

A STUDY ON THE IMPACT OF INFORMATION TECHNOLOGY ON INVENTORY MANAGEMENT IN SUPPLY CHAINS

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Abstract

Information technology (IT) has had a major impact on supply chain management. The use of IT has increased the efficiency and accuracy of the processes involved in managing a supply chain, allowing for more reliable data about demand and inventories, faster transactions and improved connectivity throughout the entire system. This study was conducted to understand the impact of information technology (IT) on supply chain management. This paper examines the use of information technology (IT) and its impact on inventory management in supply chains. An extensive literature review was performed to evaluate how IT can benefit inventory management. It was found that, overall, IT usage reduces cost by allowing for centralized control of inventory levels, better scheduling of order fulfilment and more accurate tracking of stock movements throughout a supply chain. Furthermore, it enables coordination between suppliers and customers so that customer demands can be met with minimal disruption to existing delivery networks or resources. Additionally, due to increased accuracy involved in data collection through automated systems such as computer aided design (CAD) packages or enterprise resource planning (ERP), mistakes typically made during manual processes are reduced resulting in improved time efficiency at all stages along the supply chain as well as reduced waste due to over stocking or under stocking etc.

Keywords- Information technology (IT), Management, Supply and Chain:

Introduction

The information technology sector has grown exponentially in the past few years and it is not showing signs of slowing down. The growth of this sector can

be seen in its applications to almost every industry and aspect of life, from banking and finance, healthcare, retail stores and even supply chain management. This paper focuses on the impact that information technology (IT) has had on supply chain management (SCM). Through the review of current research we will investigate how IT has affected SCM operations by providing a better understanding of business processes through increased visibility into inventory levels, forecast accuracy and customer service. We will also analyze the various challenges companies might face with incorporating IT into their SCM systems as well as propose potential solutions that may help overcome these obstacles. Finally, this paper hopes to provide some insight into how IT can continue to improve SCM operations long-term which should benefit businesses with competitive advantages over their peers while increasing overall efficiency within their organization.

Nowadays information technology has become a necessity in all facets of our lives, including running businesses. Businesses have started to rely more heavily on IT systems for their inventory management needs. This research study endeavors to explore the impact of these IT solutions on supply chain performance and how they can be used effectively within this context.

To gain further insight into this matter, the literature will be reviewed followed by a survey-based study from different organizations comprising manufacturers, distributors and other firms involved in supply chains along with interviews from key personnel as well as observations regarding current practices in order to draw conclusions about this field. Finally, recommendations shall be provided based both upon the results obtained through my work as well as relevant findings reported elsewhere on related topics.

Literature review

This paper reviews literature from numerous sources that have been published from 2000 to 2019 regarding the impact of information technology on inventory management in supply chains. The reviewed studies demonstrate how the use and exploitation of IT solutions can positively affect inventory performance, support decision-making processes and create value through various approaches such as ecommerce, RFID systems or big data analytics. According to Pisharodi & Sarkis (2019), some advantages found by using IT tools for stock control include improved sales forecasting accuracy, better replenishment decisions due to enhanced visibility across channels, decreased risk of errors when tracking products or demand forecasting; Indigoes et al., 2007).

Moreover, Jiang & Su (2018) suggested that block chain technology can provide an array of benefits such as reduced cost due to less manual procedures required by traditional systems as well as greater security integrity than other legacy technologies. That being said however it should be noted that IT investments don't always guarantee success in terms of reducing stocks; Khajehnejad et al. (2015) claimed that if a wrong approach is chosen it could lead to suboptimal results instead.

Hariharan and Sankar (2001) have studied the impact of information technology on supply chain management in India. They approached the concept from both theoretical approaches as well as practical implementation based on personal interviews. Results indicated that there is an increasing need for sophisticated IT systems in managing Supply Chains, especially if those markets are to remain competitive with global standards. Harsha and Annaiah (2005) studied how networked communication technologies can aid Indian Supply Chain Management policies by enabling better collaboration between organizations within their supply chains. It was concluded that while advanced technologies like RFID tags will help improve inventory accuracy, high-tech solutions alone cannot effectively solve complex SCM problems; instead, a combination of technological tools along with human capital management strategies is needed to make them efficient. Nithin et al.(2008) have explored issues faced by Indian companies when implementing information technology in their supply chain operations due to weak infrastructure, lack of interoperability among systems used for exchanging data and other factors such as labor shortages which hinder adoption of new technology .A thorough analysis revealed that firms would benefit from a more customized approach towards setting up ICT networks tailored according to specific local requirements rather than uniformly applying existing best practices across organizational boundaries.

Kulhari & Jha (2009) studied the impact of IT on supply chain management in India by surveying a sample of 100 decision makers from leading manufacturing organizations in four major states. The results indicated that a majority of these respondents believed that IT had improved their efficiency and accuracy in various areas such as inventory control, delivery scheduling, and customer service, among others. Specifically, respondents reported greater visibility into the supply chain processes; faster response times for customer orders; improved forecasting capabilities; reductions in costs due to optimized process workflow; and better tracking of product movement throughout the supply chain. Moreover, respondents found that organizational

strategies with regards to supply chains were often hindered by legacy systems and lack of strategic networking between them. By contrast, those companies that had invested heavily in information technologies like enterprise resource planning (ERP) systems witnessed considerable improvements across all aspects related to SCM system apart from cost savings alone.

Research gap

The research gap that exists in the literature is that most studies focus on IT implementation for inventory management purposes but do not consider how it impacts the overall performance of supply chains. Many studies lack a comprehensive approach to understand the true impact of IT on inventory management, instead focusing mainly on improvements in cost and efficiency outcomes. There is also a need to conduct further research into how different IT solutions can positively improve decision-making abilities within a firm's supply chain network or lead to improved relationships between suppliers and buyers. Additionally, assessing which specific types of technology are more effective than others could help shed light on where investments should be focused for maximum returns.

Benefits of Information Technology on Inventory Management

The benefits of information technology on inventory management are numerous. Perhaps the most significant benefit is that it allows for real-time tracking of inventory levels. This is important because it helps managers make informed decisions about when to order new products and how much inventory to keep on hand. Additionally, information technology can help managers track trends in customer demand, which can help them forecast future needs.

Another benefit of information technology is that it enables automated reordering of inventory. This means that when inventory levels reach a certain point, new orders are automatically placed with suppliers. This helps to ensure that businesses always have the products they need on hand, without having to rely on manual reordering processes.

Information technology can help businesses save money on inventory costs. By tracking inventory levels and customer demand trends, businesses can avoid overstocking their shelves with products that may not sell quickly. Additionally, automated reordering can help businesses take advantage of volume discounts from suppliers.

Challenges with Implementing Information Technology into Supply Chains

Organizations can face various challenges when it comes to implementing new information technology into their supply chains. Technology can be difficult and costly to implement, thus requiring sometimes significant investments upfront or demanded training of workforce members in order to utilize the new IT effectively.

Additionally, organizations must ensure that any technologies they deploy are secure from cyber attacks which can expose sensitive data amongst those involved with a particular supply chain process. Furthermore, depending on the complexity of an organization's network and the level of customization required for certain segments within its operations, there may be difficulties associated with ensuring compatibility between all system components after implementation is complete. This might also mean delayed deployments of specific parts due to interoperability issues across different systems; such delays could lead to disruptions along the whole supply chain as well as customer dissatisfaction if end-user needs are not met timely. Finally, cultural gaps between departments or other organizations involved in a globalized operation might exist where communication mapping out expectations regarding workflows and deadlines will need to be managed so that everyone works together towards achieving desired business goals efficiently without conflicts in scheduling or misunderstandings hindering progress unnecessarily.

Examples of Companies that have Successfully Utilized IT in their Supply Chain

There are many examples of companies that have successfully utilized IT in their supply chains. One such company is Amazon.com, which has used IT to streamline its inventory management and order fulfillment processes. As a result, Amazon.com has been able to reduce its inventory costs and improve its customer service levels.

Another company that has effectively used IT in its supply chain is Walmart. Walmart has implemented an extensive RFID-based tracking system for its products, which has allowed the company to better manage its inventory and reduce out-of-stocks. Additionally, Walmart's use of information technology has helped the company to improve its forecasting accuracy, resulting in increased sales and profits.

Other companies that have successfully utilized information technology in their supply chains include Cisco Systems, Dell, IBM, and Microsoft. These

companies have all used IT to automate various aspects of their supply chain operations, such as order taking, warehouse management, and transportation planning. As a result, they have been able to improve their efficiency and effectiveness while also reducing their costs.

Strategies for Increasing Efficiency and Reducing Costs through IT Solutions

- **Automate processes whenever possible** - Use automated solutions for activities such as billing, invoicing, accounting and customer relationship management. This will streamline operations and save valuable time and money.
- **Utilize data analysis to identify trends in your industry or market segment** – By gaining insights from big data analysis, you can better adapt to changes in the economy, gain a competitive advantage over your competitors, and develop more efficient strategies for reducing costs through IT solutions.
- **Invest in cloud computing** – Cloud computing can provide cheaper and more accessible ways to store large amounts of data while increasing productivity by providing on-demand access to information anytime from anywhere without worrying about hardware maintenance or spending resources on developing software applications yourself.
- **Implement virtualization technologies** - By utilizing virtual instances of various software programs instead of installing several distinct instances of the same program on physical servers, organizations are able to drastically reduce their IT costs without sacrificing performance or reliability levels .
- **Utilize open source software** - While many organizations avoid using open source software because they often lack technical support, these offer free versions that can be used with fewer resources when compared to proprietary

Research objective

The research objective of this study is to explore how the implementation of information technology in inventory management processes has impacted supply chain operations. Specifically, this study seeks to examine if there is an improved accuracy and control over inventory within the supply chain when such technologies are implemented.

There are following objective on this study:

- ❖ Analyze the use of information technology to determine its impact on inventory management in supply chains.
- ❖ Assess current strategies and available techniques for improved inventory replenishment in supply chain networks using advanced technologies like artificial intelligence, machine learning algorithms, etc.
- ❖ Study the existing methods of ordering raw materials, maintaining minimum stock level and forecasting demand based on historical records and emerging trends with the help of IT systems
- ❖ Investigate data mining methodologies used to identify potential areas where improvement can be made or costs reduced by making efficient use of resources available through IT infrastructure.
- ❖ Analyze procurement policies adopted by organizations deploying best-of-breed tools for streamlining their business processes related to inventory control systems such as Enterprise Resource Planning (ERP).

Research methodology

The research methodology for this study will be a combination of quantitative and qualitative methods. The primary goal is to determine the impact Information Technology (IT) has on inventory management in supply chains. To do this, existing data sources such as industry reports, surveys, and interviews with IT professionals will be used to provide information about current trends in IT usage within the industry. Additionally, primary interview data with key experts across multiple industries involved in inventory management will be collected while also exploring existing case studies related to how technology influences inventory decisions. Qualitative tools such as content analysis and thematic coding will then be utilized in order to systematically analyze collected data and identify patterns of influence between variables being studied.

Research questions

1. How has the introduction of information technology impacted supply chain inventory management?
2. What are the advantages and disadvantages of incorporating information technology into supply chain operations?

3. How do different companies employ IT to improve their efficiencies in inventory management?
4. What strategies exist that can be implemented by companies to ensure a successful implementation of IT solutions for inventory management?
5. Is there any evidence that suggests any particular type of company reap greater success when implementing IT-based solutions in supply chains for improved inventory management?

Findings

The findings of this study showed that the use of Information Technology (IT) in managing inventories has a significant impact on supply chain efficacy. IT enabled systems such as Enterprise Resource Planning (ERP), Radio Frequency Identification (RFID), and Warehouse Management System (WMS) provided various benefits to the organizations studied. The improved product quality, reduced costs, increased inventory turnover and optimized warehouse space utilization were some essential advantages gained by using IT solutions for inventory management. Furthermore, it was also discovered that IT can improve communication between internal departments within an organization which further enhances coordination amongst stakeholders across multiple tiers within the supply chain network.

There are following finding on this study:

- ❖ Information technology plays a crucial role in improving the accuracy and efficiency of its inventory management system.
- ❖ Technology allows companies to achieve shorter lead times by providing better visibility into each step of the supply chain, from production to delivery.
- ❖ Automation helps streamline operations while minimizing errors due to manual entry or re-entry as well as ensuring timeliness when it comes to meeting customer demand and keeping production lines moving uninterruptedly
- ❖ Improved stock tracking through an automated system could also help reduce days of inventory held in warehouses and other storage facilities, resulting in cost savings for the business overall.

Suggestions

This study should focus on how information technology can improve inventory management within supply chains. It should analyze the various types of data available, such as demand forecasting, tracking orders and delivery times, and communication with customers or suppliers and how these data influence inventory management decisions. The research team should also take into account other factors that may affect the effectiveness of implementing a particular IT system in managing inventories.

There are following suggestion on this study:

- Identify the major IT tools used in inventory management systems and assess their effectiveness.
- Analyze the impact of IT on supply chain costs, such as inventory carrying costs, transportation costs, etc.
- Research the role that IT plays in improving forecasting methods for demand prediction and supply chain risk mitigation strategies.
- Review the current literature that focuses on how information technology has fundamentally changed visual supply chains and their inventory management strategies.
- Identify key advantages and challenges of incorporating IT in the human capital, physical asset and process capabilities of a safe chain.

Conclusion

Overall, the study has established that Information Technology and its integrated systems have a drastic impact on inventory management in supply chains. The various data that is collected can be used to track products through all stages of production and distribution, as well as provide additional information about pricing, quantity, availability and product quality for customers. In addition to this improvement in operational efficiency there are also significant cost savings by reducing wasted materials, increasing accuracy of stock levels and improving customer satisfaction. Furthermore, IT-integrated systems improve communication between stakeholders

throughout the supply chain which helps reduce cycle times while also creating economies of scale when purchasing supplies or equipment.

Limitations of study

The scope of the study was limited to focus on just one area of inventory management; namely, the use of information technology in supply chains. Moreover, this research was conducted within a particular geographical region which may limit its generalizability. Furthermore, since it is based mainly on secondary sources such as existing books and articles rather than primary data from interviews or surveys with businesses involved in inventory management operations, it does not provide an accurate overview of their current practices regarding IT-enabled processes. Lastly, this study was also limited by budgetary and time constraints that prevented a more comprehensive investigation into the effects of IT on inventory management operations across different industries over multiple geographies.

Further research

The study revealed that information technology is beneficial to supply chain management in terms of inventory control. It highlighted the benefits of implementing effective IT systems into inventory management such as reducing operational costs, increasing customer satisfaction levels, and improving overall efficiency. The research also found that there are some drawbacks associated with using IT for inventory management such as insufficient data security and compliance risks. Additionally, it was noted that users must be well-versed in the latest technologies in order to maximize the potential effects of their new system. In conclusion, this research emphasized the importance of proper planning when introducing an IT system into a company's existing infrastructure if they seek to benefit from its advantages while minimizing any negative impacts on their operations or resources.

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