Chapter 6
Rise of the Non-Human Actors:
The Internet of Things

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ABSTRACT

The internet of things (IoT) involves connections of physical things to the internet. It is largely about the relationships between things, or non-human actors. In the past, it was rare for non-humans to interact with each other without any involvement by humans, but this has changed and the "things" sometimes seem to have inordinate power. Where does this leave humans? Are the things taking over? As a consideration of interactions like this must be a socio-technical one, in this chapter, the authors make use of actor-network theory to frame the discussion. While the first applications for IoT technology were in areas such as supply chain management and logistics, many more examples now can be found ranging from control of home appliances to healthcare. It is expected that the "things" will become active participants in business, information, and social processes, and that they will communicate among themselves by exchanging data sensed from the environment, while reacting autonomously.

INTRODUCTION: PEOPLE AND THINGS[1]

New technologies bring advantages and positive disruptions. They also have the capacity for unexpected outcomes when faced with people. Charisi et al. (2017) remind us of a Chatbot experiment that went wrong: "Tay was an artificial intelligence chatter-bot released by Microsoft Corporation on March 23, 2016 and taken offline 16 hours after launch (Wakefield 2016). Tay was programmed to learn from conversation, however, it took the netizens a very short time to 'train' it into making morally questionable statements."

Probably the fastest growing technology intimately of concern to people is the Internet of Things. The Internet of Things (IoT) could be described as technology which connects any physical thing to the Internet in order to exchange information (Colitti, Long, DeCaro & Steenhaut 2014), and could be seen as "… all about physical items talking to each other" (Mukhopadhyay & Suryadevara 2014: 2). The goal is to make use of computer sensor information without any need for human intervention. The IoT is largely about the relationships between things, or non-humans actors. Song (2014:75) suggests that soon "… computers would be able to access data about objects and the environment without human interaction." Clearly any consideration of implications of the IoT must be a socio-technical one and in this article we will make use of Actor-Network Theory (ANT) to frame the discussion. We will ask: are the things taking over?

The European Union organisation for Coordination and Support Action for Global RFID-related Standardisation Activities (CASAGRAS) sees the Internet of Things in terms of a "*metaphor for the universality of communication processes, for the integration of any kind of digital data and content, for the unique identification of real or virtual objects and for architectures that provide the 'communicative glue' among these components*" (CASAGRAS 2014:5).

Actor-Network Theory (Callon & Latour, 1981; Callon, 1986; Latour, 1986; Law & Callon, 1988; Latour, 1996) considers all the various interactions between human and non-human actors: between people and people, people and things, and things and things. In the development of computers and the Internet we have seen a trend from machines that initially required a good deal of interaction with humans, to machines that require less such interaction: a move towards machine independence (Tatnall & Davey, 2016).

In this article we will make use of this metaphor to look at how humans relate to the Internet of Things along with other non-human technologies and where the relationship between these technologies and humans may lead in the future. In some cases specific uses of IoT technologies are deliberately activated by humans while other cases are not directly human initiated and need no human input to operate. Advances in artificial intelligence that reduce, or even remove the need for human

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