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Research on Optimization of Tobacco Enterprise Parts Inventory under the Background of the Digital Economy

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Abstract: With the development of the tobacco industry under the background of the digital economy, more and more tobacco enterprises have begun to pay attention to inventory management and introduce digital technology. The parts inventory management of tobacco enterprises itself has the characteristics of many types of equipment parts and complex management forecasts. Therefore, in the background of the development of the digital economy, reducing inventory costs, reducing inventory overhang, and improving enterprise profitability has become the top priority of tobacco enterprise management. This paper aims to analyze the practical problems of parts inventory management in tobacco enterprises. The main problems include complex inventory management, imperfect inventory monitoring and assessment mechanisms, unscientific traditional inventory forecasting methods, imperfect information construction, and difficulty in guaranteeing the quality of parts. Provide suggestions for improving inventory management ability. Tobacco enterprises should improve the parts inventory management strategy, optimize the parts inventory forecast, strengthen the information construction, improve the quality of the part and establish a sound monitoring and assessment mechanism.

Keywords: Digital economy, Tobacco enterprise, Parts, Inventory management

1. Introduction

The digital economy has been fully developed, and all walks of life have ushered in new development opportunities. More and more enterprises have begun to introduce and use relevant digital technologies to carry out digital transformation [1]. The tobacco industry as a traditional industry, in the face of such opportunities also has a certain pressure. Among them, parts inventory management is a very important link in the operation of tobacco enterprises, which belongs to a management method of inventory equipment purchase, maintenance, and loss. It has the characteristics of equipment with many varieties of facility parts and poor regularity. Therefore, there are many uncertainties in the parameters of parts storage inventory, order quantity, and loss amount. In addition, as the consumption of parts changes, these parameters also need to be constantly updated [2]. Therefore, optimizing parts inventory management, improving inventory efficiency, and reducing inventory costs are urgent problems for tobacco enterprises. At the same time, the study of supply chain management optimization ideas can help enterprises improve their market competitiveness, enhance their brand image, and contribute to the improvement of global supply chain management level and global economic and social development. Therefore, it is of great practical significance to

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study the optimization ideas of tobacco enterprise parts inventory under the background of digital economy. At present, the research on inventory management mainly focuses on retail enterprises and logistics enterprises, and rarely involves tobacco enterprises. In this regard, through the analysis of existing literature, based on economic order quantity model, inventory control system and other supply chain theories, combined with the background of digital economy, the paper studies the inventory of tobacco enterprise parts. Firstly, the status quo and problems of parts inventory optimization of tobacco enterprises under the background of digital economy were analyzed. Finally, in order to improve the efficiency of inventory management, reduce the cost of inventory management and improve the benefit of tobacco enterprises, a series of parts inventory optimization schemes were proposed.

2. Literature Review

In recent years, scholars around the world have conducted extensive research in the field of supply chain management optimization. In the supply chain optimization strategy, through the analysis of the market environment, understand the internal situation of the enterprise, to formulate the appropriate supply chain strategy, such as supplier selection, inventory management. To ensure the effectiveness and adaptability of the strategy. By conducting a comprehensive analysis of the market environment, companies can better predict future trends and seize opportunities, while also being more flexible in responding to potential challenges.

There are also many research breakthroughs in supply chain modeling and simulation. By establishing a suitable supply chain mathematical model to simulate the real operation situation, so as to provide effective help for the next optimization. In recent years, many research breakthroughs have been made in this field, providing more comprehensive and accurate analytical tools for enterprises to optimize supply chains. Such as production scheduling model, inventory optimization model. With the introduction of artificial intelligence technologies such as machine learning and deep learning, the intelligence and fidelity of simulation models are improved. This allows the model to better simulate complex dynamics in the supply chain, including changes in demand, uncertainties in the production process, and fluctuations in the logistics network.

In terms of supply chain risk management, we can identify the possible risk factors in the supply chain, evaluate the impact of the risk, and formulate a strategy to deal with the risk. Such as supplier risk, market demand risk, policy risk.

Enterprises improve the overall level strength of the supply chain through information sharing, resource integration, and other supply chain collaborative strategies, such as supply chain collaborative management, supply chain collaborative optimization, and supply chain collaborative decision-making.

Research on the concept of green environmental protection in the supply chain reminds enterprises to take environmental protection into account in supply chain management, aiming to realize the green concept of sustainable development [3]. Such as green supply chains, low-carbon supply chains, circular supply chains.

These research breakthroughs allow companies to better understand and optimize their supply chains. By applying these advanced technologies and methods, companies can improve the efficiency of their supply chains at different levels and cope with an increasingly complex and unpredictable market environment. Under the premise of following the concept of green environmental protection, tobacco enterprises make reasonable use of some supply chain strategies, learn and establish a mathematical model of parts inventory management suitable for their enterprises, comprehensively evaluate risks, and integrate resources, to optimize the parts inventory management system and improve corporate benefits.

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3. Analysis of Inventory Management Problems of Tobacco Enterprises

3.1. Improper Inventory Management of Tobacco Enterprises

First of all, there are deficiencies in parts inventory management strategy and logistics management. Nowadays, most tobacco enterprises usually adopt a fixed order quantity strategy in the process of parts inventory management, which leads to the problem of inventory overhang and capital occupation. In addition, the tobacco industry has the innate advantages and urgent demands of logistics network optimization [4], nowadays, many tobacco companies focus on the innovation of logistics equipment, resulting in a large amount of funds for the update of hardware equipment, while the level of talent and management is not sufficiently developed, so there is a problem of development imbalance.

Secondly, inventory monitoring, assessment mechanisms and distribution supervision are not sound enough. Tobacco enterprises lack effective monitoring means and assessment mechanisms, which leads to problems in the process of inventory management that cannot be found and dealt with in time, which will affect the effect of inventory management. Supervision of cigarette sales and distribution in some enterprises is not in place [5], which will lead to low logistics efficiency and higher costs.

3.2. The Inventory Forecasting Method is not Scientific

Since 2015, China's cigarette production began to decline. By 2019, China's tobacco production was 2.15 million tons, down 530,000 tons from 2015 [6]. It can be seen from the data that the demand for tobacco is greatly reduced, so the inventory of parts and components of tobacco enterprises will also be greatly reduced, if the future demand for parts cannot be predicted to a certain extent, it will cause huge losses for tobacco companies, which shows the importance of inventory forecasting. However, at present, it seems that experience and subjective judgment are still the main basis for tobacco enterprises in the prediction of spare parts inventory, which leads to the lack of scientific and accurate inventory prediction. Therefore, tobacco enterprises need a more scientific and based prediction method. In addition, tobacco companies do not dig and analyze historical data deeply enough, which leads to them not making full use of the powerful forecasting basis of historical data, resulting in the low accuracy of inventory forecasting of tobacco companies, which affects corporate profits.

3.3. The Information Construction is not Perfect and the Quality of Parts is Difficult to Guarantee

In recent years, tobacco enterprises have made great achievements in information construction, but there are still certain deficiencies in the information construction of parts inventory management. At present, most tobacco enterprises have not established a complete parts information base and inventory management system, which leads to the inventory data not being accurately and timely provided to the staff, and thus affects the effectiveness of inventory management. In addition, in the face of the rapid development of information technology and the current situation of the quality of employees within the unit, there is a lack of a corresponding training mechanism [7].

Due to the unique complexity of mechanical equipment itself, the problem of one component is likely to affect the normal operation of the entire production [8]. Nowadays, in the process of inventory management of tobacco enterprises, the quality of spare parts cannot be fully guaranteed. This is because of the wide variety of parts, and many suppliers and manufacturers, it is difficult to achieve a unified standard, which leads to tobacco companies the quality parts unified there are huge problems, which not only affects the production stability of enterprises but also may lead to some safety risks and after-sales problems.

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4. Results and Discussion

In response to the problems mentioned above, tobacco enterprises should optimize parts inventory management from the following aspects. First of all, tobacco enterprises can analyze market demand and actual production situation while using rational inventory management strategies such as periodic inventory management, strengthening supervision and evaluation of the inventory management process, and establishing a sound scientific inventory management monitoring system and assessment mechanism, to reduce inventory costs and improve inventory turnover. Secondly, tobacco enterprises can introduce data mining and mathematical modeling software to use advanced inventory forecastings methods such as supplier's and agents' plan models [9], so as to improve the accuracy of inventory forecasting and reduce inventory fluctuations and risks. A multi-level modeling approach can also be adopted, considering different levels and various relationships in the supply chain. This approach can more accurately reflect the complexity of the supply chain, including strategic tactical, and operational level decisions. Incorporating risk and resilience factors into the modeling process helps companies better understand and respond to various risks in their supply chain. By simulating different risk scenarios, enterprises can develop more effective risk management strategies.

Finally, tobacco enterprises should strengthen the information construction by establishing a complete parts information base and inventory management system, to achieve real-time and accurate inventory data and improve the efficiency of inventory management. Using real-time data and advanced simulation technology, the simulation model is closer to the actual supply chain operation. It helps enterprises adjust their decisions promptly and improves the agility of the supply chain.

5. Conclusion

By analyzing the problems of complex inventory management of tobacco enterprises, imperfect inventory monitoring and assessment mechanisms, unscientific inventory forecasting methods, imperfect information construction, and difficulty to guarantee the quality of components, this paper conclude that tobacco enterprises still face many challenges under the background of digital economy. In this regard, enterprises can improve inventory efficiency and reduce inventory costs by using reasonable inventory management strategies, advanced inventory forecasting methods, and the establishment of a sound information inventory management system, so as to enhance overall competitiveness.

At the same time, this paper is still lacking in the solution to the problem. In future development, enterprises should focus on how to better implement the above recommendations. With the continuous optimization and improvement of parts inventory management by tobacco enterprises, tobacco enterprises will certainly carry out inventory management more scientifically and efficiently, and it is bound to promote the sustainable development of the entire industry.

References

[1] *Luo, F.Y. (2022) Research on Procurement Management Optimization of XYFL Company under the Background of Digital Economy.*

[2] *Liao, Y.J. and Ji, H. (2019) Spare Parts Inventory Optimization is based on the Analysis of the Mathematical Model of the Tobacco Enterprise Management research. Science and Technology Innovation Herald, 16 ,2.*

[3] *Becerra, P., Mula, J. and Sanchis, R. (2023) Mathematical Programming Models for Sustainable Inventory Management in a Supply Chain. Iot and Data Science in Engineering Management, 160, 152-157.*

[4] *Shi, Y.J. (2023) Design and Implementation of Tobacco Commercial Enterprise Logistics Network Optimization System.*

[5] *He, C.J. (2013) The Problem of the Tobacco Enterprise Inventory Management is discussed in this Paper and Countermeasures. Operator: academic 6, 2.*

[6] *Nie, X.J. (2021) Research on Cigarette sales Forecast and Inventory Control Strategy of A Company. (Doctoral dissertation, Shandong University of Finance and Economics).*

DOI: 10.54254/2754-1169/76/20241766

[7] *Xie, Y.J. (2015) Tobacco Commercial Enterprise Informatization Construction Study. Journal of horizon of science and technology 19, 1.*
[8] *Zhang, Y.C. (2017) Analysis of Tobacco Mechanical Fault Diagnosis. Architectural Engineering Technology and Design.*
[9] *Pan, F.S., Ye, C.M. and Yang, J. (2011) Inventory Optimization in Supply Chains. Mechanical, Materials and Manufacturing Engineering, 66-68, 1305-1310.*