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IoT Challenges and Risks for Supply Chain Management: A Review

Mr. Shivam L. Shukla[1], Dr. Minesh Ade[2]
Student, Department of MCA[1]
Faculty, Department of MCA[2]
LBHSST's Institute of Computer Application, Mumbai, India

Abstract: *The Internet of things (IoT) could also be a widely used term in Supply chain management (SCM). Many industries were facing 'N' forms of challenges and weaknesses with respect to the availability chain management systems. This paper will investigate the various challenges in Supply chain management & how IoT are the stop solution for SCM. It tried to evaluate the impact of IoT on inventory management & logistic management. It also put a light-weight on the end-to-end visibility & transparency.*

Keywords: Challenges in SCM, IoT, Application & Challenges of IoT deployment in SCM

I. INTRODUCTION

Supply chain management (SCM) means and includes all end-to-end processes from procurement of raw materials to the distribution of the ultimate product or the finished product to the distributor or to the final word consumer to verify that the worth is minimised.

Supply chain activities surround and have or hold within everything from product development to logistics, which include production & manufacturing, sourcing, transportation, inventory management, warehouse management and shipping product from origin to destination with end-to-end visibility.

However today many challenges are been faced by different companies or organizations below I will be able to highlight the variety of them

- Lack of the tip-to-end visibility of transportation
- Improper handling of information
- Logistics management
- Inefficient handling of stock
- Ineffective supply chain risk management
- Improper capital management

IoT has proved to be one of the emerging technologies to unravel the above-mentioned challenges. the web of things is a network of electronic devices connected with each other through wireless mode which can be easily accessed digitally from anywhere. Here, 'things' refers to an object that has been assigned with an IP address and has the pliability to assemble & transfer data with no manual intervention.

The scope of applying IoT in Supply chain management is big. it'll help objects to talk with each other openly & enable better communication & collaboration to manage the logistics. It can bring process efficiency for managing things. It also contributes to real-time end-to-end visibility within the provision chain during transportation. Real-time inventory management will bring visibility to an organization. Real-time Warehouse management will begin with proper stock management. On one side IOT will help SCM with real-time visibility of Logistics, Inventory, and warehouse management at any given point in time. On another side, it'll also allow mobile computing in SCM.

II. REVIEW OF LITERATURE

The literature review of this paper includes a definition of IoT, SCM and Deployment of IoT in SCM.

2.1 Internet of Things (IoT)

The internet of things, or IoT, might be a system of interrelated computing devices, mechanical and digital machines, objects, animals or those who are given unique identifiers (UIDs) and thus the power to transfer data over a network without requiring human-to-human or human-to-computer interaction.

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The term "IoT" was introduced in 2009 by Kevin Ashton, RFID expert (radio frequency identification) and cofounder of the Auto-ID. The definition given by Kevin Ashton on the Internet of Things (IoT) is "the network of physical objects embedded with electronics, software, sensors, and network connectivity, which enables these objects to collect and exchange data, often using the Internet"

"What the Internet of Things is completely about is information technology which is able to gather its own information. Often what it does therewith information doesn't tell an individual's being something, it just does something." — Kevin Ashton

"Despite continued security problems, the IoT will spread and others will become increasingly keenabout it. the worth of breaches is viewed similar to the toll taken by car crashes, which haven't persuaded very many folks to not drive." — Richard Adler.

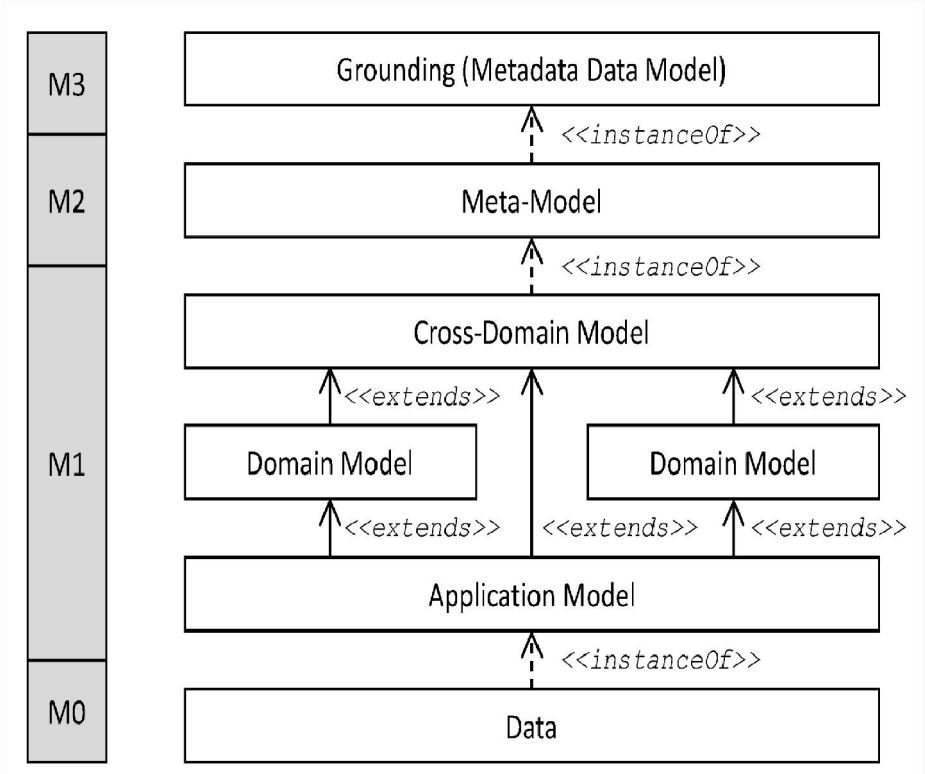

Fig 1.1 Internet of Things—Current Standards Landscape

2.2 Supply Chain Management

At the foremost fundamental level, supply chain management (SCM) is the management of the flowof products, data, and finances related to a product or service, from the procurement of raw materials to the delivery of the merchandise at its final destination.

According to the authors, Oliver and Webber (1982). "Supply chain management (SCM)" is the method of springing up with, implementing, and controlling the operations of the supply chain with the aim to satisfy customer requirements as efficiently as possible.

"Supply chains are increasingly complex and their interlinked, global nature makes them susceptible to an expansion of risks," said Colm McDonnell, Partner at Deloitte Ireland.

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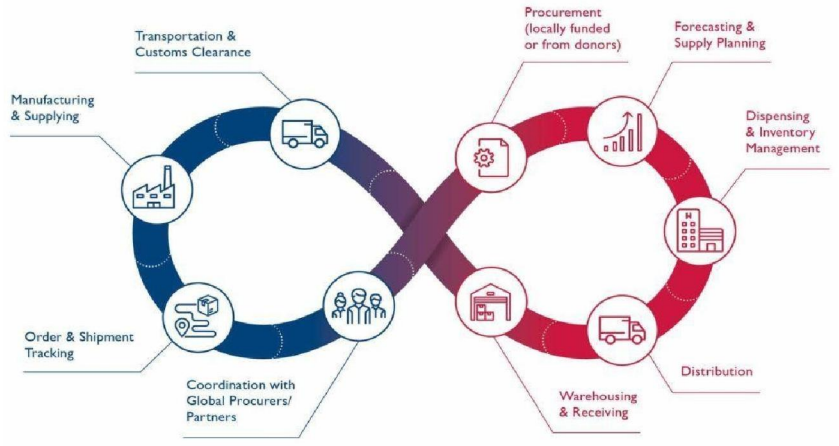

Fig 1.2: - a visual representation of the provision chain (Source: Reproductive Health Supplies Coalition)

2.3 Deployment of IoT in SCM

The IoT within the industry isn't limited to large, resourceful firms and their SCs. it is broadly available technology and widely accustomed to perform diverse roles in SCM (de Vass et al. 2018; Kaya 2020) including linking information with vendors; gathering real-time progress data from vendors; providing visibility on parts and raw materials; generating real-time quality/maintenance data; inventory tracking, information sharing, and joint ordering; quality monitoring and quality-controlled logistic; enabling enhanced reverse logistics; and capturing product data while in use to return up with operational efficiencies and maximize revenue opportunities (Ben-Daya et al. 2019; Kaya 2020).

Harry Machado and Karthik Shah, in their journal "Internet of Things (IoT) impacts on Supply Chain", explained the appliance of IoT in various aspects like Real-Time SCM, Warehouse Management, Improved Inventory Management, Increased Logistics Transparency and manufacturing communication.

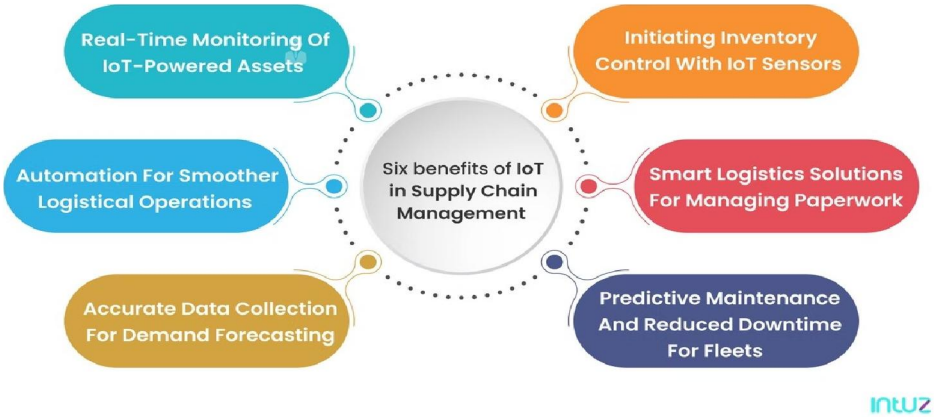

Fig 1.3: -Six benefits of IoT in Supply Chain Management

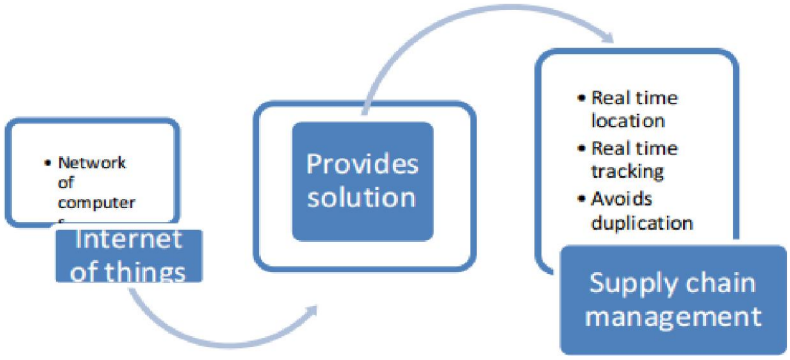

Fig 1.4: -Conceptual Model

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III. CHALLENGES OF IOT IN SUPPLY CHAIN MANAGEMENT

Despite the blazing popularity of IoT in supply chain management, many businesses still use outdated systems to trace and manage assets. Deploying IoT solutions is usually a challenge for them. Adding thereto, here are the best four:

- The skill gap in IoT knowledge
- Increased security threats
- Data shortage issues
- Poor connectivity

IV. OBSERVATION

- On completing a research and literature review, the following conclusions can be made.
- IoT is an emerging solution for SCM, majorly to bring real-timeend-to-end visibility
- It also helps in warehouse, Inventory & Logistics management

V. CONCLUSION

On doing a research and literature review, about the impact of IoT in supply chain management it can be concluded that IOT helps in bringing in real-time visibility and transparency in supply chain management.
It becomes easy to track each and every movement of SCM & Logistics

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