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Retraction

Retracted: The Application of Multimedia Visualization Platform in Business Management from the Perspective of Supply Chain Management

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This article has been retracted by Hindawi following an investigation undertaken by the publisher [1].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

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

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

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

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

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

References

[1] N. Wang, "The Application of Multimedia Visualization Platform in Business Management from the Perspective of Supply Chain Management," *Journal of Robotics*, vol. 2022, Article ID 1271691, 10 pages, 2022.

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Research Article

The Application of Multimedia Visualization Platform in Business Management from the Perspective of Supply Chain Management

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At present, in the process of enterprise operation and development, the implementation of enterprise operation modernization is a necessary condition and an effective measure to raise the management level. With the aim to achieve such enterprise modernization, it is necessary to improve the management's modernization ability by improving the modernization level of enterprises. Therefore, corporate executives should pay more attention to the construction of informatization and implement informatization through effective methods and measures to further improve management efficiency. It will note the concept and connotation of business management, analyze the significance of the multimedia visualization platform at the level of enterprise business supply chain, analyze the current business management of enterprises and put forward scientific coping strategies, cater to the social development situation, and constantly innovate the development path of enterprise network information and chemical business management; this will help related majors.

1. Introduction

Science as well as management modes are also changing. The traditional manual management system has become increasingly difficult to adapt to the needs of high-intensity and high-efficiency management, so it is very necessary to implement informatization [1] in the management process. The competent department is the director of business [2]. Once the management cannot keep up with the development of society, the development speed of the enterprise will be limited to a certain extent, and the promotion of the growth of the enterprise has not received sufficient attention in the early stage of development [3]. In the 1980s, Chinese enterprises gradually began to introduce computer information technology and modern management methods in the fields of operation and management and achieved corresponding successful development [1].

In the process of the daily management of enterprises in a network, the management level of enterprises is optimized, the management role is played for the economic development of enterprises, the current market development situation is catered for, and the realization of strategic development goals of enterprises is promoted [4]. Some enterprises lack the emphasis on network informatization and still adopt it in such process business. Therefore, enterprise management should improve the understanding of the network and the process of business management. Network information optimizes the management level of each business link of the enterprise and promotes the high-quality development of the enterprise.

The efficient integration of information technology and enterprise internal operation management can improve the immediacy and accuracy of enterprise internal information collection [5], promote scientific and effective enterprise internal management decisions, enhance the sensitivity of enterprise internal to market information, and promote the improvement of enterprise overall level [6]. The company will continue to develop. The integration of network information technology in the business management of enterprises should break the traditional way of thinking [7], avoid relying on the subjective assumptions or experience management of managers, and rely on big data technology to analyze various business data indicators of the enterprise and provide reliable data for business decision-making

support [8]. On the one hand, the company should use network technology to monitor the financial data information formed in the production and operation of all parts of the company in an all-round way, effectively acquire, integrate, classify, and analyze the data, discover the potential value of data information and combine it with the current market development trend, screen out valuable data and information for the development of the enterprise itself, help the enterprise to identify the development direction in the production and operation of the enterprise, promote the improvement of the economic profit of the enterprise, and ensure the realization of the strategic development goal [9]. On the other hand, the effective integration of network information technology in enterprise business management can help enterprises to obtain diversified data information from various internal production departments and various upstream and downstream enterprises in the external industrial chain and more comprehensively analyze the current market positioning of enterprises [10], and establish a scientific early warning mechanism, and make scientific and reasonable risk avoidance measures to help enterprises find a scientific and stable business direction and management strategy, and improve the supervision level of all aspects of enterprise operation and management [11].

Multimedia visualization technology is an auxiliary means of business management. In line with knowledge as well as information acceptance ability, the company will adopt multimedia teaching and visualization technology to alter the mode of management and innovate the management concept, so as to improve the cognitive structure of the enterprise and improve the interest of management. In view of the specific content of business management, enterprises mobilize the interests of enterprises through reasonable implementation of management design and carry out enterprise-independent learning through joint research. The business administration discipline covers a wider range and has more complex knowledge points [12]. Therefore, enterprises should carry out multimedia presentations according to the course objectives of business administration, show management scenarios to the company intuitively [13], stimulate the company's curiosity, transform theoretical knowledge into practical skills through the display of multimedia visualization technology, and encourage companies to explore in discovery [14]. Let the company learn independently and mobilize the company's learning initiative [15]. Use multimedia visualization technology in management to enhance the diversity of management [16]. In terms of management, the company introduced the specific contents of business management training in the form of photos, music, and videos, which helped the enterprise to master professional knowledge faster, flexibly apply the knowledge to a specific practice, and improve learning efficiency [17]. The use of multimedia management can strengthen the company's practical ability and improve the company's professional quality [18]. At the same time, improving the management level of the enterprise can improve the company's innovation awareness to a certain extent, fully apply the innovative spirit to the management of the enterprise, improve the management ability of the company, and increase its own knowledge reserve [19]. Based on the DirectShow framework, this paper focuses on the concept, characteristics, and connotations of business administration, analyzes the significance of multimedia visualization platforms in the improvement of enterprise business management levels under the perspective of supply chain management, discusses the current problems in enterprise business administration, proposes scientific coping strategies to cater to the social development situation, and constantly innovates the development path of enterprise network informatization business management.

2. Related Concepts and Theoretical Basis

2.1. Concepts Related to Business Management and Business Informatization. Business management contains rich management content and has a very broad concept. This is an indispensable means of modern company management and financial management. In the operation process of the company, each production link is constrained by relevant systems to ensure that each department and operation process of the enterprise conform to the industry and commerce. Management requirements can ensure the realization of the overall production efficiency of the enterprise. With the in-depth development of informatization, dataization, and intelligent technology, which penetrates deeply into various fields, it has affected the production level as well as the work rhythm of enterprises. The business decisions of various departments of the enterprise affect the strategic goals of the enterprise. Enterprises are caught in tax-related risks, financial risks, legal risks, etc., and network information on chemical business management can help enterprises avoid potential business risks and provide a clear path for the sustainable development of enterprises [20].

The informatization of business management is the integration of information technology into traditional business management models. The application of computer and Internet-related technologies to traditional business management processes has improved the efficiency of business management, broadening the functions of business management. Compared with traditional business management, the informatization of business management has the advantages of accuracy and speed in information acquisition, integration, transmission, and analysis accuracy of business decisions. Business management and informatization have different functional attributes, and the integration of the two requires such carriers. Information technology should be developed and utilized on the basis of the traditional business management model. At the same time, the business management modes of enterprises in different fields are different, and the practicality and extensiveness of informatization are required to be high, and the informatization technology is required to be compatible with different business management modes. Information technology can realize the sharing of information materials within the company, improve the quality of information transmission among various departments of the company, break down the obstacles and defects of information communication among various departments under the

traditional company mode, promote cooperation among various departments, and promote the efficient development of the enterprise.

Information processing is a kind of activity that combines management information with computer network technology and uses new information technology to manage and integrate information materials so as to control and serve information. Information processing is a very common management method for companies because the quality of data processed by computers is better and the efficiency and convenience can be greatly improved. The operation function of the system mainly depends on manual operation, and manual operation will inevitably make mistakes. After being inquired by the computer, the operator can conveniently inquire about the key information contained in the specific information.

The realization of management informatization systems in small and medium-sized enterprises has very important practical significance, and management design involves many aspects and the objects oriented are also very diverse. Unless the traditional management methods are changed, the human resources invested in management will be very large, and management departments cannot afford it. Moreover, as shown in Figure 1, under the situation of increasing management efficiency today, once the state administrative organs fail to improve their work efficiency, many business problems for industrial and commercial enterprises and traders will accumulate, and it may even take a year to handle them. This is also contrary to the state's demands for reducing the burden of business management. Therefore, it is imperative to promote the information.

2.2. Supply Chain Management. In 1996, the management and research committee of Michigan State University took the lead in introducing the concept of supply chain control. It points out that enterprise managers should integrate environmental factors into the design, procurement, production, assembly, packaging, logistics, and distribution of enterprise activities at every session. Supply chain management is an interorganizational practice that incorporates environmental factors into supply chain management, including reverse logistics. Hall believes that supply chain management starts with the concept of sustainable development and through the close cooperation between enterprise departments and enterprises. The entire supply chain is coordinated and unified in environmental management so as to achieve the optimal system environment. In addition, Tseng and others also believe that on the supplier platform, suppliers and users are the most attractive subjects for upstream and downstream cooperation of enterprises, and cooperation with core enterprises can reduce the impact of enterprises on the environment. For this reason, Tseng and others define supply chain management as follows: integrating environmental management into the enterprise process, promoting information and data resource sharing, and improving environmental performance through collaboration with customers, suppliers, and logistics enterprises. Generally, scholars define enterprise management as

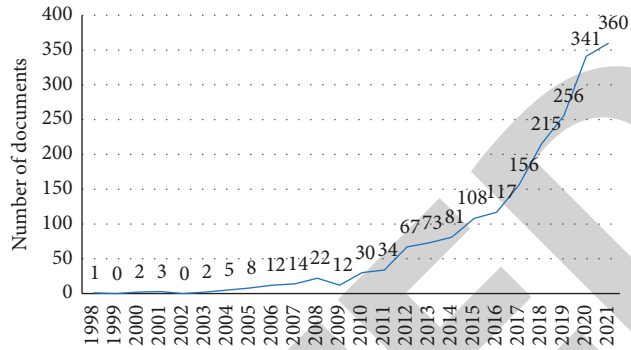

Figure 1: Time distribution of the number of publications in the international research literature on business administration.

integrating environmental knowledge into the whole process of enterprises to optimize resource utilization efficiency, reduce environmental pollution, and increase social welfare. In the research of supply chain management, Sarkis and others are based on the following nine basic theories: the basic theory of system complexity; the theory of ecological modernization; the basic theory of information; the market system theory; and the basic theory of information, including trade efficiency. For a such realization of electronically registered residence, the current database service system has defects in data analysis, and it is very difficult to obtain useful policy data. It is urgent to develop a new generation of big data analysis systems with multimedia visualization. As a new force in the field of big data analysis and application, supply chain data management has increasingly shown its good ability and practicability. It analyzes and summarizes the current theoretical research status of supply chain management and the future trend of basic theoretical research and provides research theories that can further understand and explain supply chain management issues in future scientific research, such as innovation diffusion theory and path dependence theory, social embedding theory, structure theory, and agency theory.

The drivers of supply chain management are important factors in ensuring the successful implementation of the supply chain. Supply chain management is originally driven by management and laws and regulations, and the smooth implementation of supply chain management depends on managers' insight into the macroenvironment and the ability to optimize enterprise resources, as well as their excellent management ability to take the environment and enterprise benefits into account. Considering the source of driving factors and other factors, the main motivation of driving factors can be divided into active and passive. As shown in Figure 2, environmental protection awareness comes from the company's own emphasis on environmental protection, including factors such as corporate image or social or environmental responsibility; regulatory requirements, which are externally imposed environmental protection requirements on enterprises, including local governments and international organizations; laws, rules, and regulations, such as the requirements of ISO14001 certification; and internal motivation, which comes from the company's

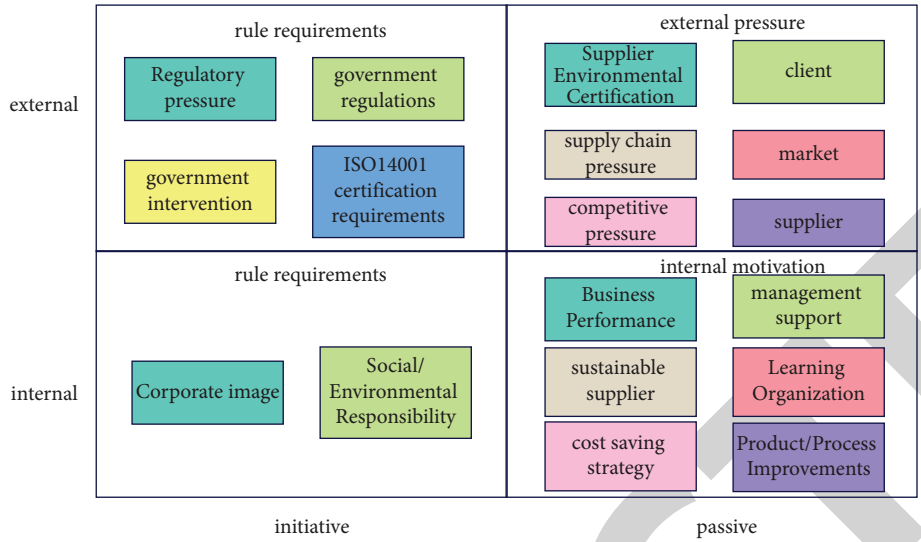

Figure 2: Drivers of supply chain management.

internal drive to implement green supply chain management. In order to achieve the goal of green environmental protection, the company needs to upgrade the green operation concept to a strategic level. External pressure refers to the direct or indirect requirements of stakeholders in the supply chain, including competitive pressures, customers, and market requirements.

2.3. Features and Advantages of Multimedia Visualization Platform. The traditional big data analysis teaching course has many problems, such as strong theory and strong concepts that are difficult for enterprises to master. The current statistical and analytical tools are not suitable for the application or practice of courses, because they are more professional and have higher training costs. The statistical analysis and visualization platform of *Python* can solve these problems well. Figure 3 gives the framework for the company to apply multimedia visualization technology to the whole process of business administration in the supply chain management horizon. It mainly uses multimedia visualization technology to enhance the diversity of management.

Enterprises can also use the data analysis module of the system. After mastering the basic knowledge, students can choose different algorithms to carry out data mining experiments according to their own interests and needs. Because the basic knowledge level of each company is different, enterprises can use the visual platform to carry out targeted training to improve their learning enthusiasm.

Give us some cases related to our practice. Combine these examples and knowledge to improve the understanding of data mining applications. You can also create and upload your own cases, contact other users, and acquire self-knowledge and skills in this process.

The operating system will provide open-source code and comments for all algorithms. Enterprise personnel can understand the specific implementation of these algorithms and execute these codes while understanding and learning. They also overcome their own difficulties by improving their own methods, improving their research abilities and application technology, and adapting to the research needs of development at all levels.

3. Related Technologies

We create a filter graph manager to coordinate state transitions between filters, establish a reference clock, and provide a way for applications to build filter graphs. The filter graph manager interface used in this system is as follows:

(1) IGraphBuilder, the main function of this interface is to create a filter graph.

(2) IMediaControl, this interface contains some functions to control the multimedia stream, which are used to control the three states of the multimedia stream (flow, stop flow, and pause flow).

(3) IMediaEvevtEx, the function of this interface is to process the events in the chart.

(4) IBasicAudio, the function of this interface is to control some attributes such as audio volume and audio balance.

(5) IBasicVideo, the function of this interface is to set some properties of the video.

(6) IMediaSeeking, the function of this interface is to set the playback speed and locate the playback position.

(7) IMediaPosition, the function of this interface is to find the position corresponding to the multimedia data. Therefore, the general steps for DirectShow-based multimedia streaming are as follows: the application establishes the corresponding filter according to a certain intention; build a filter graph manager in the application to manage these filters; connects each filter through pins as required; and controls the entire data processing through the filter graph manager.

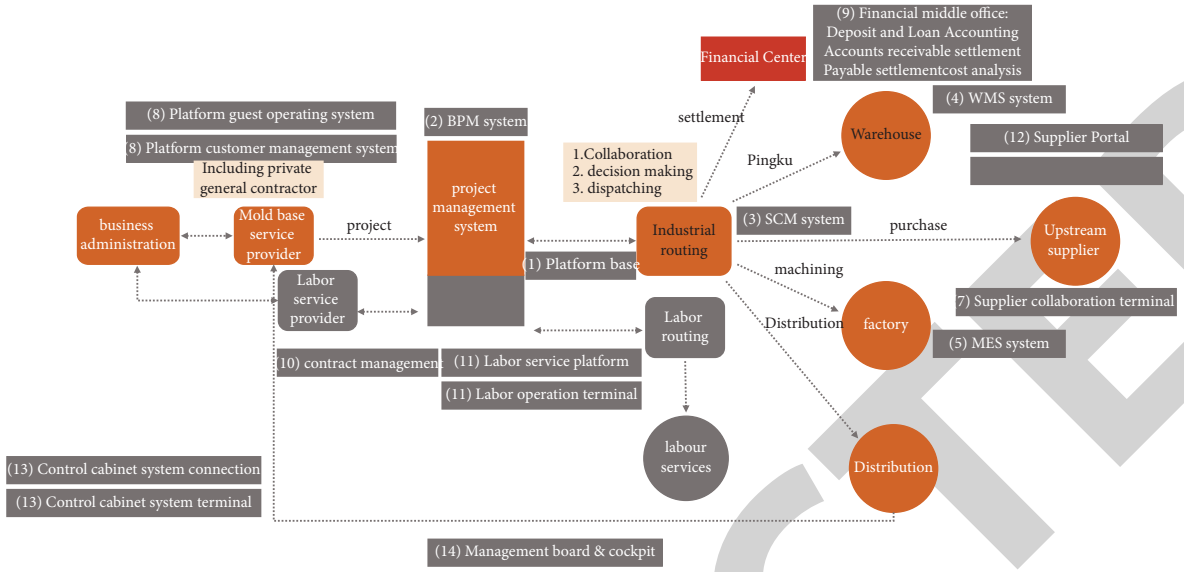

Figure 3: Visual management framework of the whole process of company operation business.

The class responsible for multimedia stream separation and decoding is the stream media pro class. The initial graph () method is responsible for initializing the filter graph, the getPin () method is responsible for obtaining the filter pins, the connectPintoFilters () method connects the pins with the filter, and the play () method, pause () mode, and stop () mode are responsible for running, suspending and stagnant states of the multimedia stream.

The voice signal is generally between 10 ms and 30 ms; we can consider it stable. In reality, speech signals are very long, and we cannot process long data at one time, but we can decompose it and take a small piece of data for analysis each time. In order to decompose the long audio into short audio segments, we adopt the method of adding a Hamming window to a long audio segment. The Hamming window can be regarded as the sum of the spectrum of the three rectangular times windows, or the sum of the three sinc (t) type functions, while the two items in parentheses move π/T left and right relative to the first spectrum window, so that the side flaps cancel each other, eliminating high-frequency interference and energy leakage. Suitable for nonperiodic continuous signals.

The calculation formula of the Hamming window is given as follows:

$$W(n) = \begin{cases} 0.54 - 0.46\cos\left[\dfrac{2\pi n}{N-1}\right], & \\ 0. & \end{cases} \quad (1)$$

After adding the Hamming window, the intercepted signal time segment is actually subjected to periodic extension processing, and the data shape has the feeling of a period. However, after the infinitely long signal is truncated, spectral energy leakage will occur because after adding the Hamming window, the data information on both sides of the window is lost. In order to solve this problem, the method we use is to move only 1/3 or 1/2 of the window when moving the window. After this method is applied, the data on both sides of the window will not be lost.

Table 1: Description dictionary of visualization requirements.

Field name	Field abbreviation	Data type	Type length
Requirement code	Request code	Int	10
Requirement name	Request name	Char	50
Functional requirement	Request function	Char	50
Data requirement	Data request	Char	50
Result requirement	Result request	Char	50
Time dimension	Time dimension	Char	50
Space dimension	Space dimension	Char	50
Parameter dimension	Parameter dimension	Char	50

The description required by business management data mining is the direction indicator for all subsequent services. Accurate positioning can effectively reduce misunderstanding during excavation. This paper uses the business management database, based on the current mining situation, including the change of the market investment scale, the operation of target customers, and the change of market entities as shown in Table 1

Information incitement was initiated by C. E. Shannon wrote in his 1948 article about the geometric concepts of communication. He believes that there is redundancy in all data, and the degree of redundancy is directly related to the probability and uncertainty of various contents (quantity, letters, or English words) in the data. The calculation formula is as follows:

$$H(X) = E[I(X_i)] = E\left[\log_2\left(\frac{1}{P(X_i)}\right)\right]. \quad (2)$$

Among them, $H(X)$ represents the information stake of attribute set meaning', and $P(X)$ represents the occurrence probability of attribute X.

Information gain is also known as information But the difference, is relatively inflammatory (relative entropy). In the view of probability and information theory, the signal gain is asymmetric, and its purpose is mainly to detect the difference between two different probability distributions. The main index of information gain is the amount of energy information contained in each feature in the process of statistical analysis. The greater the number of attributes, the greater the contribution to classification and the higher the information gain, and vice versa, the smaller the information gain.

Information gain tends to be a large number of data attributes, but they have little effect on classification. Therefore, the data gain rate was introduced in the latest classification method. The information gain value refers to the total amount of information contained in the unit attribute. Although the information gain refers to the uniformity of the information value, it cannot simply compare the total amount of information.

Suppose there are m categories in the sample data set S, which are as follows:

$$S = \{C_1, C_2, C_3, \ldots, C_m\}. \tag{3}$$

It is one of the attributes of systems V, which can divide the data set into several subsets, and each attribute has k different characteristic values.

The probability of occurrence for category Cj is given as follows:

$$P(C_j) = \frac{|C_j|}{|S|}. \tag{4}$$

Occurrence probability of attribute V = Vi is given as follows:

$$P(V_i) = \frac{|S_i|}{|S|}. \tag{5}$$

Among the samples with attribute V = Vi, the probability of containing samples of class Cj is given as follows:

$$P\left(\frac{C_j}{V_i}\right) = \frac{|C_{ij}|}{|S_i|} = \text{freq}\frac{(C_j, S)}{|S_i|}. \tag{6}$$

The calculation formula of category information abstract is given as follows:

$$\text{Info}(C) = -\sum_j P(C_j)\log_2 P(C_j). \tag{7}$$

From this decision tree, some classification rules can be obtained as follows:

(1) If the industry category = "construction industry" and the area is "Guandu District," the enterprise scale = "small and medium-sized," and the enterprise type II is "domestic-funded enterprise," then there have been many records of violations of laws and disciplines in the year

(2) If the industry category = "wholesale and retail industry" and the area 2 is "Wuhua District," the enterprise size is "small" or "small and medium-sized," and the enterprise type = "individual industrial and commercial households," then there are many records of violations of laws and disciplines in the year.

(3) If the industry category = "service industry" and the second district is "Panlong District" and the enterprise scale = "small-scale" or "small and medium-sized," and the SME type 2 is "individual industrial and commercial households," there are many illegal law enforcement records in this year.

(4) If the industry category = "financial industry" and the area = "Panlong District," and the enterprise scale = "small and medium-sized" or "large," and the enterprise type = "foreign-funded enterprise" or "domestic-funded enterprise," then there are few annual records of violations of laws and disciplines.

There are many technologies that can improve the decision tree problem, such as discrete attribute values and fixed intervals, multivalue deviation optimization based on attribute criteria, and optimal filling of vacant attributes. This paper is based on the data features and mining processes of industrial and commercial systems and realizes the system design through the feature selection criteria in C4. In the five operations, the message gain or message gain value of each characteristic must be counted, and the largest one must be selected as the node characteristic. As can be seen from equations (8) and (9), the value of the category information of the data sample is fixed, and in order to make the information gain larger, the information (, that is, the abstract category condition information) is required.

$$\text{Info}(S_j) = -\sum_{i=1}^{m} \frac{|S_{ij}|}{|S_j|}\log_2\frac{|S_{ij}|}{|S_j|}. \tag{8}$$

After the dataset is divided by attribute V, its category conditional information entropy is

$$E(V) = \text{Info}\left(\frac{C}{V}\right) = \sum_{j=1}^{k}\frac{|S_j|}{|S|}\text{Info}(S_j). \tag{9}$$

After introducing the user attention, the product of the category condition information entropy and the user attention are taken as the new information entropy, so we can get the equation as follows:

$$E'(V) = -\sigma_V\sum_{j=1}^{k}\frac{|S_j|}{|S|}\text{Info}(S_j). \tag{10}$$

Table 2: Performance comparison of C4.5 algorithm before and after improvement.

	Algorithm operation time(ms)	Number of valid classification rules	Number of invalid classification rules	Efficiency (%)
Original C4.5 algorithm	10	124	17	87.9
Improved C4.5 algorithm	10	138	3	97.9

It is obvious that in the business management data, the improved C4.5 algorithms have better mining efficiency. In addition, it can also be found in Table 2 that, like the original algorithm, the improved C4.5 algorithms have no difference in execution time, and the validity of mining results is also significantly improved. Therefore, after testing and confirmation, the improved C4.5 algorithms are obviously better than the original C4.5 algorithm.

4. Experimental Results and Analysis

According to the distribution model constructed in this paper, the optimal logistics distribution path is simulated using a 1.4 GHz quad-core Intel Corei5 with a running memory of 8 GB, and the simulation platform is MATLAB2020a. The simulation process and market composition are shown in Figure 4 .

This paper uses the customer point scale of 50 as an example, assuming that a distribution center has 25 distribution vehicles, the number of subjects to be served is 50, the maximum load of no logistics vehicle is 20t, and the consumption cost is 500 yuan/day/vehicle. The earliest time of the logistics distribution service is at 6 : 00 in the morning and the latest is at 8 : 00. The maximum working time of logistics personnel is 8 hours, and overtime pay will be provided for more than 8 hours. According to customer needs, the delivery time is set, and penalties will be incurred whether overtime or in advance.

In order to verify whether the method designed in this paper is effective, the traditional planning method is compared with the planning method designed in this paper. When the number of customers is 25, the path change is shown in Figure 5.

As shown in Figure 5, the traditional method has the optimal path when the number of iterations is 80, while the planning method designed in this paper achieves the optimal path when the number of iterations is 20. Compared with the traditional method, the method designed in this paper is significantly less time-consuming. Based on this, when the client is 50, the path changes as shown in Figure 6.

As shown in Figure 6, when the number of customers reaches 50, the traditional method achieves the optimal path when the number of iterations is 90. The planning method designed in this paper achieves the optimal path when the number of iterations is 60. It can be seen that no matter whether the number of customers is large or small, the method designed in this paper can reduce the time in the process of optimal path planning and then achieve the goal of optimal path planning, which is in line with the research purpose of this paper.

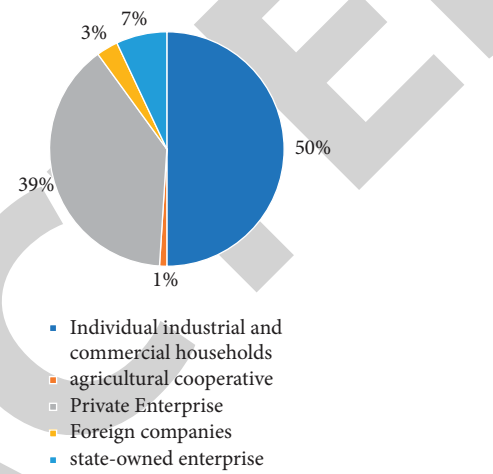

Figure 4: Statistical chart of business administration data: composition and distribution of market players.

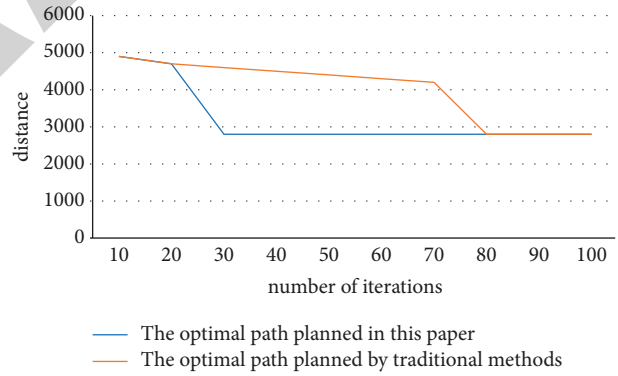

Figure 5: The path change diagram of the two methods.

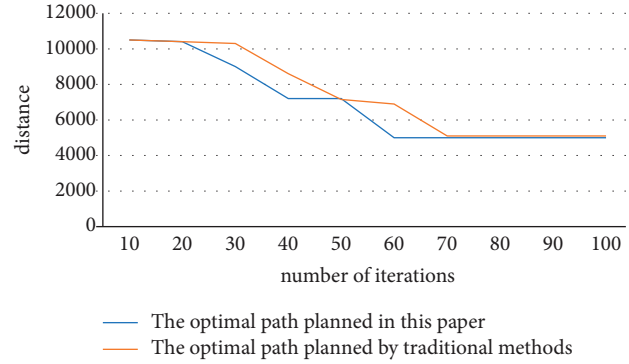

Figure 6: The path change diagram is improved by the two methods.

Table 3: Discretization of enterprise types.

Enterprise type name	Discretized value
Individual business	0
Domestic company	1
Domestic subsidiaries	1
Domestic enterprise legal person	1
Domestic enterprise group	1
Private company	2
Private branch	2
Sole proprietorship	2
Enterprise of individual partnership	2
Private enterprise group	2
Foreign funded enterprise group	3
Foreign-invested enterprise	3
Resident representative offices of foreign (regional) enterprises	3
Branches of foreign-funded enterprises	3
Foreign invested cooperative enterprise	3
Consumer goods market	4
Capital goods market	4
Production factor market	4

Table 4: Grade transformation of enterprise scale.

Number of employees (E) and total assets (M)	Enterprise scalejavascript: void (0)
$0 < E < 20$ and $0 < M < 300$	1
$20 < E < 300$ and $300 < M < 4000$	2
$300 < E < 1000$ and $4000 < M < 40000$	3
$E > 1000$ and $M > 40000$	4

Table 5: Hot modules of Supply Chain Management Research.

Hot topics	Cluster label
Concept and theory development	#1 sustainability,#4 green supply chain management, #9 green supply chain
Practice and measurement indicators	#7 reverse logistics,#5 carbon emissions
Drivers and barriers	#0 barriers,#10 environmental management
Cooperation with supply chain partners	#3 green supplier selection,#6 game theory, #8 optimization
Performance evaluation	#2 food waste, #11 performance measurement

In the original data set, some feature data of a sample will be lost, and the missing values need to be filled. The most common method to deal with missing attribute values is to assign attribute values to attributes in the training instance relative to the node IV, which is most commonly used. The training result fragments after the generalization of the data set are shown in Figure 3. This data set will include data from 2011 to 2021. Based on the time sequence of the results in the training set, we will use the results of 2011 and 2021 as the exercise data, and the results of 2021 as the test data. See Table 3.

The data from 2011 and 2021 will be used for training data, while the data from 2021 will be used for testing data. The data scale for each year is shown in Table 4.

After these operations, the original data obtained is still in the processing state of 0.5, which is not intuitive. Therefore, in the data mining process, the attribute classifications using these data are still very cumbersome. Therefore, it is necessary to summarize the original data. The most common way is to normalize the data, including minimum-maximum normalization, decimal scaling normalization, and zero mean normalization. In the above methods, the continuous value is reduced to a fixed range by a certain ratio.

The 12 clusters and their related keywords were combined to sort out five research hotspot modules in this field, namely concept and theoretical development, practice and measurement indicators, driving factors and obstacles, cooperation with supply chain partners, and performance evaluation, as shown in Table 5.

In order to stabilize the status of the industry and give full play to the dominance of the industry, enterprises should integrate network information technology in the process of enterprise business management to promote and improve the overall management level of the enterprise. Enterprises should pay close attention to the current situation of industry development, build a high-quality network information and chemical business management environment, start by raising the awareness of managers, establish a sound business management system, strengthen the introduction

and training of information talents, improve network information security systems, and constantly learn from advanced enterprise management experience and innovative business management modes, using the system to constrain the normative operation of each department and each production link, to ensure the scientificity and effectiveness of the enterprise network information and chemical business management system, and to promote the realization of the enterprise's strategic development goals.

5. Conclusion

Due to the realization of electronically registered residence, the current database service system has defects in in-depth data analysis, and it is very difficult to obtain useful policy data. It is urgent to develop a new generation of big data analysis systems with multimedia visualization. As a new force in the field of big data analysis and application, supply chain data management has increasingly shown its good ability and practicability. It has been widely used in many fields, showing a wide range of use and strong social and cultural significance. This paper extracts some enterprise data from the database of an enterprise management system. To complete the visualization work more efficiently, we must extract, process, and transform the data to improve the visualization efficiency. Through the Java language and three related open-source architecture methods, an effective enterprise business management information visualization system is established. At the same time, the application results are further introduced, and an application case in the market and entity development trend is obtained.

Data Availability

The labeled data set used to support the findings of this study is available from the author upon request.

Conflicts of Interest

The author declares no conflicts of interest.

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References

[1] F. Korfmann, S. Müller, S. Ehlert, and K. Haase, "Students' perceptions, academic departments' image, and major-choice in business administration studies—the example of Hamburg Business School," *Higher Education Quarterly*, vol. 75, no. 1, pp. 51–76, 2021.

[2] L. Gao, "Relationship between business administration ability and innovation ability formation of university students based on data mining and empirical research," *Mobile Information Systems*, vol. 2021, no. 18, Article ID 2388579, 8 pages, 2021.

[3] C. L. D. Leon, J. C. Mina, and E. G. Vitug, "Trailing the gap between the competencies of bachelor of science in business administration graduates with industry demands: as viewed by the employers," *Open Access Library Journal*, vol. 8, no. 12, p. 22, 2021.

[4] N. Almufleh and S. Alkhatib, "Supply chain practices and operational performance: an analytical study of the 5-star hotels operating in Jordan," *Jordan Journal of Business Administration*, vol. 19, no. 1, pp. 7–9, 2021.

[5] N. Hamed, F. Mohammad, and S. J. Agnieszka, "Analysis of security criteria for IoT-based supply chain: a case study of FMCG industries," *Journal of Management and Business Administration. Central Europe*, vol. 29, no. 08, pp. 81–83, 2021.

[6] M. J. Chileshe and J. Phiri, "The impact of supply chain management practices on performance of small and medium enterprises in developing countries: a case of agro-dealers in Zambia," *Open Journal of Business and Management*, vol. 10, no. 02, pp. 591–605, 2022.

[7] A. Chaudhuri, A. Ghadge, B. Gaudenzi, and S. Dani, "A conceptual framework for improving effectiveness of risk management in supply networks," *International Journal of Logistics Management*, vol. 31, no. 1, pp. 77–98, 2020.

[8] M. A. Cohen and P. C. Rogers, "When sino-American struggle disrupts the supply chain: licensing intellectual property in a changing trade environment," *World Trade Review*, vol. 20, no. 2, pp. 238–257, 2021.

[9] V. D. Gerami and I. G. Shidlovskii, "Inventory optimization considering the vehicle capacity and specifics of cash flows at rental storage sites," *Management and Business Administration*, vol. 12, no. 2, pp. 77–90, 2020.

[10] G. C. Dawaton, "Assessment of the on-the-job training program of business administration students of kalinga state university," *Universal Journal of Management*, vol. 9, no. 1, pp. 13–19, 2021.

[11] A. N. Lunkin and D. A. Lunkin, "Mining and metallurgical business: technological and integration features of management," *Management and Business Administration*, vol. 20, no. 1, pp. 50–63, 2021.

[12] N. S. Vargas, D. A. G. Gómez, and O. R. Romero, "Marketing for business opportunities management on foreign investment and productive enchainments," *Studies on Entrepreneurship, Structural Change and Industrial Dynamics*, vol. 17, no. 4, pp. 29–31, 2021.

[13] S. G. Chen, "The new attempt of network reliability in the assessment of business activities for precision management," *Springer Series in Reliability Engineering*, vol. 30, no. 3, pp. 1001–1010, 2022.

[14] K. O'Brien, S. Sood, and R. Shete, "Big data approach to visualising, analysing and modelling company culture: a new paradigm and tool for exploring toxic cultures and the way we work," *International Journal of Management Science and Business Administration*, vol. 20, no. 3, pp. 790–799, 2022.

[15] D. Gil-Doménech, N. Magomedova, E. J. Sánchez-Alcázar, and M. Lafuente-Lechuga, "Integrating sustainability in the business administration and management curriculum: a sustainability competencies map," *Sustainability*, vol. 13, no. 16, pp. 9458–9487, 2021.

[16] L. Battle and C. Scheidegger, "A structured review of data management technology for interactive visualization and analysis," *IEEE Transactions on Visualization and Computer Graphics*, vol. 40, no. 11, pp. 354–356, 2020.

[17] N. Nasrallah, O. F. Atayah, R. El Khoury, A. Hamdan, and S. Obaid, "Intellectual structure of knowledge management: a bibliometric analysis of the journal of information and knowledge management," *Journal of Information and Knowledge Management*, vol. 21, no. 01, pp. 679–698, 2022.

[18] D. Lv and Z. Li, "The strategy of optimizing quality management on supply chain with six sigma management method in the era of big data," *Journal of Physics: Conference Series*, vol. 1852, no. 4, Article ID 042018, 2021.

[19] G. V. Capelleveen, J. V. Wieren, and C. Amrit, "Exploring recommendations for circular supply chain management through interactive visualisation," *Decision Support Systems*, vol. 9, no. 6, pp. 726–741, 2020.

[20] Y. Li, J. Su, and D. Xiao, "Supply chain financial risk management under the background of wireless multimedia communication and artificial intelligence," *Wireless Communications and Mobile Computing*, vol. 2022, Article ID 9611699, 6 pages, 2022.