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Improving Supply Chain Visibility Using IoT - Internet of Things

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Abstract: ***The Internet of Things (IoT) solutions transform dark, unintelligent, and isolated assets into illuminated, intelligent, and connected assets. Future technologies, such as IoT, must be used to increase supply chain visibility. IoT apps provide actionable intelligence from real - time and historical (pseudo - or non - real time) data mixtures to assist businesses in making decisions. Applications serve as the user interface via which users can benefit from IoT's capability. In order to improve visibility, this paper identifies supply chain pain points. With today's more complicated networks, multimodal distribution, and growing number of stakeholders, end - to - end supply chain visibility is more crucial than ever. Modern solutions that close visibility gaps at a lower cost, increase speed and efficiency, reduce loss, and boost competitive levels of customer service and satisfaction are required by changing economic conditions in diverse industries like manufacturing, inventory, and shipping. Other elements that make it more exciting to manage a supply chain are shorter product cycles, complicated products, a shrinking vertical range of manufacture, global procurement, uncertain markets, and an increase in natural disasters.***

Keywords: Internet of Things; Supply chains; Intelligent interconnections; Resources allocation

1. Introduction

The Internet of Things (IoT), a relatively new advancement in information and digital technologies, has significantly increased commercial potential in manufacturing, service provision, and industry, completely reconstructing supply chains. Supply chain management (SCM) refers to and comprises all management activities that are connected to the movement of goods through an organisation from the time that raw materials are purchased to the distribution of finished goods to the final consumer in order to guarantee that costs are kept to a minimum.

Product development, logistics, production and manufacturing, sourcing, transportation, inventory and warehouse management, and shipping are all included in supply chain activities.

However today lot of challenges is faced by organizations with respect to supply chain management.

Some of the challenges are:

- Lack of visibility of assets
- Inefficient handling of stock
- Transportation or logistic mismanagement
- Improper handling of data
- Ineffective supply chain risk management

One of the best emerging options to address these problems has proven to be the Internet of Things. The Internet of Things is a network of wirelessly connected technological gadgets that may be accessed online from any location.

Things are items that have been given an IP address and are capable of gathering and transferring data over a network without the assistance or intervention of a human.

IoT technology might be worth up to $6.2 trillion worldwide by 2025. IoT applications in supply chain management have enormous promise. It facilitates free communication between things and improves logistics control. It may lead to improved process effectiveness and clever ways of handling things. Additionally, it helps with real - time inventory visibility, which improves organisational transparency.

On the one hand, IOT will enable SCM with real - time visibility so that managers may monitor the inventory at any moment. However, it will also make mobile computing possible in SCM.

2. Review of Literature

2.1 Internet of Things (IOT)

Kevin Ashton, an RFID (radio frequency identification) expert and cofounder of the Auto - ID, coined the word "IOT" in 2009. The network of physical items equipped with electronics, software, sensors, and network connectivity that Kevin Ashton describes as the internet of things (IOT) allows these devices to gather and share data frequently utilising the internet.

The internet of things is what is referred to as giving commonplace objects the ability to link to a data network that would have a variety of advantages to simplify the task, according to Neil Gershenfeld, Raffi Krikorian, and Danny Cohen in their article "The internet of Things" published in October 2004.

"IOT is the expansion of the current Internet services so that every object which exists in this world or is likely to exist in the coming future can be accommodated, " claim D. Singh, G. Tripathi, and A. J. Jara. In their article "Internet of Things: Applications and Challenges in Technology and Standardisation, " Debasis Bandyopadhyay and Jaydip Sen write that "The phrase Internet of Things (IoT) heralds a vision of the future Internet where connecting physical things, from banknotes to cars to homes to people to things"

2.2 Supply Chain Management

According to Oliver and Webber (1982), the authors. "Supply chain management (SCM) is the process of planning, implementing, and controlling the supply chain's operations with the aim of efficiently meeting client needs. Supply chain management is "an integrating philosophy to manage the total flow of a distribution channel from supplier to ultimate customers, " according to Ellram and Cooper (1993).

The term "supply chain" was first used by Mentzer et al. (2001) to describe a group of three or more entities (organisations or people) who are actively participating in the upstream and downstream flows of goods, services, money, and/or information from a source to customers. Margin erosion is one of the primary effects and causes of the risks and difficulties in supply chain management, according to Deloitte's 2013 Global Supply Chain Risk Surveyand unexpected changes in demand, ripple effects brought on by an extended value chain, inefficient risk management of the supply chain, a lack of end - to - end visibility, and outdated technology.

2.3 Application of IOT in SCM

According to Brian Ray, there are three main categories for IoT applications in supply chain management: location tracking, fleet management, and environment sensing.

The application of IOT in numerous aspects, such as Real - Time SCM, Warehouse Management, Improved Inventory Management, Increased Logistics Transparency, and Manufacturing Communication, was detailed by Harry Machado and Karthik Shah in their journal internet of Things (ioT) impacts on Supply Chains.

According to R. B. Dhumale, N. D. Thombare, and P. M. Bangare in their research paper "Supply Chain Management using Internet of Things, " the adoption of supply chain management using IoT will have a positive effect and will help our future economy.

This study unequivocally demonstrated that IOT has a beneficial.

3. Observation

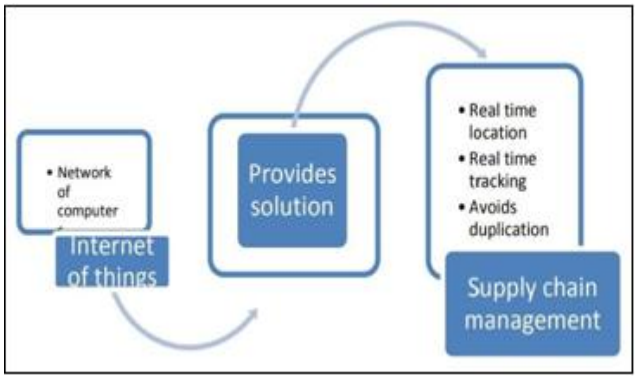
The following findings can be drawn after conducting a thorough literature review and secondary research.

1) IOT is an emerging solution to supply chain management's inadequacies, particularly in bringing real - time visibility in inventory.
2) It also makes it possible to handle logistics and the supply chain effectively.

3.1 Research Gap

IOT has been the subject of substantial research as a means of enhancing supply chain management. The ability of IOT to allow real - time inventory visibility has, however, remained a research gap. By investigating the many benefits of IOT in facilitating end - to - end visibility, this study seeks to close the gap.

3.2 Conceptual Model



IOT has been extensively researched as a way to improve supply chain management. However, there is still a research gap on the capabilities of IOT to enable real - time inventory visibility. This study aims to reduce the gap by examining the several advantages of IOT in facilitating end - to - end visibility.

4. Conclusion

It is possible to draw the conclusion that IOT contributes to real - time visibility and transparency in supply chain management after doing a thorough secondary research and literature review on the subject. It is simple to maintain inventory and keep an eye on the production process thanks to the connectivity of several production - related devices. It resolves supply chain management inconsistencies by preventing duplication, theft, and any divergence in quality or quantity.

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