

Chapter 5

How Can Industrial Internet of Things (IIoT) Improve Enterprise Productivity?

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ABSTRACT

This chapter gives brief information about internet of things (IoT) and then detailed knowledge of industrial internet of things (IIoT). Internet of things applications can be seen in different areas, such as smart cars, smart homes, smart cities, agriculture, healthcare, industry, etc. This study focuses on the industrial part. Industrial internet of things (IIoT) means internet of things (IoT) applications for industrial usage. IIoT give a chance to enterprise for tracking supply chains, monitoring production line operations, and real-time consumption of energy, managing stock, and transportation decisions. This study used case study method for developing theory about IIoT's contribution to enterprise productivity. IIoT applications can be adapted to which operations of the enterprise, and how it will contribute to enterprise productivity is explained in this chapter. The chapter discusses the projects that are within the vision of IIoT but not yet implemented and concludes with suggestions for future studies.

INTRODUCTION

Significant differences become apparent upon comparison of objects which mankind met, used or possessed in the 20th century and the ones preceding it. 20th century was the period in which the supply increased in parallel with the demand and the

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production was the source of wealth. The production has been in an unbroken state of mutual interaction with sociology, politics, economics and technology throughout history. Wool can now be purchased from Australia, scoured in China, processed in Turkey and sold to the UK in the form of fabric thanks to the globalization. Meanwhile the advances in technology contribute significantly to businesses with numerous benefits. These benefits are the creation of smart factories, monitoring production on separate locations and efficient management of supply chains to name a few.

The phrase “4th Industrial Revolution” is now common and has been the subject of various implementations upon the introduction of the concept of Industry 4.0 at the Hannover Messe in Germany in 2011. A momentous transformation has begun in the business world with Industry 4.0. The production is now in a state of paradigm shift and the businesses encounter new concepts every day. These concepts are augmented reality and simulation, 3D printing, cyber security, cyber physical systems, big data, cloud computing, smart factories and Internet of Things (IoT), among others. Practitioners are trying to keep up with them and seeking their areas of utilization after Industry 4.0. Businesses are currently working on how to adapt their operations and processes to these new concepts. Significant gains in operational efficiency have been achieved through this adaptation, motivating both theoreticians and practitioners alike in the field.

This chapter is organized as follows. First, we provide a background section where industrial transformations are assessed within the context of industrial revolutions. Then, we introduce IoT and Industrial Internet of Things (IIoT) and proceed to the methodology and IIoT case studies. This is followed by an exhibition of the areas of application of IIoT in operational efficiency. Our concluding remarks include suggestions for future work at the end of the chapter.

BACKGROUND

Industrial revolutions explain succinctly the transformation of production within a periodical context. The technological advances contribute to the renovation of the production systems and increase the level of efficiency. The First Industrial Revolution took place after Walter’s development of the steam engine at the end of the 18th century (see Figure 1). Significant improvements in productivity was attained upon adopting mechanical production in lieu of a human powered one. Henry Ford’s realization of assembly lines in production plants and utilization of the electric power in the early 20th century marks the beginning of the Second Industrial Revolution. The then newly developed serial production became the standard after a while, elevating productivity to a new level. Integration of automation systems

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