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Retraction

Retracted: Enterprise Precision Marketing Strategy and Quality Management Mobile Information System Based on Customer Satisfaction

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This article has been retracted by Hindawi following an investigation undertaken by the publisher [1].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) Peer-review manipulation

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. Wang, C. Hung, and C. Hsieh, "Enterprise Precision Marketing Strategy and Quality Management Mobile Information System Based on Customer Satisfaction," *Mobile Information Systems*, vol. 2022, Article ID 2105383, 11 pages, 2022.

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Research Article

Enterprise Precision Marketing Strategy and Quality Management Mobile Information System Based on Customer Satisfaction

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With the increasingly fierce competition in the product economy, there are more and more constraints on the development of enterprises, especially from the requirements of customers. Enterprises should be committed to development and meet customer needs first. However, the existing marketing plan and quality management also take customer satisfaction into account, so this paper aims to design the enterprise precision marketing strategy and quality management mobile information system based on the customer satisfaction model. For the precise marketing strategy of enterprises, this paper proposes three indicators of product quality, product delivery, and product service based on the customer satisfaction model and uses the hesitant fuzzy set to quantify the indicator model and apply it in the information system. For the quality management system, this paper uses PDCA cycle indicators to upgrade and optimize the quality management system. The test results show that the system has achieved a customer retention rate of 95% in terms of precise marketing strategies; in terms of quality management, it has improved the quality of enterprise products by about 20%. In the overall test of the system, the communication delay and reliability of the system are obviously optimized. This proves that the system can adjust the marketing strategy in real time according to the opinions of customers, achieve the purpose of precise marketing, and improve the quality management to a new height in line with customer satisfaction which shows that the information system designed in this paper can meet the purpose of precise marketing strategy and quality management of enterprises.

1. Introduction

In the current digital information age, traditional management analysis and decision-making methods can no longer meet the rapid development requirements of enterprises. Faced with emerging opportunities and increasingly fierce competition, new management decision-making methods emerge as the times require, among which management methods based on data-based decision-making have received more and more attention. The main method of data-based decision-making is to use data mining and other means to analyze massive data and analyze and extract potentially useful information from a large amount of actual business data. Satisfied customers are bound to be loyal, and if this loyalty can be maintained for a long time, companies are less likely to be abandoned because other companies offer slightly lower prices. Even when an enterprise faces difficulties in its operation, satisfied customers will remain loyal for a certain period of time and within a certain range, so that the enterprise has the opportunity to take measures to deal with the difficulties and buys time for the enterprise. At the same time, satisfied customers also do not choose new products immediately, because choosing new products is also risky for customers. Therefore, it is necessary to design the enterprise precision marketing strategy and quality management mobile information system based on customer satisfaction.

So far, there is no systematic research on how to reasonably improve the quality management of enterprises

according to customer satisfaction. Ma et al. studied a low-cost hybrid power quality management system for negative sequence and reactive power compensation in V/v traction power supply system [1]. Baaran has done a lot of research on the quality of enterprise generation management. He upgraded the ISO 9001 standard and proposed a higher quality management system [2]. Chupikova et al. conducted research on the production quality of fishery enterprises, and they introduced the production process plan of frozen shrimp and frozen seaweed, the control points of the process, and the recommended measuring instruments for the control parameters of the process [3]. Kalmutchi conducted research on the operational safety of airlines [4]. Krupko and Shaburova described the effectiveness of expanding the field of certification in the development of a quality management system (QMS) for metrological services [5]. However, the relevant research on quality management is more concerned with the establishment of quality standards, without taking into account customer satisfaction.

Precision marketing focuses on the comprehensive process control of sales management and strengthens the ability to implement the sales process. There are many studies on precision marketing. For the precision marketing of enterprises, Zhao and Ma combined the precision marketing data source system based on big data to introduce data standardization and quality model, so as to provide a reference for building a data source system based on big data [6]. Bo and Zhang aim to build an online precision marketing system model based on big data, realize the Hadoop + MapReduce precision marketing model platform, and provide a basis for enterprise decision-making [7]. Zhang et al. aims to use data mining clustering technology to analyze the characteristics of user's mobile behavior trajectory and build a tourism accurate recommendation system; it can provide support for tourism decision-making and can carry out precise marketing for tourist groups, so that tourists can travel more intelligently [8]. Li and Cheng use Internet technology to optimize various industrial links of agricultural production and operation, so as to achieve precise marketing of agricultural products [9]. However, the research on precision marketing rarely considers customer satisfaction, and most of them focus on tracking algorithms for customer classification and customer behavior. Therefore, the precise marketing and quality management system based on customer satisfaction in this paper is very necessary.

In this paper, a method to improve the reliability of data fusion, TGDA algorithm, is proposed. In order to analyze the basic performance of the TGDA algorithm, 100 rounds of simulation experiments are performed on the OPNET platform, which proves that the communication delay of the system is reduced by about 20%, and the reliability is improved 30%. The innovations of this paper are as follows: In view of the development trend of global economic integration, high-end customers and groups are gradually increasing, the demand for high-quality products is also increasing, and customer demand is improving, and this paper designs a mobile information system based on the customer satisfaction model. The system can implement precise marketing with more customer information and customer satisfaction and can manage product quality through the satisfaction returned by customers.

2. Precision Marketing and Quality Management in the Context of Customer Satisfaction

2.1. Precision Marketing Strategy. Data management capabilities have gradually become a winning factor in business competition. In the era of digital information, only with good data information collection and analysis capabilities can more accurate decisions be made and ultimately promote the continuous improvement of corporate value. Relying on advanced data management and analysis tools, precision marketing is an important scientific analysis method and technical means for enterprises to carry out customer relationship management. At the same time, precision marketing is different from traditional marketing that only rests on the performance requirements of sales personnel but emphasizes the transformation from a salesperson-centered management method to a comprehensive management and control of sales activities through planning, executing and monitoring the company's sales activities [10]. The effective management of the process is beneficial to the enterprise to discover the problems in the activity process and execution in time, help to adjust the strategy in time, and ensure the effectiveness of the activity. The relationship between customer satisfaction and precision marketing is shown in Figure 1.

In addition to the data analysis and preparation in the early stage, precision marketing includes the entire marketing business process based on data decision-making: that is, clarifying the campaign objectives and scope before creating a marketing campaign, formulating campaign plans based on marketing goals, and business personnel executing according to the plan. The activity phase summarizes and summarizes the entire process. The development of precision marketing business first needs to analyze the market and formulate targeted marketing activities [11]. The so-called market analysis is to make judgments by clarifying the background of the customers participating in the activities and the market performance of the business products related to the marketing activities before the formulation of the marketing plan and then describing the accurate characteristics of the target customers to establish a feature database. The marketing planning process includes formulating a marketing plan based on market analysis results and marketing objectives, targeting the characteristics of target customers and designing a targeted marketing plan, clarifying marketing steps and promotion channels, and finally implementing and supervising marketing activities.

The customer resource information of an enterprise is the most important enterprise resource. Only with good data management capabilities can an enterprise scientifically collect, analyze, and manage customer data. However, with the improvement of the level of informatization, consumers

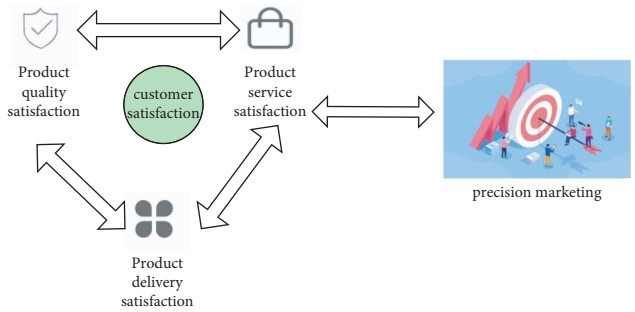

Figure 1: Customer satisfaction and precision marketing.

increasingly demand diversified, personalized, and intelligent services. In order to ensure the market competitiveness of enterprises, enterprises must be able to accurately identify the needs of customers, be customer-centric, provide accurate services to existing customers, and accurately guide potential customers, so as to achieve the goal of sustainable development. In this sense, reacquainting customers and identifying customers, being able to accurately identify important customers and effectively discover potential customers has become a crucial link in the process of customer relationship management. What this paper will study is the design and implementation of a customer-oriented precision marketing solution for enterprises [12].

2.2. Quality Management System. As a quality improvement tool, PDCA quality cycle plays an important role in the quality control of "products" of enterprises. Through the realization and operation of each link, the quality of "products" is gradually improved. At the same time, the "Quality Management System Maturity Evaluation Criteria" propose that the PDCA cycle can also play the role of evaluation criteria in the enterprise quality management system. One is that the PDCA cycle is thoroughly implemented in every link of the quality management system, and the second is that it uses the concept of continuous improvement to achieve the idea of improving the quality of "products," so that the operation of PDCA can also be used as the standard for judging the operation status of the quality management system [13]. In addition, the idea of this criterion can be used not only for self-evaluation of the internal quality management system of the enterprise, but also for the second and third parties to evaluate the operation status of the enterprise quality management system. In addition, some scholars have applied PDCA cycle to other related fields in enterprise operation such as enterprise performance evaluation and enterprise development level evaluation, which further verified that not only is PDCA a quality improvement tool, but its core idea can be applied to quality improvement of other related aspects. Among them, the specific main evaluation items are based on the four dimensions of P (Plan), D (Do), C (Check), and A (Act), and each item is quantitatively scored and qualitatively evaluated.

In "Quality Management System Maturity Evaluation Criteria," the criteria and framework of enterprise quality management system evaluation have been given according to PDCA cycle, which proves that PDCA cycle can not only be used as an improvement model, but also be used as evaluation criteria to measure enterprise quality management system. The development level and situation [14]: The quality management system studied in this paper is essentially a system for measuring the level of enterprise quality management. Starting from the concept of the system, the idea of quality improvement is permeated in every link of enterprise production, operation, and management, so as to achieve the goal of improving quality, purpose closely linked to corporate strategy, development direction, and "product" production. Therefore, this paper will continue the core idea in the "Quality Management System Maturity Evaluation Criteria" and select four dimensions of P (Plan), D (Do), C (Check), and A (Processing) as the enterprise quality. The evaluation criteria of the management system, on the basis of ensuring that the evaluation items are reasonable and correct, further use the core idea of continuous improvement to evaluate and improve the enterprise quality management system and integrate traditional quality improvement tools with emerging quality evaluation methods. Among them are P (plan): suitability, systematicness, and effectiveness of planning output; D (implementation): comprehensiveness, continuity, and strictness of implementation; C (check): sufficiency of monitoring basis and accuracy of objects and the visibility of the results; A (treatment): analyze and evaluate the monitoring results and decide whether to implement improvements.

2.3. Hesitant Fuzzy Sets. The evaluation of enterprise soft quality is a highly subjective evaluation problem, and most of the data considered in the index system are discrete data without obvious functional relationship. Therefore, compared with type-1 fuzzy sets and type-2 fuzzy sets, hesitant fuzzy sets can express the subjective hesitant ambiguity of decision makers without inducting membership functions and have more practical application value.

In the soft quality evaluation problem involving multigroup decision-making, the hesitant fuzzy set can avoid the distortion and distortion of information to the greatest extent when the opinions of decision makers are not unified and can avoid the problem of reaching a consensus. A process (this process itself has a certain degree of difficulty and the process is cumbersome and complicated) can retain the original and effective information [15].

From a statistical point of view, it is difficult for enterprises to keep data for many years in the evaluation process. If there is a lack of data in certain years, hesitant fuzzy sets can use discrete data for each year to obtain statistical results. In the decision-making process where the minority obeys the majority, the constructiveness of minority opinions cannot be ignored. To retain all the opinions, it is obvious that hesitant fuzzy sets have this function [16].

If different decision makers give results of 0.3, 0.5, and 0.7 when evaluating a certain indicator, only the weighted average will be used to calculate the evaluation value of 0.5,

and the two values of 0.3 and 0.7 will be obtained. The evaluation result loses its own meaning.

Through the above analysis, in view of the obvious advantages of hesitant fuzzy sets in enterprise soft quality evaluation, this paper intends to use hesitant fuzzy sets as the data basis, in order to make decisions that best meet the actual needs of enterprises in the decision-making process of the expert group. Next, we will introduce the algorithm of hesitant fuzzy sets [17].

Let X be a given set

$$M = \{u_1, u_2, \cdots, u_n\}, \tag{1}$$

$H_M$is defined as

$$\begin{aligned} H_M &= \{\langle x, h_M(x)\rangle \mid x \in X\}, \\ h_M(x) &= U_{u\in M}\{u(x)\}. \end{aligned} \tag{2}$$

For the convenience of expression, the whole hesitant fuzzy set on the finite universe X is denoted as HFS(X), and $h_A(x)$ is called the hesitant fuzzy element of A, abbreviated as h_A.

For any three hesitant fuzzy elements h_1, h_2, h_3, their algorithm is as follows (where θ is a constant):

$$\begin{aligned} h_1 \cap h_2 &= H\left\{\min\left(r_1, r_2\right) \mid r_1 \in h_1, r_2 \in h_2\right\}, \\ h_1 \cup h_2 &= H\left\{\max\left(r_1, r_2\right) \mid r_1 \in h_1, r_2 \in h_2\right\}, \\ \theta h &= H\left\{1 - (1-r)^{\theta} \mid r \in h\right\}, \theta > 0, \\ h^c &= H\{1 - r \mid r \in h\}, \\ h_1 \oplus h_2 &= \left\{H\left(r_1 + r_2 - r_1 r_2\right) \mid r_1 \in h_1, r_2 \in h_2\right\}, \\ h_1 \otimes h_2 &= \left\{H\left(r_1 r_2\right) \mid r_1 \in h_1, r_2 \in h_2\right\}. \end{aligned} \tag{3}$$

Define function as Θ:

$$\begin{aligned} &\Theta\colon [0,1]^N \longrightarrow [0,1], \\ &\Theta_H(x) = \cup_{r\in\{h_1(x)\times\cdots\times h_N(x)\}}\{\Theta(r)\}. \end{aligned} \tag{4}$$

Let $h(x)$ be the hesitant fuzzy element

$$s(h(x)). \tag{5}$$

The formula is called the scoring function of $h(x)$, where $\#h(x)$ represents the number of elements contained in $h(x)$.

2.4. Customer Satisfaction Model. The formula for calculating customer satisfaction is as follows:

$$CSI = \sum_{i=1}^{n} W_i C_i. \tag{6}$$

Among them, C_i represents the score of the customer's evaluation of the ith indicator, W_i represents the weight of the ith indicator, and CSI represents the customer satisfaction index.

2.4.1. Product Quality Satisfaction. Through the analysis of the calculation results of customer satisfaction in Table 1, the customer satisfaction of the standard product quality is 7.2134, which is in a state of lower satisfaction. Among them, the fourth item in terms of product quality is the convenience, stability, reliability, and advancement of product assembly: whether the 6th item can solve the quality problems reported by customers in a timely and effective manner; whether the 7th item has repeated quality incidents in the short term; whether the 8th item is satisfied with the quality system assurance capability customer satisfaction 5.7324, item 9 on the quality improvement of products, and customer satisfaction 5.5070; whether the products developed in item 12 meet the customer's requirements, customer satisfaction 6.4014, all at the basic customer satisfaction level. The third item is whether there are appearance problems such as bumps, folds, dirt, etc. Customer satisfaction is 3.4718, which is lower than the red line of 4 points of dissatisfaction, and it is in the level of customer dissatisfaction.

2.4.2. Satisfaction with Product Delivery. According to the evaluation results of the customer satisfaction statistical table in Table 2, the delivery satisfaction of the standard layer products is 8.3037, and the overall score reaches the satisfaction level. However, whether the fourth item in this part meets the customer's temporary change or additional demand for goods, the satisfaction level is 6.3380, which is at 6.3380. The 8th survey content is whether to actively cooperate with customers to improve work in all aspects. Customer satisfaction is 3.5070, which is lower than the red line standard of satisfaction and is in the level of customer dissatisfaction.

2.4.3. Product Service Satisfaction. According to the evaluation results of the customer satisfaction statistical table in Table 3, it can be seen that the overall evaluation score of H company's product service capability is 6.7176, which is in the basic customer satisfaction level and can meet the basic needs of customers for various products and services. The content has a score of 4.4648 on the speed and efficiency of after-sales handling of product problems, which is relatively low. It can only reach the basic satisfaction level and is offline, indicating that the timeliness of solving problems is not timely enough.

3. Enterprise-Level Precision Marketing and Quality Management Information System Design

3.1. Precision Marketing System Process and Prediction Model Tool Selection. As shown in Figure 2, there is the concept of customer grouping in precision marketing, which corresponds to the recommendation system and generally refers to the prediction model technology. Prediction model refers to the use of data mining methods to find the rules of customer behavior based on the massive stock of historical customer behavior data and to apply these rules to predict the customer behavior that may occur in the future [18].

Table 1: Product quality satisfaction.

Three-level indicator	Weights W_i	Mean C_i	Satisfaction CSI
Product design compliance	0.1556	8.2	
Product development process	0.1001	9.1	
Product appearance quality	0.0408	3.5	7.1234
Product assembly performance	0.1089	6.1	
Quality problem solving ability	0.0821	9.4	

Table 2: Product delivery satisfaction.

Three-level indicator	Weights W_i	Mean C_i	Satisfaction CSI
Punctuality of delivery	0.1503	8.9	
Delivery accuracy	0.1576	9.1	
Temporary supply capacity	0.0897	6.3	8.4073
Spare parts delivery capability	0.0901	8.2	
Logistics problem solving efficiency	0.0476	7.1	

Table 3: Product and service satisfaction.

Three-level indicator	Weights W_i	Mean C_i	Satisfaction CSI
Ease of communication	0.0863	9.3	
After-sales problem handling efficiency	0.2297	4.5	
Effectiveness in solving quality problems	0.5246	6.5	8.4107
Salesperson's work initiative	0.1107	9.4	
The attitude of the sales staff	0.0403	9.5	

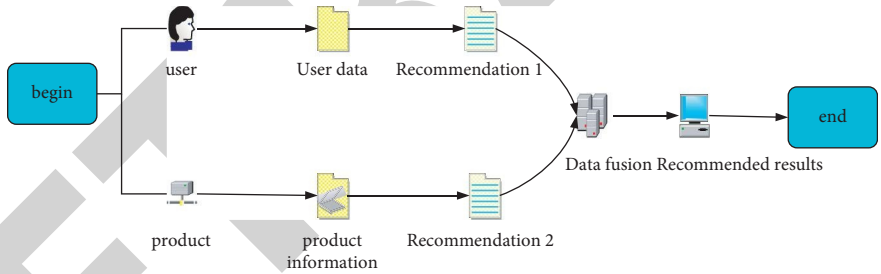

Figure 2: Recommender system flowchart.

SAS' Enterprise Miner software is the most popular data mining analysis tool [19]. SAS can apply multiple predictive models to the data at the same time and use the "lift chart" to compare the predictive effects of the models used and select the optimal model based on the evaluation. The specific process of using Enterprise Miner to build a prediction model is shown in Figure 3.

First read the data through the data reading module, then perform data transformation and data segmentation operations on the preprocessed data according to specific business requirements, and then perform the "regression model," "decision tree analysis," and "decision tree analysis" in data mining for the preprocessed data at the same time. Predictive models such as "neural network" algorithms are for predictive analysis. Finally, based on business requirements, model evaluation is carried out for the three prediction models, and the prediction results are finally sorted to obtain prediction recommendation data [20].

3.2. Quality Management Information System. This paper takes the evaluation of enterprise quality management system as the research background, selects the widely used PDCA as the evaluation criterion, and focuses on the four dimensions of P (Plan), D (Do), C (Check), and A (Process Act). Build an evaluation model that conforms to its characteristics, establish an evaluation model of the enterprise quality management system, and conduct an example analysis in the model construction of each link. The quality management information system architecture is shown in Figure 4.

3.3. Data Module Architecture Design. In order to overcome various problems faced by data integration, the data processing part of this paper adopts ETL technology to realize the integration of customer resource data. Generally, the data obtained after the predictive model analysis of the

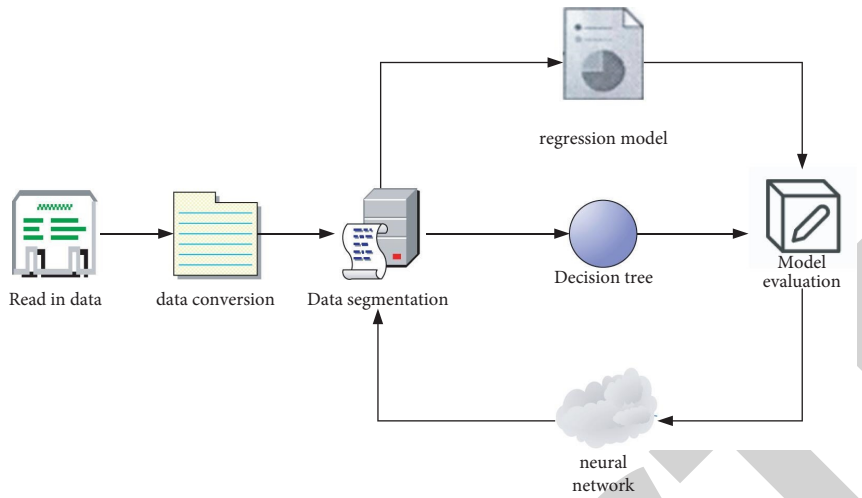

Figure 3: Prediction model flowchart.

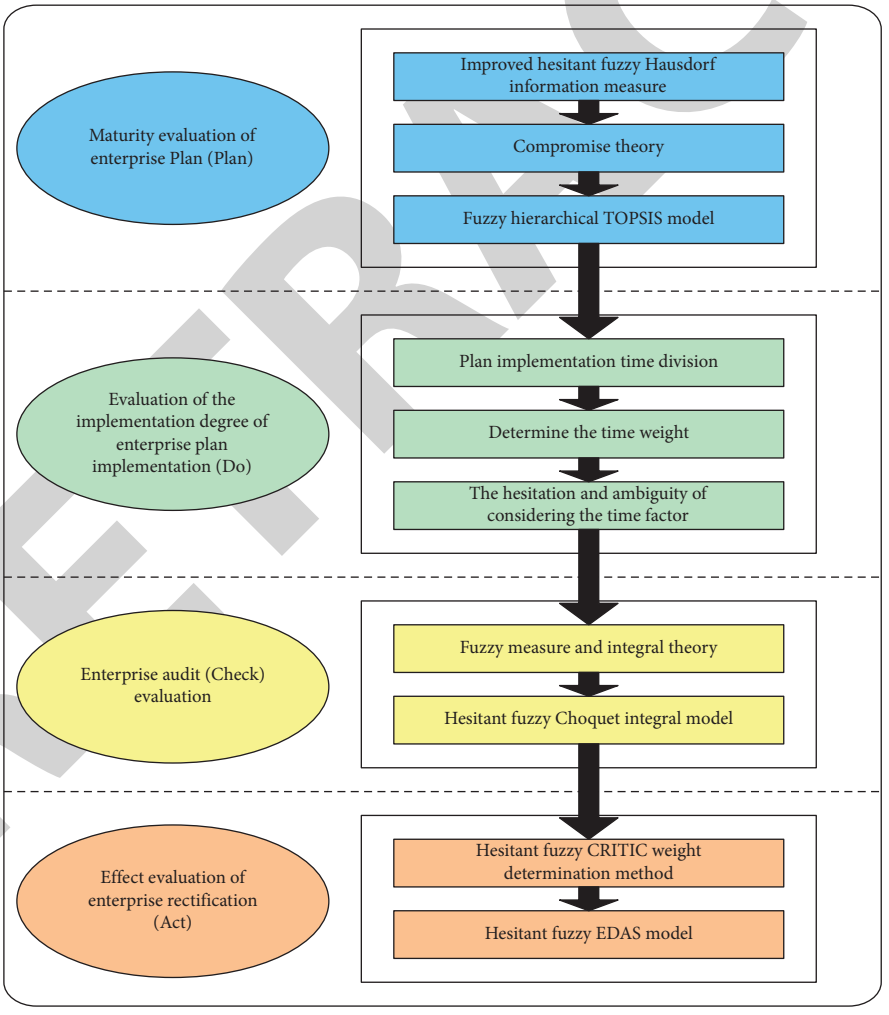

Figure 4: Quality management information system architecture.

original data (generally customer information and behavior records) cannot be directly applied to the precision marketing system. After the SAS analysis data is acquired, some data grouping and other processing operations can be performed at the same time in the process of data loading through ETL.

For the above process, the precision marketing architecture of this paper designs a four-layer data structure to store analysis data at different stages. The relationship is shown in Figure 5.

3.3.1. ETL Buffer Layer. SAS analysis results are generally in text or other nondatabase formats. So the first step is to load the SAS analysis results into the buffer layer data table through the ETL tool for the next step to perform data processing operations.

3.3.2. Data Packet Layer. ETL directly performs data processing operations on the buffer layer data table. Through the processing flow configured in ETL Job, the analyzed data results are grouped or labeled according to business requirements. The data obtained after grouping and labeling operations can be used for the recommendation system engine to execute.

3.3.3. Precision Marketing Business Layer. This is the business layer data table of the precision marketing system, which is generally designed according to the business function requirements of the system and the requirements of the recommendation engine. At the same time, some data (such as customer information data) will be stored in the corresponding business table when the ETL processing buffer layer operation is performed.

3.3.4. System Configuration Layer. The system configuration layer is mainly used for the relevant configuration during the operation of the precision marketing system. At the same time, it also includes information such as user rights and departments related to the use of system management.

3.4. Architecture Design of Enterprise Application Service System. In order to ensure the stability and pressure resistance of the enterprise-level system, the system deployment adopts B/S layering, hardware distribution, and Weblogic cluster deployment. The detailed server deployment arrangement is shown in Figure 6.

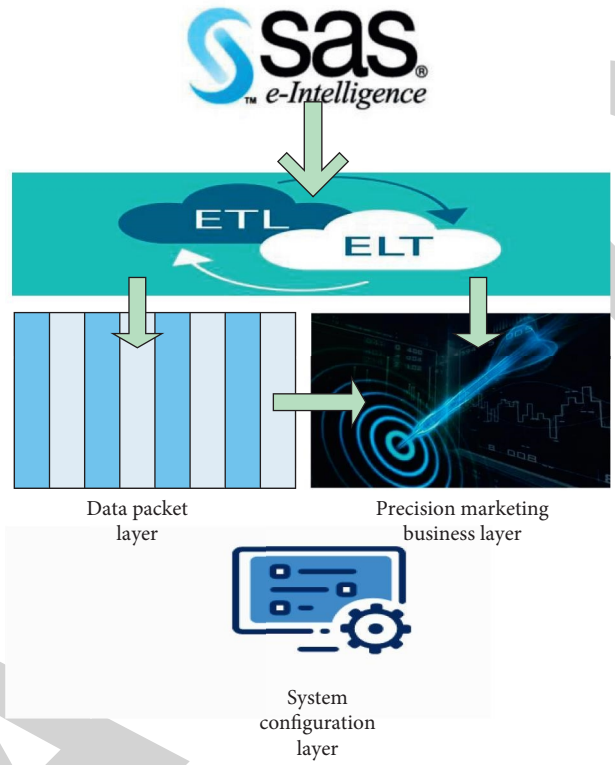

Figure 5: Database hierarchy.

4. Enterprise Accuracy Results and Discussion

4.1. Customer Satisfaction Precision Marketing Performance. For virtual unit scheduling considering customer satisfaction, the objective function of the running scheduling scheme has an optimal average customer satisfaction of 0.945, and the Gantt chart and convergence diagram of the optimal scheduling scheme are shown in Figures 7(a) and 7(b).

Based on the existing researches using triangular fuzzy numbers to represent the completion time and semitrapezoidal fuzzy numbers to represent the delivery time to establish a satisfaction scheduling model, considering the characteristics and computational complexity of the actual scheduling problem, a six-point fuzzy number representation is proposed. Completion time is a trapezoidal fuzzy number representing the satisfaction scheduling model of the delivery date. This paper uses the stability evaluation index to evaluate the stability of the theoretical optimization scheme in actual implementation to verify that the representation method proposed in this paper is more in line with the actual production, and the obtained optimization scheme is more stable.

The optimal scheduling scheme of manager satisfaction and customer satisfaction obtained above, as well as the triangular fuzzy number representing the processing time and the semitrapezoidal fuzzy number representing the delivery time, the optimal scheduling scheme of manager satisfaction and customer satisfaction is between 0.5 and 0.5. Solve the stability index at the 0.75 confidence level. Table 4 shows that the six-point fuzzy number represents the completion time scheme in the case of manager satisfaction. Contrasting triangular fuzzy numbers represent optimal results and stability values under the make-time scheme.

By comparing the results in Tables 4 and 5, it can be seen that the optimal scheduling scheme obtained by the manager satisfaction and customer satisfaction models designed in this paper is more stable than the optimal scheduling obtained by the model in the previous research at the confidence level of 0.5 and 0.75. Under the same confidence level, in the optimal scheduling scheme obtained by the model designed in this paper, the actual completion time of each workpiece is more likely to be in the excellent area of the theoretical fuzzy completion time, and the consistency between the actual and theoretical scheduling results is also more likely. Therefore, the problem of insufficient stability of the optimization scheme of the scheduling model in which

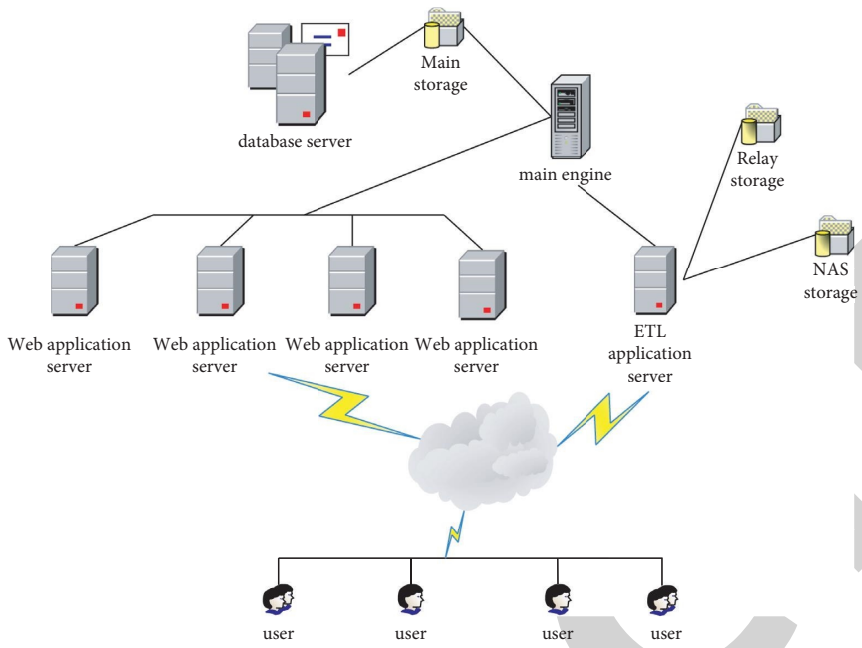

Figure 6: Information system deployment architecture diagram.

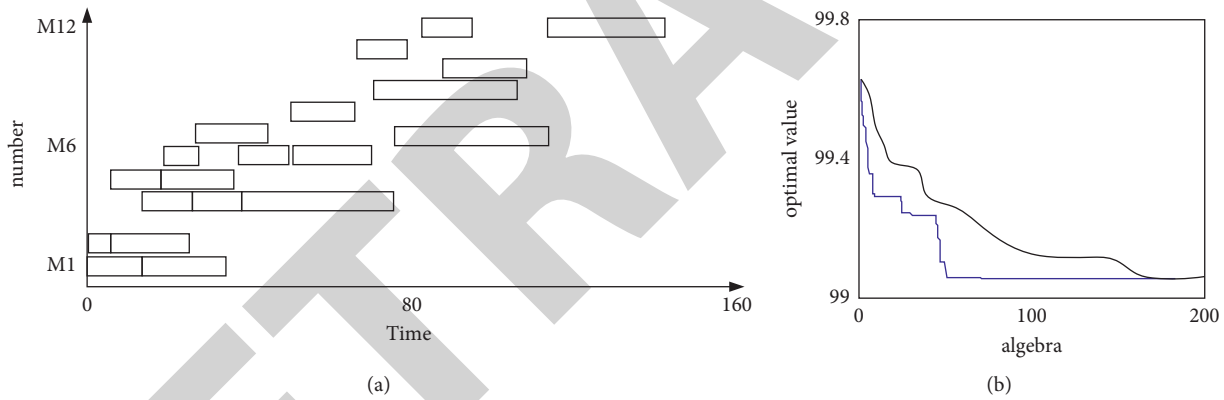

Figure 7: Customer satisfaction precision marketing performance analysis. (a) Gantt chart of optimal customer satisfaction scheduling scheme. (b) Convergence diagram of optimal customer satisfaction scheduling scheme.

Table 4: Comparison of optimal results and stability under managerial satisfaction.

	Six-point fuzzy number	Triangular fuzzy number
Satisfaction value	0.855	0.645
Stability ($\alpha = 0.5$)	0.568	0.521
Stability ($\alpha = 0.75$)	0.365	0.251

the triangular fuzzy number is used to represent the completion time and the semitrapezoidal fuzzy number to represent the delivery time in the previous research is improved.

4.2. System Quality Management Function. The main purpose of applying PDCA cycle in the enterprise quality management system is to help enterprises build a logical framework in the process of quality improvement. Only by establishing a rigorous and scientific logical framework can an enterprise maintain stability in long-term operation and continue on this basis to achieve the purpose of quality improvement and promotion. In order to ensure that the enterprise can always maintain the management foundation

Table 5: Comparison of optimal results and stability under customer satisfaction.

	Six-point, trapezoidal fuzzy number	Triangular, semitrapezoidal fuzzy numbers
Satisfaction value	0.965	1
Stability ($\alpha = 0.5$)	0.609	0.499
Stability ($\alpha = 0.75$)	0.391	0.250

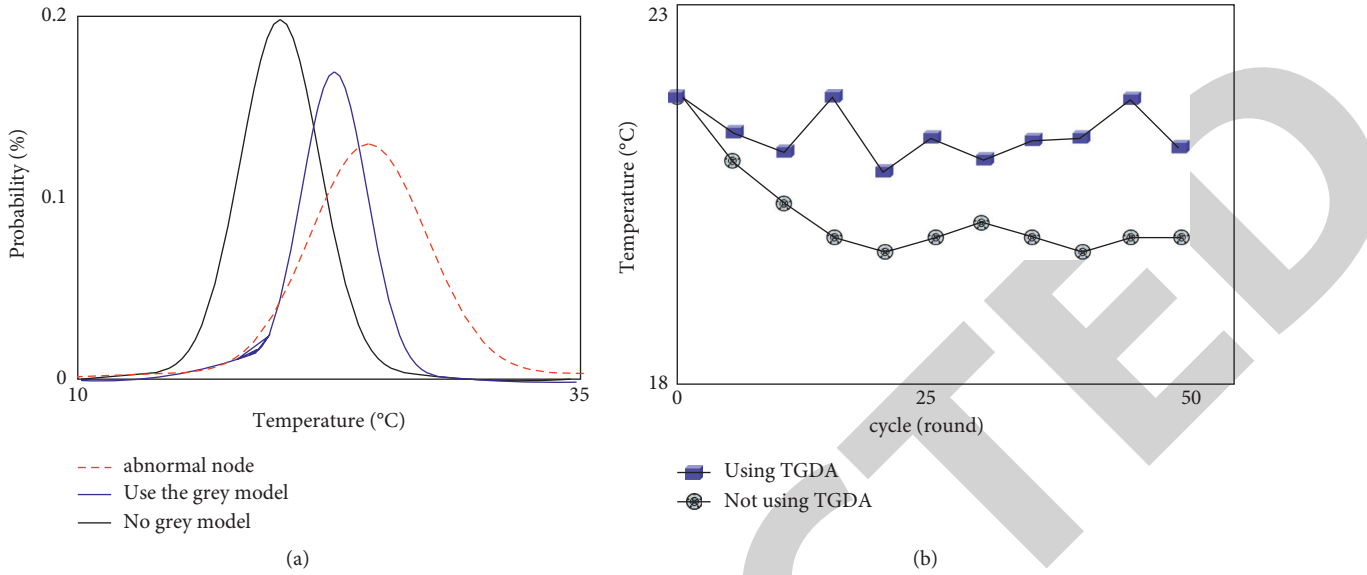

Figure 8: Accuracy analysis. (a) Node metric model. (b) Fusion result change curve.

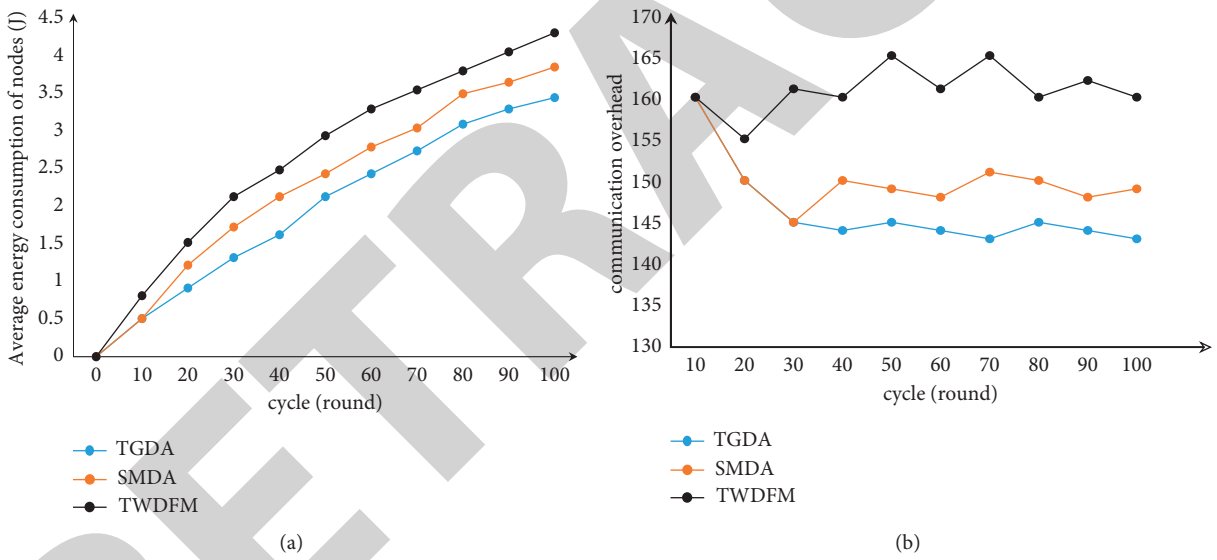

Figure 9: Algorithm energy consumption analysis. (a) Average energy consumption of nodes. (b) Network communication overhead.

with quality as the core and maintain a high management level no matter it develops to any stage or period, this paper chooses PDCA cycle as the logical framework of quality management system evaluation.

4.3. Overall Performance of the System. The nodes used in the 200 experiments in this paper are scattered in an area of 200 m ∗ 200 m. The wireless sensor network composed of these nodes monitors the temperature of the target monitoring area in real time. Each node generates a data packet per second. The experiment assumes that the collected temperature values follow a Gaussian distribution curve. Simulation experiments include the reliability of data fusion, the accuracy of fusion results, the average energy consumption of nodes, and the communication overhead of the network.

4.3.1. Accuracy Analysis. It can be clearly seen from Figure 8(a) that the more the abnormal nodes in the network, the greater the degree of deviation of the obtained results from the actual situation. However, after removing the abnormal node, the collected data is not complete enough, which will cause a certain deviation and cannot reflect the real situation. It can be found from Figure 8(b) that when the TGDA algorithm is used, the temperature value in the first 10 rounds is higher than 20°C, but after 10 rounds the temperature value fluctuates around 20°C and gradually becomes stable, because the abnormal node is

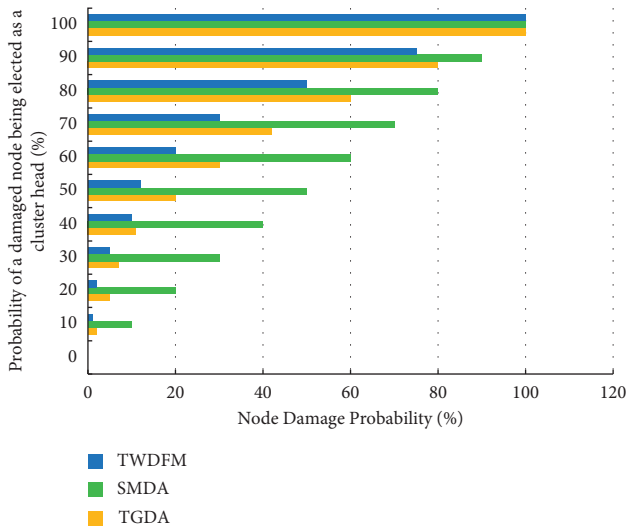

Figure 10: The probability of the damaged node being elected as the cluster head.

continuous. The abnormal data is replaced by the predicted data, so the fusion result will gradually tend to the true value.

4.3.2. Energy Consumption Analysis. Figure 9 shows the comparison of the three algorithms on the average energy consumption of nodes. It can be seen from the figure that the average energy consumption of the nodes of the TWDFM algorithm is the highest. This is because the TWDFM algorithm focuses on the security of the data fusion results and improves the accuracy of the fusion results, which will increase some additional computation and data transmission, so it is different from the other two. The energy consumption of the model is relatively large compared to this model. The TGDA algorithm will remove abnormal nodes before initiating data fusion.

4.3.3. Reliability Research. As shown in Figure 10, the nodes in the TWDFM algorithm select reliable cluster head nodes by constructing a trust table and use a weighting mechanism to add abnormal nodes to the blacklist, which greatly reduces the probability of damaged nodes being selected as cluster head probability. However, in the TWDFM and TGDA algorithms, the probability of the damaged node being selected as the cluster head will increase sharply when the proportion of damaged nodes in the network exceeds 75%. The trust mechanism has no effect, and there is no way to ensure that the selected cluster head is reliable.

5. Conclusions

With the development of society, the sharing of resources between global supply chains is getting higher and higher, the competition among enterprises is becoming more and more fierce, and the profits of products in the same industry are becoming more and more transparent, but the requirements of customers are getting higher and higher. How to reduce quality costs and improve quality benefits on the premise of meeting customer product quality requirements, thereby enhancing corporate market competitiveness and stabilizing customer relationships, is a serious problem facing companies today. Customer satisfaction is an important business indicator for the normal and sustainable development of an enterprise. The results of customer satisfaction assessment directly affect the operating efficiency of the company and its reputation in the industry. Many companies unanimously recognize the importance of customer satisfaction. There is still a lot of deficiencies in the analysis and improvement of factors affecting the degree of management. How to analyze and effectively improve is also necessary to combine the theoretical basis of scientific management and the research viewpoints of scholars' literature to carry out practice verification and choose the improvement direction suitable for one's own enterprise and improve customer satisfaction.

Data Availability

No data were used to support this study.

Conflicts of Interest

The authors declare that they have no conflicts of interest.

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