

## **The New Generation of “Connection”, The New Generation of “Communication”: An Examination of Internet of Things (IoT)**

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### **Extensive Summary**

#### **1. Introduction**

The internet of things, a frequently used term to describe technological developments around the world recently, constitutes a new subject for scientific researches since it is still in its formation stage (Ju, Kim and Ahn, 2016; Balaji and Roy, 2017). To study and explore the subject “internet of things” can be possible in many disciplines. However, the main strength of the subject is that it can greatly affect the daily lives and behaviors of potential users in various ways (Atzori, Iera and Morabito, 2010). As noted by Atzori, Iera and Morabito (2010), this technology is important for both users and businesses. From this point of view, the aim of this study is providing evidence that this technology is not only “a technological innovation”; it can be also used to gain competitive advantage by “businesses” and can create value for “consumers”, and thus revealing what the internet of things means for "business" and "consumer".

#### **2. “Internet of Things” as A Concept**

The concept of "internet of things", was first used by a British entrepreneur in 1999, and then Haller, Karnouskos and Schroth's (2008) work on how the internet of objects creates value to invest in businesses and Ashton's (2009) on how this

technology can be implemented came (Haller, Karnouskos and Schroth, 2008; Ashton, 2009; Kim et al., 2017). It has been generally accepted that the term of *internet of things* can be used as the “communication” ability of things with other things, devices or people through various (Ju, Kim and Ahn, 2016; Balaji and Roy, 2017) (Andersson and Mattsson 2015; Whitmore, Agarwal and Da Xu, 2015; De Cremer, Nguyen and Simkin, 2017). Indeed, things communicate with other things on behalf of people through internet technology and that brings the beginning of a new era in information and communication technologies. This refers to a period of "any things, anytime, anywhere" connection (Tan and Wang, 2010).

### **3. Theoretical Background**

According to Alter (2013), a work system, even if it was created by using information technology heavily, is not only related to information technology-based issues such as software. It should also include such issues like human-computer interaction, the use of information technology with a competitive advantage, business-information technology cooperations, information technology strategies, and the impact of information technology in society and so on. This led to the work system theory, which has developed a perspective that allows systems to be understood within organizations. The theory also consider the fields in which the systems operate and the related parties. It also strengthens the interaction of information technologies with social sciences such as business administration, management and marketing. In the context of this article, internet of things is considered a complex and socio-technical work system parallel to Krotov (2017). In order to provide a holistic perspective, Krotov (2017) discussed the concept with the dimensions of technological, physical and socio-economic environment, and held it as a "complex and socio-economic" system, which is composed of various technologies and encompasses various parties. Within the scope of the present study, a similar approach was taken to explore the use of information technologies to gain competitive advantage within the framework of work system theory (Alter, 2013).

### **4. Benefits of Internet of Things**

#### **4.1. For Consumers**

Internet of things allows the development of many new applications that will enhance the quality of individuals’ lives (Xia et al., 2012). The general tendencies, habits, etc. of users can be learnt by connected devices through internet of things. Besides, it develops a control mechanism according to the daily lives of the people and this be considered another benefit of the internet of the things for the consumers (Ju, Kim and Ahn, 2016). This technology offers the opportunity of "control" to its users for such expenses like electricity, water, etc. and people can control these expenses by controlling the connected devices.

#### **4.2. For Businesses**

It is seen that the main benefit of internet of things for businesses is "data acquisition" (Yang, Yang and Plotnick, 2013; Weinberg et al., 2015; Ju, Kim and Ahn, 2016; Balaji and Roj, 2017; De Cremer, Nguyen and Simkin, 2017; Falkenreck and Wagner, 2017 Saarikko, Westergren and Blomquist, 2017). The obtained data are concurrent (Balaji and Roj, 2017; Falkenreck and Wagner, 2017) and continuous (Saarikko, Westergren and Blomquist, 2017). In this context, data collection and sharing

processes are much more powerful and efficient (Yang, Yang and Plotnick, 2013). In other words, the Internet of things has created a new kind of data gathering in the sense that the data can be generated automatically (Fleisch, 2010).

### 4.3. Threats

In addition to the benefits of *internet of things* for businesses and consumers, there are some threats to the nature of the objects (Roman, Zhou and Lopez, 2013). It can be seen that the most important ones of these threats are privacy and security (Roman, Zhou and Lopez, 2013; Weinberg et al., 2015; Li, Tryfonas and Li, 2016; Kim et al., 2017). Concept of security in this technology; (Keoh, Kumar and Tschofenig, 2014), including data privacy, service continuity and integrity, protection against malware, information integrity, privacy protection, and access control. In this context, it can be said that security includes privacy (De Cremer, Nguyen and Simkin, 2017), which expresses the protection of information and data about users. Here, one of the most important benefits of this technology, data collection and sharing (Yang, Yang and Plotnick, 2013; Weinberg et al., 2015; Ju, Kim and Ahn, 2016; Balaji and Roj, 2017; De Cremer, Nguyen and Simkin, 2017; Falkenreck and Wagner, 2017; Saarikko, Westergren and Blomquist, 2017), constitute an important threat, which should be carefully managed, at the same time.

### 5. Implications

- Wideness of data (Yang, Yang and Plotnick, 2013; Weinberg et al., 2015; Ju, Kim and Ahn, 2016; Balaji and Roj, 2017; De Cremer, Nguyen and Simkin, 2017; Falkenreck and Wagner, 2017; Saarikko, Westergren and Blomquist, 2017), can be a significant contributor to marketing research.

- Through the addition of a powerful control mechanism to the lives of consumers (Allmendinger and Lombreglia, 2005; Ju, Kim and Ahn, 2016) and the enhancement of life quality (Xia et al., 2012), the Internet of things provides effective and facilitating functions to consumers. In this context, it can be argued that businesses can interact with consumers in a new and powerful way by using this technology.

- The integration of products and services with internet of things technology is seen as an "assistant" in people's lives that directly meets of their needs, not with just products and services own. As a result, the scope of products and services is expanding so that businesses have the advantage of offering comprehensive and feature-rich products and services to consumers.

- Businesses will have positive changes in their strategic decisions when delivering products or services produced using the internet of things totally or with help of this technology to their customers.

### 6. Limitations and Suggestions

The fact that the articles hold the subject of *internet of things* is rather narrow in Turkish literature and that represents the limitation of this study, which aims to explain the subject in a broad perspective. When the issue is dealt with from a managerial point of view, it can be seen that in addition to the benefits related to gain competitive advantages, businesses also need to move towards solutions that will govern the threats and challenges of the internet of things. This can be achieved not only by the turning of threats into new business models, but also through the management of existing systems. On the other hand, studies can be carried out to discover what the scope of technology is

and what it means for the parties that develop and implement it, as well as what are the perspectives of the buyers of this technology in future research.

## **7. Conclusion**

Within the scope of this study, which aims to provide evidence that this technology is not only “a technological innovation”; it can be also used to gain competitive advantage by “businesses” and can create value for “consumers”, conceptual framework, theoretical background, applications, benefits, threats of *internet of things* were presented. After that, managerial implications about gaining competitive advantage by using this technology were given in the study.