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INTERNET OF THINGS: OVERVIEW, ADVANTAGES AND DISADVANTAGES, CURRENT TRENDS

Internet of Things is one of the most modern trends in IT. Institute for Housing and Urban Development Studies predicts that there will be approximately 70 billion IoT devices in existence by the end of 2025 [1].

But what is Internet of Things itself? The Internet of Things (IoT) is the network of physical devices, vehicles, home appliances and other items embedded with electronics, software, sensors, actuators, and connectivity, which enables these objects to connect and exchange data. Each thing is uniquely identifiable through its embedded computing system but is able to inter-operate within the existing Internet infrastructure [2].

The first smart device (the first Internet-connected appliance) was a modified Coke machine at Carnegie Mellon University. It was able to report its inventory, and whether newly loaded drinks were cold.

The concept of Internet of things became popular in 1999, through the Auto-ID Center at MIT and related market-analysis publications. Radio-frequency identification (RFID) was seen by Kevin Ashton (one of the founders of the original Auto-ID Center) as a prerequisite for the Internet of things at that point. Ashton prefers the phrase "Internet for things." If all objects and people in daily life were equipped with identifiers, computers could manage and store them. Besides using RFID, the tagging of things may be achieved through such technologies as near field communication, barcodes, QR codes and digital watermarking.

Since then, the idea of smart devices spread out so much that it covered a wide range of applications such as healthcare, utilities, finances, traffic, etc. A lot of big companies are taking part in the development and improvement of IoT. There are the biggest of them: Amazon, ARM, AT&T, Ayla, Bosch, Cisco, Dell, Fujitsu, GE, Google, Hitachi, Huawei, IBM, Intel, Microsoft, Particle, Qualcomm, Samsung, SAP, Siemens [3].

It is obvious that this technology would not be so popular if it didn't give any advantages in the fields where it is implemented.

The major advantage of the IoT is the possibility to integrate the system into the surrounding environment where it can adjust and perform work based on aggregated data, making day-to-day life more convenient, easier and more productive. IoT devices can be compact, ergonomic and may not differ from regular social life objects.

The IoT can be used in medicine performing a continuous medicine check, in everyday life – developing the smart house paradigm, wide application in all kinds of industries, utilities, logistics, education, entertainment sectors, etc. [4].

Undoubtedly, the IoT world of future can be exciting and carefree, although at the moment this technology is too young and requires huge investment of funds to realize the conceived potential. One of the most salient weaknesses of the IoT is its implementation and upkeep costs.

There are many different manufacturers of the smart things already exists and they support only their own products, creating certain limitation of choice for the potential customer and the need to use individual applications for IoT devices administration.

Bret Greenstein, VP of IBM's Watson IoT Consumer Business, who highlights four key IoT trends.

Interestingly three of those trends were around convergence with other distinct yet highly correlated technologies. This underlines the principle that data is the fundamental ingredient of digital transformation. The technologies predicted to make big waves in the coming year – including IoT, artificial intelligence, blockchain and edge – are all methods of collecting, analyzing and storing information.

AI will make the IoT smarter and more productive to work with. According to Greenstein, however, 2018 is the year that understanding of its role as the brain running IoT systems will spread. As more and more devices become connected and capable of speaking to each other, AI – deep learning, natural language processing, image recognition and neural-network driven decision-making – will help them to understand each other, and us.

More CPU power will be spent at the edge. Pushing processing power to the “edge” – the front-facing elements of the IoT such as cameras and sensors which traditionally passively collect data to be processed in the cloud – brings a number of benefits and opportunities. Movement towards greater exploitation of this technology is a key trend for 2018 too, says Greenstein.

Blockchain adds immutability and integrity to IoT transactions. Blockchain and the IoT in many ways seem built for each other. Blockchain – a distributed and encrypted digital ledger – is well suited for recording details of the millions of transactions which take place between IoT machines. It's only recently that the idea of convergence between these technologies has been widely talked about, though. Greenstein tells me that though the partnerships are not yet public IBM is working in “multiple industries” with clients on bringing them together and hinted that more details are very likely to emerge in 2018. “What people missed about blockchain, because they were so focused on the financial side of things, which is the obvious use case,” he tells me, “is that all of this IoT data, particularly in supply chains or where things move between owners, requires all of that data to be stored in some kind of unchangeable record.”

Massive growth of IoT in manufacturing and industries is being expected in the nearest future. Augmentation is the keyword here – and the vision here is that smart, connected tech will continue to help humans in skilled and manual tasks. This will be done by giving them access to context-sensitive insights that answer specific questions about specific things at the right point in time [5].

As a conclusion we can obviously state that IoT is a technology of a future. Of course, there are a lot of things to study and to research, and a lot of work to do. It is undeniable that this technology will make our life easier and bring much value in different fields.

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