Building What-If Simulation to Improve Inventory Control by using Logistic Data in Sales & Distribution Area

Business Intelligence

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1. Research Problem Background

The management and coordination of all activities involved in the production and delivery of a product or service is known as supply chain management, or SCM. Procurement, production, logistics, distribution, and customer service are all included in supply chain management (SCM). The goal of supply chain management (SCM) is to make the flow of goods, information, and resources from suppliers to customers as efficient as possible. (Seuring, S. et al, 2022, pp. 3)

The aspect of implementing global management strategies for the supply chain can help the company operate more effectively, cut costs, and improve customer service. The management of a company's supply chain includes all of the steps involved in turning raw materials into finished goods and services.

What-if simulation in the SCM area is a modelling and analysis technique that allows researchers and practitioners to explore different scenarios and assess their impact on logistics operations. It is a powerful tool for exploring the potential consequences of different decisions and assessing the risks and benefits associated with different strategies. (Frederico, G.F, 2021, pp. 3)

In logistics, what-if simulations can be used to model and analyze a wide range of processes, including transportation, warehouse management, inventory control, and supply chain optimization. For example, a researcher may use a what-if simulation to explore the impact of a change in delivery routes on transportation costs, delivery times, and fuel consumption. Another researcher may use a what-if simulation to analyze the impact of different inventory control policies on stockouts, carrying costs, and order fulfilment times.

Overall, what-if simulations in the logistics area are an important tool for exploring the potential consequences of different decisions and developing effective strategies for optimizing logistics operations.

2. Research Question

- How can what-if simulations be used to improve supply chain sustainability and minimize the negative impact of logistics operations (such as increased cost and delayed deliveries)?

3. Justification

There are several reasons why research in what-if simulation in logistics is worth investigating:

- Improved decision-making: What-if simulations can provide valuable insights into the potential consequences of different decisions and help logistics practitioners make informed choices about their operations. This can lead to improved decision-making and increased efficiency and effectiveness in logistics operations.
- Better understanding of logistics operations: By exploring different scenarios and assessing their impact, what-if simulations can help researchers and practitioners gain a deeper understanding of logistics operations and identify areas for improvement.
- Minimization of risks: What-if simulations can help identify potential risks associated with different decisions and strategies, allowing practitioners to minimize these risks and ensure the stability and resilience of their operations.

- Increased supply chain visibility: What-if simulations can help practitioners make informed decisions about their operations and provide greater visibility into supply chain operations by modeling and analyzing the impact of various scenarios.
- Improved sustainability: What-if simulations can help researchers and practitioners identify strategies for reducing the environmental impact of logistics operations and improving supply chain sustainability.
- Enhanced competitiveness: By using what-if simulations to optimize logistics operations, practitioners can increase their competitiveness and gain a competitive advantage over other companies in the industry.

Overall, research in what-if simulation in logistics is worth investigating because it can help practitioners make informed decisions, improve their operations, and stay ahead in a rapidly changing and competitive industry.

4. Specific Items to be Addressed

Item #1: what-if simulation

What-if simulation is a modelling and analysis technique that allows researchers and practitioners to explore different scenarios and assess their impact on a given system. It is a powerful tool for exploring the potential consequences of different decisions and assessing the risks and benefits associated with different strategies.

What-if simulations can be used in a wide range of applications, including business, engineering, operations research, logistics, and more. The goal of a what-if simulation is to analyze the behavior of a system under different conditions, so that practitioners can make informed decisions and develop effective strategies. (Nag, B, 2022, pp. 2853-2863)

In a what-if simulation, a model of the system is created, and different scenarios are tested by changing one or more input variables. The results of the simulation are then analyzed to assess the impact of the changes on the system.

Item #2: logistic data in sales and distribution area

The management and coordination of the flow of goods, information, and resources from the point of origin to the point of consumption is referred to as logistics in sales and distribution. This includes activities like transportation, warehousing, order processing, and customer service planning, executing, and controlling. (Wang, G. et all, 2016, pp. 98-110)

By optimizing the entire supply chain, from the sourcing of raw materials to the delivery of finished products to customers, logistics plays a crucial role in sales and distribution to ensure that products reach customers promptly and efficiently. Effective logistics management can help companies reduce costs, improve customer satisfaction, and increase competitiveness.

Logistics in sales and distribution involves several tasks, including demand forecasting, inventory management, transportation planning, and distribution centre management. It requires close collaboration between different functions and departments, including sales, marketing, finance, and operations. Companies can acquire a comprehensive view of their supply chain and make well-informed decisions to enhance their overall logistics operations by making use of tools like logistics software and real-time tracking systems. (Tiwari, S, 2018, pp. 319-330)

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