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## The Framework of Business Model in the Context of Industrial Internet of Things

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### Abstract

The purpose of this article is an attempt to develop the concept of a business model dedicated to companies implementing technologies of the Industrial Internet of Things. The proposed concept has been developed to support traditional companies in the transition to the digital market. The study was based on the available literature on the impact the Industrial Internet of Things has on the economy and business models.

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### 1. Introduction

The digital revolution changes the perception of the economy and business. The current rate of technological development makes the standard IT business systems considered unsatisfactory. Nowadays, the goal of most IT providers is delivering systems as much as possible intelligent. Increased use of mobile technologies and cloud computing initiates changes in the design and ways of using applications. The possibility of communication between machines without human intervention and analysis of the acquired data in this way allows monitoring and automating many processes. It drives to the growing importance of the Internet of Things [1, 2]. It causes, that companies are somehow forced to redesign their products and to reorganization activities, aimed at provide the client specific benefits and survive in the market [3].

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## 2. The Industrial Internet of Things

The concept of the Internet of Things was first used by a British entrepreneur, Kevin Ashton, in 1999. He used it to name the communication system of the material world with computers by using sensors. This concept involves combination clearly identifiable devices via a computer network. Objects thus have the possibility of direct or indirect data collection, processing or exchange. Beyond smartphones and tablets, devices connected within IoT are also household appliances, lighting and heating as well as wearable devices [4]. At the turn of 2008 and 2009, the number of devices connected to the Internet exceeded 7 billion. This moment is considered appropriate to initiate the development of the Internet of Things. CISCO Systems Inc. has formulated a broader concept for this phenomenon – the Internet of Everything. This concept defines the connection of people, processes and data via the Internet [5].

IIoT (Industrial Internet of Things) is a concept based on the same principles as the IoT, but for the connection of machines in the factory. IIoT is primarily communication between machines (M2M) and autonomous action based on the information exchanged with each other. An extremely important role in this type of communication plays a layer of high availability software. It makes the Internet of Things can be used in all of industries. It allows the network system to work with other systems to provide information, e.g. about any problems on the state of the equipment, etc. Employees receive them on mobile devices and can appropriately react quickly. The information is provided in a right time, without delay. Another element having a crucial impact on the increased use of IoT in industry is to equip factories with large quantities of sensors. In the industrial centers began to use signals from a large number of connected sensors, combining them with high power computer, which began building the foundations of a new generation of intelligent factories. Once all the data industry, will eventually be connected online, comprehensive software will be able to be used to optimize exactly everything [6].

IIoT ecosystem consists of several layers of hardware and software. The first consists of many sensors, which collect data relating to processes. Then, the data using a communication hub, gateways and switches, are sent as Big Data to the cloud computing or intranet. Transferred data can be analyzed using a variety of analytical and optimization programs, and then uses them to increase the efficiency of production for a lot of types of tasks that make up the production and service, and better use of resources. IIoT provides the ability to integrate data from the production software with ERP and CRM systems. The production activity can not only be used effectively in the planning and evaluation of processing costs, but also to use information from buyers, enabling real-time to make changes to the assembly lines and process parameters [6].

The main risks of the development of IIoT are related to the exclusion of a large part of employees as a consequence of the high level of automation. Probably they will be forced to raise their skills and to get knowledge of advanced tools. The second most frequently mentioned threat is the risk of interception of data stored in the cloud by unauthorized persons. It should be noted, however, that the works on the development of this technology, and thus also increase the security of stored data [7].

Analyzing publications related to the development IIoT, we can often meet the term Industry 4.0. It is a term for generalizing the concept relating to the “industrial revolution” in connection with the modern mutual use of automation, processing and exchange of data and techniques. Differences between IIoT and the Industry 4.0 are not large, and these concepts are often considered equivalent. Still, we can venture the opinion that the way to Industry 4.0 lead by IIoT. Industrial Internet brings together numerous applications and operating on a smaller scale (sensor), which becomes the infrastructural base for larger applications (automation) associated with Industry 4.0 [8].

## 3. The phases of Industrial Internet evolution

Companies are beginning to see the potential in the Internet of Things using in order to optimize production. However, this is a big challenge. Implementation IIoT requires appropriate infrastructure, as well as a change in the approach to the management of the organization. It should focus on delivering value for customers. Figure 1 shows four predicted phases of the IIoT development.

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