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Optimizing Supply Chain Efficiency through Technology Integration: A Case Study on Digital Transformation in Amazon

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ABSTRACT

Using Amazon as a case study, this research explores how digital technology might improve supply chain efficiency. From procurement and warehousing to last-mile delivery, it assesses how technologies like artificial intelligence (AI), the Internet of Things (IoT), robotics, big data analytics, and cloud computing enhance operational performance at different points of the supply chain. The analysis is based on a case study methodology, secondary data from reliable web sources, and primary data (a poll conducted using Google Forms). The results demonstrate that supply chain speed, accuracy, scalability, and customer happiness are all greatly enhanced by technology. For businesses looking to upgrade their supply networks through digital transformation, this report offers helpful insights.

Keywords: AI, IoT, digital trans

I. INTRODUCTION

The project's main goal is to determine which technology methods Amazon has used in its supply chain and assess how they affect productivity. Additionally, it aims to comprehend how the industry as a whole views the use of digital technology in logistics. The scope excludes other company divisions like marketing and finance and is restricted to operational supply chain responsibilities. The study is limited to replies from students and supply chain professionals as well as publicly accessible data.

In the age of intense global rivalry and rapidly shifting consumer demands, supply chain optimization is essential. The intricacies of contemporary logistics are frequently too complex for traditional methods to manage. Through the integration of cutting-edge technologies, speedier deliveries, real-time inventory management, and predictive analytics, Amazon has completely redesigned the e-commerce supply chain. The use of digital technologies by Amazon to obtain a competitive advantage is examined in this thesis, along with the lessons that can be learned by other businesses looking to develop innovative logistics systems.

Profile of the Company

Leading e-commerce and logistics company Amazon.com, Inc. is renowned for its innovative supply chain systems and customer-focused philosophy. To guarantee quick, accurate, and effective order fulfillment, the company uses a variety of technologies, including AI-powered inventory systems, robotics in warehouses, and AWS-based logistics platforms. Amazon is a prime example for researching supply chain digital transformation because of its ongoing investments in automation and innovation.

II. LITERATURE REVIEW

The literature emphasizes how digital supply networks are becoming more and more significant. AI and IoT are emphasized by Chopra & Meindl (2021) as essential technologies for real-time inventory management and demand forecasting. According to Deloitte (2022) and McKinsey (2023), supply chains driven by technology are 30–40% more efficient than conventional ones. The Harvard Business Review talks about Amazon's innovations in last-mile delivery and fulfillment center automation. The idea that technology enhances logistics' accuracy, agility, and customer service is supported by these sources.

Objectives

- To examine how supply chain efficiency is increased by digital technologies.
- To investigate the use of Amazon's digital transformation in logistics.
- To determine the potential and obstacles associated with supply chain technology adoption.

III. RESEARCH METHODOLOGY

- Mixed-method study that incorporates both qualitative and quantitative data is the research methodology approach.
- Primary Data: Supply chain experts and MBA students were given a structured Google Forms survey.
- A thorough examination of Amazon's digital supply chain procedures is presented in this case study.
- Reports, publications, journals, and websites like McKinsey, Deloitte, Forbes, HBR, and Amazon IR are examples of secondary data.
- Analysis Tools: The data was interpreted using thematic analysis and descriptive statistics.

IV. DATA ANALYSIS

According to survey results, there is broad consensus that digital technologies like automation, IoT, and artificial intelligence (AI) improve supply chains' speed, efficiency, and customer happiness. The Amazon case study demonstrated how real-time tracking, predictive analytics, and robotics may be used to enhance logistics performance. Tech-driven supply chains perform better than traditional systems in terms of cost, scalability, and delivery time, according to secondary data.

V. FINDINGS

- According to more than 80% of study respondents, supply chain performance depends on technology.
- The success of automation, data analytics, and cloud computing is demonstrated by Amazon's business model.
- Lead times and errors have decreased because of AI-based forecasting and real-time tracking.
- Businesses implementing comparable technologies report notable increases in productivity.

VI. CONCLUSION

The study comes to the conclusion that increasing supply chain efficiency requires digital transformation. An effective illustration of using technology to gain a competitive edge may be found in the case of Amazon. In order to stay flexible and customer-focused in the current digital economy, companies looking to enhance logistics performance should make investments in AI, automation, and cloud-based solutions.