Digital Supply Chain Improves the Performance of e-Commerce Enterprises

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Abstract: The need for technology is rising in all industries in the context of the times, and so is the e-commerce industry, and the action that needs to be taken in order to improve the performance of e-commerce companies is the development of a digital supply chain. In the development of an emerging technology is bound to encounter a number of difficulties, mainly for the current e-commerce industry digital supply chain to identify problems and solve them.In this paper the authors have proposed solutions and suggestions to the current difficulties in the development of digital supply chain through research, such as conducting research on logistics robots, which play a great role in improving the performance of e-commerce companies. In addition the authors have tried to propose the future direction of development through the progress of the current stage of development, such as the sustainable development of the digital supply chain.

1 INTRODUCTION

The advancement of technology and increased reliance on electronic products, has driven a surge in demand for e-commerce and the growth of e-commerce platforms. The current business environment is characterized by rapid change, complexity, intense competition and uncertainty in the supply chain. This landscape is driven by unpredictable customer demand and is influenced by a variety of factors, including economic fluctuations, technological innovations, social changes, and geopolitical dynamics. As a result, supply chain management faces many challenges.

The aim of this paper is to explore the current barriers to the development of digital supply chains. In the study, timeliness is an important criterion for companies to consider. However, achieving digital transformation requires a lot of time, effort and money. Another obstacle is the rapid updating of the e-commerce industry, which is constantly changing as technology evolves. Therefore, in order to keep up with this pace, it is crucial to conduct relevant research on digital supply chain, which is an important strategy to enhance the competitiveness of the e-commerce industry. However, the costs invested in research and development do not always bring the expected returns. During the research process of the digital supply chain, there are various risks and obstacles that may lead to fruitless research and development in the end. Therefore, when a company decides to conduct digital supply chain research, it is important to carefully assess the risks and formulate appropriate strategies to deal with them. At the same time, it is also necessary to focus on the combination of technological innovation and market demand in the research process to ensure that the R&D investment can achieve a good return and bring sustainable development for the company.

This paper provides effective suggestions for the obstacles facing the development of digitalized supply chains, including measures such as the development of logistics robots. Logistics robots are of great significance in enhancing the digitization of the supply chain. Firstly, they can significantly improve the efficiency of the supply chain and realize the rapid processing and distribution of goods through automation and intelligent technology. Second, logistics robots can improve accuracy and reduce the incidence of human error, thereby enhancing the quality and accuracy of supply chain operations. In addition, logistics robots can improve the safety of operations, avoiding collisions or other safety hazards

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through accurate sensors and navigation technology. At the same time, they can effectively respond to emergencies, improve the emergency response capability of the supply chain, and ensure the stable operation of the supply chain. In addition, logistics robots can better meet the growing demand of consumers and realize faster and more flexible services.

In addition, this paper also emphasizes the importance of sustainable development. For a long time, the continuous improvement and development of digital supply chain has been the focus of enterprises. Especially after the impact of the global epidemic in recent years, the importance of the digital supply chain has been emphasized. In order to prevent similar tragedies from happening again, enterprises need to further improve the digital supply chain, enhance its ability to cope with emergencies, and ensure the stable operation and sustainable development of the supply chain.

Overall, the development of digital supply chain not only serves the enterprise itself, but also aims to improve the performance level of the entire e-commerce industry. By reducing costs, improving efficiency and quality, the digital supply chain can help enterprises better adapt to market changes and conform to the development trend of the times, so as to maintain a competitive advantage in the fierce competition and achieve sustainable economic growth.

2 LITERATURE REVIEW

As science and technology continue to advance, society's dependence on electronic products has grown significantly. Consequently, the demand for e-commerce services has surged, prompting continuous evolution in e-commerce platforms. In the current business environment, supply chains are traversing a dynamic landscape characterized by rapid change, heightened complexity, fierce competition, and uncertainty. This landscape is primarily shaped by the ever-shifting and unpredictable nature of customer demand, influenced by various factors including economic fluctuations, technological innovations, societal shifts, and geopolitical dynamics. As a result, supply chain management faces unprecedented challenges in adapting to these multifaceted and often volatile market conditions. In this process, in the e-commerce platform performance improvement is crucial. Implementation of digital procurement processes positively and directly influences supply chain performance. The current study focused on digital procurement capabilities that reflect both the organizational maturity in adopting e-procurement technology and the institutionalization of the e-procurement processes, and results confirm their direct relationship with supply chain performance (Jukka,2021). However, any of these would require a significant investment of time by the e-commerce platform to develop them. To ensure that the research did not lag behind the rapidly advancing times, it became imperative to adopt a more efficient approach.

3 EXPLORING RESEARCH FINDINGS

3.1 Technological Innovation Takes Time

Abbas suggest that provision of free time to employees is a cheap and an easy measure to adopt for the less resourceful formal firms of South Asia and is complementary to R&D intensity in boosting innovation in the more resourceful firms(Abbas, 2022). Presently, digital transformation across an entire supply chain commonly faces issues of underdevelopment and structural imbalances. The fundamental reason for this is the relatively weak linkage effects and collaborative capabilities of the upstream and downstream enterprises(Wei,2024). Developing and implementing new technologies is a complex and lengthy process, far from being a quick fix. It requires time-consuming in-depth research, continuous development, sophisticated testing and continuous improvement. Only after going through this rigorous series of steps can a new technology be successfully introduced into the market or society. This concept deeply recognizes that innovation is a continuous iterative process that constantly faces challenges and obstacles. From the conceptualization of a technology to its final application, new difficulties may be encountered at each stage, requiring iterative review and adjustment. In this process, innovators need to be resilient and creative in order to overcome the various difficulties that may arise. These problems may include feasibility verification of technology, accurate grasp of market demand, effective allocation of resources, and so on. Only with sufficient awareness and effort can people ensure the smooth implementation of innovations and bring about real change and progress to society.

3.2 The e-Commerce Industry Is Changing too Fast

The development of the internet retail business has increased industry competition. Because the customer churn rate in the e-commerce industry is so high, business owners must examine ways to reduce customer churn in online purchasing. Because the customer's behaviour is predictable, it is possible to predict the customer's future trading inclinations using the relevant data acquired and the necessary analysis (Berger,2019)The advent of the digital age, so that a new generation of information technology is constantly upgraded and updated, and the internal control system of enterprises in order to adapt to the changing business needs and the external technological environment, it is also necessary to carry out timely updating. Currently, many enterprises' internal control systems are not updated in a timely manner, which may increase the threat of network security of the enterprise and create compatibility problems, reduce the efficiency of information transfer between various departments of the enterprise, and fail to effectively supervise the activities of the enterprise(Xu, 2024).With the rapid development of the Internet and mobile technology, people are able to access the Internet and shop online more easily. Advances in technologies such as cloud computing, big data analytics and artificial intelligence have also provided e-commerce with more efficient and personalized services. More and more consumers tend to shop online because e-commerce platforms offer more choices, a more convenient shopping experience, and more competitive prices. Especially during the epidemic, people's reliance on online shopping further increased. E-commerce platforms have shortened the time from production to consumers and improved the efficiency of order processing by optimizing supply chain management and logistics and distribution systems. Many countries and regions have introduced policies and regulations to support the development of e-commerce, promoting prosperity and innovation in the e-commerce industry.

However, rapid developments in the fields of Internet technology, mobile technology, and artificial intelligence continue to change the landscape and rules of the e-commerce industry. In order to maintain a competitive advantage, e-commerce companies need to keep abreast of and apply the latest technology trends and tools. Consumers' preferences, shopping habits and behaviors are constantly changing, putting forward new requirements for product quality, service quality and shopping experience. E-commerce companies need to constantly adjust and optimize their products and services to meet consumer demand. Competition in the e-commerce market is fierce, new competitors continue to emerge, and traditional enterprises are also actively entering the field of e-commerce. In order to be invincible in the fierce competition, e-commerce enterprises need to constantly innovate and improve in order to maintain market leadership.

3.3 The Investment is not Always Oroportional to the Return

As with any transformation, there are some risks that professionals should know as more and more supply chains become increasingly digitized. (Staff,2024). The supply chain information system has weak forecasting and early warning capabilities in demand, procurement, supply and operation analysis(Ye, 2023). Investment return can be defined as a metric used to evaluate the profitability of an investment. This metric serves as a tool to assess the effectiveness of various investments at a given point in time. The amount of money or resources invested in a particular endeavor does not necessarily correspond directly to the level of return or profit obtained. In other words, there is not always a linear relationship between the investment made and the outcomes achieved. Factors such as market conditions, competition, timing, and unforeseen circumstances can all influence the return on investment (ROI). Therefore, even a significant investment may not guarantee a commensurate level of return, and there is inherent risk involved in any investment decision.

4 SUGGESTIONS FOR FUTURE RESEARCH DIRECTIONS AND PRACTICES

4.1 Utilization of Logistics Robots

Collaborative Robots in internal logistics systems will continue to be a topic of interest and will pave the way for more efficient and cost-effective logistics operations(Sharama,2023).There is an option to create logistics robots to assist in the work. The reasons are as follows:

Increased efficiency: Logistics robots can automatically perform a variety of logistics tasks, such as cargo handling, sorting, loading, etc., faster and more accurately than manual operations, thereby increasing the efficiency of logistics operations.

Logistics robots can improve efficiency. Optimized logistics processes can effectively reduce labor costs and the incidence of human error, while improving operational efficiency and thus reducing the overall total cost of logistics operations. By introducing automation and intelligent technologies, companies can achieve more efficient cargo handling and distribution and reduce potential errors caused by human intervention. This fully optimized logistics system not only improves operational efficiency and accuracy, but also reduces operational costs, creating a more stable and sustainable foundation for the company.

Logistics robots can improve work accuracy. Utilizing logistics robots equipped with sensors and advanced navigation technology, precise task execution can be achieved, effectively avoiding human error and significantly improving the accuracy and efficiency of order processing. This automated system ensures that goods maintain a high level of accuracy throughout the entire handling process, thereby reducing errors and delays that may be caused by human operations. The intelligent operation of logistics robots not only enhances operational reliability, but also dramatically improves the efficiency of the business, providing customers with more reliable and timely service.

Logistics robots can enhance work safety. Logistics robots have advanced environmental awareness and obstacle avoidance capabilities when performing tasks, and can accurately recognize the surrounding environment to avoid collisions or other potential safety hazards in a timely manner, significantly improving the level of safety in logistics operations. This highly automated mode of operation can not only protect logistics equipment and goods from damage, but also effectively reduce the incidence of accidents in the workplace, to protect the safety of employees and equipment. Intelligent characteristics of logistics robots for the logistics industry to bring a more reliable and safe operating environment, for enterprises to create a more stable and sustainable development basis.

Logistics robots can respond to peak requirements in a timely manner. In the logistics industry, especially during peak hours such as promotions or holidays, demand for orders will increase rapidly, challenging the logistics capabilities of enterprises. Utilizing logistics robotics, companies can effectively cater to the surge in demand during peak hours and improve order processing capabilities and efficiency. This efficient logistics solution not only meets customer demand for fast delivery, but also reduces error rates, improves the customer experience, and enhances an organization's competitiveness in a highly competitive marketplace.

Logistics robots can effectively improve customer experience. By introducing advanced logistics robotics, companies can dramatically increase order processing speed and delivery efficiency, thereby shortening overall lead times. This efficient logistics system not only meets customer demand for fast delivery, but also improves the accuracy and reliability of order processing, thus enhancing customer satisfaction and shopping experience. As customers' demands for service quality and delivery speed continue to rise, utilizing the technological advantages of logistics robots not only improves customer satisfaction, but also increases customer loyalty and promotes long-term business development.

4.2 Focus on Sustainability

The study highlights the essential role of the Sustainable Management Control System (SMCS) in integrating sustainability principles into organizational management. SMCS enhances sustainability measurement, compliance, risk management, collaboration, and continuous improvement within the supply chain. Eco-innovation complements SMCS, positively impacting environmental, social, and economic sustainability. Supply Chain Management (SCM) optimizes operational efficiency, reducing costs, and enhancing customer satisfaction, while digital adaptability empowers organizations with technology for sustainable outcomes(Dharmayanti, 2023). The development of the digital supply chain faces a number of challenges, with the outbreak of the COVID-19 pandemic at the end of 2019 being a particularly significant obstacle. This global health crisis has dealt a major blow to markets across the globe, disrupting supply chains and causing significant economic losses.

The pandemic has highlighted the fragility of current supply chain systems, which are often complex and reliant on a global network of suppliers, distributors, and customers. As the virus spreads, businesses have been forced to close their doors, borders have been closed, and travel restrictions have been implemented, all of which have had a negative impact on the flow of goods and services.

Supply chain intelligence is crucial to the operational efficiency of retail enterprises. Therefore, retailers should set clear supply chain intelligence goals, allocate sufficient resources, and establish a sustainable supply chain intelligence plan. The initial

investment in a supply chain intelligence system may pose challenges, but it will yield significant benefits in the long run（Ma，2024）.To mitigate the effects of the pandemic and ensure the resilience of the supply chain, companies have had to adapt their business models and operations. This has involved a shift towards digitalization, as businesses have moved online to conduct their transactions and manage their supply chains remotely. Digital tools and technologies have played a crucial role in enabling this transition, with platforms such as e-commerce websites, supply chain management software, and logistics tracking systems being essential for maintaining the flow of goods and information. The future development will be even more challenging, and it is the long-term plan to be able to sustain the supply chain.

5 CONCLUSIONS

According to the analysis of the research results, the digital supply chain in the e-commerce industry suffers from the problems of low timeliness, fast industrial update and payoffs that do not necessarily pay off. These problems are particularly prominent in today's competitive e-commerce market, affecting operational efficiency and profitability. However, this study proposes recommendations for developing logistics robots and promoting sustainable development, which provide useful ideas for solving current supply chain problems

However, it should be noted that the current research still has certain shortcomings, such as not exploring the root causes of digital supply chain problems in depth and not fully considering the impact of external environmental factors on the supply chain. Therefore, future research should pay more attention to digging deeper into the root causes of the problems and analyze them from multiple perspectives, such as the industrial chain and market demand, in order to develop more effective solutions. At the same time, the efficiency and environmental friendliness of the supply chain should be continuously improved by combining intelligent technology and the concept of sustainable development.

Looking forward to the future direction of research, it is recommended to focus on the following aspects: firstly, Enhance monitoring and optimization of key aspects of the digital supply chain. Utilize big data, artificial intelligence and other technologies to improve the timeliness of the supply chain; secondly, the e-commerce industry needs to be sustainable. In order to achieve sustainable development of the supply chain, green logistics and circular economy concepts need to be promoted; and Lastly, the e-commerce industry needs to strengthen cross-border cooperation with related sectors. Changes in business models should be made along with continuous innovation. By doing the above, the e-commerce industry can think of a healthier and more sustainable direction.

REFERENCES

Coursera, S. 2024. Digital Supply Chains: Definition, Benefits, and Careers

Hallikas, J., Immonen, M., Brax, S. 2021. Digitalizing procurement: the impact of data analytics on supply chain performance.

Ma, J. 2024. Analysis of the Impact of Supply Chain Digital Intelligence on the Operational Efficiency of Retail Enterprises

Nela, D., Tubagus, I., Imam, Abu, H., Muhamad, T. 2023. Exploring sustainability management control system and eco-innovation matter sustainable financial performance: The role of supply chain management and digital adaptability in indonesian context

Naveen, S. Rafal, C. 2023. Real-Time Control and Optimization of Internal Logistics Systems with Collaborative Robots

Patrik, B., Michal, K. 2019. User modeling for churn prediction in E-commerce

Sadia, A., Sujana, A., Alison, S., Muhammad, Masood, A. 2022. Informal competition and firm level innovation in South Asia: The moderating role of innovation time off and R&D intensity

Takashi, T. 2024. Digital transformation in supply chains: Assessing the spillover effects on midstream firm innovation

Wei, G. 2024. An Exploration of Internal Control Optimization Strategies for Enterprises in the Age of Digital Intelligence.

Ye, X. 2023. Supply Chain Digital Innovation Drives Compliance and Efficiency in Procurement Activities