

## *Retraction*

# **Retracted: Optimization of the Marketing Management System Based on Cloud Computing and Big Data**

### **Complexity**

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This article has been retracted by Hindawi following an investigation undertaken by the publisher [1]. This investigation has uncovered evidence of one or more of the following indicators of systematic manipulation of the publication process:

- (1) Discrepancies in scope
- (2) Discrepancies in the description of the research reported
- (3) Discrepancies between the availability of data and the research described
- (4) Inappropriate citations
- (5) Incoherent, meaningless and/or irrelevant content included in the article
- (6) Manipulated or compromised peer review

The presence of these indicators undermines our confidence in the integrity of the article's content and we cannot, therefore, vouch for its reliability. Please note that this notice is intended solely to alert readers that the content of this article is unreliable. We have not investigated whether authors were aware of or involved in the systematic manipulation of the publication process.

Wiley and Hindawi regrets that the usual quality checks did not identify these issues before publication and have since put additional measures in place to safeguard research integrity.

We wish to credit our own Research Integrity and Research Publishing teams and anonymous and named external researchers and research integrity experts for contributing to this investigation.

The corresponding author, as the representative of all authors, has been given the opportunity to register their agreement or disagreement to this retraction. We have kept a record of any response received.

### **References**

- [1] L. Zhang, "Optimization of the Marketing Management System Based on Cloud Computing and Big Data," *Complexity*, vol. 2021, Article ID 9924302, 10 pages, 2021.

## Research Article

# Optimization of the Marketing Management System Based on Cloud Computing and Big Data

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With the rapid development of the Internet information age, social networks, mobile Internet, and e-commerce have expanded the scope of Internet applications. The “big data” era is a challenge and chance for companies and has a great impact on social economy, politics, culture, and people’s lives. An accurate marketing system is developed based on J2EE, and the architecture is selected from the user layer, business logic layer, and data layer and the B/S3 layer application (three-tier application), including three layers of crip-dm and semma. And, other process methods are used. Data-mining-based marketing system information solutions consist of several parts, such as requirement analysis, design, implementation, and testing. This paper introduces data mining technology to the marketing business based on the practical use and design IT solutions for precision marketing, attribute selection tools, attribute analysis tools, modeling prediction tools, and others. This paper introduces a precision marketing system based on data mining technology. The system passes the actual test and the deployment and the operation of this system are confirmed. The system, which can improve marketing activity, is tested, and the development and operation of this system markedly increase the company’s earnings.

## 1. Introduction

The integration of computer technology and information technology has made computers an important tool for human daily production and life, especially in the field of data processing, which can not only store data resources in large quantities but also carry out statistics and analysis on them, so as to further explore the application value of data resources. Since the creation of application databases especially, people have managed data more efficiently, and data resources have become more important in the fields of office, management and research. Since the beginning of the new century, with the maturity of information technology and the popularity of computers, all walks of life have generated more data than imaginable while gaining great development, and people use “information explosion” to describe the geometric growth of data. The excessive existence of information has also brought many problems to people’s daily production and life, especially those related to how to obtain useful information efficiently. For modern

enterprises, only by acquiring market dynamics and user needs, and then providing products and services that meet market demand to consumers, can they make profits and maintain development. In the highly saturated market environment especially, enterprises need to dig out useful information and make full use of information resources for user tracking, market analysis, and scientific decision-making. In the process of mining useful information, useless information becomes a burden for enterprises, which not only affects the efficiency of data analysis but also may play a misleading role. Accordingly, data mining technology shows significant value, while having a strong vitality in future development [1].

In recent years, the competition in the gaming industry has become more and more intense, and at the same time, game players have higher and higher requirements for game quality and game services. Traditional game marketing strategies include in-game promotions, in-game client advertisements, game pop-ups, and so on. Such identical and full-coverage marketing methods have many drawbacks,

which not only have high cost and low resource utilization, but also lead to game players' disgust and lower and lower consumption [2]. In the current game market, the early marketing methods are unsustainable, and major operators should devote themselves to solving the problems of "how to accurately locate target users," "how to quickly discover the characteristics of user groups," and "how to reduce the disturbance to nontarget users." The operators should focus on solving the problems of "how to accurately locate target users," "how to quickly discover the characteristics of user groups," "how to reduce the disturbance to nontarget users," and "how to improve user experience" [3]. From the application point of view, data-based operation can push games that users like to users from a wide variety of online games and avoid promoting those online games to users that are not interested, so as to improve the user experience based on those two aspects and establish good interaction [4]. From the middle to the end of the 20th century, database technology has moved from theory to practice, gaining widespread application, and as a result, the volume of database storage has grown rapidly. With the help of database management systems, data resources can be managed effectively to ensure the security and integrity of the database, while with the help of data mining technology, useful information can be discovered from a large, incomplete, fuzzy, and random dataset for the purpose of knowledge discovery, thus better serving the real work. Until now, most database management systems have the functions of data input, data query, and data statistics, which better meet people's application needs. However, there are shortcomings in data analysis and knowledge discovery, which limit the application value in terms of data resources, and this therefore is the subsequent development direction of database management systems [5]. In simple terms, data mining is the process of analyzing and extracting data containing a large amount of noise using data algorithms and finally mining data information that meets the user's needs, as shown in Figure 1. Data mining processes integrate several fields, such as data statistics, software design, and database technology. Heterogeneous data are used for realizing relational data, structured data, hierarchical and detailed multifaceted data mining, and knowledge discovery using various mining techniques, such as inference and mathematical methods [6]. It is also customary to classify data mining based on its functions, which include types of association analysis, cluster analysis, and analysis and prediction [7–12]. The significance of the implementation of game marketing system based on data mining technology is that it cannot only accurately discover and predict the target users and provide platform support for the operation of new business but also optimize the allocation of marketing resources, improve the efficiency of accurate marketing, reduce operational costs, and improve user experience [13].

Data mining can provide useful information for precision marketing, and this is inline. Database technology developed greatly at the end of last century, and the market competition also tends to be white hot. In order to reduce marketing cost and improve marketing effect, enterprises put forward a strong demand for precision marketing and

also indirectly promote the progress of data mining technology. In fact, before the concept of data mining was formed, people had already created some data mining methods, including quantitative statistics, machine learning, regression analysis, and neural networks. However, the concept of data mining is significantly different from this, and is not "old wine in a new bottle." The concept of data mining clearly defines several types of problems that can be resolved, flexibly uses various methods, completes tasks, such as design, processing, and statistics, develops an appropriate data analysis path, and ultimately applies it to practice. The topic of how to make game marketing is based on using "big data" to optimize marketing resource allocation and improve the accuracy of target user detection, user experience, and data mining efficiency. We also designed a system to solve the problem of how to discover and predict the characteristics of the target user.

## 2. Related Work

In this regard, the mainstream research directions can be divided into two categories: the first is developing new algorithms and updating existing designs, and the second is exploring commercial applications of existing methods in the form of, for example, precision marketing business [14]. The prediction function is achieved through classification, but the predicted results are not quantitative but categorical results. For example, after being informed of the base information of a specific user, a company can predict the behavior of that user, "the user's creditworthiness profile," "the user's propensity to spend," "whether the user will accept new products," "whether the user is likely to develop into a potential customer for the company," and "whether the user will respond to current marketing activities."

Broadly speaking, the value of classification problems for business applications can be divided into two parts: first part is predicting the size of the probability of users' reengagement in business activities, and second is analyzing the users' historical consumption records to predict their loyalty to their own products and developing marketing strategies in this regard [15]. The researchers introduced the basic theories of customer relationship management and data mining and application of data mining techniques in customer relationship management and proposed a detailed process for data mining techniques to deal with specialized problems. At the same time, based on the study of existing classification algorithms, a new algorithm is proposed according to the actual needs of the domain problem. The new evaluation index system and algorithm are applied to the problem of customer discovery in the field of sales, providing an exhaustive solution for the application of classification technology in the field, and the modeling results prove the science behind the index system and new algorithm and their practicality. On this basis, a system framework for the application of classification techniques to the domain is further constructed, which is representative for the application of classification methods in the solution and also makes some new explorations and attempts for the development of data mining techniques in the domain [16].

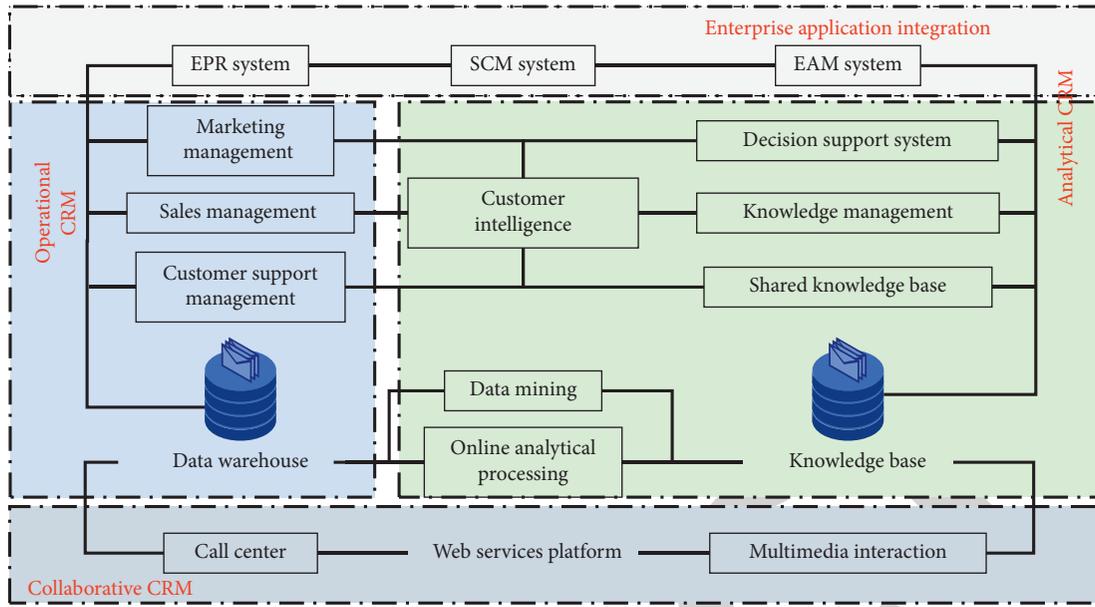


FIGURE 1: Data noise processing based on data mining.

The purpose of the clustering problem is to decompose a group of objects into multiple different classes based on the core of the clustering problem. In the application, first, multiple indicators are set, and then a group of users are divided accordingly, so that the purpose of clustering division is achieved. The more common criterion used for clustering is the length of the distance between users [17].

The implementation process of clustering division contains the following links: first, set the indicators for user clustering; second, select a distance calculation formula to calculate the distance between users; third, cluster the users with smaller distance into one category, while keeping a longer distance between each category. In business applications, based on different indicators, such as cost, assets, and behavioral characteristics, the existing user groups are clustered and divided and decomposed to get several groups, and users that have similar characteristics are placed in the same group. Then, set the appropriate marketing activities for the users and groups with that characteristic, so as to achieve marketing maximization. The researchers propose a new method for selecting initial clustering centers. In the process of clustering, we dynamically count the information of the divided and unclustered datasets, and then, apply these statistics to the next step of cluster classification, and gradually detect the relatively dense area in the unclustered part of the dataset. If the coverage of this dense area and the divided clusters is less than a certain threshold, then, this area is used as an initial cluster center. After finding a set of initial clustering centers, the remaining unclustered data are divided into the most similar class clusters, and finally, the clustering results are further optimized by the criterion function [18].

In the marketing process, after consumers buy one kind of goods, they usually tend to buy another kind of goods, and this becomes a marketing concern, so a more reasonable marketing list should be developed. Research

directions in this area include the following: first, the study of association, which identifies goods as one-time purchases and thus analyzes the association between various goods, and second, the study of sequential problems, which analyzes the existence of time intervals in users' purchasing behavior, while paying attention to the temporal connections. Regarding business applications, the association problem serves cross-selling activities of enterprises, where if consumers have already purchased a certain type of goods, they are more likely to purchase other related types of goods based on the conclusions of the association problem, and therefore, enterprises push such goods to users [19]. Researchers have investigated probabilistic clustering of large-scale datasets and proposed a probabilistic clustering algorithm for large-scale datasets based on partially constrained information. The previous research work focused on deterministic clustering; that is, a certain data can only uniquely belong to a certain class. However, in the clustering process of practical work, in many cases, a certain object will belong to several categories at the same time with a certain probability [20]. This is often reflected in the corresponding dataset, which is not very clearly separated and has a certain degree of overlap [21]. Previous studies on probabilistic clustering mainly focus on smaller datasets, and when dealing with large-scale datasets, there are often problems of unstable quality of clustering results, poor quality of clustering results, slow convergence of algorithms, and further improvement of algorithm performance. Incorporating the idea of semisupervised learning, the PC\_SEM algorithm is proposed. The algorithm uses the partial constraint information that can be automatically obtained through the dataset to guide the clustering process, which makes the efficiency of probabilistic clustering of large-scale datasets and the quality of clustering results further improved [22, 23].

### 3. General Architecture Based on Data Mining

**3.1. Data Mining Theory.** On the basis of data sources, it is possible to develop many forms of data mining and harvest different useful information. Huge amount of data is stored in databases, so databases are the most dominant data source at present. Data mining techniques are classified according to the differences of databases, including spatial data mining, relational data mining, and so on [24–26]. At present, various data mining techniques have been developed, including genetic algorithms, rule induction, fuzzy and rough set methods, nearest neighbor techniques, decision trees, artificial neural networks, and so on. With a large number of Internet users, online platforms are important platforms for information interaction and the most promising data sources.

Web access information mining can only obtain the access information of a group of users and learn the preferences of the public, but it is not possible to mine the access information of independent users, which makes this kind of data mining method only universal but not specific. The process of web access information mining includes two parts: the first is data preprocessing and implementation of mining algorithms, which are listed as follows: in the preprocessing stage, user information is processed and analyzed. The user information is retrieved from the data source, and then a large amount of data information is filtered and unwanted information is eliminated, and valuable data are retained as a database of subsequent data mining. In the implementation stage of data mining algorithm, the useful information provided in the preprocessing stage is used as the basic data, and the corresponding data mining algorithm is designed by selecting the appropriate data pattern to achieve data mining and obtain the information that can serve the business needs. WWW documents contain document information, and multiple documents are related, so from the application point of view, if a WWW document is selected, other related documents can be known, and these related documents can be sorted according to the number of visits or the strength of the association, and business purposes can be achieved on this basis. On the basis of hypertext and hypermedia technology and transmission protocols, web information resource is a form of resource that integrates various media contents, such as text, image, sound, and video, into one page and provides information to users in a visual interface. Data mining is a process of mining potentially useful information from information resources. Generally speaking, data mining includes six links, which are, in order, identifying and selecting mining objects, preparing and processing user data, data modeling, data mining, analyzing data mining results, and knowledge application of data. Different links are time-series, each reaching different purposes and ultimately serving business needs, as shown in Figure 2.

Accordingly, first of all, the object of data mining should be clarified, after which various data resources related to the data mining object should be widely collected with the help of various data sources, and the information resources available for data mining should be screened. After this

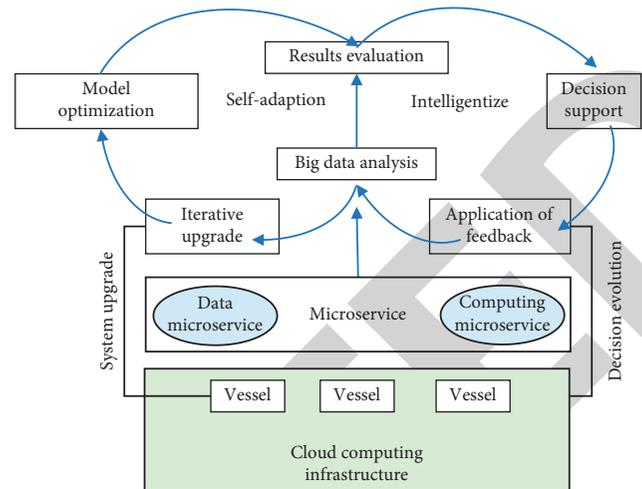


FIGURE 2: Knowledge discovery process in data mining.

comes the data preprocessing link. In this link, to complete the analysis and processing of data, according to the type of data, select the appropriate analysis model. A suitable mining algorithm is selected, with the help of mining tools for the grassroots data mining.

After harvesting some data results, they have to be evaluated and combined with other domain knowledge, and their utilization value will be analyzed by the users. Useful information will be used in the decision-making stage to harvest the utilization value. At present, the research on knowledge data mining is hot, and the hot spots are the application transformation of knowledge data mining and the visualization research of data mining, so as to break the obscurity of data mining and finally develop it into a science and technology that can be understood by users and has an application value. In addition, the network research of data mining is also hot, and its research aims to build a data mining web server. In addition, the networked research of data mining is also hot, and its research aims to build a data mining web server to provide a platform for highly integrated data mining. It is certain that the research of data mining is undergoing changes and more and more research directions, but a basic research purpose is realizing the realistic application of data mining technology. All kinds of research results should contribute to the transformation of data mining technology, dismantling user problems and then solving them. The results obtained should serve the real business and meet the user's needs. In this process, attention should also be paid to the development of more intelligent and efficient mining tools.

**3.2. Data Mining Method Design.** Based on the realistic game operation process, this paper mainly introduces process methods such as Cross Industry Data Mining Process Standard (CRISP-DM) and SEMMA. The model is a complete process description of a database knowledge discovery (KDD) project. The model typically divides a KDD project into six distinct, but not exactly sequential, phases: business understanding, data understanding, data

preparation, modeling, prediction, and deployment. In the business understanding phase, as a system designer, you have to understand what the ultimate purpose of the project is and what the requirements from the project operator are from a business perspective, and then organically combine these purposes and requirements with data mining techniques, as shown in Figure 3.

In the data understanding phase, work starts with the collection of data. After collecting the data information, you have to be familiar with the data and have a preliminary understanding of the collected data information. Then, the characteristics of the data are initially detected, and a simple classification of data characteristics is performed, while the completeness and readiness of the data are checked.

The data preparation phase covers the entire work from the raw data to the construction of the final dataset. Data preparation is likely to be repeated several times, and the sequence of these implementations is not preplanned.

The modeling phase sets the parameters of the model and evaluates the model to calibrate the parameters to the most desirable parameter values. Since some modeling approaches have special requirements for different forms of data, it is necessary to return to the data preparation phase to repeat some of the tasks while performing this phase.

From a data analysis perspective, the prediction phase has already constructed one or more high-quality models. However, before the models are deployed, it is important to review each step performed during the modeling process, and only then, can you be sure that these models are meeting the objectives of the gaming company.

One of the most critical evaluation indicators is to see if there are still important business issues that have not been adequately attended to and considered. In the deployment phase, the previously obtained results and processes are organized into a readable, codified form. Creating a model is not what the project is ultimately trying to achieve; depending on the requirements, the deployment phase can be as simple as a report or as complex as a repeatable data mining program.

The method usually consists of five phases: sampling, exploring, modifying, modeling, and assessing. The first phase is the sampling, where a dataset is isolated from the entire database, and then, the sample is adjusted to the target characteristics, thus reducing the amount of data processing. The second phase is exploring, where the data is explored and analyzed using a number of visualization tools, so that data personnel can identify the data more clearly. The third stage is the modifying stage. After the first two stages, data personnel have a certain understanding of the data, and the task in this stage is sorting out and refining the data in detail. Next is the modeling phase, which is the most important phase of the SEMMA process, and requires modeling of the data to build a data mining model that meets business needs. The last stage is assessing, where predictions are made based on the final model, and then, the predictions are applied to actual marketing practices. In this paper, the various aspects are planned with the help of the previously mentioned two process methods.

The stages of the model presented in this paper are as follows. In the business understanding stage, based on the business objectives proposed by the operator, the technical issues are transformed into user classification issues, such as pulling new users, pulling back flow, pulling payment, and so on. The developers communicate with the business side for the core issues to fully understand the business objectives.

In the data management phase, the business side provides data dictionaries, data sources, and other basic data to ensure that the data quality is up to standard.

In the data preprocessing stage, a large amount of basic data are processed to perform attribute filtering operations, complete data sieving, and then, the decision tree is used to build a model, based on this data integration and transformation.

In the modeling phase, the following are executed: formal modeling, deriving test records, varying metrics such as positive and negative sample ratios and sample time periods around the test objectives, and determining the parameters of the training set.

In the model prediction stage, the model is evaluated with the help of data mining tools, and the subsequent development direction is decided based on the evaluation results. In the model deployment stage, the predicted model can be connected to the information platform and turned into the operation stage.

*3.3. Functional Design.* Based on the module in this paper, it is possible to have technicians evaluate the business in the early stage of accessing the system, so that the best modeling parameters can be learnt, and the adapted user attributes can be obtained. The training set refers to the dataset with labels, which is the basic building block of the modeling tool, so the training set generation tool should be developed in the design of this module. The basic framework of the modeling tool and its business logic are shown in Figure 4. In the analysis, the first step is that the training set pulls cryptos based on the training set generation tool. The second step is to continuously update the current training set and form the training set of postscript into a large database. Finally, modeling work is performed based on the modeling prediction tool, and the model result or prediction result is obtained. Based on this functional module, the training set generation module can provide training sets for data mining algorithms. It completely replaces the earlier base table, and the training set reflects the user behavior with the marketing labels for the future period. Operationally, the training set data can be updated by the business operator at any time according to the business needs, and thus, the latest data information can be provided for data mining.

The main task of the training set generation tool is to write different computer marketing business codes according to the different needs of the game operator, for example, predicting which new game players are likely to pay. According to the business logic of the modeling prediction tool described before, the training set consists of two groups, which are the database tables of users that have paid in the previous period and database tables of users that will

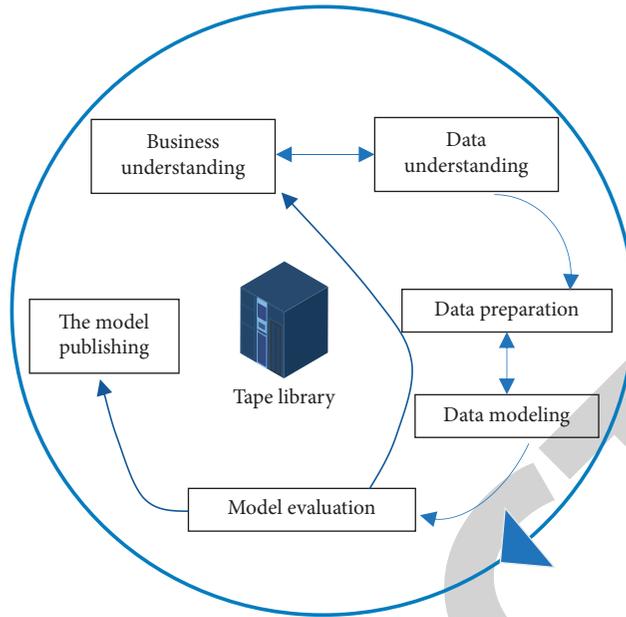


FIGURE 3: Cross-industry data mining model.

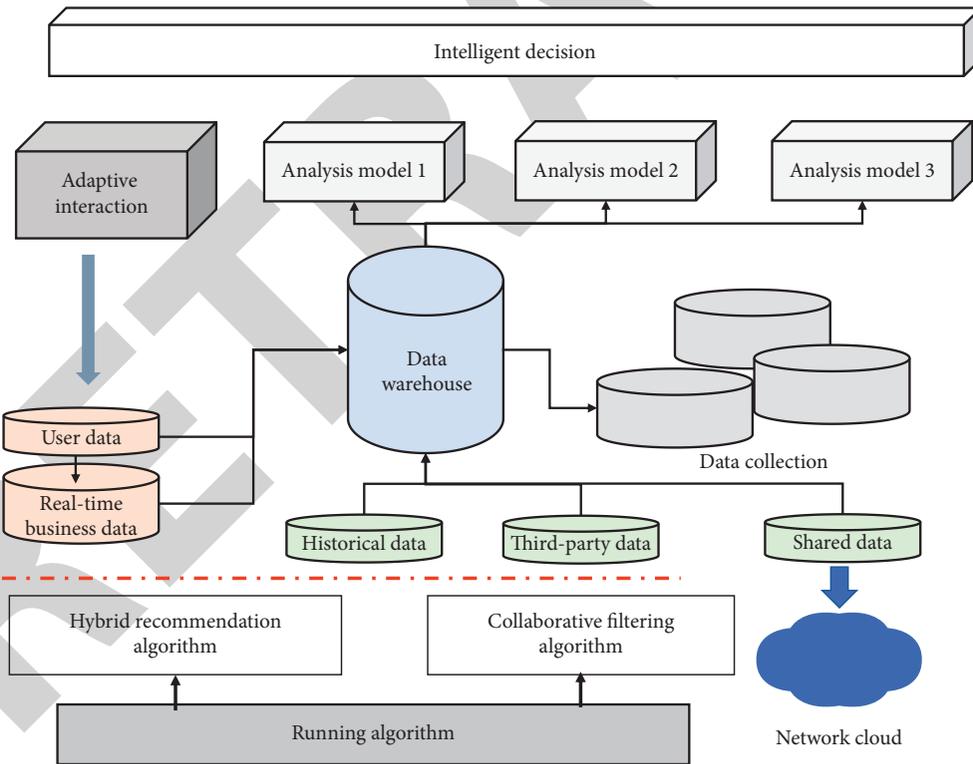


FIGURE 4: Schematic representation of the business logic of the modeling and forecasting tool.

pay or not in the later period. The set of paying players to be predicted consists of the database tables of users that have not paid in the previous period and the database tables of users that will pay or not in the later period.

The core of the design technology of the automated user classification system is the classification algorithm. Business personnel set marketing objectives or give classification

labels. Afterwards, you can output the user number package, according to which the marketing activities are set, making marketing more targeted. Therefore, the business party usually uses pop-ups and other forms to send the campaign information to users and make sure to minimize the disturbance to nonpaying users, while sending the campaign information to the target users at the lowest cost, which

becomes an important element of the game marketing campaign. The basic framework of the automated user classification system is shown in Figure 5. Briefly, the marketing business management platform provides information about marketing activities and holds it in the MySQL database. The scheduling module then executes the data mining calculation link, and the calculated results are sent to the business party through the switch machine. It also sends the operation of the user collected by the operation to the switch machine, integrates the previously mentioned information, supports the system, and finally provides the result of data mining.

The advertising user management system integrates two functions, the advertising query server and the result data statistics server, both of which are the core building blocks of external services. Among them, the advertising query server sends the marketing advertisement query results corresponding to the behavioral attributes of game players to the backend of advertising channels, obtains the number information through data mining technology, and continuously updates the number search scope. The information of marketing advertisements is entered by the business party, and this process is also dynamic. The business party can enter the information at any time according to the demand. The resultant statistics server can receive information from users through advertising channels for a certain period of time, and this information is stored in a local database in the form of documents. In real operation, the information stored in the local database and user feedback is the basic information for data mining, according to which marketing results are obtained, after which the joint advertising and result feedback links actually create a closed loop of user classification, adapted to real business needs.

#### 4. System Optimization Test

Based on the previously mentioned test scheme and environment, the following test results were obtained by observing the scheduling automation user classification system from the backend logs. (1) By accessing in different browsers, the scheduling module regularly checked that the initialization function was running well. During the test, the running data was read normally, no program running error or machine failure occurred, and the data results were correct and basically the same as the expected output. In addition, abnormal result detection was added to test the results according to the user access output error, and the system was able to promptly alert the error message and alarm. (2) Regarding the modeling and statistical process list, the system runs well. Each functional module test in this system is tested according to the output results of game players, and the results are obtained through testing. Each business data module is able to complete automated generation of statistical tables. The system performs automated classification according to different attributes of users. The system classifies accounts into left or right, according to the various attributes of the player, such as "left-lpfc," "right-lpfs," "left-sd," and "right-sd." In the query server test usage program, the sending request was sent to the query server and the correct feedback was provided. The

query server sends a request command to the result statistics server and checks the backend MySQL database, and the server records the results of the advertisement. In the waiting process of the game, we query the game "Crossfire" and pop up advertisements of different players' reactions and subsequent operations. Figure 6 shows the obtained system test results statistics. As seen from the figure, about 100 left-lpfc chose to display an outdoor live by clicking and selecting the player's left SD to close directly, and the right-ipfc complained about the advertisement.

The modeling prediction results of the automated user classification system are stored in the MySQL database, and there is an ad user management system outside of this subsystem to query and display the modeling results. Figure 7 shows the modeling records of business X. The analysis of this figure shows that the improvement of each modeling is at least two times. It can be seen that the automated user classification system is an important element of game marketing. In the real scenario, business parties often carry out online activities, the purpose of which is to "retain," "pull in," and "pull new," that is, to retain existing users, increase revenue, and pull new users. This also becomes the basic goal of marketing. In order to achieve the previously mentioned marketing goals, the business party needs to improve the attractiveness of the game through online activities, so as to attract more players to participate in it.

The system modeling prediction results are stored in MySQL database, and there is an ad user management system, not mentioned in this paper, that can query and present the modeling results. Figure 8 shows the modeling records of business Y. The analysis of this figure shows that the improvement of each modeling is at least two times. The whole automated user classification system works properly and achieves the expected results. Considering that this subsystem runs automatically in the background like the automated user classification system, and the required data is transmitted by the external management system, the training set generation tool is used to test and observe and get the corresponding information of the automated operation. Using the query server test procedure, requests are sent to the query server, which gives the correct feedback. The query server sends a request command to the result statistics server and checks the backend MySQL database, and the server records the results of the advertisement. Finally, there are models 1, 2, 3, and 4. In the waiting process of the game, there will be various player reactions and pop-up advertisements. The business staff can understand the game faster through the results obtained using the attribute analysis and selection tools during prior access. For model 1, you can use the attribute analysis tool to analyze the player's cancellation rate. The result shows that the team system is an important factor to determine the player's activity and the enhanced team system can allow more players to play. Positively, in models 2 3, part of the game marketing campaign that will be regularly performed will reduce personnel costs to almost zero and aggregate the results regularly during the run. The advertising user management system provides a stable query interface for advertisers that need it. This system performs also classification management and generates various reports for different needs, where business data

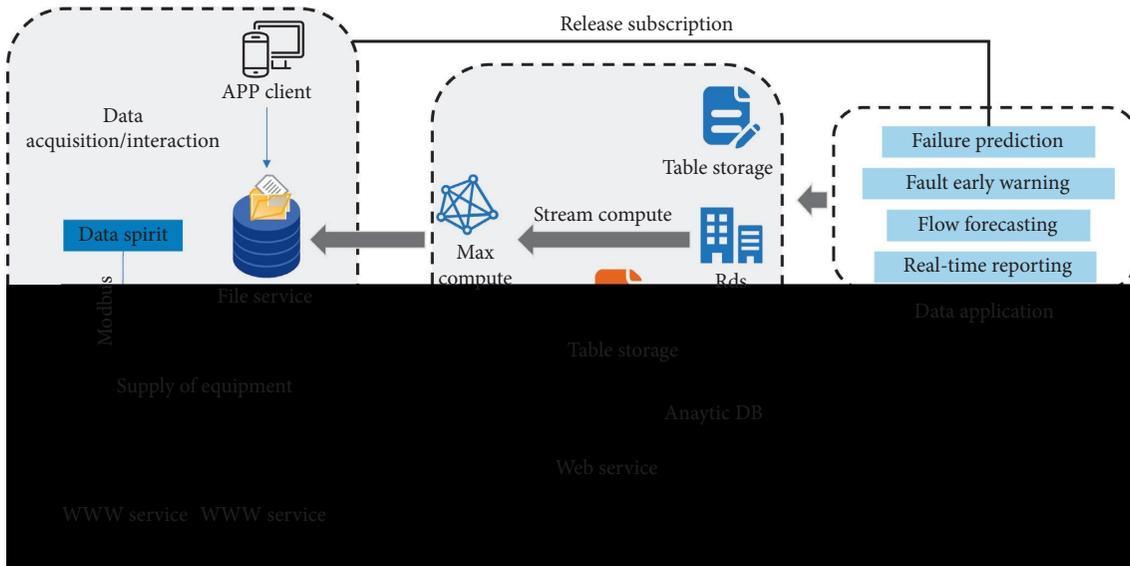


FIGURE 5: Structure of the automated user classification system.

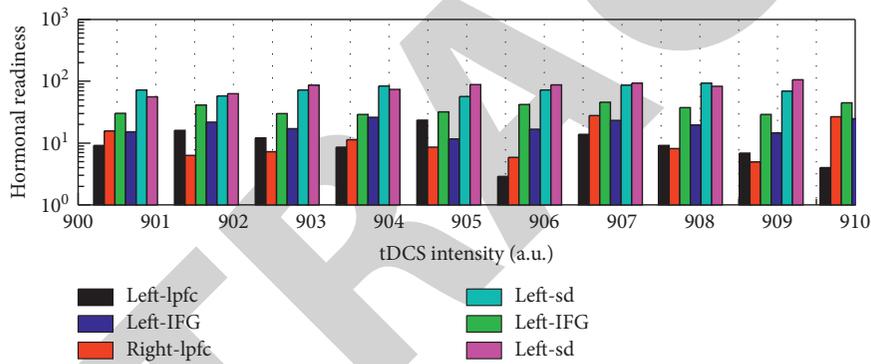


FIGURE 6: Account list classification of the automated user classification system.

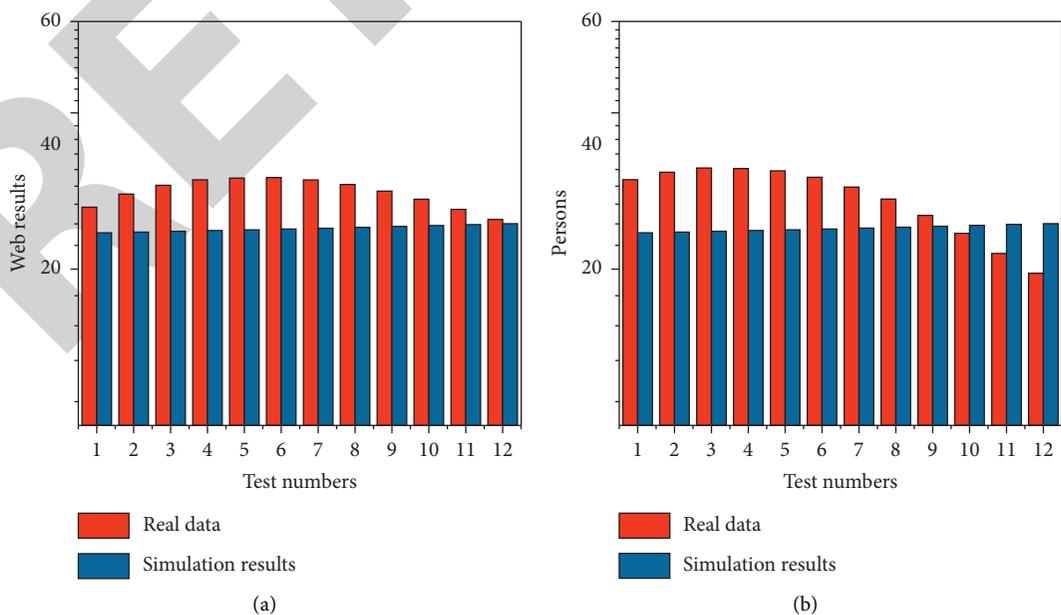


FIGURE 7: Continued.

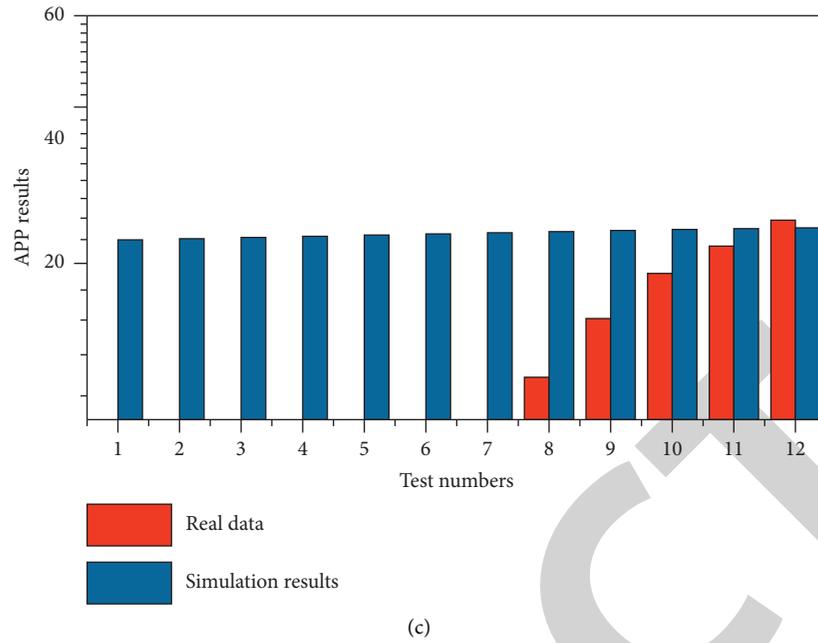


FIGURE 7: Modeling results table for business X.

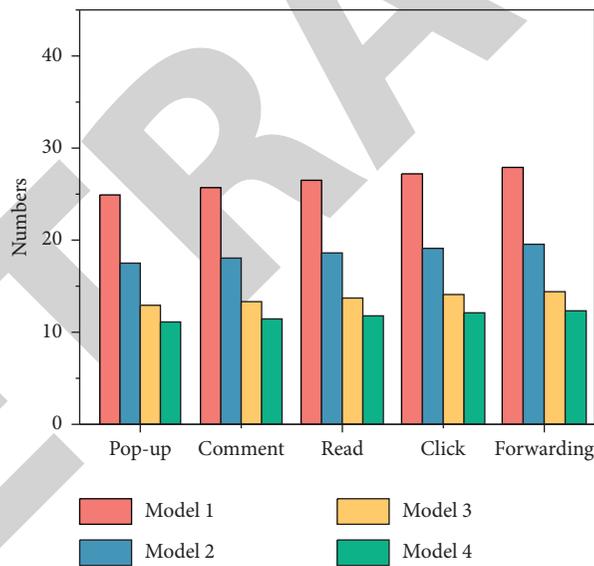


FIGURE 8: Modeling results for business Y.

management basically meets the requirements. After completing the access process, not only has the level been improved, but also its own ability has been enhanced. At the same time, the business staff can understand the products better from the data level, thus exposing the problems of the game products.

### 5. Conclusion

The integration of computer technology and information technology has made computers an important tool for human’s daily production and life, especially in the field of data processing, which can not only store data resources in

large quantities but also provide statistics and analysis to further explore the application value of data resources. In this paper, we introduce data mining techniques to game marketing business and develop IT solutions for game precision marketing, attribute selection tools, attribute analysis tools, modeling prediction tools, and other sub-systems. The game precision marketing system based on data mining technology is designed and implemented. The system passes the actual test, and the development and operation of this system are testable and increase the company’s earnings and marketing activities. In this paper, we tried to apply data mining technology to game marketing, developed a game marketing system, completed testing the system, and

succeeded in development and application. However, realistic marketing activities do not exist independently, and the game itself is marketing activity, and guidance about the behavior of the user is made. This requires attention. For model monitoring, you must create a user classification model to determine the change of the player group based on the model changes. Therefore, subsequent technological development or system optimization must maintain dynamic development thinking, ensure advanced technological levels and system levels, meet business needs more appropriately, and pursue corporate interests.

## Data Availability

The data used to support the findings of this study are available from the corresponding author upon request.

## Conflicts of Interest

The author declares that there are no conflicts of interest.

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