In this era of data explosion, in order to make better use of data, people need to collect information to analyze and judge future decisions. For enterprises, the management of time, capital, and decision-making can directly affect the acquisition of enterprise profits. The sooner we analyze financial data, the earlier we use an intelligent system to assist management and promote operators to make reasonable business decisions. Traditional enterprise data management is very backward and has few functions. In order to achieve the purpose of optimal allocation of enterprise resources, information-based financial management. According to the financial status and functional requirements of enterprises, the specific functions of the system are designed. The method based on edge computing has a high reference value. This paper puts forward a financial management system of intelligent analysis. It can provide rich solutions to financial problems. Data mining and analysis of financial situation provide support for decision-making management of enterprises. The research results show that (1) after 10 times of inspection and adjustment, the system grade is all D grade, and there is no defect. (2) There is no abnormality in system response time; the average response time of F1, F2, F3, and F4 functions is in line with expectations. The fluctuation of time range is no more than 3 s; the overall average response time is 1 s. (3) After CPU detection, the CPU of the system is less than 70% of the expected utilization rate. The system is qualified. (4) The whale algorithm is used to combine new and old tasks. After comparison, it has an excellent performance in computing resources and delays energy consumption. Some follow-up improvement work needs to be optimized.

1. Introduction

With the continuous innovation of information technology and the advent of the era of big data, the world has quietly undergone unimaginable changes. With the change of computer technology, it must be the innovation and development of all walks of life. For many enterprises in China, the continuous improvement of the economic system puts forward more and stricter requirements for enterprises. This promotes the optimization of enterprise business practice in disguise. According to the existing scientific and technological support, establish a scientific financial system to reduce management pressure. So far, there are many works and researches on intelligent finance in the market, which provide a reference for the design ideas of this system.

Adopt a business intelligence method to support data analysis of a company system [1]. Artificial intelligence, information system risk management, and enterprise entrepreneurship contribute to the influence of decision management [2]. Based on the FCM clustering algorithm, a fuzzy decision model is established to intelligently evaluate and analyze the financial performance of enterprises [3]. Building models based on artificial intelligence and machine learning involves financial analysis and decision-making policies [4]. For the application of distress prediction and evaluation cases in financial decision-making, a multistandard decision-making assistant model is proposed, and random forest and bagging CART perform well [5]. Based on edge computing, a new data processing system is proposed for analysis [6]. Design a financial intelligent decision support system for company statistics and information research [7]. In order to achieve the purpose of scientific decision-making and management, the existing distributed data-sharing platform is used to build a financial decision-making analysis system in colleges and universities [8]. Internet plus builds an intelligent financial decision support
information system in the era of big data to promote the digital transformation of finance [9]. Discuss the architecture and application trend of the intelligent financial system for enterprises [10]. In view of the abnormal financial data of enterprises, the convolution neural network is used to classify, evaluate, and analyze the constructed time series financial data [11]. According to the deep learning model, edge computing and artificial intelligence are integrated to develop edge intelligence [12]. The multiagent to design financial risk early warning information assistant decision-making system to reduce the incidence of corporate financial risk was introduced [13]. This paper analyzes the application of the intelligent financial system in scientific research institutions and provides a reference for application cases [14]. Artificial intelligence is widely used to accurately predict financial problems of enterprises [15].

The above literature describes the research direction and the architecture design of the system. Use a variety of technical guidelines to explore, and explain the problem from many aspects and angles. On the basis of a distributed system, the B/S mode is selected, and various data sources are merged into a database to improve data utilization efficiency. Finally, the performance and indexes of the system are tested to verify the influence of edge computing on the minimum cost and delay energy consumption of the system.

2. Theoretical Basis

2.1. Edge Computation. MEC [16]. Edge computing is an important part of 5G. Traditional network mobile services no longer meet the requirements. The proposal of edge computing can effectively solve the problem of cloud computing’s own shortcomings and provide better services from the fundamental principle. NFV [17] and SDN [18]: they are the main technologies involved in MEC. It can provide computing services nearby and sink the resources of the server to the users. Because the nodes of edge computing are distributed on the access network side, the core network can better protect users’ privacy and reduce the security risk of virus attack than cloud computing without bearing the pressure of data uploaded by users. In addition, edge computing adopts a distributed method to design cloud servers. Even if a single point has a small probability of downtime, the whole network service will not collapse. All kinds of computing services concentrated on the server can reduce the energy consumption of the terminal. ECC Alliance has designed the specific architecture of edge computing to promote cloud edge collaboration. The top level is the central cloud, which is the most important and powerful data processing platform. This architecture connects the cloud server and the edge computing server part well with the core network. At the bottom is the user of the terminal. It includes mobile phones, cameras, sensors, and other terminals. The middle part belongs to the core layer, which can not only receive the tasks uploaded by the terminal but also cooperate with data and control in the central cloud, as shown in Figure 1.

![MEC Architecture Diagram](image)

The cost in edge computing is analyzed. This kind of cost is not needed in the general traditional sense, and it is not the material and resource expenditure. The cost here belongs to abstract cost, which shows the user’s experience in the form of cost. The better the user experience, the lower the cost of edge computing.

(1) Delay cost [19]

\[
C = \alpha L,
\]

where \(C\) represents the calculation amount of the task; \(\alpha\) represents a variable coefficient, which is taken according to the actual situation; and \(L\) represents the size of the file.

(2) Energy consumption cost

Because the server of edge computing is not sensitive to energy consumption, when analyzing the cost of energy consumption, only the energy consumption on the terminal is analyzed. Due to the characteristics of the 5G network, the energy consumption of edge computing is far less than the processor energy in computing tasks, which can improve the experience of user terminals.

(3) Comprehensive cost

Mainly based on weight, the delay cost and energy consumption cost are transformed into superimposed problems. Consider the cost comprehensively.

2.2. Data Mining. In the past, the information accepted by people was relatively simple, but with the continuous...
development and change of science and technology, it was widely used. In the era of big data, these massive redundant data come, which brings a lot of burden to people. With too much information, it is easy for people to ignore the really valuable information, resulting in the failure of information distance. If people want to select the data they need from these data and use algorithms to search for useful information, they need to do data mining. According to these data, we can predict the future trend and make decisions and judgments. This is the value of this technology, as shown in Figure 2.

2.3. OLAP Technology. OLAP [20]. It is a practical and efficient tool. Using this tool, we can help query and process historical data, provide an intuitive interface for inquirers, and help operators to obtain massive valuable things. As a result, the workload of users and those who do not use the tool is obviously compared. Users become more flexible and efficient and can make correct and accurate judgments quickly. Finally, the results can be given quickly. Many operations of the whole process are very transparent, as shown in Table 1.

2.4. System Model

(1) Communication submodel

\[ r = B \log_2 (1 + \text{SNR}). \]

Communication rate takes Shannon capacity; \( B \) is the bandwidth occupied by the wireless channel; \( \text{SNR} \) is the signal-to-noise ratio after passing through the channel.

Considering superimposed noise and electromagnetic wave channel loss:

\[ \text{SNR} = \frac{h_P}{\sigma^2}. \]

Wired connection between base station and edge computing server. The allocation scheme of communication bandwidth is determined by the search algorithm. Adjust and allocate communication resources in an iterative way.

Finally, the purpose of optimizing the system cost is achieved.

(2) System cost modeling

Consider the case where the server of edge computing has remaining resources. If you choose to uninstall to edge server computation:

Time overhead situation:

\[ T^f_j = T^t_e + T^c_e. \]

Energy consumption of terminal:

\[ E^f_j = T^t_e p_j. \]

In addition, there are

\[ T^t_e = \frac{l_j}{r_j} \]

\[ T^c_e = \frac{c_j}{f_j}. \]

When the transmission rate reaches the ideal state, there is

\[ r_j = B^j \log_2 \left(1 + \frac{p_j}{\sigma^2 j} \right). \]

Select local calculation, and the corresponding ones are as follows:

\[ T^l_j = \frac{c_j}{f_j} \]

\[ E^l_j = \kappa \left(T^l_j \right)^2 c_j. \]

Consider the comprehensive cost of the system:

\[ P_j = a_j \left(a_j T^l_j + \beta_j E^l_j \right) + \left(1 - a_j \right) \left(a_j T^l_j + \beta_j E^l_j \right). \]
Total cost [25]:

\[ P = \sum_{j=1}^{J} P_j. \] (10)

To sum up, the objectives and tasks of optimization are:

\[
\min P = \min \sum_{j=1}^{J} P_j \\
\text{s.t. } \sum_{j=1}^{J} a_j B_j \leq B, \\
\sum_{j=1}^{J} f_j \leq F, \\
a_j \in \{0, 1\}. \] (11)

Redistribute the task set with the following optimization goals:

\[
\min P = \min \left( \sum_{k=1}^{K} P_k + \sum_{i=1}^{I} P_i \right) \\
\text{s.t. } \sum_{j=1}^{J} a_k B_j \leq B, \\
\sum_{j=1}^{J} f_k \leq F + \sum_{i=1}^{I} b_i f_i, \\
\sum_{k=1}^{K} a_k c_k - \sum_{j=1}^{J} a_j c_j \leq \sum_{i=1}^{I} b_i c^\text{free}_i, \\
a_k \in \{0, 1\}, \\
b_i \in \{0, 1\}. \] (12)

2.5. Search Optimization Algorithm. In this paper, the system cost is modeled under the scenario of edge computing mode.

Taking the whale-based algorithm as an example, the whale algorithm is improved. In this way, the edge calculation of the system at the cost minimization is discussed.

Define the fitness function as:

\[
\text{fitness}_1(X) = C + \text{penalty}_1 + \text{penalty}_2. \] (13)

The newly defined fitness function is:

\[
\text{fitness}_2(X) = C + \text{penalty}_1 + \text{penalty}_2 + \text{penalty}_3. \] (14)

WOA is optimized and improved to prevent the optimization result from being affected by the optimal whale falling into the local optimal solution. The specific algorithm flow is shown in Figure 3.

(1) Surrounding predation

\[
C = 2 \text{ rand}, \\
D = |CX(t)_{\text{rand}} - X(t)|, \\
a = W_{\text{max}} - \left( \frac{W_{\text{max}} - W_{\text{min}}}{T_{\text{max}}} \right) t, \\
A = 2a \text{ rand} - a, \\
X(t + 1) = X(t)_{\text{better}} - AD, \] (15)

where rand is a matrix of random numbers with values between 0 and 1, C is the swimming factor, D stands for the distance between the individual and the leading whale, \( t \) represents the current number of iterations, \( T \) represents the maximum number of iterations, \( a \) represents the convergence factor, and \( A \) is the convergence coefficient.

(2) Bubble netting

| Characteristic | Description |
|---------------|-------------|
| Online [21]   | The needs of customers are a problem that needs careful consideration. In order to reflect the true information of users, it is necessary to transform data. Customers can observe and infer their own needs by analyzing the future results. For customer requests, the system needs to respond quickly to the requests in terms of response time. If you do not get the response of the system for a period of time, it may affect the correctness of the analysis results. The client is likely to lose certain data information. |
| Analytical    | Analyze the logic of relevant data and analyze the specific data situation. There are two points in total: internal data analysis of analysis tools; on the OLAP platform, the statistical results of customers are further analyzed. |
| Informational [22] | The system can save valuable information anytime and anywhere. These are all survived by the history it needs to obtain. The storage space of this information needs to combine the performance and efficiency of a data warehouse. Rethink and position them. |
| Multidimensional | It is different from a relational database. Relational databases belong to flat relationships [23]. OLAP data warehouse is from a variety of dimensions and a variety of angles to analyze and introduce the law of data. In a data warehouse, the latitude of data is the most basic and important, also known as the latitude table [24]. The fact table can be extracted separately. |

| Table 1: Main features of OLAP. |
|----------------------------------|
| Characteristic | Description |
|----------------|-------------|
| Online          | The needs of customers are a problem that needs careful consideration. In order to reflect the true information of users, it is necessary to transform data. Customers can observe and infer their own needs by analyzing the future results. For customer requests, the system needs to respond quickly to the requests in terms of response time. If you do not get the response of the system for a period of time, it may affect the correctness of the analysis results. The client is likely to lose certain data information. |
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operation of this process, more and more information and data, loose enterprise management, will accumulate a large number of useful or useless business data. The task of financial analysis is huge, and the manpower and material resources are not fully utilized, resulting in certain unnecessary losses. Group enterprises cannot monitor and view key financial indicators in time and cannot effectively compare with historical data. In addition, the financial system itself lacks a secure login path, which is at risk of being leaked and maliciously attacked. And the connection between sub-systems is not close, and multiple sets of superimposed systems cause trouble in use. As a result, enterprises urgently need to adapt to the development of the times and actively coordinate the work of finance and various departments.

(b) Requirement analysis

(1) Strong creativity: it should conform to the characteristics of the enterprise itself, and its style should be distinct and unique

(2) Strong maintainability: the background maintenance program interface of the system

(3) Efficiency: the design of the system page is simple and beautiful. Browse as quickly as possible and highlight the main information

(4) Reasonable structure: the system setting should be reasonable and conform to people’s browsing habits

(5) Safety and stability: while fully considering the site access performance, we should pay special attention to the safety and stability of the site

(6) Strong concurrency: the system is required to support multi-input operation, establish cache mechanism, and provide users with access speed

(7) Portability and continuity: it is convenient for future upgrading and transplantation. Strive to reduce the secondary development cost of enterprises

(8) Platform-independent: changing the operating platform or database only needs to be changed through simple settings

(9) Interactivity: the system requires interaction, and the feedback mechanism of the front and back office systems is established. Realize automatic response mechanism and high interaction

3.2. Database Design. According to the actual situation of the enterprise itself and the basic principles of design, the exclusive database mode belonging to the enterprise is designed.

(1) Data granularity

Because of the complex operation of enterprises every day, a large amount of data and information will be generated. This system adopts the strategy of dual data
Figure 4: Dual data granularity.

Figure 5: Data flow.

Figure 6: Functional design.
granularity. To store data, the database is a very important part of the system, which mainly stores and operates various data. We can clearly see the transformation and change of historical data. Whether it is the detailed data of recent months or the historical data of a certain year, it can be found through the database, as shown in Figure 4.
(2) Data flow

Through ETL technology, the data scattered in each subsystem is copied and concentrated in the transaction database for integration and processing. The data of the system comes from merging different data sources. In this way, various financial data indicators can be comprehensively analyzed. The flow direction of the data set of the system, leveraging the SQL Server data platform, is shown in Figure 5.

3.3. Function Module Design. This system mainly realizes four analysis functions, including management, index, finance, and comparison. Use F1, F2, F3, and F4 to represent these four functions. There are 4 to 5 subfunctions under each function, as shown in Figure 6.

3.4. System Architecture Design. We mainly show the data architecture of the system. Collect different database data into the data collection platform; then, through the data warehouse, the processed data through several models, OLAP data calculation, and analysis; finally, through the data navigation of OLAP, the data is transmitted to the application program for the final system decision-making, as shown in Figure 7.

4. Experimental Analysis

4.1. Development Environment. The test environment of the system is mainly configured by the current mainstream software and hardware. In this test environment, our system can run normally and perform well. In this performance test, we use the JMeter tool based on JAVA to test, as shown in Table 2.
In order to better analyze and evaluate the system, we set up some evaluation criteria to determine the current status of the system. In the design of the system, if the problem reaches the A, B grade, it must be modified to solve the problem before the next system design can be carried out, as shown in Table 3.

### 4.2. System Test

#### 4.2.1. Systematic Review.

According to the function module designed in the third chapter of this paper, it is divided into four major functions, with a total of 18 subfunctions. This system review mainly evaluates the classification of these 18 subfunctions. A total of 10 adjustments and modifications have been made to the test group. Every time the test group tests, it is committed to reducing the number of A, B, and C grades and increasing the number of defect-free functions. Until the final system functions are all D grades, the number of A, B, and C grades is 0. There are no defects, so as to complete the state evaluation of the system, as shown in Figure 8.

#### 4.2.2. Response Time.

The test scheme we plan is to measure the page response time of the four functions of the system. The set conditions are as follows: a test scenario with a maximum concurrent user of 100; set the assembly point to 70; gradually increase ten users per second. We can find that no anomalies occurred during the whole test. Therefore, the abnormal rate of system response is 0%. The average response time fluctuation of the four functions (F1, F2, F3, and F4) is less than 3 s. Their overall average response time is about 1 s. The results of all functional tests meet the expected requirements, as shown in Figure 9.

#### 4.2.3. CPU Utilization.

Our experiment sets the expected goal as follows: the CPU utilization rate of the system should not exceed 70%; once exceeded, it is regarded as an unqualified index, which needs to be adjusted and modified until the utilization rate is reduced to below 70%. The system testing tends to be stable, and we check the CPU utilization of different functions according to the number of requests per second. We can find that with the increase of the number of requests, the CPU utilization trend of all functions is steadily increasing. The maximum CPU utilization rate of the system is 34%; the minimum utilization rate is 2%. In terms of functions alone, CPU utilization is up to 40% of F4 functions. To sum up, the system passed the CPU test, which was less than 70% of the expected utilization rate, and the system was qualified, as shown in Figure 10.

### 4.3. Edge Computing Task Optimization.

The iteration times of edge calculation have a great influence on the algorithm. Therefore, we must fix the parameters of related simulation experiments well. Due to space constraints, we only show some values, as shown in Table 4.

#### (a) Constant parameter scheme

The whale algorithm is used to combine the old and new tasks for experiments. It is compared with the new task method, random unload method, all local method, and all upload method. We can find from the figure that it is obvious that the method in this paper is more dominant.

---

**Table 4: Parameters.**

| Parameter name                      | The value of the parameter |
|-------------------------------------|-----------------------------|
| Number of iterations                | 500                         |
| Number of terminals                 | 25                          |
| Terminal data transmission power    | 0.5 W                       |
| Delay specific gravity              | $\sim U(0,1)$              |
| Terminal computing capability       | 500 MHz                     |
| Scale setting                       | 60                          |
| Population number                   | 4                           |
| Spiral characteristic constant      | 1                           |

---

*Figure 10: CPU utilization.*

*Figure 1: CPU utilization.*
Combine old and new tasks
New mission
Random unloading
All local
Upload all

**Figure 11:** System cost-constant parameters.

**Figure 12:** System cost-computing resources.

**Figure 13:** System cost-latency energy consumption.
Whether it is the total cost of task time or energy or the system cost, this method consumes the least resources and improves the system performance more, as shown in Figure 11.

(b) Computing resources

Using the control variable method, the factor of calculation resource is changed, and other parameters remain unchanged. Here, computing resources refer to the total route processing capacity in the edge server. Total cost, which is the worst way, completely abandons the profit effect brought by edge calculation. The benefits brought by this method are the most obvious. However, we should note that the method of the new task is only slightly worse than the method in this paper. After reaching a certain bottleneck of computing resources, the gap between the two methods is equal and the system cost is similar, as shown in Figure 12.

(c) Delay energy consumption

When determining the offload decision, we can find that the delay energy consumptions of random upload, all local, and all upload are all fixed values. They are no longer affected by computing resources and will not change with the increase of resources. However, the method in this paper and the method of new tasks still decrease with the increase of computing resources. Among them, the strategy effect of this method is the best, as shown in Figure 13.

5. Conclusion

According to the various financial requirements of the development of enterprises in compliance with the times, a multisource database is established, and the architecture and functions of the intelligent system are analyzed and designed by using the edge computing platform. After analysis and verification, the research results of this paper show the following:

(1) In order to evaluate the performance of 18 functions of the system, grade evaluation of functions is carried out. After 10 adjustments, all functions are D-level, that is, the state without defects. (2) The abnormal rate of system response time is 0%. The average response time of F1, F2, F3, and F4 functions is in line with expectations. Their time range fluctuation is less than 3 s. The overall average response time of the system is about 1 s. (3) After testing, the whole system runs, and the maximum CPU utilization rate is 34%; at the smallest, it was only 2%. The system has passed CPU detection. Test less than 70% of the expected utilization rate, and the system is qualified. (4) This paper chooses the whale algorithm to combine the old and new tasks. It has an excellent performance in computing resources and delays energy consumption.

For enterprise managers, the system designed in this paper is a good auxiliary tool for decision analysis; it can intuitively view data from various sources and conveniently observe the final financial situation. Our system basically meets the performance requirements of intelligent finance. However, it still needs further improvement and perfection. For example, improve the details of the system and expand the application scope of the financial system; perfect each functional module of the system to make the decision closer to reality and more accurate; better integration, design, and operation of databases; optimize the computing resources of edge computing. Based on the above, this paper can consider more factors in more practical scenarios, which is a long-term optimization work.

Data Availability

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

Conflicts of Interest

The author declared no conflicts of interest regarding this work.

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