IS IOT THE NEW BUZZWORD IN SUPPLY CHAIN MANAGEMENT?

DR.S.GAYATHRI

Associate Professor, Department of Management Studies,

VISTAS, Chennai, India

Email : gayathri.sms@velsuniv.ac.in

DR. D. ANITHA KUMARI

Assistant Professor, Department of Management Studies,

VISTAS, Chennai, India

Email : anitha.sms@velsuniv.ac.in

Abstract

Supply chain management is a rest of integrated tasks involving flow of information and materials. IoT refers to the suite of technologies which includes sensors, servers, analytics engines and network connectivity that has the ability to link the physical and information worlds. The advent of new technologies like artificial intelligence, analytics and agile business has changed the business models of major industries. Supply chain management can gain the most from these sweeping changes thus saving time and increasing efficiency.IOT has the potential to change the supply chain from a step by step, linear process to a seamless, data driven process. This paper analyses the transformation of the SCM from the physical system to inter connected information oriented system.It examines the increased in transit visibility, innovation and revenue generation through the IoT Process.

Keywords : Internet of Things, Supply Chain Management, Information, In transit visibility, Agility

Introduction

Supply chain management refers to an integrated set of approach aimed at integrating the suppliers, manufacturers, warehouses and distribution centers. Delivery of product/service at the right time to the right location in right quantity is an essential feature here. The mere movement of goods from point of origin to point of consumption is not what SCM intends to do in the

present scenario. The modern day customer is oriented towards obtaining value added products/services for the same price. The organizational goal is to achieve operational excellence by adopting sustainable strategies for SCM. The focal thought of inventory network the board is to apply an absolute framework push toward to deal with the stream of data, materials and administrations from crude material providers through production lines and distribution centers to the end clients. Internet of Things offers the best possible solution for this challenge by way of its synergistic interconnectivity.

Objectives

- To study the transformation of SCM and the role of IoT.
- To identify the major enablers of IoT which transform the Supply chain Management
- To enumerate the possible benefits of IoT Implementation to the existing SCM Process

Need for the Study

Supply Chain management is the underlying current for the operation of industries and this domain is now undergoing a sea change. Companies now demand swift response to customer's need and they desire very less lead time. Automation has now become a wide spread phenomenon in all SCM activities, be it , ordering, sourcing, warehousing, tracking of goods and delivery. Fulfilling the customer experience with less lead time, increased productivity, less inventory, optimised cost and higher revenues are the challenges facing the Supply chain domain. The repercussions of not facing the challenge could beplaying havoc on a network of industries. IoT is found to have a profound impact on these challenges and it could help in providing integrated solutions for this concern. Hence this study is aimed at analysing the assistance of IoT in SCM in the present scenario.

Internet of Things

The Internet of Things is "a worldwide framework for the data society, empowering propelled administrations by interconnecting (physical and virtual) things dependent on existing and advancing interoperable data and correspondence innovations". The IoT is a large umbrella encompassing various technologies. The success of IoT lies not tin the technologies involved but in the way they are leveraged to enable efficiency in any given

field. With this motivation, this paper analyses the impact of Iot on the supply chain management process.

Review of Literature

Ascencio et al 2008 had proposed a collaborative logistics framework comprising of the Port Logistic Governance, the Logistics Management Platform System (LPMS) and the Port Logistics Operations Mode. This examination had created bury venture business procedures of interest the executives, orders the board and vehicles the executives at a strategic (arranging and booking) and operational (control and execution) levels. The worldwide goal of these between big business forms is the coordination of regular assets and the decrease of operational fluctuation.

Yan (2009) had planned a SCM information spread model based on RFID and Internet of effects. This research had taken the pharma industry as model and analyzed the specific application model of Internet of things in drugs supply chain and information retrieval. The model had claimed to solve information asymmetry problem in supply chain effectively and increase the efficiency of supply chain information transmission network.

Closs (2011) had suggested a framework to define the dimensions of sustainability and the categories of initiatives within each dimension for a supply chain for end to end solutions.They advocate that companies nust adopt a broader view to ensure that the stakeholder's relations remain viable and sustainable.

Bandyopadhyay(2011) had analysed state-of-the-art of IoT in their research and presented the key technological drivers, potential applications, challenges and future research areas in the domain of IoT.

Sun(2012) had studied the application of RFID in logistics domain. As Radio Frequency Identification RFID is a non-contact automatic identification technology, there is no need for manual intervention and there is better control of the flow. This is being widely used by the global logistics service providers.

Miorandi(2012) overviewed the different advancements, applications and research difficulties for Internet of-Things, in their exploration. Writing on how Internet-of-Things imagines a future in which advanced and physical elements can be connected is dissected in detail. From the reviews,

it is clear that the very perception of Supply chain management had been changed and the new era is focused more on the integration of the activities.

Supply chain Management

The production facilities of the companies are expanding all over the world. When the world gets flattened, the supply chains get longer. The expansion into new markets is enabled by global communication systems and increased usage of digital services. The conventional supply chain had witnessed a plethora of changes, over the past decade.

Vendor ⟹ Sourcing ⟹ Operations ⟹ Distribution

A normal Supply chain comprises of the steps of procurement, production , inbound and outbound storage and distribution. There is flow of material, money and information. Asset management including tracking of goods, reducing the lead time, optimising the cost had been the tough challenges.Without the usage of internet and facilities like GPS, RFID the in transit visibility and storage would be ineffective.

The advent of developments in the fields like artificial intelligence, big data, automation and E commerce had led to the transformation of the SCM and there is a strong need for seamless integration of all the activities in order to satisfy the customer who is well aware of the latest developments and the competitiveness of the industry.

Figure 2

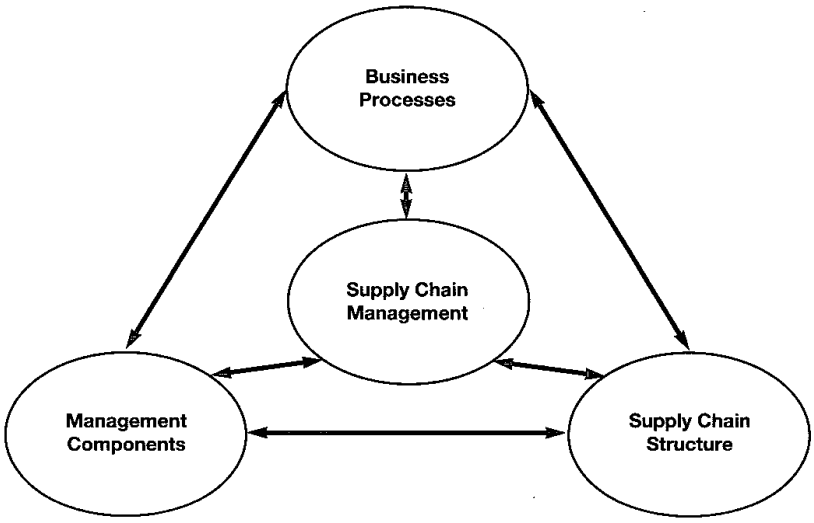
Phases of Supply Chain Management

Source :Digital image retrieved from http://holisollogistics.com/supply-chain-management-process-five-steps-for-building-excellence/

The SCM process consists of the five phases namely planning, sourcing, executing, delivering and returning. These phases involve tasks that require meticulous efforts with respect to information flow and management, material sourcing, inventory planning, production, warehousing, transportation and distribution, financial planning and management.Cooper (1997) had made clear the require for a number of stage of organization of behavior and processes within and among organizations in the supply chain.

Figure 2

Activities in Supply Chain Management



Source : Retrieved from Cooper, M.C., Lambert, D.M. and Pagh, J.D., 1997. Supply chain management: more than a new name for logistics. *The international journal of logistics management*, *8*(1), p.6

For the enhanced SCM experience, IoT brings in the features of transparency, visibility,

vehicle tracking, data storage and analysis, RFID, GPS and online payments.(Rahman, 2018)

Challenges

From the reviews , we are familiarised with the benfits of reduced lead time, better asset management, in transit visibility, GPS tracking and RFID for warehouse management. The question at hand now is how easy is the change and what it would cost. For companies with good scaling , the transformation may be feasible. The plight of start ups, established small players and the immediate problems they may face has to be thought of.

Technological challenges include reliable data storage, retrieval and access, security of the data stored, avoiding intrusion of unwanted third or fourth party into confidential information and other interferences. The needed infrastructure has to be built on a large scale for all companies to adopt the changes on the same pace. This includes commercialisation of the technologies, availability of the software at lower prices, user friendliness of the technology, support form Government and other sources. Cost is another important challenge here. Like any new technology, the initial cost would be very high. The first movers may bear with this and throught the experience curve and the economies of scale concepts, the cost may be reduced for this IoT enabled SCM in the forthcoming years.

Conclusion

This paper has made an attempt to give an overview on the concept of Supply chain, the regular functions and the other challenges. The technological changes or disruptions has also smitten the Supply Chain domain and there is a need to evolve and adopt the changes to make the service agile and robust. Hence we have analysed the IoT concept and how it enables supply chain. As this a overview, there is more concrete scope for the analysis from technical aspects such as implementation of RFID and its advantages over bar coding. It is concluded that IoT enabled Supply chains would become the norms of the day in future. It is imperative that companies analyse the risks and adopt the new changes so that they are able to have their supply chain robust and compatible with the emergent technologies.

References

Alam, A.I., Rahman, M., Subho, M. and Haque, R., 2018. Iot based supply chain management (Doctoral dissertation, BRAC University).

Ashton, K., 2009. That ‘internet of things’ thing. RFID journal, 22(7), pp.97-114.

Bandyopadhyay, D. and Sen, J., 2011. Internet of things: Applications and challenges in technology and standardization. Wireless Personal Communications, 58(1), pp.49-69.

Closs, D.J., Speier, C. and Meacham, N., 2011. Sustainability to support end-to-end value chains: the role of supply chain management. Journal of the Academy of Marketing Science, 39(1), pp.101-116.

Cooper, M.C., Lambert, D.M. and Pagh, J.D., 1997. Supply chain management: more than a new name for logistics. The international journal of logistics management, 8(1), pp.1-14.

Sun, C., 2012. Application of RFID technology for logistics on internet of things. AASRI Procedia, 1, pp.106-111.

Yan, B. and Huang, G., 2009, August. Supply chain information transmission based on RFID and internet of things. In Computing, Communication, Control, and Management, 2009. CCCM 2009. ISECS International Colloquium on (Vol. 4, pp. 166-169). IEEE.