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APPLICATION RESEARCH STATUS OF COMPUTER TECHNOLOGY IN MANAGEMENT

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ABSTRACT
This study focuses on the application of computer technology in the field of management, exploring related aspects such as data analysis and decision support, artificial intelligence and machine learning, supply chain and logistics management, and human resource information systems and talent management. Through case analysis and literature review, it reveals the influence of computer technology on improving management efficiency, optimizing decision making and creating business value.And analyzes the main disciplines combined with management, as well as the current situation and trend of combining computer with management.To sum up, the application of computer technology in the field of management has not only brought great opportunities for organizations, but also accompanied by a series of challenges. By fully understanding and addressing these challenges, organizations can make better use of computer technology, improve efficiency, enhance competitiveness, and create greater business value.

Keywords: *Computer technology, management,data analysis, artificial intelligence, machine learning*

1.0 INTRODUCTION

1.1 Background

In today's information age, computer technology has penetrated into various fields. Management, as a discipline that studies the rules and methods of management activities, cannot be separated from the support of computer technology. With the rapid development of information technology, the application of computer technology in management is more and more extensive (Wei, 2020)、(Kun et al., 2019). This section will discuss the background, trend, purpose, significance and main application scenarios of the combination of management and computer technology, and analyze its influence and function on management.

With the rapid development of science and technology (Forcina et al., 2024), computer technology has been widely used in many fields, including management. Computer technology provides new tools and means for management, and greatly improves management efficiency and management level. The following is a discussion of the background of the application of computer technology in management.

First of all, the globalization of economy makes the competition between enterprises more intense. In this context, enterprises need to quickly respond to market changes and efficiently organize and coordinate production activities. Computer technology provides new solutions for enterprise management, such as enterprise resource planning (ERP), supply chain management (SCM) and customer relationship management (CRM) and other information systems, which can help enterprises optimize business processes and improve decision-making efficiency.

Secondly, the rapid development of computer technology provides strong technical support for management. Database technology enables a large amount of data to be stored and analyzed, and data mining technology can help enterprises find potential business opportunities from data. Technologies such as artificial intelligence and machine learning can be used for forecasting and decision-making, while networking and communication technologies can facilitate collaboration and communication within enterprises.

In addition, computer technology has also promoted the development of management disciplines. For example, the theory of complex adaptive Systems (CAS) provides a new tool for the study of organizational complexity, while the decision support system (DSS) provides an intelligent decision-making environment for decision makers. Computer simulation and simulation techniques also provide new methods for management research, which can help researchers better understand and predict organizational behavior.

Finally, computer technology also provides managers with new ways to lead. For example, social media and online communities provide a new way for businesses to communicate and can allow employees to better participate in corporate decisions. At the same time, data analysis can help managers better understand the behavior and needs of employees, thus providing a more personalized management approach.

In short, the application background of computer technology in management is multi-faceted, it can not only improve the management efficiency and management level of enterprises, but also promote the development of management disciplines and management innovation.

1.2 Tendency

The many trends (Bakhtiari et al., 2024; Cooper et al., 2023) of computer technology application in management, It mainly includes the following aspects:

Artificial intelligence and machine learning: Artificial intelligence and machine learning technologies will be used more and more widely in management, such as predictive analytics, decision support, and optimizing workflows. These technologies can help companies better understand market and customer needs, optimize operational strategies, and improve

efficiency and accuracy.

Big Data and Cloud computing: As big data and cloud computing technologies continue to evolve, enterprise management will become more dependent on these technologies. With big data analytics, businesses can better understand markets and customer behavior and uncover hidden trends and opportunities. Cloud computing can help enterprises to share resources and collaborate to improve work efficiency.

Digitalization and automation: Digitalization and automation will be an important trend in the future of business management. Enterprises will realize the intelligence and interconnection of all aspects through digital technology, and improve management efficiency and decision-making ability. At the same time, automation technology will also replace some repetitive and mechanical work, improve work efficiency and quality.

Blockchain technology: Blockchain technology will play an important role in business management, such as enabling transparency and trust mechanisms, and improving the efficiency and security of supply chain management.

Man-machine collaboration: In the future, enterprise management will pay more attention to man-machine collaboration, that is, people and computers make decisions and perform tasks together. Computers will play more of an auxiliary decision-making role, helping humans to improve work efficiency and quality.

In short, the future management application of computer technology will pay more attention to intelligence, digitalization and man-machine collaboration, in order to improve the competitiveness of enterprises and innovation.

1.3 Purpose And Meaning

In today's society, the application of computer technology in management has become very important(Guo et al., 2021). The application of computer technology plays an important role in improving management efficiency, optimizing resource allocation, enhancing decision-making ability and improving organizational performance. The following is a detailed explanation of the application purpose of computer technology in management.

First of all, improving management efficiency is an important application purpose of computer technology in management. Computer technology can automatically process and manage a large number of trivial daily management work, such as information storage, inquiry, processing and transmission, so as to reduce the burden of management work and improve work efficiency. For example, enterprises can use various management information systems, such as enterprise resource planning (ERP), supply chain management (SCM) and customer relationship management (CRM), to achieve information sharing and collaborative work among departments, reduce duplication of labor, and improve management efficiency.

Secondly, optimizing resource allocation is another important application purpose of computer technology in management. Computer technology can help managers better grasp the resources and human conditions of the organization, adjust and optimize the allocation of resources reasonably according to the actual needs and business conditions, and realize the efficient use and saving of resources. For example, through database technology and data mining technology, managers can deeply analyze various business data, find potential problems in resource and manpower allocation, and take effective measures to optimize in time.

Thirdly, enhancing decision-making ability is one of the important application purposes of computer technology in management. Computer technology can provide rapid, accurate and comprehensive information analysis and decision support to help managers better cope with the complex and changeable decision environment. For example, technologies such as artificial intelligence and machine learning can be used for market forecasting and decision analysis, while decision support systems (DSS) can provide decision-makers with an intelligent decision-making environment, improving the accuracy and efficiency of decisions.

Finally, improving organizational performance is the ultimate purpose of computer technology application in management. Computer technology can promote the process

optimization and collaborative work of the organization, improve the productivity and performance of the organization. For example, through computer simulation and simulation technology, organizational structure and business process can be simulated and evaluated, potential problems can be found and solved, organizational structure and process can be optimized, and organizational performance can be improved.

In short, the application of computer technology in management aims to improve management efficiency, optimize resource allocation, enhance decision-making ability and improve organizational performance. The realization of these application purposes requires managers to deeply understand the characteristics and advantages of computer technology, and combine the actual situation to carry out reasonable application and continuous optimization.

The application of computer technology in management is of great significance, which not only improves management efficiency and management level, but also promotes the development of management discipline and innovation of management mode. The following is a detailed explanation of the application significance of computer technology in management.

First of all, the application of computer technology can improve management efficiency. Computer technology can automatically process and manage a large number of daily management work, such as information storage, inquiry, processing and transmission, so as to reduce the burden of management work and improve work efficiency. For example, enterprises use various management information systems, such as ERP, SCM and CRM, to achieve information sharing and collaborative work between departments, reduce duplication of labor, and improve management efficiency.

Secondly, the application of computer technology can optimize the allocation of resources. Computer technology can help managers better grasp the status of the organization and resources, according to the actual needs and business conditions, reasonable adjustment and optimization of resource allocation, to achieve efficient use and conservation of resources. For example, through database technology and data mining technology, managers can deeply analyze various business data, find potential problems in resource and manpower allocation, and take effective measures to optimize in time.

Third, the application of computer technology can enhance the ability to make decisions. Computer technology can provide rapid, accurate and comprehensive information analysis and decision support to help managers better cope with the complex and changeable decision environment. For example, technologies such as artificial intelligence and machine learning can be used for market forecasting and decision analysis, while decision support systems (DSS) can provide decision-makers with an intelligent decision-making environment, improving the accuracy and efficiency of decisions.

Fourthly, the application of computer technology can promote the development of organizations. Computer technology can optimize business processes and improve organizational performance. For example, through computer simulation and simulation technology, organizational structure and business process can be simulated and evaluated, potential problems can be found and solved, organizational structure and process can be optimized, and organizational performance can be improved.

Finally, the application of computer technology can also promote the development of management. Computer technology can provide new methods and tools for management research, such as complex adaptive system (CAS) theory, decision support system (DSS), etc., which provide new tools for the study of organizational complexity. At the same time, computer technology can also promote innovation in management methods, for example, social media and online communities provide enterprises with a new way of communication, which can allow employees to better participate in corporate decision-making.

In a word, the application of computer technology in management is of great significance. It can not only improve management efficiency and management level, but also optimize resource allocation, enhance decision-making ability, improve organizational performance, and promote the development of management disciplines and management

innovation. In the future, with the continuous development and progress of computer technology, its application prospects in management will be broader.

This paper mainly analyzes the current situation of the application of computer technology in management. The first part introduces the relevant background, trend and significance. The second part introduces the analytical methods used. The third part analyzes and discusses the research results, the fourth part summarizes and looks forward to the application of computer technology in management.

2.0 METHOD AND LITERATURE REVIEW

2.1 Method

1. Research methods

This paper adopts the research method of literature review and empirical analysis, comprehensively combs the relevant research on the application of computer technology in management science, and deeply discusses the application status quo, problems and future development trend of computer technology in management science through empirical analysis.

2. Data source

The data in this paper come from academic papers, monographs, reports and practical application cases. Among them, relevant literatures were mainly collected through academic databases such as CNKI, SCIENCEDIRECT, SCI, EI, etc. At the same time, we also refer to well-known journals, conference reports and practical application cases in the field of management.

3. Data analysis methods

In this paper, qualitative and quantitative data analysis methods are used. On the basis of literature review, through statistics and analysis of data in literature, the application of computer technology in management has been empirically analyzed. Specifically, we use the following methods:

Literature review method is a process in which researchers conduct in-depth and comprehensive search, sorting and processing of relevant literatures before research, so as to form a more comprehensive and in-depth understanding and grasp of the problem under study. On the basis of reading literature, researchers should comprehensively summarize and sort out literature, find out research gaps and existing problems, and provide ideas and basis for further research.

The basic steps of literature review include:

Collecting relevant literature: Researchers obtain literature related to the research topic through various channels, including libraries, archives, and the Internet.

Reading literature: Researchers read the collected literature to understand the history, current situation and development trend of the research problem, as well as previous research results and existing problems.

Collate and summarize literatures: Researchers collate and summarize literatures, compare and analyze similar or related literatures, find out the similarities and differences among them, and put forward their own views and evaluations on this basis.

Writing review papers: Researchers write review papers based on the results of sorting and summarizing, combined with their own understanding and thinking. The paper should include the background of the research problem, the research status, the research gaps and existing problems, the research ideas and methods and so on.

Literature review is an important research method, which can help researchers to comprehensively understand and grasp the research status and development trend in related fields, and provide the basis and ideas for further research. At the same time, literature review can also provide reference for future generations and promote the development of related fields.

Empirical analysis is a kind of analysis and research based on actual data and observation results, using statistical methods and techniques. The purpose of empirical analysis is to reveal the actual relationship between variables, explore the causal relationship, and formulate the basis for forecasting and decision-making.
The basic steps of empirical analysis include:

Data collection: Collect data related to the research question, which can be obtained through surveys, observations, experiments, etc.

Data processing: The collected data is cleaned, organized and summarized for further analysis.

Descriptive statistical analysis: Descriptive statistical analysis of data, such as mean, standard deviation, frequency, etc., to understand the distribution and characteristics of the data.

Inferential statistical analysis: Use inferential statistical analysis methods, such as hypothesis testing, variance analysis, regression analysis, etc., to explore the causal relationship between variables and prediction models.

Interpretation and conclusion: Based on the results of the analysis, conclusions are drawn and interpreted, evaluation of whether the research hypothesis is supported, and recommendations and predictions are made on this basis.

Empirical analysis is an important research method, which can help researchers obtain valuable information from actual data and observation results, and provide scientific basis for decision-making. At the same time, the empirical analysis can also provide support for the development of theory and promote the development of the subject field.

Future research can further expand the data sources; In addition, this paper mainly focuses on the application status and problems of computer technology in management without in-depth discussion of specific application scenarios. Future studies can further refine the research topic and further explore the application scenarios and effects of computer technology in management.

2.2 Literature Review

The integration of computer technology in management studies has sparked a great deal of academic discussion, leading to a rich literature exploring the multifaceted relationships between these fields. The literature review reveals key trends, insights, and debates surrounding this convergence, revealing the evolution of management practices in the digital age. This paper explores the use of computer technology in management from four main aspects, including data analysis and decision support, artificial intelligence and machine learning, supply chain and logistics management, human resource information system and talent management, information security and risk management and project management.

Data analysis plays a crucial role in management, which can extract valuable information from massive data to aid decision making and business optimization. The literature often involves the application of statistical methods, data mining techniques, and visualization tools to enable management to more accurately understand business trends and patterns and make more informed decisions. Lei G and Hao R used computer technology to process text data and analyzed the differences in risk judgments of bank managers, financial analysts and credit rating agencies, so as to achieve a more comprehensive assessment of bank risks (Lei et al., 2023) . Dumitrache I and Predescu L develop a collaborative, dynamic, heterogeneous decision-making system that creates and maintains a knowledge management flow through selective collection of data and appropriate conversion of data into information. Is essential for making informed decisions (Dumitrache et al., 2023).

Artificial intelligence (AI) and machine learning (ML) have a wide range of applications in management, from market forecasting to risk management, which are able to make predictions by analyzing large amounts of data and patterns. Research areas include natural language processing, image recognition, recommendation systems, etc. These technologies help improve the accuracy of decision making and provide intelligent solutions. By using the

nonlinear autoregressive distributed lag (NARDL) method and constraint test, Wang Y and Li Y came to the conclusion that artificial intelligence and natural resource management can promote economic growth (Wang & Li, 2023). Priyanka A and Gauthamarayathirumal P used machine learning algorithms to achieve active decision making in handover management for 5G and beyond (Priyanka et al., 2023).

In supply chain and logistics management, computer technology can optimize all aspects of the supply chain, including demand forecasting, inventory management, transportation planning, etc. This paper discusses how to use information technology, sensors, Internet of Things and other means to achieve efficient and real-time supply chain management, so as to reduce costs and improve production efficiency. Yan W and He J proposed risk-aware supply chain intelligence and AI-supported supply chain and logistics management considering risk reduction (Yan et al., 2019). Gunasekaran A and Ngai E proposed a decision support system for logistics and supply chain management (Gunasekaran & Ngai, 2012).

Human Resource Information systems (HRIS) play a key role in talent management. They integrate employee information, performance evaluation, training and other data to help organizations manage human resources more effectively. The research includes the design and implementation of systems and how data analytics can be used to optimize employee performance and recruitment processes to improve the efficiency of talent management in organizations. Phudphad K and Watanapa B proposed a human resource information system based on analytic Hierarchy Process (AHP). Taking the security factors of human resource information system (HRIS) as the research object, the analysis hierarchy Process (AHP) was used to explore the impact of each factor on the working atmosphere. The results show that confidentiality is the most important factor, followed by non-repudiation and privacy. Organizational factors fostering human resource information system security were also ranked to gain insight into management concerns(Phudphad et al., 2017).

The complex interplay between computer technology and management studies. By analyzing the works of different scholars, this paper expounds four main aspects of using computer technology in the field of management.

Information security and risk management are important links in enterprise management, and the application of computer technology provides a new solution for this. For example, data mining technology can help enterprises identify potential security risks from large amounts of data and predict possible information security incidents. In addition, by establishing the information security risk assessment model based on computer technology, the information security risks faced by enterprises can be quantified and assessed, and the accuracy and efficiency of risk management can be improved. Cartwright A and Cartwright E analyzed the UK Cybersecurity Vulnerability Survey (2018-2021) to distinguish the different channels through which micro and small businesses access cybersecurity information. IT is found that the main channel for obtaining information is through IT companies. Few businesses get their information directly from government or law enforcement, and micro and small businesses are increasingly relying on digital and online technologies. However, they have very limited resources and expertise in cybersecurity. Therefore, how to improve the cybersecurity of small businesses is an urgent economic and social challenge (Cartwright et al., 2023) . Brunner M and Sauerwein C explore the current state of risk management in information security in the DACH region and investigate the current state of risk management practices used in information security management in the DACH region (Germany, Austria, Switzerland). An anonymous online survey of strategic and operational information security and risk managers was conducted and data was collected from 26 organizations. It analyzes general practices, document artifacts, stakeholder collaboration patterns, and the types of tools and data sources that organizations use to perform information security management activities. The results show that the practice of information security risk management needs to be improved. Current industry practices rely heavily on manual data collection and complex, potentially subjective decision-making processes involving multiple stakeholders. Specialized risk management tools and methodologies have been selectively used and ignored in favor of generic documentation tools and direct communication among stakeholders. Finally,

guidelines are proposed for developing risk management practices to better align with current information security management operations(Brunner et al., 2020).

The application of computer technology in project management is also very extensive. For example, project management software can provide project planning, schedule management, resource allocation and other functions to improve the efficiency and accuracy of project management. At the same time, through the computer technology can realize the real-time monitoring of the project progress, timely discovery and solution of problems, to ensure that the project is completed on time and in good quality. In addition, computer technology can also be used in project risk management to improve the efficiency and accuracy of project risk management through tools such as risk assessment models and early warning systems. Miranda C and Tereso A studied project management in Portugal within the scope of the Portuguese Project Management Observatory, with the main objectives of understanding the most and least commonly used tools and techniques in organizations, the use of agile methods, the maturity of each project management area, and the dimensions of success. The results show that the most commonly used tools and techniques are start-up meeting, progress meeting, project work description, Gantt chart and activity list. Least used are Monte Carlo analysis, decision trees, simulation project management software, bidding meetings, and parameter estimation. There are statistically significant differences between the use of various tools and technologies and factors such as gender, age, current job title, education level, and activity sector. Agile methods are used in the majority of respondents' organizations, however, no correlation was found between the use of agile methods and the scope, time, and cost of completing projects. The process identified as having the highest maturity is the activity definition in the project schedule management area, followed by project execution in the project integration management area, and schedule development in the project schedule management area. Customer satisfaction is the most commonly used KPI(Miranda et al., 2023).

3.0 DISCUSSION AND ANALYSIS

By using the above methods, CNKI academic database can first retrieve the publishing trend of academic papers in management from 2000 to now, as shown in Figure1. The horizontal axis is the publication year and the vertical axis is the number of publications. Among them, the total number of published papers of management discipline is 8744, and the top three interdisciplinary literatures are higher education, medical and health policies and laws and regulations research, and enterprise economics, among which the number of published papers combined with computer technology is 226, and the peak area of published papers from 2008 to 2019, It shows that management research has great potential.

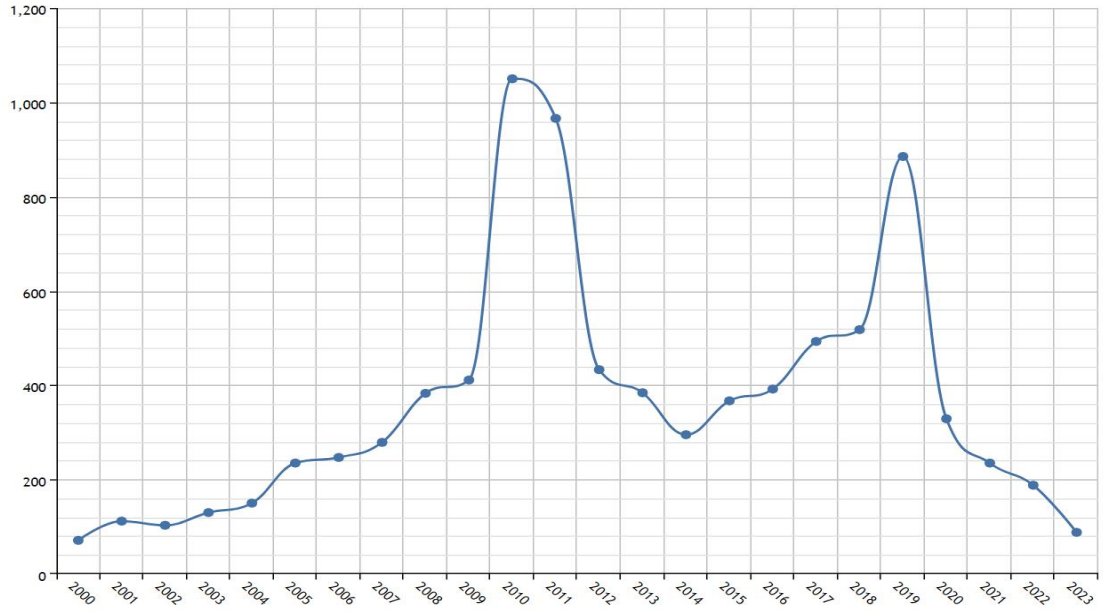

Figure 1: The nubmer of management papers

Literature search of management subject through SCIENCEDIRECT database It can be found that the top six publications of management combined with other disciplines are Medicine and Dentistry, Business, Management and Accounting, Social Sciences, Engineering, Environmental Science, Computer Science, and the number of published papers in each discipline are shown in Table 1. When the keyword managerment was searched in the SCIENCEDIRECT database, the number of academic articles rose from 16,897 in 2010 to 31,049 in 2023. The above results show that more and more scholars have conducted in-depth research on management, and the application of computer technology in management is also an important branch.

Table 1: The nubmer of published papers of management combined with othe disciplines

Medicine and Dentistry	Business,Management and Accounting	Social Sciences	Engineering	Environmental Science	Computer Science
143103	110185	98081	83161	76353	75070

This paper explores the application of computer technology in management, focusing on insights and challenges in data analysis and decision support, artificial intelligence and machine learning, supply chain and logistics management, as well as human resource information systems and talent management. Through empirical cases and literature reviews, we demonstrate the potential of computer technology to improve management efficiency, optimize decision making, and create business value.

In the data-driven era, data analysis becomes the cornerstone of management decisions. Computer technology provides powerful tools for data processing and analysis to reveal key information such as market trends, customer behavior, and business performance. By applying methods such as descriptive statistics, predictive analytics, and data mining, organizations can better understand their business and develop more informed strategies. For example, our case study shows that in the retail industry, using association rule mining analysis, companies can identify which additional products are likely to be purchased by customers who purchase goods, thereby optimizing sales strategies.

However, as the volume of data continues to increase, data privacy and information security become a serious challenge. Organizations need to take steps to protect customer data and ensure compliance. In addition, over-reliance on data analytics can also lead to

information overload, requiring managers to be able to sift through massive amounts of data for key information to support decision making.

Artificial intelligence and machine learning have revolutionized management. Applications such as natural language processing, image recognition and predictive modeling enable managers to analyze data from multiple dimensions and predict market movements in advance. For example, in the field of marketing, AI can optimize product marketing strategies by analyzing social media data to capture consumer sentiment and feedback.

However, these technologies come with some challenges. The construction of machine learning models requires a large amount of training data, and data quality and availability may affect the accuracy of the models. In addition, AI decision-making processes are often black boxes and difficult to interpret, which may raise some transparency and ethical issues.

The application of computer technology in supply chain and logistics management has significantly improved efficiency and visibility. Optimization algorithms can help find the best shipping routes and inventory levels, reducing costs. Iot technology enables real-time monitoring and tracking, improving the traceability of goods. For example, in the logistics industry, real-time monitoring of warehouse temperature and humidity ensures the quality and safety of goods.

However, close collaboration of all links in the supply chain is the key to achieving technological optimization. Information asymmetry and cooperation difficulties can lead to technology not being fully used. In addition, the introduction of technology also needs to consider the investment cost and training needs.

The application of human resource information system and talent management promotes the digital transformation of human resources. HRIS integrate employee data to make talent management more efficient. Through talent analysis and forecasting, organizations can predict employee performance and turnover risk to develop targeted training and motivation strategies.

However, digital transformation also raises data privacy and ethical issues. Managers need to ensure that employee data is secure and in compliance with relevant regulations. In addition, the introduction of technology also requires the active cooperation of employees and appropriate training.

The application of computer technology in management provides organizations with powerful tools to support data-driven decision making, increase efficiency, and create business value. However, with this comes a host of challenges, including data privacy, information security, transparency and cooperation issues. While harnessing technology, organizations need to be fully aware of these challenges and take appropriate steps to address them.

The combination of management and computer technology will also face challenges

1. Technological upgrading

The upgrading of computer technology is very fast, and managers need to constantly learn and master the latest technology in order to better apply computer technology.

2. Security issues

Managers need to ensure the security of computer systems and protect the security of systems and data.

3. Privacy issues

When processing and analyzing data, computer technology needs to protect the privacy of data.

4.0 CONCLUSION AND FUTURE DIRECTIONS

This paper discusses the application of computer technology in management, covering data analysis and decision support, artificial intelligence and machine learning, supply chain and logistics management, human resource information system and talent management, information security and risk management and project management. Through empirical cases

and literature review, it is found that the application of computer technology in management has provided tremendous opportunities for organizations. Many scholars have conducted in-depth research on the combination of management and computer technology, so as to achieve more efficient, intelligent and sustainable operations. When it comes to data analytics and decision support, data-driven decisions are replacing intuition-based decisions, enabling organizations to better respond to market changes and customer needs. The introduction of artificial intelligence and machine learning has taken the decision-making process of management to a new level. Technologies such as predictive analytics, natural language processing and image recognition allow managers to extract valuable information from massive amounts of data to support innovation and strategic planning. The application of technology in supply chain and logistics management optimizes transportation, inventory and production processes, improving the efficiency and visibility of the supply chain. The application of Internet of Things technology makes real-time monitoring and tracking possible, thus improving the traceability of logistics. The digital transformation of human resource information systems and talent management has changed the way human resources operate. The use of HRIS makes the management of employee data more efficient, and talent analytics and forecasting help organizations better understand employee needs and performance. The research on information security and risk management has received more and more attention, and computer technology has been used to develop risk assessment and management tools for identifying, evaluating and dealing with potential information security risks. These tools can be based on data analysis, model prediction, and other methods to help organizations better understand risks and act accordingly. There is an increasing number of applications in project management that contribute to the efficiency, transparency and success of projects.

In a word, the application of computer technology in management is promoting the innovation and development of organizations. However, as technology continues to evolve, managers need to recognize the challenges posed by technology and actively seek solutions. In the future, we look forward to seeing more interdisciplinary research and collaboration to promote the further application and development of computer technology in the field of management.

Although computer technology has made remarkable achievements in management, there are still many future research directions and challenges. First of all, with the growth of data, how to better deal with big data and improve the efficiency and accuracy of data analysis will be an important research direction. Second, the issue of transparency and explainability in AI and machine learning still needs in-depth research to improve the credibility of decisions. In addition, data privacy and ethical issues also need to receive more attention in the application of technology to ensure data security and compliance. Finally, interdisciplinary cooperation will become a trend in the future, combining computer technology with management, sociology and other fields to explore broader research fields and application prospects.

AUTHOR CONTRIBUTIONS

Zheng, Y., Ren, Z., Xia, Y., Zhu, R., and Nor Saidi, M. N. contributed to the design and implementation of the research, to the analysis of the results and to the writing of the manuscript.

CONFLICT OF INTEREST

The manuscript has not been published elsewhere and is not under consideration by other journals. All authors have approved the review, agree with its submission and declare no conflict of interest on the manuscript.

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