

## Chapter 8

# The Internet of Things in the Corporate Environment: Cross-Industry Perspectives and Implementation Issues

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### ABSTRACT

*The Internet of Things (IoT) is formed by a set of physical objects with embedded sensors, connected using a network so that they can collect and exchange data. Though the concept looks simple, its deployment in industry has enormous potential to bring major business benefits and radical change. This chapter examines IoT technology and how it is being used in the corporate environment. Based on a review of existing literature and case examples, the various definitions and elements of IoT are discussed, followed by an assessment of how IoT is being used and what benefits are being delivered. Some key emergent themes are then examined – security aspects, the significance of 5G networks, and the need for an IoT strategy and project implementation guidelines. The chapter concludes by outlining possible areas for future research and suggests a step-change in the mega-infrastructure connecting IoT devices is imminent.*

### INTRODUCTION

The term “Internet of Things” (IoT) was reputedly first introduced by Kevin Ashton of the Massachusetts Institute of Technology in a presentation to Procter & Gamble in 1999. However, the concept of connected devices even then was not new, but rather built on the principles of local and wide area networks dating back to the 1970s, overlain with wireless technologies and the Internet. In a manufacturing

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context, it also built upon the supervisory control and data acquisition (SCADA) systems that became commonplace in the 1980s, as part of the shop floor data capture infrastructure that fed the Manufacturing Execution Systems (MES) and Enterprise Resource Planning (ERP) applications at the corporate level. Now, however, applications are much wider in scope. As Vodafone Business (2019) note “by IoT, we mean connecting sensors in things like cars, buildings and machines, enabling them to communicate about their status and environment and to be controlled remotely. It’s making possible everything from asset tracking and condition monitoring to preventative maintenance and autonomous cars. The uses of this technology are broad and constantly growing” (p.1). According to Gartner (cited in Zscaler and ThreatLabZ, 2019, p.2), in excess of 20 billion IoT devices were estimated to be in use by 2020, with more than 65 percent of all companies using IoT products of some sort. According to PaloAlto Networks (2021), in excess of 30% of all network-connected endpoints are IoT devices in a typical company today.

Following this introduction, this chapter first discusses a number of different perspectives regarding the IoT concept, and sets out the main components of IoT infrastructure. Then, through an assessment of a number of secondary sources, it identifies the main business areas where IoT technology is being deployed, and assesses the potential benefits of IoT deployment. This is followed by a discussion of a number of emergent themes. Finally, the conclusion summarises key issues, and suggests some possible areas for future research in this field of study.

## **TECHNOLOGY OVERVIEW**

### **The IoT Concept**

There are a number of different but overlapping definitions and understandings of IoT in the extant literature. Wollowski and McDonald (2019) suggest that “at the most basic, IoT is about connecting all sorts of things to the internet. Those things, whether washing machines, cars, our bodies, or our food, produce data, in particular real-time data” (p.119). This is elaborated upon by Zscaler and ThreatLabZ (2019) who affirm that “IoT devices are nonstandard computing devices that connect wirelessly to a network, and have the ability to transmit data. These devices can communicate and interact over the internet, and they can be remotely monitored and controlled” (p.3). Gillis et al. (2020, February) bring in some other related concepts when they suggest that IoT is “a system of interrelated computing devices, mechanical and digital machines, objects, animals or people that are provided with unique identifiers (UIDs), and the ability to transfer data over a network” (para.1). Finally, Qlik (2018) provide an idea of the scale and impact of IoT in their definition: “the Internet of Things is the network of connected devices or ‘things’ with sensors that collect and transfer data through the internet, from wearable devices, connected vehicles, smart homes and even smarter cities to the Industrial Internet of Things (IIoT) or Industry 4.0. It is estimated that there will be more than 20 connected devices per person on the entire planet by 2020” (p.2).

However, other authors point out that it is the combination of IoT with other digital technologies that has most potential for radical transformation, notably in the areas of better predictive capabilities and enterprise machine optimization. Custance (2020), for example, notes that “IoT, coupled with cloud, enables efficient sensing and understanding of the environment, machines, assets, and people, providing a broad range of applications which can help businesses and their staff” (p.3). In similar vein, Carew (2020, July 31) has assessed the potential of Artificial Intelligence (AI) working with IoT. He points out

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