
USE OF IOT TECHNOLOGY FOR SUPPLY CHAIN MANAGEMENT PROCESS IN SRI LANKA

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ABSTRACT

Advancement of the new technologies has made rapid changes in the industrial revolution of countries. Business enterprises are in high competition among others to achieve the best efficient products management process to gain a competitive advantage through managing the business efficiently and cost-effectively. Supply Chain Management is one of the main important processes that highly focused on managing a business efficiently. Supply Chain Management is the administration of the progression of merchandises, enterprises, and incorporates all cycles that change crude materials into definite items. It includes the dynamic smoothing out of businesses' flexibly side, exercises to amplify client worth and increase an upper hand in the commercial centre. Internet of Things (IoT) is one popular technology that can be used to efficiently streamline the Supply Chain Management process. The idea of IoT in the context of Supply Chain Management is embedding connectivity and intelligence using a wide range of devices across the main stages of the Supply Chain Management process. IoT technology influences the industries that have a positive impact on the performance of Supply Chain Management. The intension of the research is to conduct a review on the use of IoT technologies embedded to the Supply Chain Management process as warehouse management, remote monitoring technologies as well as to find about its future directions in Sri Lankan context. Desk research has done by referencing researches, reports, articles, and going through the journals that are already done and published related to the topic. Thus, the details are gathered within a short time to prepare the details on the use of IoT technologies for the betterment of the Supply Chain Management processes in Sri Lanka.

Keywords: *IoT, management, supply chain*

1. INTRODUCTION

The supply chain is that the cycle of products, services, funds, and knowledge from the material to the end-user. Thus, the supply chain is often taken as the foundation of an organization. This can coordinate cycles to style, source, make, convey, and produce things back (Mishra, 2019). Supply chain structure and integration area unit are basics for higher performance. Supply chains have likewise given the advantage of fast admittance to the knowledge that area unit in basic decision making. Because the organizations face a significant role, look at to fulfil the customers' wishes with an occasional value. The supply chain as a result has been challenged. During this method, an enormous improvement within the supply chain is needed. The customer is one exceptionally worry concerning the item quality, value, administration aside from the time taken for the delivery. However giant logical enhancements on many elements of supply chains, many flighty and laborious to manage variables will influence the ideal satisfaction of requests. Typical common variables are inflicting late delivery area unit traffic and lack of stocks. Quick advancements in innovation have driven the many-sided nature of supply chains. Henceforth, supply chain the board (SCM) has become a basic and vital part of various enterprises (Mostafa et al., 2019). To urge by in such serious and testing condition, organizations should type a dynamic, however basically filmable, innocuous and exceptionally responsive chain. One of the foremost energizing regions of the result is that the worldwide supply chain. This has been accomplished through correspondence, securing, and communication info that empowers speedy dynamic and upgrading supply chain execution. Usage of IoT has improved traditional difficulties of Supply Chain Management like permeability of the chain and at the same time, it has upgraded readiness and flexibility of Supply Chain Management (Ben-daya et al., 2019). This paper manages completely different parts of the supply chain and its administration. The report provides an intensive audit of writing on Supply Chain Management, the transient authentic purpose of reading on the advancement of IoT and its incorporation into supply chain integration. Additionally, the report provides a detailed record of IoT foundation and therefore the application frameworks (Abdel-basset et al., 2018). These days, the IoT innovations are utilized in numerous chains the board area unit delineate well. Associate degree energy is created to offer some connected analyses on the utilization of IoT in Supply Chain Management. A list of the references used for the study area unit is given at the end of this paper.

2. LITERATURE REVIEW

With the global advancement of technology, the Supply Chain Management system has emerged as a result of the industrial sector adaptation of new technologies for the advancement in industries. Conducting a Supply Chain Management system takes the production process into another level. In the modern supply chain, warehousing has been a primary element. While the

concept is evaluating globally with the touch of IoT, Sri Lanka business context is still in its infancy. (Karunaratna et al., 2019). In future, Sri Lanka may face the potential challenge of shortage of labour that highly required for warehousing operations. IoT based warehousing can be considered as important in finding solutions to overcome this challenge. Supply Chain Management contains the processes of planning, implementing and controlling. Harry Machado and Karthik Shah explain the various aspects of using IoT in SCM like Improved Inventory Management, Increased Logistics Transparency, and manufacturing communication (Kothari et al., 2018). Even though the IoT is a solution to improve SCM, there is a gap in how IoT can enable real-time visibility of inventory. Use of IoT in SCM can be benefited in many ways (Abdelbasset et al., 2018) such as goods can be monitored at any time and anywhere, GSP can track products, facilitate to collaborate, sharing between supply chain partners, and smart transportation (Sharma & Sharma, 2019). By developing SCM with IoT, it can increase the production chain in Sri Lanka and it can be economically benefited. However, IoT adoption in the supply chain is very rare in Sri Lanka to consider it in other countries.

As an agricultural country, Sri Lanka can avoid some potential problems which are related to the agricultural production chain by developing SCM systems with IoT technology. It can be done by networking production process island-wide, monitoring product evaluation etc. (Jayaratne et al., 2011). Collaboration in supply chains is vital to obtain competitive advantages in the perspective of supply chains. Firms attempt to promote moderate relationships through supply chain collaboration, collaborative advantage and firm performance (Dissanayake & Jayaratne, 2017). Niles Perera, Amilia and Ranil have analyzed to identify the SCM in Sri Lanka and have compared them globally to find technological aspects which can develop the SCM (Perera, 2016). The importance of using IoT is that to collect data about SCM by using network devices and that can be facilitated by getting connected to all supply chain, providing intelligent decision making and can be applied to the variety of fields such as transportation, energy, healthcare, retail, manufacturing, agriculture and other areas (Grida et al., 2020).

3. METHODOLOGY

We describe how we conducted our literature search as well as the technique used to select the reviewed literature. As we use the existing data by published researches, reports, and literature materials, it is categorized under the secondary type research methodology which is a Desk research. Under this research, it has been around 30 researches relieved the research team since a short period was available to come up with current solutions. The main objective of this research is to identify the current use of IoT technology in the Supply Chain Management system in Sri Lanka and the discuss improvements. We defined the best keywords to collect the best and the most relevant literature on

the topic. We used Google Scholar and ResearchGate to look for a better and different type of papers. Google scholar was mostly used because of its user-friendliness. And browse some web pages to find the relevant data about the current use of Supply Chain Management in Sri Lanka. We carefully studied around 40 research papers to select the most relevant research papers on the topic, which are included the IoT based Supply Chain Management in worldwide, Asian, developing countries and Sri Lankan contexts about the concepts and modification of the relevant Supply Chain Management Systems. Most of the papers were related to “production” and “delivering” and some of them contained the details of IoT concepts. The papers related to the use of the Supply Chain Management System in Sri Lanka were mostly linked to the apparel industry and the tea industry along with the food industry.

4. DATA ANALYSIS & RESULTS

IoT provides much information for us to make better decisions across a range of industries. Some of them; better monitoring of personal health information, efficient security and surveillance, improved product quality, reduced manufacturing defects, improved building, environmental management, saving time in transport with best routes, reduced energy usage, and optimized Supply Chain Management System (Perera, 2016).

IoT Supply Chain Management system often used to increase the production of Sri Lanka. There were 21 industrial sectors identified in several institutions in Sri Lanka. From those industries, 79% of the contribution for total establishments in Sri Lanka is from the manufacturing of food and beverages, apparel and textile, rubber and plastics and chemical and chemical products. These industries are in Western, North, Central, Southern, Sabaragamuwa and Northern provinces in Sri Lanka. The enterprises have already implemented effective waste management solutions to reduce the number of wastes while making a substantial contribution towards sustainable development and economy.

IoT Supply Chain Management is widely used in the world. On the other hand, Sri Lanka seems to have a low level of using it. Below figure shows how IoT has been used for the world’s supply management system in 2019.

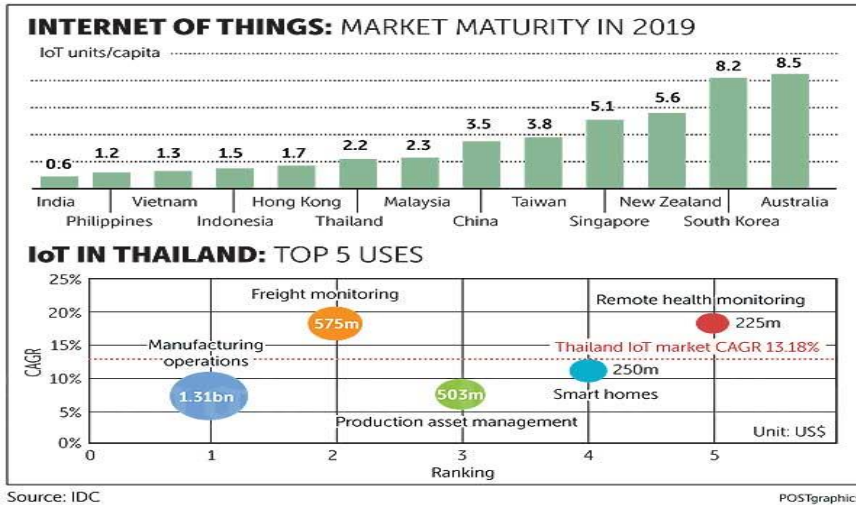


Figure 1: World's supply management system in 2019

5. DISCUSSION OF THE FINDINGS

From all the industries in Sri Lanka, 70% of industrial companies are located in Colombo and the greater areas. And 30% of industries are alienated all around Sri Lanka. All these companies greater and minorly use technology in many aspects like Supply Chain Management systems. Most of the 30% use traditional technological aspects for the current ongoing automation. Most of 70% of industries use new technologies for the Supply Chain Management systems. In Sri Lanka, Supply Chain Management systems use new technologies as modifications. Among all industries that use SCM, apparel and food industries use IoT based SCM. IoT based SCM has many plus advantages other than the traditional systems such as the factories can interconnect and get updates easily through the network devices by considering detail decision making and production management.

6. CONCLUSION & CONTRIBUTIONS

Management of the supply chains in numerous businesses has developed considerably from manual to automatic and safe operations to a larger extent. As a third world country, Sri Lanka supports the country economy by manufacturing industries in a huge state. Even though industries use Supply Chain Management systems, the majority is using traditional methods, and few industries use IoT technologies. Even though the use of IoT is limited, it plays an important role in increasing the performance of Supply Chains. In this research, we found that IoT based Supply Chain Management Systems gain the popular among the parallel industries and it can profitably enhance productivity. Therefore, by developing this concept, the government and the privet sector can gain enhancement of profitability and overall sustainability.

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