Design of Enterprise Intelligent Decision Support System Based on Data Mining

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Abstract. Faced with the lack of data and redundant data, traditional decision support system is difficult to obtain accurate decision support index, which leads to the decline of system response and control performance. This paper studies the enterprise intelligent decision support system based on data mining. In the hardware design, the impedance conversion circuit, the signal transmitting and receiving FPGA interface circuit are designed to strengthen the software service. In the software design, the enterprise data design mode is set based on data mining, the decision indicators are selected according to the influencing factors, and the enterprise decision results are generated through the data analysis rules of the decision support system. The experimental data show that the response time of the proposed system is 0.0448 s and 0.0403 s lower than that of the two traditional systems in complex environment; When the data is missing or redundant, the control quality of the proposed system is 22.16% and 15.57% higher than that of the two traditional systems, respectively. Therefore, the decision support system based on data mining has better performance.

Keywords: Data mining · Enterprises · Intelligent decision making · Support system

1 Introduction

The process of enterprise development will involve a large amount of development information. At the same time, some large-scale enterprises need to collect a large amount of data to get the difference value in order to realize the data link comparison work, so as to provide a data support for the subsequent enterprise development and transformation work. For this reason, the relevant researchers will take the research content of reference [1] as a reference, combine the targeted design principles and overall architecture, take the enterprise development as the foundation, establish the intelligent decision support system belonging to the enterprise, and provide more accurate data for enterprise decision. Some scholars combine the research content of document [2], combine the "Internet plus" with decision support system, combined with the specific speeches of various experts, optimize some hardware and software of the system, and

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strengthen the data acquisition ability of the system. Reference [3] proposes that the construction of operation decision support system can meet the data needs of different departments of the hospital for operation management, and improve the decision-making level and management efficiency of the hospital. Therefore, the relevant personnel take this reference as a reference, and combine Hadoop big data technology with system decision-making to provide more comprehensive statistical data for enterprises.

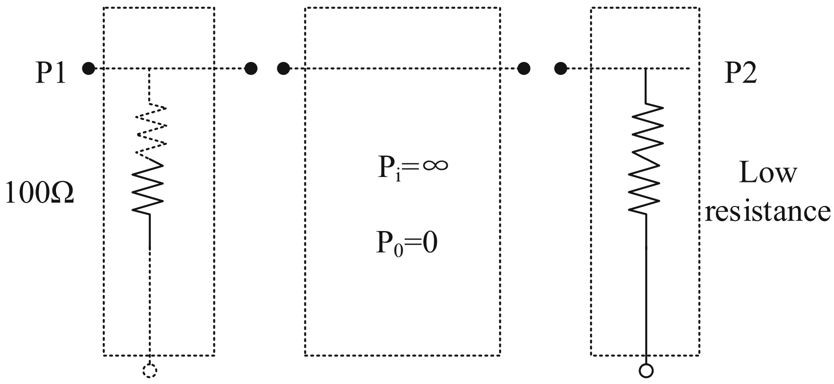
On the basis of the above design, data mining and enterprise intelligent decision support system are integrated to provide more reliable technical support for enterprise development and transformation. From the hardware design, the impedance conversion circuit, signal sending and receiving FPGA interface circuit are selected to strengthen the software service. Focus on the software design part, set the enterprise data design mode based on data mining, select the decision indicators according to the influencing factors, and generate the enterprise decision results through the data analysis rules of the decision support system. Finally, it is verified by comparative experiments.

2 Hardware Design of Enterprise Intelligent Decision Support System

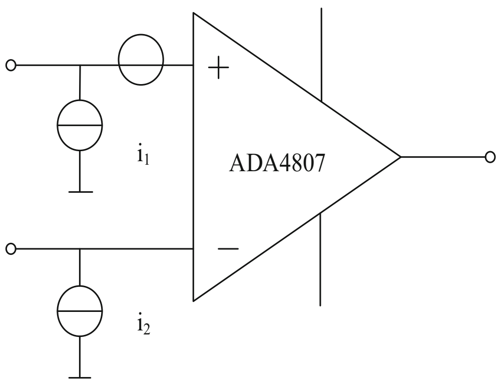
2.1 Design Impedance Conversion Circuit

In the process of decision-making enterprise related data, affected by the external signal and its own equipment signal, it is easy to appear noise interference. In order to achieve the research purpose of intelligent and accurate decision-making, the oscilloscope is introduced into the design system for noise reduction. The input impedance of the oscilloscope is known to be 100 Ω. It can achieve the purpose of matching the source end with the load end. In order to effectively reduce the signal attenuation and reflection and achieve more accurate data decision-making, a new impedance conversion circuit is designed for the signal conditioning channel of oscilloscope, which can improve the input impedance of the later stage circuit, reduce the output impedance and reduce the load effect of the input signal. The impedance transformation circuit is the same as the two port network, and its input impedance is the total input impedance after the input port of the oscilloscope. Figure 1(a) is the design diagram of the impedance transformation circuit in the ideal state.

P1 in Fig. 1(a) represents the input resistance of the front stage of the oscilloscope; P2 represents the input impedance of the later stage variable gain amplifier. The input impedance of the circuit is very large and the output impedance is very small, so it is easy to appear the phenomenon of impedance mismatch, which affects the normal work of the system circuit when searching literature. Therefore, according to the requirements of the noise level, bandwidth and dynamic range of the oscilloscope, the impedance conversion circuit is designed by using integrated operational amplifier. The integrated operational amplifier is not easy to be affected by the distributed parameters, so it has better impedance conversion effect [4]. In this study, the integrated operational amplifier and voltage follower are built. According to the known equivalent input noise in Fig. 1(b),



(a) Im pe dance transform circuit in the ideal state



(b) Im pe dance - equivalent input noise of the transform circuit

Fig. 1. Impedance transformation circuit in the ideal state

the impedance conversion circuit required for retrieval is designed. The circuit is no longer built by using the peripheral resistance. Through the noise characteristics of the device itself, the influence of resistance thermal noise on the retrieval results is avoided.

2.2 Design of Interface Circuits FPGA Signal Transmission and Reception

The design of decision support system, using AD9787 converter to achieve signal transmission. The selected converter is a dual channel parallel structure, and the connection between the hardware and FPGA is established, and the communication transmission of data signal is controlled by the clock signal. The hardware mentioned here is field programmable gate array, and the design scheme of interface circuit between them is shown in Fig. 2 below.

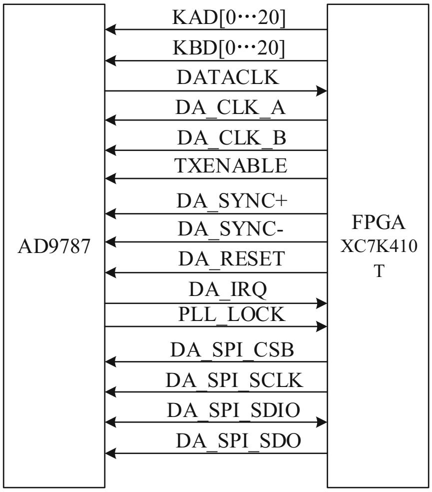


Fig. 2. FPGA Interface circuit AD9787 to the converter

When designing the interface circuit shown in Fig. 2 above, it is necessary to determine whether the I/O level of the interface is compatible in advance. According to the level division standard, the DA is divided into three levels_ CLK_ A and DA_ CLK_ B is set as the level standard of differential clock signal; Will DA_ SYNC+ and DA_ SYNC - set as the level standard of differential synchronization signal. The above ports are connected with FPGA, and two pairs of differential I/O interfaces are connected with BANK20 of XC7K410T, while other ports are connected with bank10. Using the above circuit, KAD [0… 20] and KBD [0… 20] correspond to a and B signals, using databack to synchronously feed back the clock signal of DAC, using TXENABLE and DA_ The reset port sets the enable signal and reset signal, while the da_ IRQ and PLL_ Lock port, respectively, indicates the interrupt signal in case of error and the indication signal of PLL locking. Finally, four groups of signals are used to represent the bus signals of SPI under the control of SPI protocol. Through the interface circuit designed above, the clock control and data communication control of the system are realized. When the signal receiving FPGA interface circuit is designed, the analog signal is collected by using dual channel parallel converter AD9650, and the converted signal is transmitted to FPGA in digital form. Figure 3 shows the interface circuit between FPGA and ad9650.

It is known that the DC power supply of the converter is 1.8 V, so it supports lvcmos-18 level standard. The bank32 of xc7k410t is used to connect the converter and FPGA. It is known that bank32 belongs to HP bank group and uses 1.8 V DC power supply to provide power for I/O, so the interface also supports 1.8 V DC power supply. It should be noted that the I/O interface of FPGA supports differential signal level, and the ADC_ CHA_ D[0…15]、ADC_ CHB_ D [0… 15] port, as a tool for 14 groups of differential lines to obtain ad9650 digital signal. When the circuit is used to transmit signals, the signals of all differential lines and different lines are transmitted alternately, and the configuration mode is determined through SPI interface to realize the task of register configuration [5]. So far, with the help of AD9787 and AD9650, the FPGA interface circuit of signal transmitting and receiving is designed.

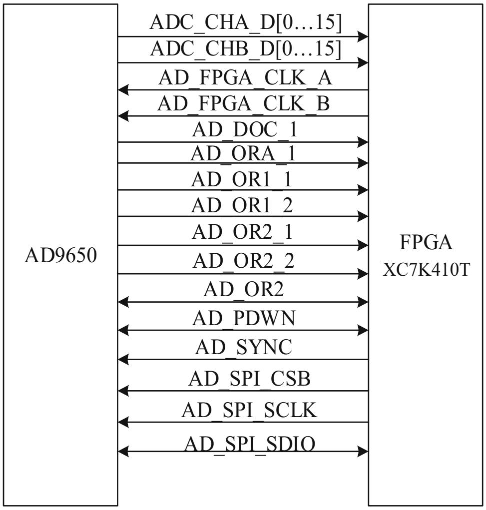


Fig. 3. FPGA Interface circuit AD9650 with converter

3 Software Design of Enterprise Intelligent Decision Support System Based on Data Mining

3.1 Set Enterprise Data Classification Mode Based on Data Mining

In data mining, clustering analysis is an advanced machine learning technology, which can calculate data sets with distance differences according to the target variables or attributes. So, the data mining technology is used to classify the data of enterprise monitoring matrix. The hierarchical clustering analysis method pre initializes similarity matrix and distance, then updates and merges the minimum set, and updates the new data set repeatedly and ends iteration after reaching the set number of sets. Set the distance to r, the distance between the a monitoring area and the b monitoring area is:

$$r = \sqrt{\sum_{m=1}^{n} (x_{am} - x_{bm})^2} \tag{1}$$

In the formula: x_{am} and x_{bm} represent the actual monitoring value of index m in the a and b monitoring areas respectively. It is known that there are linear characteristics among the decision-making data of enterprises, so all the decision-making historical data of enterprises in the region are normalized, and the data set composition analysis results are obtained

$$C_{ab} = \sum_{e} \mu_{ae} x_{eb} \tag{2}$$

In the formula: C_{ab} represents the composition of enterprise data; μ_{ae} is the influence degree of the change index on the composition data; e represents the total number of changes in the constituent data [6]. According to the data mining method, training sample data, get the actual available parameters, find out the spatio-temporal association between different enterprise decision data, use the intelligent computing program of the model, monitor the changes of these data in a fixed period, find out the implicit relationship between indicators and other parameters in each time and space area, Complete the recognition of data changes in a specific area. The monitoring model designed in this paper can reasonably explain the important implicit relationship between data in the way of intelligent reasoning, and provide analysis basis for data change and invariance. According to the above calculation parameters and design concept, the data composition change recognition pattern is constructed based on data mining, as shown in Fig. 4 below. The model is used to monitor the data change characteristics contained in the system in real time and provide data sources for supporting programs [7].

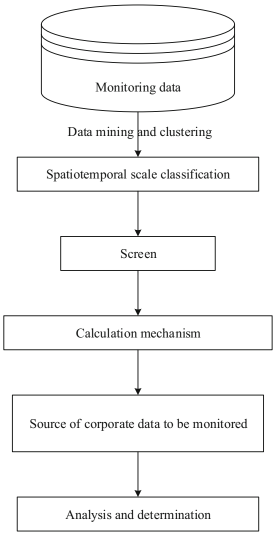


Fig. 4. Modelling of monitoring cell

Establish an effective connection between the identification mode shown in Fig. 4 and the central monitoring unit of the system, and control the data monitoring behavior of the system through this mode.

3.2 Selection of Decision-Making Indicators

According to the above design, the divided enterprise data will be obtained. According to the above results, the purpose and influencing factors of enterprise strategic decision are considered to select the decision-making index, analyze and confirm various enterprise information, and form a set that can support the basic strategic decision-making of various resources and further screen data. At present, there are many methods to set up decision-making indicators, including comprehensive analysis method, attribute category analysis method, etc., comprehensive analysis and comparison. This design selects the excellent part of these methods, combines with the specific reality, and takes the previously used indicators that have an impact on the enterprise development strategy as a reference to reset new decision-making support indicators. There are different strong and weak correlations among some indicators, and some of the data will be affected by enterprise factors, as shown in Table 1 below.

Table 1. Factors affecting the enterprise decision - making indicators

Serial number	Secondary indicators	Serial number	Secondary indicators
k1	Number of employees	k11	Enterprise scale
k2	Resource quality	k12	Corporate culture
k3	Input training	k13	Enterprise Strategy
k4	Per capita income	k14	Competition among enterprises
k5	Labor cost	k15	Enterprise income
k6	Labour productivity	k16	Market Competition
k7	Employee satisfaction	k17	Market labor force
k8	Sector structure	k18	National policy
k9	Labour law	k19	Socioeconomic
k10	Other resources	k20	Scientific and technological productivity

It can be seen from the above Table 1 that the factors influencing the decision-making indicators include internal self influence and external environmental influence. Therefore, it is necessary to establish a preliminary selection set of decision-making indicators, which is represented by $D = \{d_1, d_2, \ldots, d_n\}$. Entropy is used to represent the index dispersion, and the original matrix is $F = \left(s_{ij}\right) \times n$, where s_{ij} represents the i-th candidate index and the j-th sample data. In this case, the entropy dispersion can be calculated by the following formula:

$$\gamma = \alpha_i - \varepsilon \sum_{i=1}^{n} \gamma s_{ij} \ln s_{ij} \tag{3}$$

In the formula: α_i represents the entropy value under the i alternative index; $\varepsilon = \frac{1}{\ln n}$. Represents decision reference data. The larger the γ value is, the greater the screening ability of the index is; When the γ value is too small, it indicates that the index is not accurate enough. At this time, the index has little ability to distinguish enterprise information, so it needs to be re selected [8].

3.3 Building Data Analysis Rules of DSS

The decision classification algorithm is used to construct the analysis rules of the support system, which makes the decision support system generate decision information related to the development situation of the enterprise quickly. The database table generated automatically by the known system is the object of decision classification algorithm processing, so it is assumed that the analysis system is:

$$Z{=}(U, V, G, H, f) \tag{4}$$

In the formula: $U = u_1, u_2, \ldots, u_n$ represents a nonempty finite set with n data; B is the set of condition classification attributes; K is the set of decision attributes; H is the set of attribute values, and there exists $H = \cup_{\beta \in U} H_\beta$, where β is the limiting parameter; In this function, $(V \cup G)$ constitutes the attribute set of the data table, and $(V \cap G) \neq \varnothing$. The decision classification algorithm is used to define the change characteristics of all kinds of enterprise decision data, and to deal with the related analysis problems of enterprise development situation. The following equations are the boundary equations of the data set obtained by the decision classification algorithm

$$\begin{cases} F^{-}(U) = \cup_{\beta \in U}\{[u]_F \cap U \neq \varnothing\} \\ F_{-}(U) = \cup_{\beta \in U}\{[u]_F \subseteq U\} \\ DN_F(U) = F^{-}(U) - F_{-}(U) \end{cases} \tag{5}$$

In the formula, $F^{-}(U)$ is the upper approximation of the non empty finite set U; $F_{-}(U)$ is the lower approximation of the non empty finite set U; $DN_F(U)$ is the boundary area with area D and the number of boundary N; $[u]_F$ represents the equivalent class on F. Under the application of decision classification algorithm, the approximate area of the system for the enterprise data set is shown in Fig. 5.

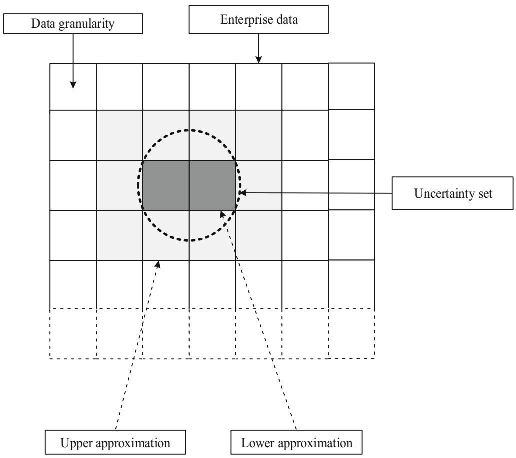


Fig. 5. Upper and lower limits of the data set

According to the upper and lower approximation, the concepts of positive domain, negative domain and boundary domain are introduced. The dark part in the graph represents the positive domain, which is the set of lower approximation; The white part is negative domain; The light color part is the boundary region. Suppose that an enterprise's information presents two states, represented by $z = \left(w, w'\right)$, where w indicates that the enterprise has achieved good results in development; w' indicates that the development of the enterprise has not achieved good results [9–11]. Let P denote the degree of decision support, and $T = (t_P, t_N, t_D)$ denote the three action indexes of decision support system. All the information of the enterprise is divided into positive domain, negative domain and boundary domain as shown in Fig. 5 above. Let η_{ij} denote the action cost of the system, where $i \in (P, D, N)$ and $j \in (P, N)$, φ_{ij} are required to satisfy the following equations under normal conditions:

$$\begin{cases} \eta_{PP} \leq \eta_{DP} \leq \eta_{NP} \\ \eta_{NN} \leq \eta_{DN} \leq \eta_{PN} \end{cases} \tag{6}$$

Choose the action with the lowest cost, and get the analysis result of the enterprise development situation.

$$\begin{cases} \textit{If } F(t_P|[u]) \leq F(t_D|[u]) \textit{ and } F(t_P|[u]) \leq F(t_N|[u]),\ \textit{then } u \in F^-(U) \\ \textit{If } F(t_D|[u]) \leq F(t_P|[u]) \textit{ and } F(t_D|[u]) \leq F(t_N|[u]),\ \textit{then } u \in F\_(U) \\ \textit{If } F(t_N|[u]) \leq F(t_P|[u]) \textit{ and } F(t_N|[u]) \leq F(t_D|[u]),\ \textit{then } u \in DN_F(U) \end{cases} \tag{7}$$

A given decision classification algorithm requires the following formula to be true, namely $P(w|[u]) + P\left(w'|[u]\right) = 1$. according to the above formula, the system decision rules under the application of the algorithm can be obtained.

$$\begin{cases} \textit{If } P(w|[u]) \geq \delta_1 \textit{ and } P\left(w'|[u]\right) \geq \delta_3,\ \textit{then decide } F^-(U) \\ \textit{If } P(w|[u]) \geq \delta_2 \textit{ and } P\left(w'|[u]\right) \leq \delta_1,\ \textit{then decide } F\_(U) \\ \textit{If } P(w|[u]) \geq \delta_3 \textit{ and } P\left(w'|[u]\right) \geq \delta_2,\ \textit{then decide } DN_F(U) \end{cases} \tag{8}$$

Among them:

$$\begin{cases} \delta_1 = \dfrac{\eta_{PN} - \eta_{DN}}{(\eta_{PN} - \eta_{DN}) + (\eta_{DN} - \eta_{PP})} \\ \delta_2 = \dfrac{\eta_{PN} - \eta_{NN}}{(\eta_{PN} - \eta_{NN}) + (\eta_{NP} - \eta_{PP})} \\ \delta_3 = \dfrac{\eta_{DN} - \eta_{NN}}{(\eta_{DN} - \eta_{NN}) + (\eta_{NP} - \eta_{DP})} \end{cases} \tag{9}$$

In the above formula, δ_1, δ_2 and δ_3 respectively represent the decision support parameters corresponding to the three action indicators of the system. When $(\eta_{PN} - \eta_{DN})(\eta_{NP} - \eta_{DP}) > (\eta_{DP} - \eta_{PP})(\eta_{DN} - \eta_{NN})$ was established, there was $\delta_1 > \delta_2$, so $\delta_1 > \delta_2 > \delta_3$ was further deduced. The most simplified decision rules for the development situation of the enterprise obtained by the system are as follows:

$$\begin{cases} \textit{If } P(w|[u]) \geq \delta_1,\ \textit{then } u \in F^-(U) \\ \textit{If } \delta_1 < P(w|[u]) < \delta_2,\ \textit{then } u \in F\_(U) \\ \textit{If } P(w|[u]) \leq \delta_3,\ \textit{then } u \in DN_F(U) \end{cases} \tag{10}$$

The decision classification algorithm sets the system analysis rules, and according to the above rules, generates an automatic pop-up statistical table of enterprise information.

3.4 Generate Enterprise Decision-Making Results

In order to improve the analysis results of the system, the real-time state of the data is determined based on Bayesian network. According to the characteristics of Bayesian network, the variational Bayesian inference is carried out. Using the criterion of minimizing singular distance, the virtual distribution $g(\lambda_t)$ is optimized to make the posterior probability density function $q(\lambda_t|R_{1:t})$. The singular distance between two functions is defined.

$$KLD\big[g||q\big] = \int g(\lambda_t)\ln\left(\frac{g(\lambda_t)}{q(\lambda_t|R_{1:t})}\right)d\lambda_t \tag{11}$$

In the formula, *KLD* is singular distance; λ_t is the total variable; $R_{1:t}$ is the posterior probability of the observation vector. Suppose that the virtual distribution corresponding to the total variable λ_t can be decomposed into the following form:

$$g(\lambda_t) = \prod_{m\in\theta_t} g\left(\lambda_t^m\right) = g(x_t)g(\varepsilon_t)g(v_t)g(\sigma_t)g(h_t) \tag{12}$$

In the formula, λ_t^m represents the m-th univariate component of the total variable λ_t; $g\left(\lambda_t^m\right)$ is the best approximation result of single variable λ_t^m; $g(x_t)$ is the moving target position; $g(\varepsilon_t)$ is the expected value of position; $g(v_t)$ is the moving speed; $g(\sigma_t)$ is the target transfer accuracy; $g(h_t)$ is the observation accuracy. Therefore, according to the above calculation results, Bayesian network is used to analyze the spatial transition state of the target data in the system, and then the dynamic law of the data change in the next cycle is predicted. It is known that there is mutual independence between the observation data, so according to the likelihood distribution corresponding to the observation information, the mobile tracking position is updated according to Bayesian network, and the position with deviation is corrected [12, 13]. According to the basic definition of likelihood distribution, the nonlinear observation results and observation accuracy are uncertain, and the posterior distribution $q(\lambda_t|R_{1:t})$ loses the ability of closed expression. Therefore, according to the multi-layer dynamic characteristics of Bayesian network, the posterior distribution $q(\lambda_t|R_{1:t})$ is adjusted to obtain the best variational approximation of a single variable.

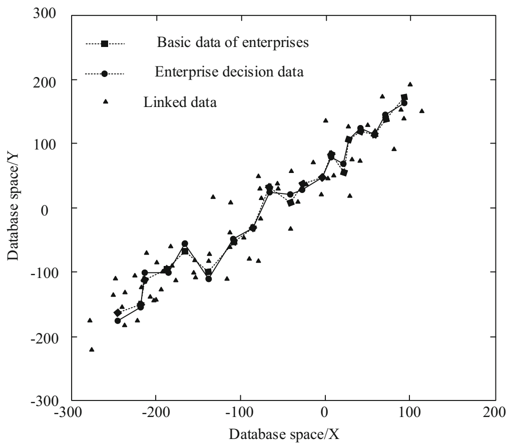
$$f(\theta) = \exp\langle \ln g(\theta, h(\theta))\rangle_{q(\lambda_t|R_{1:t})} \tag{13}$$

In the formula: θ represents prior parameter; $h(\theta)$ is the Markov carpet of a single variable λ_t^m in Bayesian networks. According to the above calculation process, the moving target in the system database is located and tracked, and the real-time change law of the target is mastered. The data fusion is carried out through Bayesian network, which provides the operation basis for the decision support system to generate enterprise decision results. So far, the enterprise intelligent decision support system based on data mining is realized.

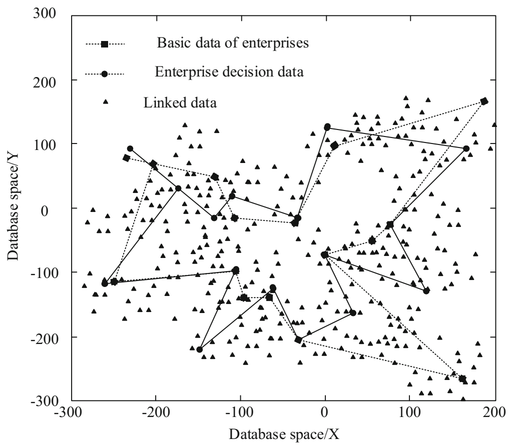
4 Experimental Study

4.1 Experimental Preparation

In order to verify that the design of the decision support system, can be truly applied to the development of enterprises, the establishment of simulation experiment test environment. Several PC servers are selected as application server and database server. The CPU model of the server is Intel Xeon 3.0 GHz * 4, with 32 g memory and 1 TB hard disk. It supports Windows Server 2018 operating system. Figure 6 shows two different test environments for this experiment.



(a) Simple enterprise decision objectives



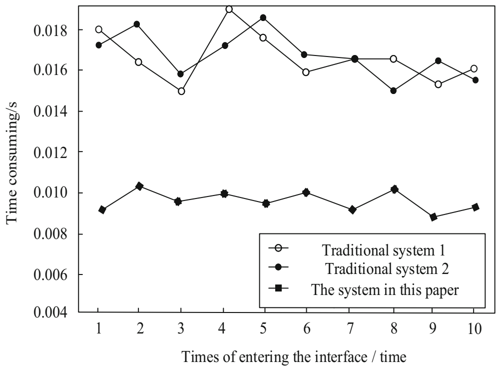
(b) Decision-making objectives of complex enterprises

Fig. 6. Experimental test environment

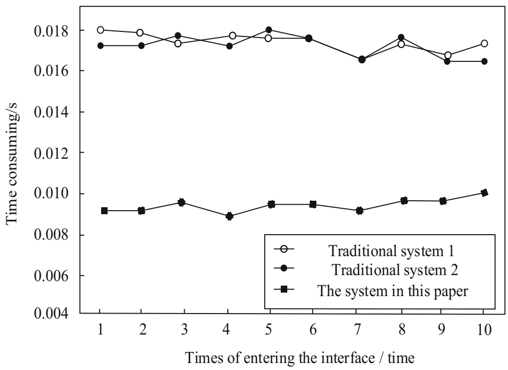
In Fig. 6, (a) and (b) are respectively affected by different volumes of associated data, which have different degrees of impact on the decision support of the system. Taking the above test conditions as variables, two groups of traditional design decision support systems based on big data in reference [4] and artificial intelligence in reference [5] are selected as the control group, which are recorded as traditional system 1 and traditional system 2 respectively, and the performance of the three groups of systems is analyzed.

4.2 Response Time Test

As an important parameter, response time is one of the measurement standards of system quality, so when testing system quality, it is necessary to test the corresponding time. Three groups of systems are used to process the enterprise development data, and the response time of the system entering the information integration interface, information monitoring interface, information retrieval interface and information extraction interface is distinguished. Figure 7 below is the test result of system response time based on the test environment in Fig. 6 (a). Among them, the test times were 200 times each time, and 10 groups were tested.

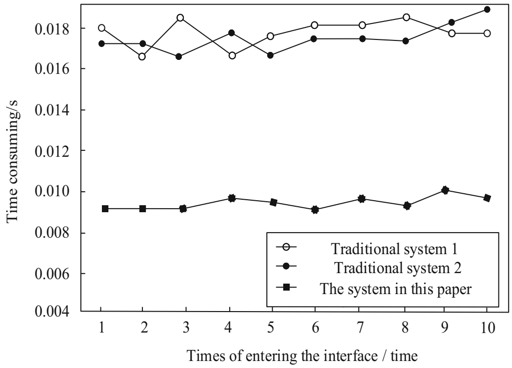


(a) Enter the information integration interface

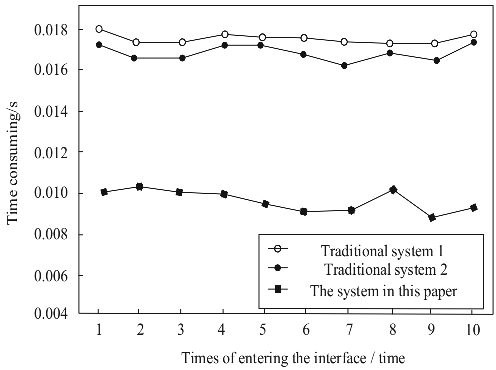


(b) Enter the information monitoring interface

Fig. 7. System response time test results in a simple environment



(c) Access to the information retrieval interface



(d) Access to the information extraction interface

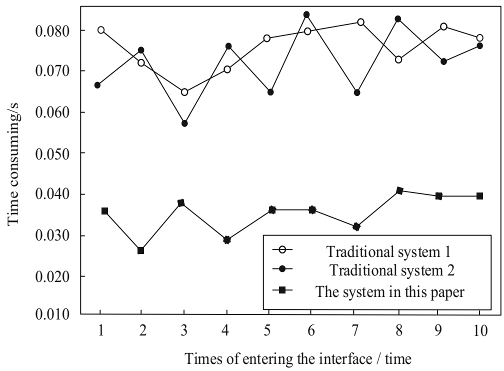
Fig. 7. continued

According to the four groups of test curves, it is obvious that the response time of the system in this paper is slightly lower than that of the traditional system. The total response time of the four groups of systems is exported and summarized in Table 2 below.

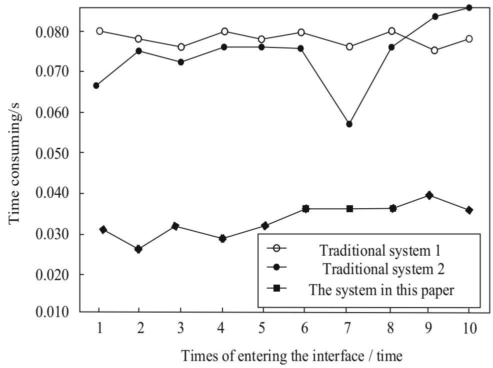
Table 2. Average response time of system in simple environment (s)

Test group	The system in this paper	Traditional system 1	Traditional system 2
a	0.0098	0.0167	0.0182
b	0.0086	0.0178	0.0177
c	0.0094	0.0178	0.0183
d	0.0107	0.0179	0.0172

a, b, c and d in Table 2 correspond to (a), (b) (c) and (d). According to the test results in Table 2, the response time of the system in this paper is obviously less than that of the two groups of traditional systems, but the difference between the three groups of systems is small and can be ignored. The main reason is that the system uses data mining technology to process and classify the response data before decision-making, which optimizes the transmission performance of the system. Based on the test conditions in Fig. 6 (b), the response time of three groups of systems in complex environment is compared, and the results are shown in Fig. 8.

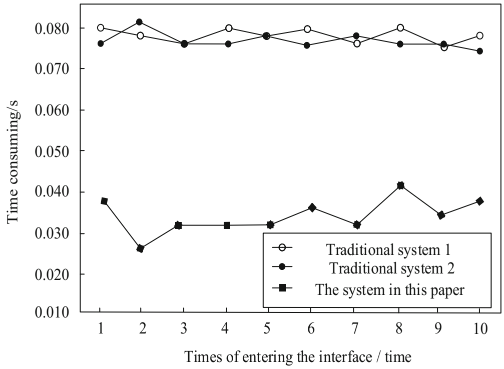


(a) Enter the information integration interface

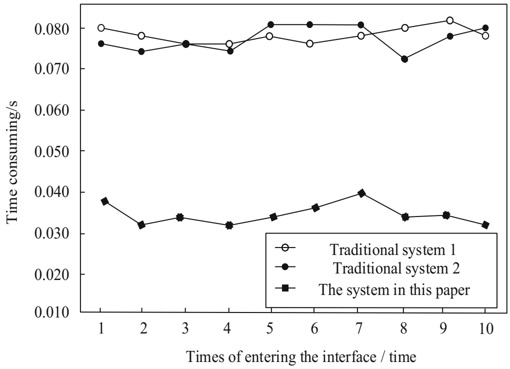


(b) Enter the information monitoring interface

Fig. 8. System response time test results in complex environment.



(c) Enter the information retrieval interface



(d) Enter the information extraction interface

Fig. 8. continued

According to the test results of the second stage, although the response time of the system in this paper increases, it is far less than the two groups of traditional systems. The total response of the system is also exported and summarized in Table 3 below.

Table 3. Average response time of system in complex environment (s)

Test group	The system in this paper	Traditional system 1	Traditional system 2
a	0.0325	0.0715	0.0691
b	0.0322	0.0794	0.0699
c	0.0317	0.0792	0.0752
d	0.0331	0.0788	0.0767

According to the test results shown in Table 3, in the face of a complex system environment, the response time of the system in this paper is obviously slightly less than that of the two groups of traditional systems, but there is a great difference between the three groups of systems at this time. The average time consumption of the three groups of systems in the four groups is 0.0324 s, 0.0772 s and 0.0727s respectively. According to the above calculation results, the time consumption of the system in this paper is 0.0448 s and 0.0403 s shorter than that of the traditional system respectively, which shows that the response performance of the system in this paper is better. In this paper, the response time of the system is increased because the complex environment has a certain impact on the efficiency of data processing, but compared with the comparison system, the data mining technology only slows down the processing efficiency, and the overall response performance is still better than the comparison system.

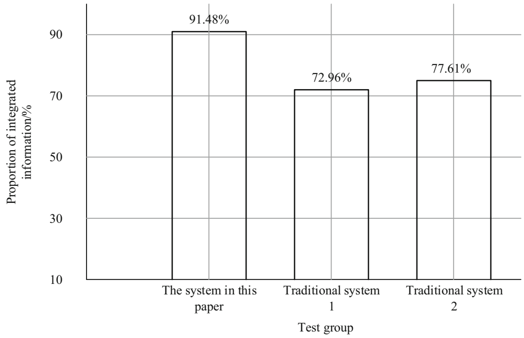
4.3 Decision-Making Accuracy Tests

The first half year enterprise data of a company is selected as the basic background of the test, and three groups of systems are used to integrate and manage the information during this period, and the authenticity and integrity of the feedback data of the system are compared. The following Table 4 shows the missing and redundant data in the test task.

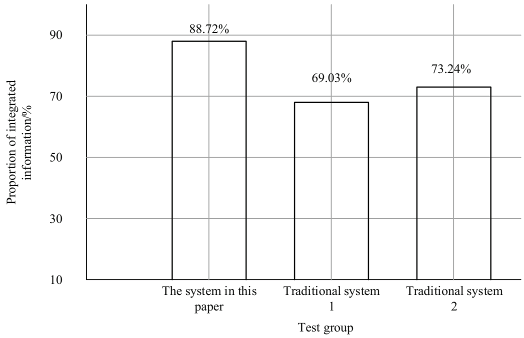
Table 4. Problems with data

Question number	Missing ratio	Redundancy ratio
1	4.2%	3.5%
2	8.3%	1.7%
3	16.7%	11.3%
4	7.45%	6.4%

According to the statistical data in Table 4, there are four types of data problems in the data of the enterprise. Three groups of systems are used to make data decisions under the test conditions shown in Table 4. The test results of the decision accuracy of the system are shown in Fig. 9 below.

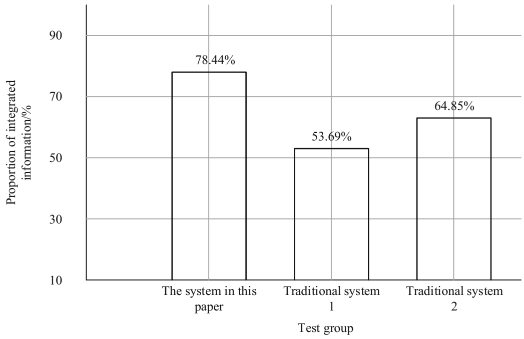


(a) Conditions 1

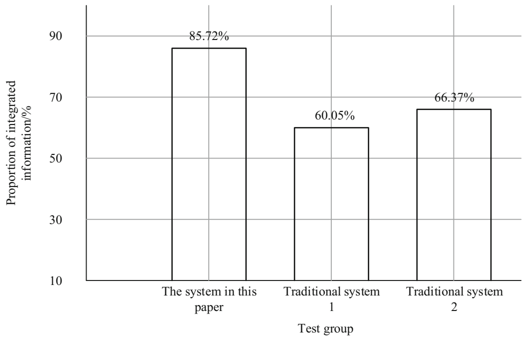


(b) Conditions 2

Fig. 9. Enterprise information integration control quality



(c) Conditions 3



(d) Conditions 4

Fig. 9. continued

According to the test results shown in Fig. 9, when the data defects in the three groups of system applications are small, the system decision accuracy is high; When the system data defect is large, the system decision accuracy is low. The average decision accuracy of different systems was 86.09%, 63.93% and 70.52% respectively. According to the above calculation results, the decision accuracy of the design system based on data mining technology is 22.16% higher than that of the traditional system 1 and 15.57% higher than that of the traditional system 2.

5 Conclusion

Starting from the functional requirements of decision support system, this paper analyzes that enterprise management is a complex decision-making problem. It has the characteristics of dynamic, distributed, large amount of data and complex nature of data. In the face of sudden disasters and massive, complex, changeable and distributed data and information, it is difficult for decision makers to make timely decisions. The traditional decision support system can not meet the needs of modern enterprises because of its lack of function. Data mining technology is one of the effective ways to solve this problem.

Therefore, this paper designs an enterprise intelligent decision support system based on data mining. According to the above test results, the response time and control quality of the system are better than the traditional system, which provides more reliable data for enterprise decision-making. But in the process of designing the system, the calculation program involved is more complex, and the system is prone to collapse. In the future, it is necessary to simplify some software programs and test the operating pressure of the system to prevent the system from frequent crashes.

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