Chapter 14

Industry 4.0 From the Supply Chain Perspective: Case Study in the Food Sector

Andrés Boza
Universitat Politècnica de València, Spain

Faustino Alarcón
Universitat Politècnica de València, Spain

David Perez
Universitat Politècnica de València, Spain

Pedro Gómez-Gasquet
Universitat Politècnica de València, Spain

ABSTRACT

Industry 4.0 proposals have an important impact not only in companies but also in the complete supply chain. The effect in the supply chain is different depending on each Industry 4.0 proposal and each supply chain configuration. This chapter deals with Industry 4.0 from the supply chain perspective. Four levels of scope on the supply chain and a classification scheme based on three blocks (technologies, features and extensions) have been defined. Finally, the case study in the food sector gives a real vision of some previously introduced concepts about Industry 4.0 from the supply chain perspective.

INTRODUCTION

Industry 4.0 promotes, among other things, autonomous decision-making, interoperability, agility, flexibility, efficiency and cost reductions. This is the reason by which many companies are aiming to implement the technologies and concepts related to “Industry 4.0” (Perez et al., 2017). Industry 4.0 holds huge potential. Smart factories allow individual customer requirements to be met and mean that even one-off items can be manufactured profitably. In Industry 4.0, dynamic business and engineering
Industry 4.0 and the Industrial Internet of Things (IIoT) has become one of the most talked about industrial business concepts in recent years. The IIoT has brought about a new strategy, which has arisen in industry, especially within manufacturing, and it is based on the producer focusing on what the customer actually wants rather than the product they buy. According with Gilchrist (2016) the four main characteristics of Industry 4.0 include:

- Vertical integration of smart production systems
- Horizontal integration through global value chain networks
- Through-engineering across the entire value chain
- Acceleration of manufacturing

Reviewing these main characteristics, it is easy to identify the important contribution of Industry 4.0 for the value chain or SC.

On the other hand, according to Gilchrist (2016) the nine technological trends more important in an Industrial 4.0 context are: Big Data and Analytics, Autonomous Robots, Simulation, Horizontal and Vertical System Integration, The Industrial Internet of Things, Cyber-Security, The Cloud, Additive Manufacturing and Augmented Reality.

Within these trends, IoT is possibly the most important and far-reaching technological trend. In that sense, Gubbi et al. (2013) indicates that the IoT is a radical development of today’s Internet towards a network of interconnected objects that not only collects information from environment and interacts in the physical world (action/command/control), but one that also uses existing standards on the Internet to provide information transfer services, analyses, applications and communications. An important component of Industry 4.0 is the fusion of the physical and the virtual world (Kagermann, 2013). This fusion is made possible by Cyber Physical Systems (CPS). CPS are “integrations of computation and physical