THE IMPACT OF THE INTERNET OF THINGS ON THE ECONOMY OF BUSINESS ENTITIES

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Annotation: In this digitalized era, almost every work can be done with the help of technology, even in the last decades, it was an imaginary situation of seeing robots doing the work instead of people. However, thanks to the advancements in various scientific fields that the most hazardous jobs are now solved by robots, such as fighting against fire, or different laboratory stuff or even some surgeons. Since it's become handy at such scale, businessmen have also started implementing diversity of achievements of science in their entities. Take internet of things (IoT) as an example. IoT often helps to keep contact among such electronic things at anywhere comfortable, it can be your workplace, home, university, shop and so on and this thesis is going to state some persuasive ways of using IoT in business.

Key words: IoT, sensors, actuators, internet, industry 4.0

Special tools, sensors, technologies with various software and processing ability which are all connected within the internet are called the internet of things (IoT). IoT is considered to be one of the greatest achievements of 21st century and thanks to the developments in sensor productions, connectivity, cloud computing programs, artificial intelligence that is conversational and machine learning and analytics, internet of things have been evolved successfully [1].

The term "Internet of Things" first introduced in the speech by Peter Lewis and he defines it as integration of people, processes, technologies with connectable devices.

Definition of IoT differs from person to person. As for me, internet of things is a group of smart devices which are connected with each other by means of internet and special software programs to ease our life. And those technologies can gather and exchange data with each other during the process. In IoT architecture, there are two types of technologies: sensors and actuators or controllers in other words. Sensors are the devices that are connected together, whereas actuators are the ones that convert the electronic messages to physical actions. These orders made might be opening the door of your house, starting your car or the vacuum cleaner, lowering the temperature of the room and so on. To be more precise IoT is equal to sensors plus controllers plus internet.

Currently, it is possible to have a communication between people and technologies, we just connect everyday objects - cameras, kitchen tools, cars, thermostats and other home appliances through the net and control from distance.

The internet of things is being consumed widely, today, in the field of home automation, to provide care facilities, in medicine and healthcare, transportation, in industries, manufacturing, agriculture, infrastructure, environmental monitoring, management of energy, military and so on [2].

Now, let us look at how IoT affects business.

The smarter the products, the easier and more comfortable we live. In other words, IoT brings new smart devices for usage and it provides with the best versions of current goods.

Thanks to IoT that now big companies, such as Microsoft, Apple, Google or others are using the big data to get to know what the customer wants, with the information changes occur in unnecessary features and goods will be improved.

The internet of things also reduces the number of inaccuracies happening to the machines connected together. Since IoT sensors are always controlling the health of machines, any problems can be noticed beforehand and it is believed that these sensors can take action before any failure occurs. As a consequence, maintenance costs of businesses will be less, which in term means better downtime management as it allows scheduling the optimal time for any fixation.

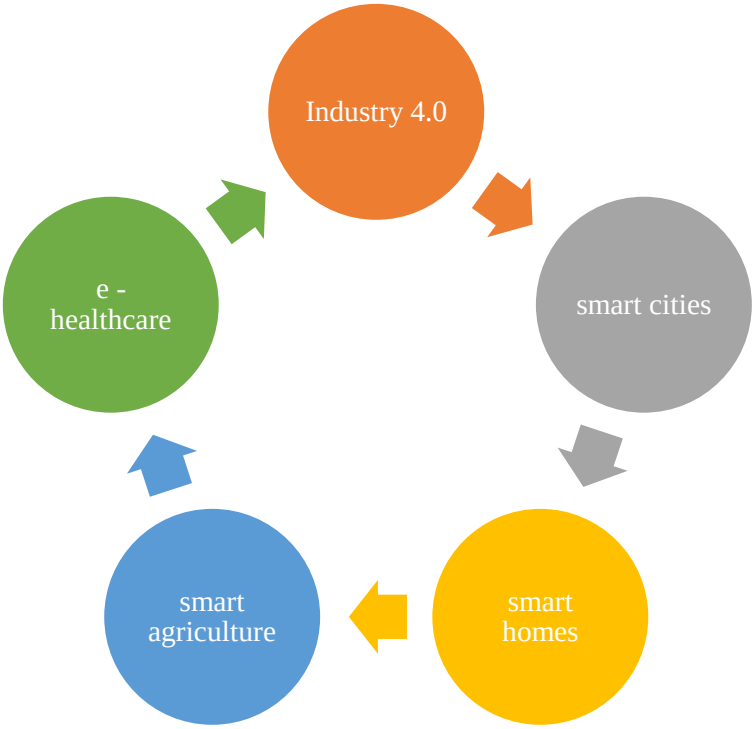
Businesses who implied IoT will have an opportunity of better waste management because an annual 5-15 % decrease in energy consumption is estimated if a company empowers the internet of things' monitoring systems. The biggest contribution to electricity savings will be associated with smart electricity grids. [3]

The next noticeable effect of IoT can be seen in the spread of remote working. Not a secret that just some years earlier, the whole world suffered from the Covid-19, but after that pandemic period a new way of working boomed in the business field. According to statistics, companies increased the opportunities of distance work. It is noteworthy, there is a difference between working from home and distance work which means diversity of workers at the workplace. In 2018, the percentage of distance workers was around 7.9 %, globally, which means about 260 million people, but now it is around 1.87 billion.

It also effected the remoteness of education in terms. Especially, in higher education, particularly, college students are moving away from the ordinary teaching methods toward laptops, computers, smartphones. So, they have the chance of studying from home. While it can be convenient for them, it also benefits the quality of the lessons. Professors can only pay attention to their lectures rather than being snowed under tons of paperwork.

What types of new business models emerge along with the growth of the internet of things trends, while the existing ones will change?

Figure 1. The areas which will be affected by IoT.



Industry 4.0

Industry 4.0 is the new industrial revolution that aims at making the industry smart with interconnectivity, automation, and real-time data monitoring and exchange. Industry 4.0 is entirely customer-centric, necessitating the manufacturers to put added efforts in order to deliver priceless customer experience and services. The customer-centric approach of industry 4.0 covers product visioning, product sales, manufacturing, assembling, and service management. IoT makes this process absolutely effortless by helping the owner stay updated with the continuously evolving needs and expectations of customer [4].

To be more simple, industry 4.0 is a transformation of manufacturing to a fully digitalized process which is controlled by intelligent systems in real time based on the global industrial network of the Internet of Things and Services [5].

Smart cities

The concept of smart city is not that widely spread yet, even though some basic elements have already been invented, such as street light adjustment. Along with various software programs, the Internet of Things is used to exchange data between public and machines. The information came from IoT is stored on special clouds and developed or improved if necessary, of course every process wil be conducted with a special security system.

Smart homes

In simplified words, IoT operation has got 5 stages at smart homes, beginning with connecting devices. In this step, all appliances should be linked via wireless protocols, like Wi-Fi, Bluetooth or something else. Then IoT sensors start gathering data, they detect the temperature of the room, light, or others and send them all to the central hub. Before being commanded by the hub, the received data is processed in the heart of the smart home. The last element of our chain is

the interaction that an owner can do with his home with the help of different applications or web interfaces, by them owners monitor and control.

For the reasons of growing market demand, partnership opportunities, sustainability, flexibility, and most importantly energy efficiency, business in smart homes industry can be counted as lucrative venture.

Smart agriculture

IoT-enabled smart agricultural solutions are intended to assist in automating irrigation systems and use sensors to monitor crop areas. Farmers and related brands may now conveniently and remotely check field conditions without any difficulties [6]. Since 1800s a number of robots are being used in agriculture, starting from weeding robots to harvesting ones. The most distinctive IoT-based device is remote sensor, revolutionized way of collecting data about the conditions of crops, weather, soil quality and so on.

E-healthcare

Healthcare is one of the most positively affected industries by the Internet of Things. In this case IoT becomes a health assistant and collects biometric data of patients and send them to doctor, so that they can diagnose better as they have the real time diagnosis of the patient.

Implementing the IoT in business may offer several benefits including:

- Distance controlling
- Maintaining before the problem occurs
- Data-driven decision making
- Cost savings
- Better operational efficiency

All things considered, applying the Internet of Things in your industry is a wise decision, even if it is manufacturing, investing company or servicing one.

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