Application of Data Mining in Recommending Mode of Agricultural Products Market System

Chunjiong Wu
Department of Management, Yango University, Fuzhou City, Fujian Province, 350015, China,

Abstract. The agricultural product trading system is a system that involves multiple links and multi-agency network-based work management methods. The article describes the overall design, system architecture, network architecture and related modules of the system through flow charts and structure diagrams. The design is implemented, and the database diagrams and attribute fields of related modules are given. The application process of data mining algorithm in the system is studied. Firstly, the data mining workflow is analyzed. Then the data collected by the system is studied. The data preprocessing process is studied, which makes the data set suitable for data mining. According to the characteristics of the data, the decision tree method is used to perform data mining. The data has been preprocessed. Based on the analysis of data and build a decision tree.

1. Introduction
Data mining usually refers to searching information hidden in a large number of data by algorithm. Data mining is usually related to computer science, and through statistics, online analysis and processing, information retrieval, machine learning, expert systems (relying on the rules of experience of the past) and pattern recognition to achieve the above objectives. Need is the mother of invention. Data mining has also quickly embraced ideas from other fields, including optimization, evolutionary computing, information theory, sign processing, visualization, and information retrieval. Some other fields also play an important supporting role. In particular, database system is required to provide effective storage, indexing and query processing support [1]. Technology derived from high-performance (parallel) computing is often important in dealing with massive datasets. Distributed technology can also help to deal with massive data, and it is even more important when data cannot be centralized together. The commonly used methods for data analysis are classification, regression analysis, clustering, association rules, characteristics, changes and deviation analysis, Web page mining, etc. They are used to mine data from different angles. The figure 1 shows the basic process and main steps of data mining [2,3].
2. The application of data mining in agriculture

2.1. Data mining in Agrometeorology
Meteorological disasters have an important impact on the output and quality of agricultural products [4]. Therefore, the prediction of meteorological disasters is of great significance for agricultural production. The data mining technology is used to deal with the local meteorological conditions recorded by meteorological departments over the years.

2.2. Data mining technology is applied in agricultural market information
Using the database of the agricultural market price and the data warehouse of the import and export trade of China's agricultural products as the data source of data mining, the data mining algorithms and rules are used to extract the information hidden in it, trustworthy, novel, people not known beforehand, but also potential useful information. For example, the use of correlation analysis, the discovery of relevant rules and use of statistical techniques to detect the price trends of various agricultural products, such as the price trends of livestock products and fresh chicken. Use classification and prediction to predict future prices; use clustering analysis to objectively classify products, such as turning aquatic
products into a class of meat, eggs and oil, and using isolated point analysis techniques. To find out some rare events, such as finding disaster, financial events, import and export problems, and even political events. Through the analysis of evolution, we can know some laws and trends of product price changes [5].

3. overall design

3.1. The agricultural market management system
The development of the agricultural market management system based on RFD technology is for the management departments and the competent units at all levels to provide advanced and efficient technical means. In order to realize the monitoring and management system for the production and circulation of agricultural products, and to use RFID technology for the management department and agricultural products related files for agricultural product information statistics, agricultural product production and management process supervision and comprehensive information management (including the phase of information management). The management of the basic information and the information management of the production and management of agricultural products, etc., which will be supervised by the market management departments and the owners in the process of production, processing, storage, transportation and market access of agricultural products. The agricultural market management system based on RFD technology is helpful to maintain the management order of agricultural production and management of agricultural products and prevent food safety accidents caused by agricultural products. It will play a positive role in ensuring the safety of people's life and property. Data mining technology is used to find out what factors the user consumption is related to, so as to encourage users to consume more C cards.

The architecture system architecture includes 4 layers, namely user interface layer, function module layer, database layer and data mining technology application layer, as shown in figure 2. The user interface layer is the place where the user and the system interact with the data. In addition to the user can view the relevant information, the user can also modify the basic information within a certain authority. The functional module layer includes the management of the management of the meat factory management, the commodity management of the vegetable, the heart management in the transaction, the management of the trade, the management of the user, the public information management and the statistical information. The data is stored in the server; the database layer stores all the data information: the application layer of the data mining technology, which is based on the data source of the database. It uses the data mining decision tree method, and constructs the decision tree model by the data preprocessing and data mining algorithm application.

3.2. User management module design
Module design based on RFID technology and based agricultural product easy management system involves multi link and multi agencies. It is based on the network ring and based on the work management mode, and there are more peripherals which need to be used. Therefore, the system uses CS and B/S mode to develop and implement. The development platform mainly selects NET platform system based on SQL server and based network database development, in order to improve the overall stability of the system. Qualitative and working efficiency, data mining and decision tree method are used to build data mining models and analyze the results. This system is a comprehensive management platform, the customer covers a wide range, the peripheral equipment types are diverse. Therefore, the whole system has multiple functional modules. In the scope of the study, the data collected by many modules are applied. The detailed design and realization of the related modules are listed in this paper: user management module, recharge payment module, commodity management module and transaction center module system module structure are as shown in figure 3. The work flow chart is shown in figure 4:

The database table used by 4.3 database design system includes: (1) user management table: recording user's detailed information, and binding with information on IC card; (2) to recharge the
module table: record user recharge information, user C card number is the associated foreign key between the user table and the recharge table; (3) management cost table: record the percentage of management costs to be charged in the process of buying and selling; (4) the weight: record the person's information, the name of the weigher is connected to the foreign key of the weigher on the single master list of the transaction; (5) a single master table: the public information of the transaction, including the information of the buyer and the seller, the weigher, the way of trading, and so on; (6) the transaction sheet from the table: record the information of the specific transaction items, a transaction list includes a number of transaction items, use the master slave table to save the database space, the master slave table uses the trade single number foreign key to connect; (7) the product information main table: record the detailed information of the transaction product, each product has the corresponding code representation; (8) product information from the table 1: product charge standard record is the price fluctuation record; (9) product information is collected from table 2: each product has different server standard records. ER diagram is shown below.

From the data, it can be seen that the improved color reproduction method does not have much increase in the brightness of the full white screen, but the brightness of the dark screen is greatly reduced. And the contrast value is greatly improved. 6 times higher than the original, it also reflects the improved color reproduction method which has greatly improved the contrast of the display screen.

Figure 2. System architecture diagram
Figure 3. System module structure diagram
Figure 4. User management module workflow

Table 1: user management module table

| Field Name      | Data Type | Description          |
|-----------------|-----------|----------------------|
| V_ID            | INT       | auto numbering       |
| Name            | VARCHAR   | Names                |
| Sex             | VARCHAR   | gender               |
| Card Send       | VARCHAR   | Card date            |
| Card Type       | VARCHAR   | IC card type         |
| Card No.        | VARCHAR   | IC card number       |
| Phone           | VARCHAR   | telephone number     |
| Id Card         | VARCHAR   | ID number            |
| Native place    | VARCHAR   | Domicile             |
| Address         | VARCHAR   | Current address      |
| Grow place      | VARCHAR   | Planting place       |
| Grow Area       | VARCHAR   | Planting area        |
| Vegetable type  | VARCHAR   | Vegetable species    |
| Card begin      | VARCHAR   | Business card start date |
| Card end        | VARCHAR   | Business card end date |
| photo           | VARCHAR   | Photo path           |
| Field Name      | Data Type | Description          |
| ID              | INT       | ID number            |
| Name            | CHAR      | Names                |
| ADDRESS         | CHAR      | address              |
| TELEPHONE       | CHAR      | contact number       |
| STATUS          | CHAR      | ID number            |
| MONEY           | CHAR      | Store money          |
Table 2: recharge management module table

| Field Name | Data Type | Description   |
|------------|-----------|---------------|
| ID         | INT       | ID number     |
| Name       | CHAR      | Names         |
| ADRESS     | CHAR      | address       |
| TELEPHONE  | CHAR      | contact number|
| STATUS     | CHAR      | ID number     |
| MONEY      | CHAR      | Store money   |

4. System Improves Color Restoration

4.1. Brightness and contrast tests

The process of establishing decision tree is the process of segmenting data continuously. Each part corresponds to a field corresponding to a node four. The difference between the groups required for each part is the largest. The main difference between the various decision tree algorithms is that the distinction between the different measurements is to divide a set of data into several parts, each of which is as different as possible, and the data in the same part is the same as possible. But if the decision tree is too large, it will bring difficulties to the result analysis, so we need to prune the decision tree after making the decision tree. Finally, the decision tree is transformed into a rule, and the new case is classified. Although all the decision tree algorithms are very similar in the way of processing the data, they pick up how to group and sort the different variables according to the importance. Use different mathematical algorithms. The construction process of decision tree is as follows: (1) select variables from data sources. The user selects a variable from all the variables of the data source as the dependent variable, and there are many similar input variables; (2) to analyze each variable that affects the result, and the values of each variable are grouped. This is an iterative process; (3) after calculating the grouping based on each variable, you can find a variable that is most predictable for the dependent variable, and can use this variable to create the leaf node of the decision tree. The process of establishing decision tree, that is, the growing process of trees is the process of segmenting data. Each part corresponds to a problem, and it corresponds to a node. The difference between each group is the largest.

Because of the noise of the number of trees, the decision tree generated by the training period is often over adapted. That is, the decision tree can accurately classify the records of the given training data set, but the prediction accuracy will fall sharply once the new data are made. The decision tree algorithm uses the pruning (Pruning) method to deal with the problem of excessively adaptive data. It usually uses statistical measures to cut off the most unreliable branches and thus brings faster classification. There are two commonly used pruning methods. If the tree is constructed to prune the tree and if the node stops, the node will no longer continue to split, and the internal node is called a leaf node. The tree leaves use the most frequent classes in the subset sample or the probability distribution of these samples as the identification first pruning algorithm, which is pruning at the same time when the tree is generated. Therefore, the efficiency is improved, but it may cut some useful but not generated nodes. However, it is difficult to choose an appropriate value. Higher values may lead to over simplification of trees, while lower values may make trees too complex. In the latter pruning method, it is cut off by completely growing trees. By deleting the branch of the node, the tree nodes are cut off. When the tree is built, the error rate of each node is calculated by weighted average of the error rate of each branch, if the error is not pruned. If the node is cut off, the error rate can be reduced, so all the child nodes of the node are cut off. The node is called leaf node. After generating a group of trees that are gradually pruned, using an independent test set to evaluate the accuracy of each tree. A decision tree with the minimum expected error rate can be used to cross the pruning and post pruning methods to form a combination method. Post pruning is more computable than pruning, but the often produced trees are more reliable.
Brightness and contrast are both important parameters of the display. Brightness reflects the lightness and darkness of the display. The contrast reflects the degree of contrast between bright and dark images of the display. It is the brightness of the white screen and the brightness of the dark screen. Test the brightness and contrast data when the improved color reproduction enhancement function is turned on and off in the liquid crystal display.

5. Conclusion
With the popularization of information technology, various industries gradually realize the computerized management of the business through information systems. The basis and core of the information system is the database. Currently, a large amount of data has been accumulated in the databases of various industries. Based on RFD, the agricultural product trading center management system was constructed. Based on the data collected by the system, a decision tree model was constructed based on the improved ID3 algorithm, and the model was analyzed to draw conclusions. In addition to the transaction information, the information collected by the agricultural products trading center management system has much other very useful information, such as the vegetable inspection module, the meat factory module, etc. Through which the data is collected and data is mined. We may find more useful information that may not be known to us. In the future work, we can gradually improve the system and use data mining methods to find out more useful things and bring us convenience.

References
[1] Sun L. The Application Design of Personalized Recommendation System Based on Data Mining to E-Commerce. Advanced Materials Research. 989-994,4538-4541(2014).
[2] Yao C, Sun C, Fan F, et al. Improvement of Web Data Mining Method and its Application in Personalized Recommendation. Information Technology Journal. 13(2):333-339(2014).
[3] Sanati-Mehrizy R, Sanati-Mehrizy A, Sanati-Mehrizy P, et al. Application of sequence data mining for adverse event prediction and action recommendation. Journal of Experimental Marine Biology & Ecology. 225(2):197-218(2015).
[4] Aoto T. Development of a recommendation system to promote of utilization of libraries(Data mining methodologies and application for libraries. Journal of Information Science & Technology Association. 60:236-241(2010).
[5] Morzy M. Recommendation Rules — a Data Mining Tool to Enhance Business-to-Customer Communication in Web Applications. Advances in Soft Computing. 31:456-460(2005).