

Study on Intelligent Decision-Making Platform in the Agricultural Production

Saiteja¹, A.Prasanth², Irshad Khan³, Adarsha Bikram⁴, Ambika B J^{5*}

^{1,2,3,4,5}C&IT, REVA University, Bangalore, Karnataka, India

Corresponding Author: ambikabj.pesj@gmail.com, Tel.: +919845571794

DOI: <https://doi.org/10.26438/ijcse/v7si14.288291> | Available online at: www.ijcseonline.org

Abstract—By knowing the difficulties that present in the process of decision system that the present agriculture is not able to solve this problems in the agriculture production in this environment, so the technologies that the agent will do which is used in the field of agriculture is presented in this paper. The idea that how this intelligent decision system in the agriculture field also displayed, The design of this idea has also been constructed. So this system platform is developed by using java agent development framework to make the communication easy among agents with java language and also secure shell technology has been used for secured services SSH which is finally result to share the information of agriculture. The advantages of this process is to operate the crop cultivation, and also be the main role in environment protection and also used to change the economic condition to small scale.

Keywords: Agriculture; Intelligent decision system

I. INTRODUCTION

Agricultural intelligent decision system is an application program, which gives suggestions based on the specialist in agriculture field for those technical problems that need specialist knowledge in agriculture field to get rid from the problems. In recent years the info for agriculture in rural areas has got more development based on this information system. Almost all around implementing this in agriculture field. so because of this there will be more investment and also income in agriculture field which will give the outstanding result in agriculture growth. However the ability of understanding this decision relatively becoming low. Meanwhile for the technician that not having any agriculture knowledge having less professional knowledge cannot able to ensure the difficulties in agriculture field so that the farmer getting effected because of that. So when these non agriculture technician face the complexity in the field then the expert technology should be involved to solve that problems and to fast and accurate results. So the motive of this intelligence decision system is to improve the income as well as agriculture growth to farmer which are required to be solved.

II. INTELLIGENT DECISION MAKING

We here we use the Multiple user technology By using this intelligent decision method to introduce the knowledge over

about the artificial intelligence and it is in process that method we use it into the decision theory. By this technology,

In some situation one of the system with the capacity to understand the design goals, we can do cross field between artificial intelligence and software engineering in search border of the intelligent system, we cannot use single agent not proper for a huge and difficult system with variability, communicative and intelligence, which can also be described by multi Agent system, we can solve the complex problems in this technology by using the divide and rule method, the opinion ability and capacity to solve problems and external communication capability is an entity. they may be so many calculable agents. Which can be act by themselves and environment to communicate with other agents because everyone of them is an individual body. By agent communication, coordination, scheduling, management and control we can express the system's structure, function and behaviour characteristic. The agent thread will be established on the model, it will be the execution path as shown in Figure 1

First, we can establish an agent by "setup()" and begin it. So that we can decide whether it destroy an Agent or not by "doDelete()" . if "Yes" then we can log out agent from AMS and we can also set agent status to "deleted"; if "not", then take out executing behaviour from behaviour pool and also

they will carry out agent behaviour. "down()" function is used to check whether behaviour has been completed and if "yes", remove current behaviour from behaviour pool, otherwise return to "doDelete()" function and continue process. We can analyse the different URL when we runs the multi-Agent use its special right like cooperation and activity to reproduce a way in which group deals with the different problems , which will be having some good effect on solving data, controlling problems with distribution and also the improving system's efficiency.

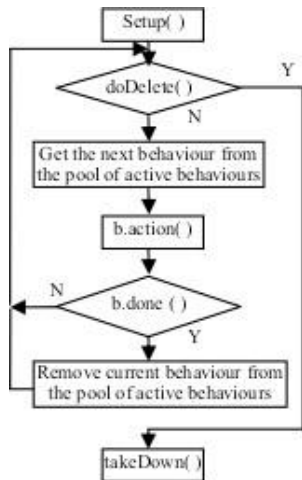


Figure 1. Agent's execution path

B. Study on communication mechanism

Here we have interaction between software bodies in different computers which has main features of administration system, so interaction between them becomes more vital while agent of the concept can be treated as independent, mobile distribution software body , Here we need to cooperate with other agents to reach expected goals because single agent is not strong. Here the communication is most important basis and services that, an agents can be communicated and work can be done collaboratively.

The system will takes the most important JADE as the tool for developing Multi agents, JADE which has includes two parts an Agent platform compatible with FIPA standard and an Agent development kit. The Agent development kit Of JADE provided users for abstract class and interface which was a packaged a series Of comprehensive System service and Agents. It also provided the information transmission, coding, decoding and Agent lifecycle control service between Agents that is irrelevant with application program, which is convenient for users to develop all sons Of Agents with special task. The Agent platform model defined by FIPA is shown in Figure 2. The platform included Agent Management System, AMS, which was used to charge the other system and external application program's use in this platform; Directory Facilitator, DF, which have yellow page

service, according to which an Agent can depends the Other Agent providing its needed service, information Transmission System, also known as Agent Communication Channel, ACC, which is the component controlling all information exchange in the platform Between the agents communication ability which was very important was provided by the JADE, here we use the asynchronous communication transmission. We will have a message queue, then JADE will send the message to other agent into it ,then the receiver will get the queue . By ACL (Agent communication language) followed by FIPA standard we will format message sent between the agents.

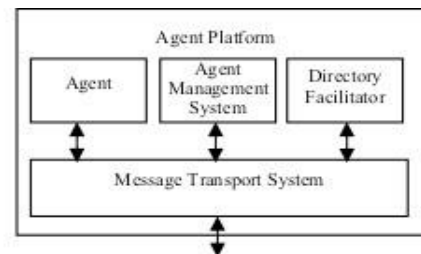


Figure 2. Agent platform system following FIPA specification

An ACL message generally having following format. Of which was shown below

```

(inform
:senderagent1
:receiveragent2
:content
(status(dental pulp)dead)
:in-reply-to id02
:reply-with id01
: language fipa-s11
:ontology dentistry-ontology )
  
```

In this sender field and receiver field explains message sender and message receiver, content field also explains practical message, content can be expressed how to indicate language field, word list of symbol in content and significance, while control occurring dialogue or confirm receiving timeout can be controlled by some fields such as conversation-id , reply-with, in-reply-to, reply-by, etc.

III. CONSTRUCTION OF INTELLIGENT DECISION SYSTEM PLATFORM

We have constructed a system which user have three-layer design with client and server, consists of only client, application server and data server which was shown in figure 3.

Agent problems for integration and interacting in client can know or gain some information that users input and questions. The application sever include some management agents like model management, case management agent, method management agent ,knowledge management agent

,which all managements agents corresponds to decision - making model of agricultural production feild, in this algorithm, case of solving problems in every field respectively. We will have an discussion and also interaction function between four agents above and also between agent and user by using the decision making and supporting agent, The data base server will have fundamental database will be achieved.

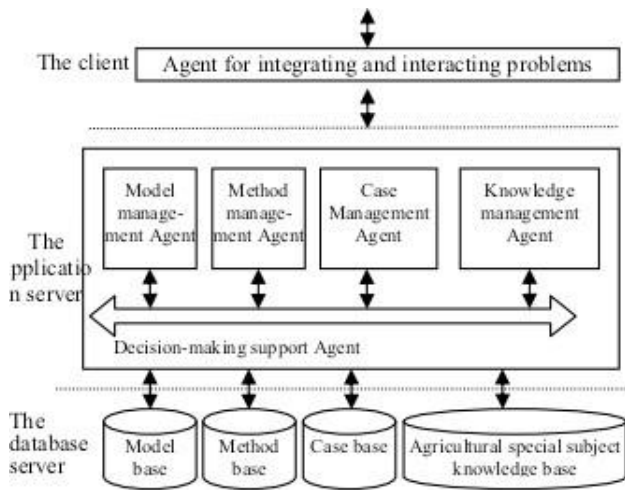


Figure 3. Structure of Agriculture Intelligent Decision-Making System

Data store which will combine every agriculture feild is stored in data server , this data store determine range of knowledge and with computer science work in agricultural field, it will clean and also arrange and combine information about topic in different fields of agriculture ,it will also changes the information to available forms and gives different users with information about random enquiry, data combination and also decision system analysis. Here agriculture special knowlledge base stored with units which has been performed and also edited and carries a hierarchicall management in different feilds and also some disciplines, The decision-making activities which supporting the basic model was stored by base model with different levels, we are having single model supporting frequent operation and remaining will be basic modules and also some basic elements which generate new models ,Which provide some arithmetic basic and method supporting library model solution by using all kind of methods and the method base will be stored.

Here by using J2EE as understanding of intelligent decision system in agriculture production, which will have three framework “Struts2+Spring+Hibernate”. By using this design “Struts” to achieve separation presentation layer from business logic layer which was in the large system in complete control and jump this process and presentation layer.

Here basic business of your model or process is as follow :we create interactive interface through the JSP, In presentation layer the transform request and also receiving response are responsible, according to request that Struts Action Servlet received, Struts can be used in business layer to assign the corresponding action, we will get the business process which was responsible of spring IOC management service component and its DAO to complete business logic its also provide components such as business and buffer pool to increase system performance and also guarantees data integrity, presentation layer which will depends on the Hibernate object map and also database that is used to deal with data requested by a DAO components after that we will processed the results, as shown in figure 4

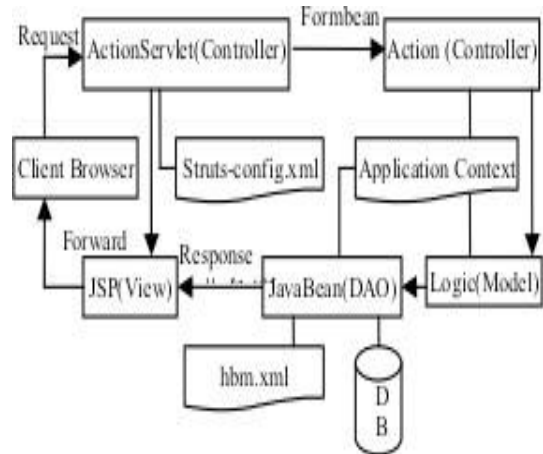


Figure4: Busines flow chart

IV.THE PROCESS OF INTELLIGENT DECISION- MAKING

In figure 5 we can see that process of intelligent decision system in agricultural production by model management agent of network remote entry server and by land fixed the identification and analyses model according to delivery problem from the different agriculture lands, Through this network remote and agent for integrating and interaction problem and confirm the decision of agricultural user send an identification request then model for a own base and the similar algorithm or method in own base to analyse and calculate solution then send it as a solution to user ,so any user was not happy with analysed suggestions, they can search for similar cases in case base and adjust that data in model base or we can add some more data, then we have to analyse and calculate the new solution for all feedback users, if is ok with analysed solutions then we can save those to case base to create a new sample data for noticing knowledge ,self-learning and update which will make the system perfect slowly, here at that same time system gives measurement to solve this problem to users by integrating and interacting

agent, which can provide good decision information for agricultural production.

V. CONCLUSION

The quick growth of this big data technology gives us a new practical way for testing and growth of agricultural intelligent decision system. This can actually increase the speed and rightness of this project and can give ideas for agricultural production. Implementation of big data technology and artificial intelligence in this project is next development step.

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