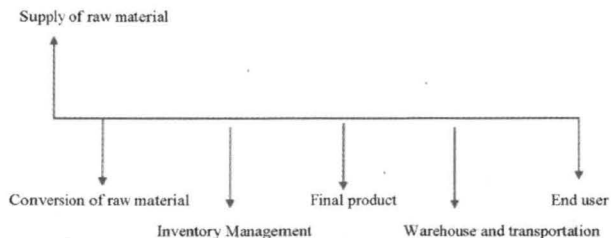# SUPPLY CHAIN MANAGEMENT 4.0 AND
IoT TECHNOLOGY

Abstract

SCM is the chain link process from supply of raw materials to end users. For this various technologies are being used in SCM 4.0. This article explores the use of IoT technology in SCM and its challenges. Technology plays a key role in the development of industry and SCM, but there are certain challenges in adopting them. The IoT makers can look up to it and provide better solutions. The business should look to adopt various technologies like IoT for their growth and betterment of the economy.

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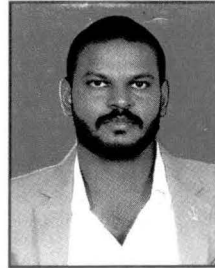*vani@psgcas.ac.in*

INTRODUCTION

Supply chain management is briefly referred as SCM. The supply of goods from raw component to final consumables to the consumers is known as supply chain management. It involves various process from purchase of raw material, conversion of raw material to a product, storing, packing, transportation and delivery of the product to the consumer. It can be described through a flow chart as under:

The supply chain consists of three components which link the supplier and the end user. These are supply, business and end user. Supply chain network consists of various processes starting from supplier and ending with to the end user and links, producers, warehouse and storage and customers. In this network there are various costs incurred such as freight, material cost, manufacturing cost, packing and transportation cost.

SUPPLY CHAIN MANAGEMENT

SCM functions are the primary link of all business activities from planning and organising the product with information flow with available funds according to the consumers. It provides right product at the right place to the customer at right cost. The supply chain increases the value generated. The three main flow in SCM are stock flow, information flow and flow of finance.

BASIC SUPPLY CHAIN MODEL
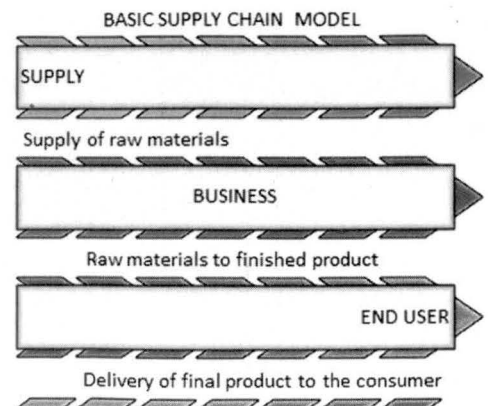
PROCESS OF SCM

Supply chain management consists of five process as listed below
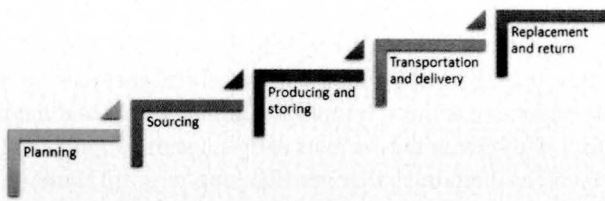
1. Planning

Every business organisation needs to plan its product well to achieve its organizational goal. They must look into the market demand for the product and based on that plan must be made in accordance with the available resources of the organisation like location of manufacturing process, warehouse and availability in the market.

2. Sourcing

In this process, the organization needs to ascertain the best possible supplier of raw material for their business. For this process organization needs to look at various factors such as quality of the raw material, cost of the raw material, freight cost, terms of payment and duration of carriage inward.

3. Producing and Storing

An organization needs to produce the product in its manufacturing unit, which involves machinery cost, labour cost, electricity cost, processing cost, testing at each process, wastage and packing cost. These costs go to determine the product price. The organization should look to minimize the cost of production with better quality. Storing is the next most important process. For storing the goods produced, packing is very important. Packaging reduces damage and mishandling of the product. Storage is mainly used to make the product available in the market in regular intervals.

4. Transportation and Delivery

Goods which are produced and stored in the warehouse are then transported to the end consumers based on the order given by the consumers. This process involves transportation cost, scheduling the delivery, tracking, invoicing and payment for the goods delivered to the consumer.

5. Replacement or return

This is the final process of SCM and this process is known as post delivery service to the users of the product. If the product is defective or damaged the consumer would ask for replacement or return. The SC manager needs to replace the product within the time period and with low-risk management. In case of replacement the SC manager should ensure to take back the product within the time period and refund payment within the stipulated time schedule. Tracking facility enables the receiver the facility to track their consignment's delivery status.

IoT provides better transparency, enables real time analysis and recommended actions, minimizes human errors and their effort

LOGISTICS AND SUPPLY CHAIN MANAGEMENT 4.0

Industry 4.0 has changed the logistics and SCM to move forward with the use of technologies. Industrial technologies like IoT, AI, cloud, big data and blockchain make the production and process of production easier with smart factories. This provided the foundation for smart supply chain management. Technologies like IoT make SCM process easy by relating each process of the industry.

In Industry 4.0, SCM gains huge advantage with interconnected process as it reduces the cost of operations, provides better inventory management and enhanced chances of selling the product. Adoption of Industry 4.0 needs more funds and investment and greater efforts.

IoT (Internet of Things)

IoT refers to Internet of Things, which means the devices that are connected to each other through internet. It has the ability to collect and store data with minimal human interference.
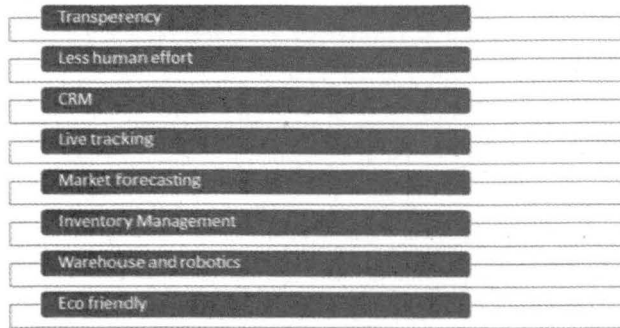
IoT in supply chain

Internet of things helps to track the product or the raw substance which is in the movement or in rest. The supply chain manager can easily identify the goods and their location at any time. The users of the goods can get regular updates on transit and in case of any delay, they can also identify wheatear the goods are damaged. IoT further helps to monitor the inventory and warehouse and reduces human efforts.

BENEFITS OF USING IOT IN SCM

The IoT technology provides huge benefits to SCM like data transparency, live tracking of the product, better management of inventory and warehouse. It reduces human efforts and saves time, minimizes the transportation

risk and most importantly, helps in maintaining better customer relationship with early indications and tracking. Following are certain benefits of using IoT in the supply chain management.
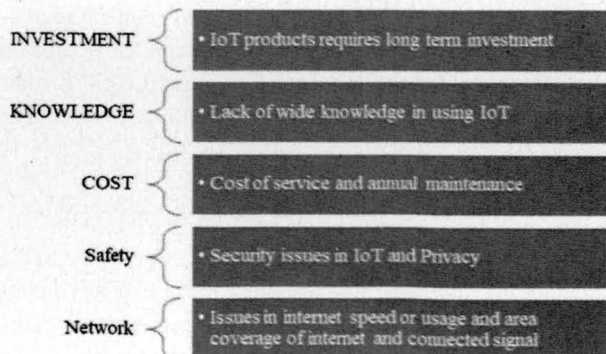
- Transparency
- Less human effort
- CRM
- Live tracking
- Market forecasting
- Inventory Management
- Warehouse and robotics
- Eco friendly

REVIEW OF LITERATURE

Tjahjono, B., Esplugues, C., Ares, E., & Pelaez, G. (2017), analysed the effect of supply chain and Industry 4.0 with source of supply, inventory storage, transportation and delivery of the order. The study concludes that, the usage of 3D printing and virtual technology provides better opportunity. Further IoT, big data analysis, cloud data gives more opportunities and it can also be a threat to the business. The threat is mainly of interconnection. De Vass, T., Shee, H., & Miah, S. (2021), investigated IoT usage in supply chain and its possibilities and difficulties in retail industry. The findings and conclusions of the study are that adoption of IoT technology increases the data gathering, follow of information, business intelligence and clarity of product in motion. The study found certain difficulties from retailers like lack of management support, cost of investing in new technology, shift to new technology, acceptance by stakeholders, reluctance in sharing of information and inability to use the information and its exchange.

CHALLENGES IN ADOPTING IoT

IoT is the advanced technology which has lots of advantages to the business, but there are certain challenges in adopting it in the business. The common challenges in adopting IoT in business are as follows:

INVESTMENT	• IoT products requires long term investment
KNOWLEDGE	• Lack of wide knowledge in using IoT
COST	• Cost of service and annual maintenance
Safety	• Security issues in IoT and Privacy
Network	• Issues in internet speed or usage and area coverage of internet and connected signal

CONCLUSION

Industry 4.0 and 5.0 have huge growth potential in the industry and in SCM. The advancement in technologies like IoT, AI, Cloud storage, big data analysis, Blockchain provide greater advantage to the industry. IoT provides better transparency, enables real time analysis and recommended actions, minimizes human errors and their effort. This technology is in its early stage of adoption and it involves certain challenges like long term investment, cost of maintaining, level of knowledge to use IoT devices with full effect and security and network issues. IoT makers can look into this and provide better standard products which would help the industry and SCM to grow. MA

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