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Retraction

Retracted: Optimization of Intelligent Management System for Crafts Production Based on Internet of Things

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This article has been retracted by Hindawi following an investigation undertaken by the publisher [1].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) 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] X. Zhou and K. Li, "Optimization of Intelligent Management System for Crafts Production Based on Internet of Things," *Complexity*, vol. 2021, Article ID 5594754, 11 pages, 2021.

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Research Article

Optimization of Intelligent Management System for Crafts Production Based on Internet of Things

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Crafts are a special kind of personalized goods that can be personalized with the help of the Internet to better meet consumers' individuality and make them part of the personalized craft design. The development of information technology has made it possible to grasp personal information and talk to individuals, and the past practice of grasping consumers' needs by age level has become obsolete, and providing one-to-one product service to customers through the Internet will become a new market growth point. The design and implementation of the system hardware are introduced by focusing on the functional circuits of various sensors of the data collection terminal, The functional circuit of the wireless communication module CC2530, the functional circuit of the microprocessor STM32, and the functional circuit of the collection terminal. In addition, this paper introduces the development environment of IAR software, the implementation of sensor acquisition function, 4 G module communication function, and coordinator network from the software point of view and provides a detailed explanation using program flowcharts. Next, by comparing the three filtering algorithms, an error optimization algorithm can be used to optimize the filtered data errors and obtain better results. By establishing an experimental platform for collecting all kinds of data, a network formation experiment is performed, and the coordinator normally forms the network, and the collected and processed data by the algorithm are matched to the MATLAB simulation platform. The Topix is compared with the exact data measured by the sensor. Finally, calculations show that two dry batteries can be used to maintain the system over 6 months. The system provides power and low-power design is practical and effective.

1. Introduction

Under the development situation of economic globalization, the competition in the handicraft industry is intensifying. The fundamental factor for building strong handicraft enterprises is to rely on the leapfrog progress of scientific and technological productivity and achieve a significant increase in labor productivity. The international competitiveness also changes from labor cost advantage to the high-level advantage of product quality innovation advantage, product development innovation advantage, brand innovation advantage, and cultural innovation advantage. At present, the number of more well-known brands in the handicraft industry is very small, and there are only a few that go international [1]. Brand is an intangible asset, a general term for the added value of a product, a synthesis of an enterprise and its products, which covers the comprehensive characteristics of the enterprise's innovation ability, enterprise management, market positioning, marketing services, and other aspects. Creating independent brands is the way for the handicraft industry to go to the top end of the global value-added chain. Traditional brand marketing still occupies the main market, but with the current accelerated pace of life, the decrease in the use of traditional media and the growth in the frequency of the use of the Internet have posed a great challenge to the brand management of traditional handicraft enterprises [2]. Rising costs have created new challenges for craft businesses. Rising living standards and rising worker wages have increased labor costs. The cost of raw materials and transportation is also increasing, making the change and innovation of business channels for craft enterprises imperative. China's department store retail

industry has long adopted the business model of associating, introducing factories into stores and charging various "entry fees," resulting in inflated prices [3]. With the rising cost, the department store industry has come to the urgent need to change and vigorously develop its own brand as the future trend. At the same time, other sales channels such as the Internet and online shopping are stepping up to expand their territories. The new business model in the direction of minimizing channel costs and giving benefits to consumers will have a greater prospect of development [4].

Traditional handicraft enterprises are slow to respond to the market, and it takes a long time to analyze data from consumer preferences, design products, produce and sell them. Often a product may have missed the popular period of the product by the time it is officially launched, or the season is no longer appropriate. This causes a lot of inconvenience and loss to the business [5]. The traditional handicraft industry has to start preparing for the launch of a product long in advance so that they do not miss the peak of the market, and the production of the next year's product may start this year [6]. This is both a waste of time and human and financial resources and may result in a large inventory backlog due to a wrong estimation of the market [7]. The competition in the twenty-first century will be the competition among supply chains, and strengthening industrial supply chain management has become a strategic choice for worldwide enterprises to further improve their competitiveness. And the current supply chain operations in the crafts industry are inefficient. There is an imbalance between and within each process unit, and there is a mismatch between supply and demand. It is difficult for the whole supply chain to reach such an ideal level of delivering the products required by customers to the right place at the right time, with the right quality and the right quantity. Lack of information resource sharing, slow information feedback, and lack of necessary communication between supply, production, and demand make it difficult to arrange production according to market demand [8]. At the same time, the situation of global economic integration is getting deeper and deeper, and e-commerce, as a new business operation mode and a new market competition means established on the Internet, has been rapidly involved in the market competition and enterprise management field worldwide [9]. With the continuous development of technologies such as computers and networks and the widespread use of e-commerce, enterprises are able to establish cross-regional or even global markets on a larger scale. The characteristics of the supply chain in the craft industry include sales/brand enterprise as the core; rapid changes in market demand; order-oriented production; short supply chain cycle; complex product information management; a globalized ecosystem. Facing the increasingly competitive market environment, it is an inevitable trend for international handicraft enterprises to accelerate the development of e-commerce and information technology, which will help them increase foreign trade channels, reduce transaction costs, simplify business processes, and shorten production cycles [10].

Crafts are a special kind of personalized goods that can be better catered to consumers' individuality with the help of the Internet and make them part of the personalized craft design. The development of information technology has made it possible to grasp personal information and talk to individuals, and the past practice of grasping consumers' needs by age level has become obsolete while providing one-to-one product services to customers through the Internet will become a new market growth point. The high brand value will be generated in the areas of "individualized services and products" and "personalized products" that have high market value. In the future, it will be more and more difficult to seek differentiation in terms of product functions, but more in terms of the added value of product information. Manufacturers will focus more on product design and perceptual needs, and the old practice of making plans and forecasts before product launch will become obsolete, replaced by a marketing model of constant revision in the process of dialogue with consumers. The competition will focus on how to accept orders in a short period of time and deliver the products to consumers as requested. In this paper, we propose to use an experimental platform to collect all kinds of data and conduct network experiments, where the coordinator forms a network successfully and in good condition. Through the MATLAB simulation platform, the collected data and the algorithm processed data are compared with the accurate data measured by the sensors in agreement. Finally, it is demonstrated through calculations that the system can be maintained for more than six months of normal operation by using two dry batteries for power supply, showing that the low-power design is practical and effective.

2. Related Work

Throughout the development of e-commerce, it can be roughly analyzed by three stages. Stage 1: Primary preparation stage. This stage was around the mid-1990s to the end of the 20th century, and the main work was to study issues such as network access and preparation of exchange platforms [11–15]. The second phase: the mid-exploration period. This period is mainly focused on the late 1990s, and the main task is to solve the difficult work that has not been completed in the first phase and study certain commercial solutions. The third phase: vigorous development and application phase. The starting point of this stage is the beginning of the 21st century. In this decade, e-commerce has been developed more rapidly and widely used in all walks of life, which is widely valued by all walks of life, and the economic benefits generated by the use of e-commerce are also obvious to all. Not only is this the case internationally, but the importance attached to e-commerce in the international market is also increasing, and the proportion of e-commerce applications is greater, especially in developed countries led by the United States, where e-commerce has gradually and comprehensively replaced general business activities, largely enhancing the ability of enterprises to compete in the market [16].

Since 1990, the international Internet construction work has been gradually carried out nationwide and has been popularized at a faster pace. The government has gradually realized the importance of informatization work and has given great support to the Internet construction and

informatization development, and under the impetus of this force, the international Internet has been basically built nationwide with a coverable interconnection network, including data communication network, image communication network, and the multimedia communication network under construction. The current international interconnection network has been able to cover basically all, and international network interconnection has been achieved with the United States, the United Kingdom, Germany, Canada, Japan, and other countries [17, 18]. Thus, it can be seen that in the current form, the international community has all the conditions for the development of e-commerce, and the foundation is relatively solid. Since the middle of 1990s, the construction of the Internet has accelerated and formed a certain scale. An incomplete statistical data shows that by the end of summer 2001, the total number of computers connected internationally exceeded 10 million, and the number of Internet users reached more than 26 million. By now, the Internet users are close to half of the number of the country's population, and the international Internet sites and domain names are also continuing to increase rapidly [19–21]. The number of e-commerce market has grown in multiples since the initial stage to the rapid development stage. Although China's e-commerce started late, but the development momentum is fierce, and the development speed and achievements exceed those of many countries.

In recent years, e-commerce has entered a mature and practical stage, producing a number of famous e-commerce enterprises, such as Taobao and Alibaba. Although the international development of e-commerce is faster and the results are promising, some problems have been exposed in the development, mainly because many international supporting facilities and policies and regulations cannot keep up with the development needs, and foreign countries have obvious advantages in this regard. First of all, it is necessary to further promote the development process of commercial banking networks, accelerate the establishment of security mechanisms for network transactions, and improve the relevant laws and regulations [22, 23]. Until a few years ago, there were probably only a few banks internationally, such as the Bank of China, that could handle online banking, which greatly restricted the development of e-commerce. In recent years, major banks in China have gradually realized this problem and have carried out the construction of online banking and continuously researched and evening security work, which has achieved better results. Secondly, as one of the supporting services of e-commerce courier or logistics services, it must also be rapidly developed and improved. Because e-commerce transactions are not only completed and implemented by the Internet but also often require express delivery or logistics to complete. Therefore, it is necessary to increase the courier delivery and improve the delivery system. At the current stage, the network distribution system has gradually changed from the original relying on postal services to the current rise of courier and logistics companies, such as Shunfeng, Shentong, Yuantong, and other courier companies, which have gradually became indispensable distribution channels for e-commerce [24–26].

Once again, it is also necessary to carry out the formulation and improvement of relevant laws and regulations. Due to the special nature of e-commerce, information is a bridge between buyers and sellers and the importance of information is self-evident. Information security protection work has become the focus of attention. To better protect the security of consumer information, financial security has become the relevant national network management department needed to solve the problem. The country needs to introduce and improve the relevant laws and regulations to ensure that e-commerce work properly. To provide a safe environment for the development of e-commerce and guarantee the rapid and sustainable development of e-commerce. Although the development of e-commerce in China has encountered many difficulties and setbacks, the speed of development is rapid and the achievements are promising. As the scale of the Internet continues to expand, the number of people using e-commerce continues to increase, the volume of e-commerce transactions increases dramatically, and with the continuous improvement of various systems and regulations, the development of e-commerce in China will usher in a brighter tomorrow.

3. System Analysis

System analysis is an important guide for the later development work and also provides the basis for the later maintenance. Requirements analysis of the system is the initial step; only a full understanding of the user's needs ensures that software development is complete towards the intended goal, in the requirements analysis stage, the user will be for the system's psychological expectations expressed; as analysts, it is necessary to speculate on these words, as far as possible to make it the real needs of users; it can also be done correctly for problems that are difficult for users to express.

3.1. System Feasibility Analysis. Moreover, the system's feasibility is simple and easy to understand. Only through simple training, which is quick to start, company leaders and staff can operate; the operating environment requirements are low. In the face of the system, design should also be "standard, security, efficiency, confidentiality, maintainability" ; on the basis of focusing on the current reality, there is room for future expansion and upgrade of the system.

3.1.1. Management Feasibility. With the general increase in international awareness of information technology, the industry application of computers has become the trend. The Internet application of most commercial enterprises is becoming more and more popular, and the application of numerous software within the company also makes most managers have basic computer application skills. The level of software development and development ability has improved compared with the previous. The national policy environment tends to be relaxed, which provides a good policy environment for the development of industry

software. The development of the software should be able to meet the development needs of the company in a longer period of time. The development of such an e-commerce system is linked to the development of society and the popularity of computer applications, and there is no technical problem in the management.

3.1.2. Economic Feasibility. Customers order products, manufacturers information release and other business competition is only the delivery of information, which is relatively easy for newborn Internet companies, and, the profit margin of this industry is more generous in all industries. Plus, online stores, compared to traditional stores, can greatly reduce a variety of costs and fees so that profits will be more substantial. They also give full play to the cost-income effect of the network economy; the website and back-end system only requires a one-time fixed cost investment and very little variable input, and the user can easily complete the service with just a phone call or a click of the mouse. Therefore, the cost of processing an order for a craft business website is much lower than that of a traditional craft store, so its net profit is the highest in the industry.

3.1.3. Technical Feasibility. The system server operating system is Microsoft Windows 2003, and the client operating system is Windows XP/7. We use the familiar VS.net, Dreamweaver and SQL server as the system development software, and the Web server is Internet Information Server (IIS). The Web server is Internet Information Server (IIS), and the browser is IE6.0 or above. The hardware uses the IBM host as the server and client, mainly in consideration of the degree of existing enterprise software and hardware and the level of developers and system security requirements designed. At the same time, this is a good software operation, good management, good maintenance, and easy to start. The overall system design steps can be shown in Figure 1.

3.2. Decision Tree Algorithm to Mine Data Correlation. Software development needs to be carried out on the basis of accurate knowledge of user needs, and all software that is detached from user needs is not qualified and will not be valued by the market. Therefore, the requirements analysis must be given full attention to work; usually in the requirements analysis stage, the research team needs to be busy every day and the target system users to communicate and communicate, for the system needs to discuss the functions and performance, and then summarize and analyze these requirements; the formation of written requirements documents and requirements documents for the later development work has important guidance. This is the real meaning of requirement analysis.

After detailed field research and analysis, the functional requirements of the target system were described as follows:

(1) The target system contains three main types of users: customers, enterprise customer service, system administrators, etc. The functional modules operated by different types of users are different. Customers mainly browse the information and announcements of handicrafts released by handicraft enterprises through the system and can place orders online and submit orders after seeing the handicrafts in the process of browsing. The customer service of the enterprise receives the customer's order and carries out the corresponding shipment processing and carries out the enterprise announcement and the release of the craft product information, etc. The system administrator has the highest authority and is responsible for all the processing work in the background, including data update, system maintenance, etc. Since the fuzzy set and its affiliation function form a one-to-one correspondence, the operation of the fuzzy set is also inscribed by the operation of the affiliation function to represent the following:

$$\widetilde{A}_{x_{II}} = \sum_{i=1}^{q} \chi_{ii} \Leftrightarrow \mu_A(x) = 0. \tag{1}$$

(2) The target system needs to provide the commodity management function. Through the commodity management module, the enterprise customer service and the system administrator can manage all the craft product information in the enterprise, including the setting of the commodity category and the operation of entering, querying, updating, and deleting all the commodity information, and the customer can see all the craft commodity information after the operation. Two fuzzy sets $\widetilde{A}, \widetilde{B}$, if for all elements x, their affiliation functions are equal, then $\widetilde{A}, \widetilde{B}$ are also equal, i.e.,

$$\widetilde{A} = \widetilde{B} = \sum_{i=1}^{q} \mu_{ii}(x) \Leftrightarrow \mu_A(x) = 0. \tag{2}$$

(3) The target system needs to provide an online shopping function; through the online shopping module, customers can put all the goods they like into the shopping cart, then query, add, delete, and do other operations on the information of the goods in the shopping cart; finally, they place an order to buy, and after payment, they can check the processing result of the order at any time. In the fuzzy set $\widetilde{A}, \widetilde{B}$, the so-called $\widetilde{A}$ is a subset of $\widetilde{B}$ or $\widetilde{A}$ is contained in $\widetilde{B}$ means that for all elements X, there is $\mu\widetilde{A}(x) \leq \mu\widetilde{B}(x)$, denoted as $\widetilde{A} \subseteq \widetilde{B}$, i.e.,

$$\widetilde{A} \in \widetilde{B} \Leftrightarrow \mu_A(x) > 0. \tag{3}$$

(4) The target system needs to provide an order management function. Through the order

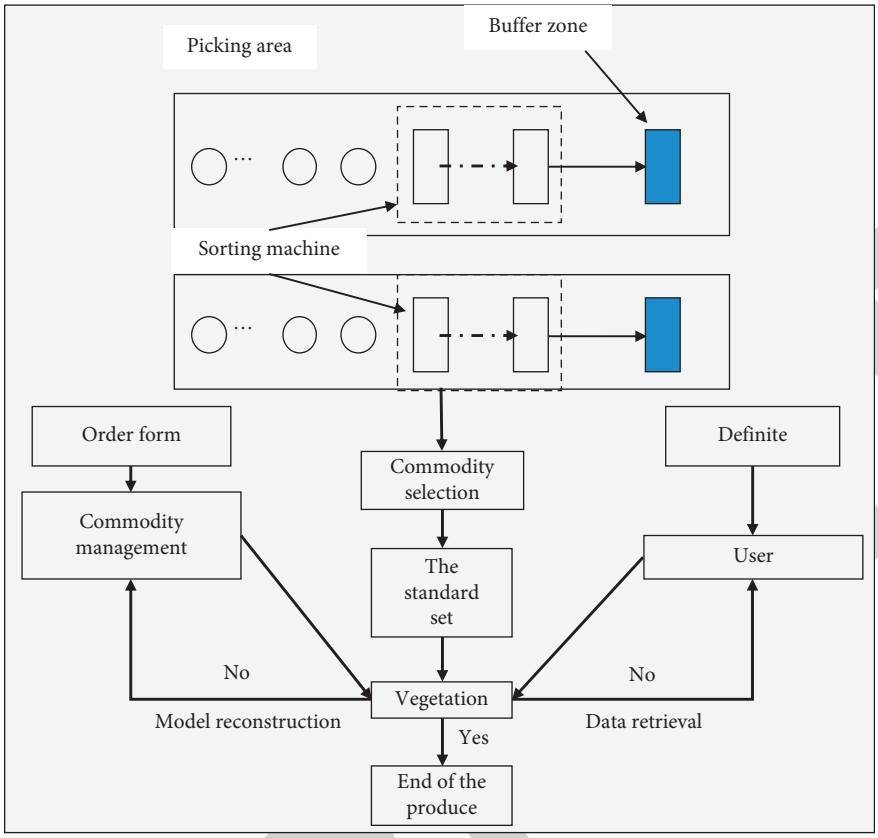

Figure 1: Overall system design steps.

management module, customers can place orders online to generate orders and can also delete orders if they are not satisfied with the goods. Enterprise customer service can review the customer's order after receiving it, then they process and ship the order and delete it for untrue orders. The system administrator can also review and delete orders.

(5) The target system needs to provide a comment management function. Through the comment management module, customers can evaluate the purchased goods, fill in various purchase and user experience forms; the administrator can reply to these comments and other processing operations.

(6) The target system needs to provide a user management function. Through the user management module, the system administrator can manage all the user information, including the addition, deletion, and change of enterprise customer service personnel and the management of customer information, etc.

To make it easier to visually describe the specific functional requirements of the system, the target system will use UML modeling tools to analyze and refine these functional requirements in detail. The use of UML modeling tools means that the system requirements are modeled in an abstract way to express the specific functional requirements of the system in a way that is easier to understand and comprehend in the real world. In the analysis phase of the requirements, it is a matter of defining what the system needs to do and yet in what order to complete the set of problems that need to be done. The use case module of UML is used to express these requirements in a good way. The use case diagram includes the business operators, the business operations, and which operators should correspond to which business. The following is a detailed analysis of the functional requirements of the system using the use case diagram in UML. The overall use case diagram of the target system is shown in Figure 2, which gives the main functional modules provided by the e-commerce system of the craft enterprise, including product management, online shopping, order management, comment management, system management, etc.

Data flow analysis is to analyze the flow of data, which is the most commonly used method in system requirement analysis and is the main content of requirement analysis. Data flow analysis is to analyze the data flow process to ensure that the data flow process is smooth, and if there is a data flow problem, then it needs to be solved symptomatically. The results of data flow analysis need to be represented graphically to provide a basis for later system development. There are often many problems in the data flow process. For example, common data flow problems include poor data flow; data before and after the type does not match, and some data is not reasonable, etc. These data problems often directly lead to system errors. If not found

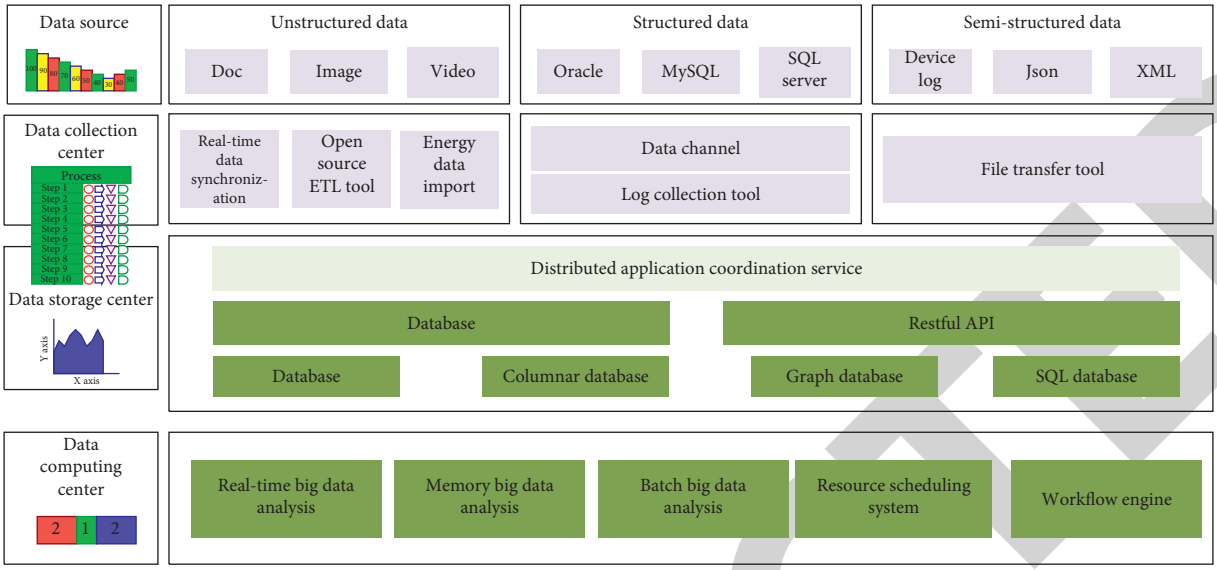

Figure 2: Overall system use case diagram.

early, it will have a direct impact on the system but also more difficult to modify at a later stage.

The analysis of data flow is actually hoped that through the data flow analysis, the problems existing in the data flow can be found earlier, and timely discovery can also facilitate early correction. There are various reasons for the formation of data problems, some are caused by improper management, and some are caused by mistakes in the data input process. If the causes of the problems can be found, they can also be corrected, which will have an important role in the normal use of data later. The top-level data flow diagram of the system only gives the overall data flow between the user and the system, while the specific processing of data between various operations needs to be clarified by a detailed division of the top-level data flow diagram, which is the zero-level data flow diagram. The zero-layer data flow diagram of the target system is shown in Figure 3, which shows the correspondence between the main functional modules of the system and each user and the flow and processing of various data information after the user's operation.

3.3. System Data Flow Diagram. The top-level data flow diagram of the target system is shown in Figure 4, which gives the main data input and output relationships in the system. For example, customers can input order information of products and comment information of products to the system, while the system outputs processing information of product orders to customers; enterprise customer service can input various information of products to the system, while the system outputs order and comment information of customers to customer service after processing; system administrator can input various basic information of products and users to the system, while the system outputs order information of customers to the administrator. Usually, when carrying out the system design work, the overall design objectives of the system should be defined. Only in the case that the objectives are determined, the design work be carried out according to the expected plan, and the system can be designed to meet the needs of users. The overall objectives of an e-commerce system include the following:

(1) Since the system architecture is based on the Internet model, the system must ensure the security of the data transmission process when operating the data.

(2) The business model involved in the system and the overall perspective of the system implementation, the whole process of the system design and implementation should be progressive, rather than a rush.

(3) According to the use of the system in actual business, ensure that the system has the ability to store data information for the next three years and can provide flexible data backup and recovery operations.

(4) The system is put online and running after taking into account the operating environment and usage of the implementation to ensure the stability and reliability of the system in the process of continuous operation.

(5) The system must have a perfect exception information processing mechanism to ensure that it can alert the system manager when there is an abnormal situation.

(6) Because the system involves data whose sensitivity is very strong, for different roles of users need to rule their scope of operation so as to avoid the misalignment of role functions leading to confusion between data information in the system. Therefore, the system needs a complete set of operational rights management mechanisms.

(7) In order to ensure the security of the system data and the data loss caused by the user's misoperation, the

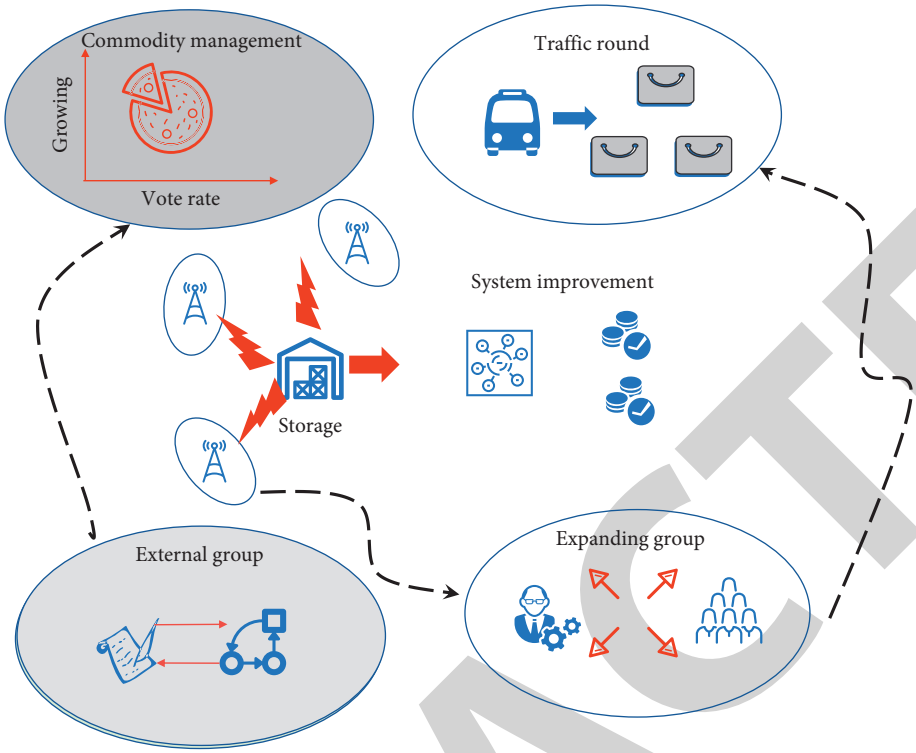

Figure 3: System zero-layer data flow diagram.

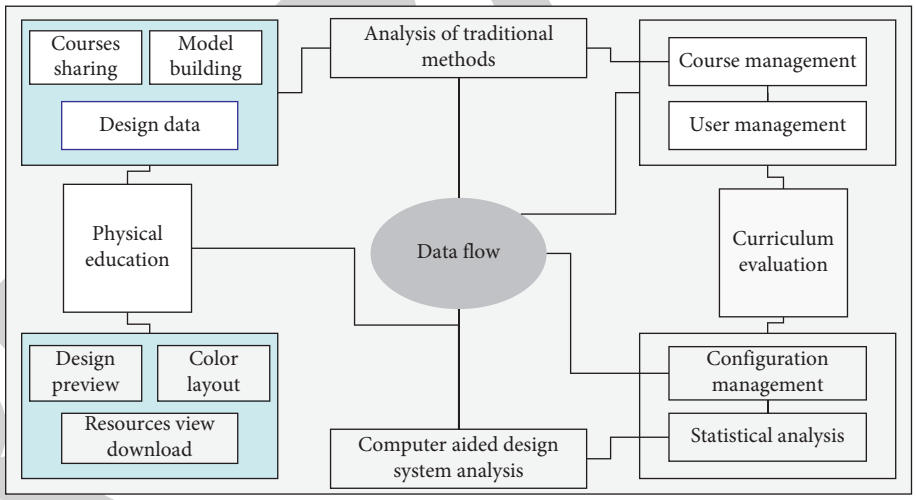

Figure 4: System top-level data flow diagram.

system database server adopts the mechanism of one master and one standby, which can add another insurance for the data in the system.

(8) The design of the database should be standardized so that the data can be shared and exchanged between different modules or systems.

4. System Testing

After the designers develop a new software system, they must also go through important work before entering the market online, and this work is software testing. Only after a rigorous testing process, to the maximum extent possible to identify hidden problems and defects in the software system, the problems and defects are identified for timely improvement and correction, in order to ensure the correctness of system functionality and performance stability, so as to meet the needs of users. The main goal of software testing is to ensure the quality of the product. Regardless of what testing methods are used and what content is tested, it is necessary to take this goal as the premise. Because for any software system, the purpose of its development is to solve the actual work of the problem and the use of user expectations to achieve the expected demand. In addition, for

software developers, their access to the test data of the software system, through the analysis and improvement of the data, can quickly identify the shortcomings in the design, and the improvement of the shortcomings can help developers to avoid such problems in the next software development process, thus improving the developers' software design to a large extent. The development of a software system is a cyclical process that includes multiple links of development work, and only by ensuring the correctness of each link of work can the overall efficiency and quality of the software system be guaranteed, as shown in Figure 5. When carrying out software testing work, to obtain good software testing results, several testing principles must also be followed, including the following:

(1) The role of software testers should not be filled by developers as much as possible. This is because the developers know very well the functional implementation and performance indicators of the whole software system, so they will subconsciously avoid design errors in the testing process, and the results will naturally lack comprehensiveness. If users are chosen to test the software, a more comprehensive and accurate conclusion can be drawn because for users; they will try to find out the shortcomings of the system, and only by solving all the shortcomings in advance can the probability of problems in the process of using the software be reduced.

(2) Testing should be carried out in every step of software system development, and software testing is a circumstantial process. For any software system, it will include the process of requirement analysis, general design, detailed design, coding implementation, and so on, and each process may produce unexpected problems and defects, only for each stage of testing, in order to find the problems in the system as early as possible; after solving the problems, repeated testing should also be applied to ensure that the problem no longer appears. In addition, early detection of problems and early resolution can also effectively reduce the generation of subsequent problems in the system, thus reducing the development cost of the software system in general.

(3) Attention must be paid to the selection and writing of test cases. In software testing, the selection and writing of test cases is an important task because the system testing is executed step by step according to the test cases, and if the test cases are not properly written, it is difficult to get accurate test results. Therefore, the test cases must be written in a representative manner and be able to consider various reasonable and unreasonable situations comprehensively so that the system can be tested to see whether the operation of the system can produce correct results and whether the system can provide timely warnings in case of errors.

(4) Software testing is rather complex and tedious work, requiring sufficient perseverance and patience of testers. After the testing work begins, it is not just a matter of finding a few problems and then solving them. For the system problems that have been solved, repeated testing is required until no new problems are found. In addition, it is necessary to record all the testing process, the problems found, the test results, and the solutions to form a test document to be saved as a reference basis for subsequent reference.

The white-box testing method is mainly used by project developers in the module testing and unit testing phases, and it is carried out on the basis of a clear understanding of the logical structure of the program, and usually, these tests can locate the code level of the degree block. The white-box testing method requires the tester to have a complete understanding of the internal logic structure of the program so that he can design test data based on the logical structure of the program and check for program errors that are difficult to test with the black-box testing method. It can also be called the exhaustive path testing method.

From the user's point of view, he may prefer the black-box approach to functional testing because he does not need to use much brain power to think about the internal structure of the program and only derives the output data according to the input data in the program specification, and then he judges whether it is consistent with the actual business processing, as shown in Figure 6. However, although white-box testing requires some complex processes, it can find some potential problems that are difficult to find in the process of functional testing. Therefore, they both have advantages and disadvantages, and the combination of both is the best way. The main purposes of white-box testing are as follows:

(1) Execute all paths of the system functional modules once using white-box testing.

(2) The use of white-box testing allows logical verification of the internal business logic of functional modules.

(3) Testing the boundaries of the system using white-box testing to detect omissions in functional testing.

(4) The validity of information, such as the data structure of the system, can be checked.

The target system is tested on the basis of white-box testing and then using black-box testing. The structure of the two approaches allows a more comprehensive verification of the system's functionality.

The application of data mining in e-commerce systems is usually to achieve sales forecasting, which is essentially a time-series forecast. There are many methods currently used for sales forecasting, mainly taking statistical analysis methods, such as linear regression model analysis, gray system model analysis, time-series analysis, and so on. All of these methods try to solve practical problems by building mathematical models. However, in the actual product sales process, the product demand is determined by many factors, and it is difficult to complete

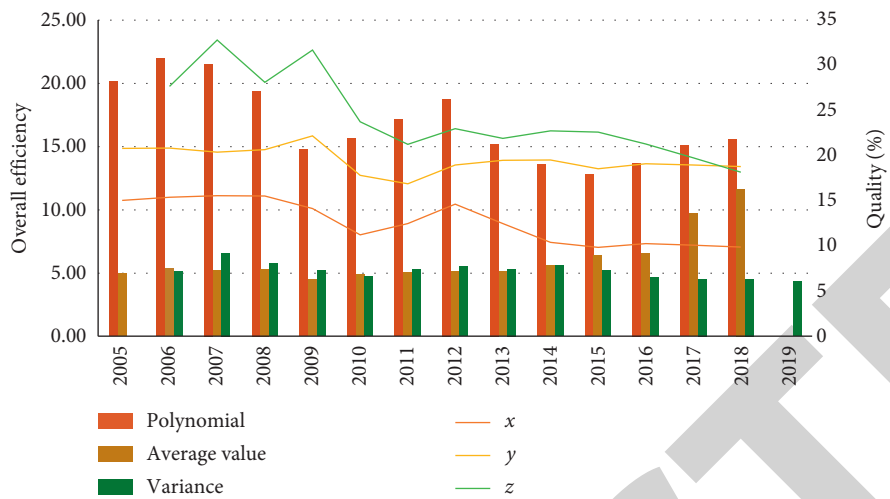

Figure 5: Overall efficiency and quality of the system.

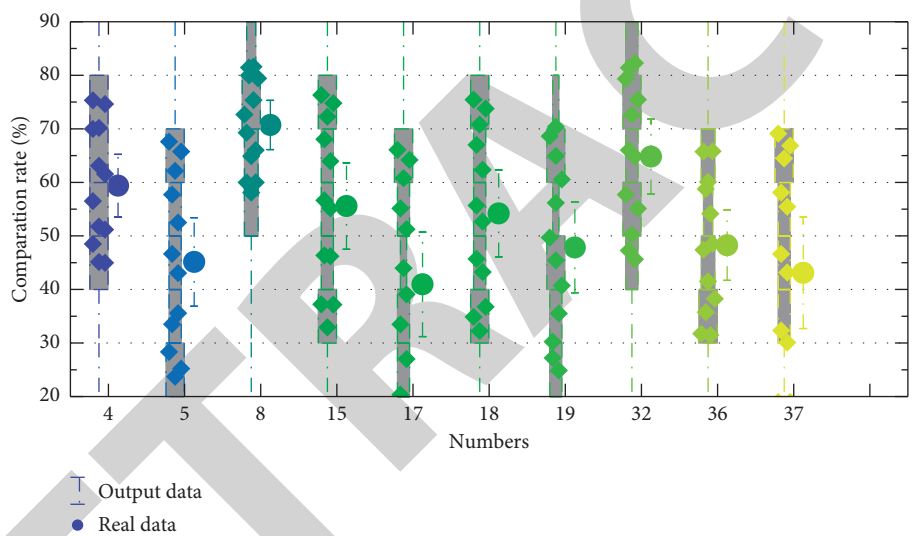

Figure 6: Comparison of output data with actual data.

the sales forecasting work by this simple statistical analysis method. Since there are many factors affecting product sales and they are intrinsically linked, the mathematical models established by using traditional methods are not suitable for expressing the interactions among the factors. Currently, most of the models for sales forecasting are implemented based on artificial neural networks, which is due to their extremely strong nonlinear mapping capability. Given some qualified sample data, the neural network algorithm can learn and discover the patterns in the sample data in a way similar to human memory and build a reliable data model for this pattern. In artificial neural networks, there are several learning systems, among which feedforward networks are widely used, especially the radial basis function neural network (RBFN) has better performance; in addition, this neural network has some other advantages: such as simple structure, faster learning convergence, simple training, etc. Since this neural network can approximate any nonlinear function, it is used in various fields such as prediction and control, etc. The e-commerce system studied in the topic uses RBF neural network as a data mining algorithm for the sales prediction function. The actual data of the application unit of the system is taken as the training sample, the sales data between early May 2012 and early June 2013 is taken as the learning sample, and then the sales data from mid-June 2013 to late September 2013 is taken as the test sample. From there, the accuracy of the prediction can be calculated, as shown in Figure 7. After the training of the previously described

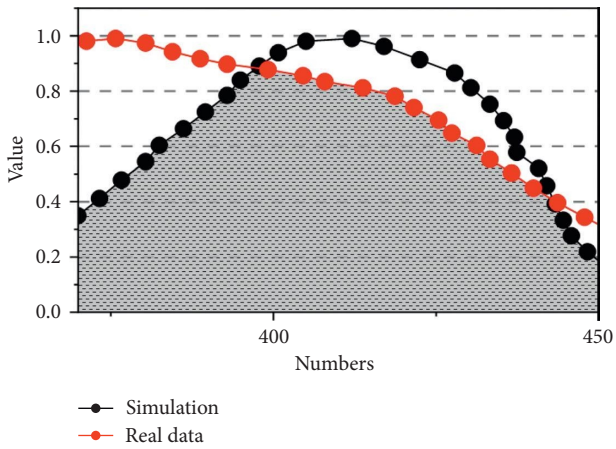

Figure 7: Real vs. forecast production.

method, the network has 7 input nodes and 1 output node.

5. Conclusion

This paper uses the Zig Bee wireless sensor network solution. The design and implementation of the system hardware is a functional circuit of the various sensors of the data collection terminal, functional circuit of the wireless communication module CC2530, functional circuit of the microprocessor STM32, and functional terminal of the collection terminal. This paper combines existing software development tools, selects the appropriate development platform, compares the corresponding development methods, and improves the performance of the ERP management system. This paper analyzes the problems of production and sales chains of handicrafts. Based on the results of the requirements analysis, the ERP system functional structure is classified into handicraft companies, including system management modules, production management, purchasing management, sales management, inventory management, financial management, and several function modules. More detailed design analysis of the functionality of some feature modules in the system is performed.

Data Availability

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

Conflicts of Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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