Chapter 6

Industrial Internet of Things:
How Industrial Internet of Things Impacts the Supply Chain

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ABSTRACT

Industrial Internet of Things (IIoT) refers to the extension of the Internet of Things and It is used for industrial purposes such as manufacturing, supply chain.IIoT can be connected with billions of industrial devices and machines that supported machine learning and big data technology. Because of its potential to authorize faster and better decision making, the IIoT becomes essential for supply chain processes. The IIoT is set to revolutionize the supply chain with both operational efficiencies and revenue opportunities made possible with just this type of transparency. This study attempts to fill this gap by developing a conceptual framework for predicting the advantage of the IIoT and supply chain performance. This chapter synthesizes existing literature reviews and making bibliometric analysis on the IIoT and supply chain. Additionally, It also outlines avenues and opportunities for future research aiming at the contribution of the IIoT to Supply Chain processes.

INTRODUCTION

The Internet of Things (IoT) is the network of communication of physical devices, mechanical and electronic machines, the other items embedded with communication things or objects - such as Radio-Frequency Identification tags, sensors. IoT can

identify, transfer, and collect data over a network without requiring human-to-human or human-to-computer interaction (Gubbi, Buyya, Marusic, & Palaniswami, 2013);(Lee & Lee, 2015). The IoT was which emerged in the early 21st century, is the most important technological component of the underlying philosophy of Industry 4.0. Kevin Ashton, the co-founder of MIT's Auto-IDI Center, introduced the term of Internet of Things in the presentation proposed for Procter & Gamble in 1999 (Gubbi et al., 2013). IoT is a novel technology that is rapidly gaining ground in the scenario of information and communication technology. According to the report prepared by Cisco, the number of devices connected to the Internet of Things was estimated to be 3.47 in 2015, while the average of the number of devices connected per person will likely reach to be 6.58 on average in 2020 (Evans, 2011).

The IIoT is a subset of the IoT and is mainly focus on the manufacturing and industrial process. Industrial Internet of Things, the other name is "Industrial Internet," was coined by General Electric (GE) in late 2012. This term is also called "the Internet of Everything" or "Internet 4.0" by Cisco (Gilchrist, 2016).

The IIoT is the term for all the number of industrial devices, computers, objects that can work together through the wireless network to enhance manufacturing and industrial processes. The configuration of physical devices, mechanical and electronic machines, the other items embedded with communication things or objects - such as Radio-Frequency Identification tags, sensors allow for data collection, exchange, and analysis, potentially facilitating developments in productivity and efficiency as well as other economic benefits. A layer of high availability software plays an essential role in this type of communication. With it, the possibility to use the Internet of Things in all industries is guaranteed. So, this means that the network system to work with other systems to provide information is allowed. For example, with that information via the network, some employees can be informed about problems and react quickly. More and more data industries are connected online, and the software will be able to be used to optimize everything.

According to Accenture analysis, the contribution of IIoT technologies point to cumulative GDP is estimated to be $10.6 trillion by 2030 for 20 countries (Purdy & Davarzani, 2015). Additionally, the IIoT can contribute to trillions of dollars to the global economy by 2030 (see Figure 1). The result of the Accenture survey showed that IIoT would provide many job opportunities for a long-term period.

IIoT enables to accelerate the manufacturing by allowing the acquisition and accessibility of far more significant amounts of data at far higher speeds of machines; therefore, several innovative companies have started to implement the IIoT by leveraging intelligent, connected devices in their factories. For example, ThyssenKrupp - one of the world's leading elevator manufacturers and serving with 1.1 million elevators worldwide, decided to use the IIoT technology to provide more efficient service, to prevent malfunctions, and to reduce lift waiting times. Everything

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