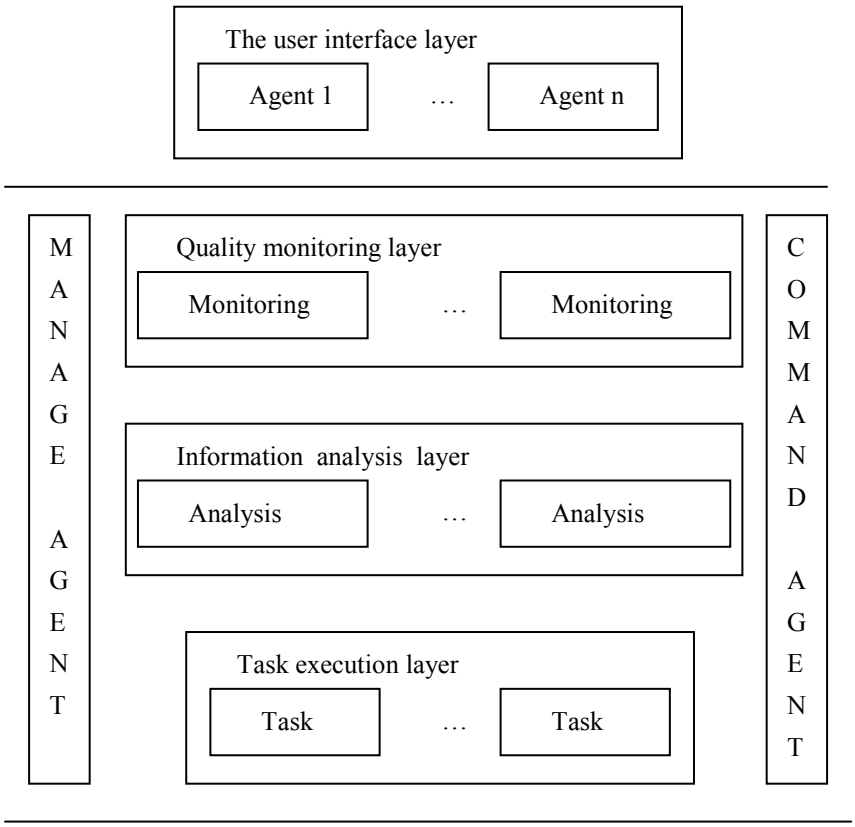

Fig.2. BPQ control group based on Agent

(1)The monitoring layer responsible for monitor the specific monitoring objects, monitoring factors related information data acquisition, and evaluation according to users set parameters. In the front end of BPQ control chain, mainly complete information collection and processing, equivalent to a quality observatory of nature. Monitoring layer Agent called monitoring Agent, such as the production monitoring Agent, sales monitor Agent and so on.

(2)Analysis layer is mainly responsible for accept data from monitoring layer in the Agent, and according to the types of data, nature, carries on the analysis, the assessment and to determine the detection of links (or critical control point) presence quality safe hidden trouble, whether serious harm (determine harm degree level), whether start quality emergency measures, etc. Analysis layer also contains morel analysis Agent, such as abnormal data analysis Agent, harm rating Agent and so on. It plays the role of quality evaluation experts.

(3)Command layer responsible for the concrete implementation of BPQ emergency disposal measures, and control related executed Agent. Usually, a task for emergency disposition, only one emergency command Agent. Specific tasks including the emergency disposal scheme determination, task decomposition, coordination strategy formulation, implementation and the monitoring of the implementation of the Agent. Command layer is central nervous of BPQ control chain.

(4)Execution layer mainly responsible for specific emergency measures of performance, such as quality tracking, accident liability sure, release emergency report and so on. Execution layer contains different function executive Agent, according to emergency plan, independently run to finish the task of distribution, and will be submitted to the related information of management department, direct responsibility department, etc.

(5)Communication coordination layer is mainly responsible for control interaction communication between all of Agent. For each one of the specific task, it can product a communication Agent. Communication Agent is equivalent to a station, the relevant data of the emergency response, information, task, and the results will be submitted to the communication coordination Agent, it is equivalent to a resource sharing platform, will be responsible for the upload information issued.

Because other related links in the BPQ control based on Agent has similarities, therefore, mainly in bee products production process as an example, this paper describes a BPQ control process based on Agent.

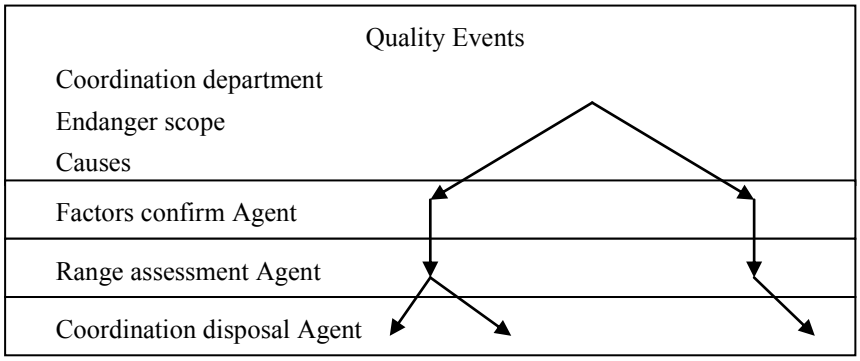

Fig.3. BPQ Emergency process based on Agent

(1) The user input corresponding critical control points (elements) parameters, such as bee drug.

(2) And then the system automatically start the corresponding quality control Agent, forecast Agent and assessment Agent, input data parallel detection processing.

(3) If the value in safety assessment scope, on the one hand, to users test information; on the other hand, do not product the alarm behavior.

(4) The system of the related Agent to be automatic cancellation, or place to hang up state; the user testing the loop ends.

(5) If, in (2) executive process, found the quality safety problems, immediately start emergency Agent.

(6) According to the quality safety emergency Agent event situation, on the one hand, to convey quality event information users; On the one hand, to be automatic or user input of the related information of physical objects, such as the other bees fields, the business, the processing factory, sales, pharmaceutical factory and so on.

(7) Start decision-making Agent, evaluation Agent and Quality safety evaluation of other aspects.

(8) To the corresponding inspection institution, supervision department report analysis and test emergency report.

(9) To the user Agent submits information.

The BPQ control chain contains two aspects: the earlier evidence collection, after the emergency period. In the system structure based on Agent, the earlier evidence collection main application of related business process analysis and simulation based on Agent. After the emergency period main application for

emergency treatment measures harm the analysis, communication and rehabilitation evaluation based on Agent.

Conclusion

The BPQ control chain based on the Agent is an organic whole include relevant organization, personnel, communication, information and so on. It is provide decision-making information, knowledge for the BPQ management and control. In the intelligent decision-making system, based on each link collection data related information, use of computer, Agent, network information technology help managers monitor BPQ, once found BPQ safety problems, through the coordinated decision to de whether start the emergency response mechanism and how to choose a specific emergency plan measures for BPQ control of the effective implementation.

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