

## **INDUSTRIAL INTERNET OF THINGS AND ITS APPLICATION IN BELARUS**

The aim of the research is to examine such aspect of cloud technologies as Industrial Internet of things (IIoT) and to determine conditions of its development in Belarus.

The Industrial Internet of Things (IIoT) is a system of integrated computer networks and linked industrial physical objects with built-in sensors and software, that are used for collecting and exchanging data, with the purpose of remote monitoring and control in an automated mode, without human intervention. The advantages of Industrial Internet of things lie in the fact that it has assisted in transforming industrial growth and economy ensuring greater efficiency across the value chain manufacturing system.

IIoT technology helps in predictive maintenance. The manufacturing and other similar industries bear a great loss every year due to faulty equipment and system failures. By implementing the IoT automation tools, it becomes easier for the operator to predict the fault in a machine or identify probable defect even before it arises and take predictive measures to ensure safe machinery. As a result of this, manufacturing unit save time, reduced repeat work and lower scrap.

Another benefit of IIoT is connected with cost-effectiveness. Automating the industries brings in the possibility of saving costs on extra human labor, which has its own limitations. Not only that, industrial IoT reduces the overall expenditure by conserving energy. Smart meters record and regulate the factory's use of basic resources like fuel, electricity, water, gas, etc. and gives you a report of the consumption so you cut it down or amp it up accordingly to save money.

IIoT allows to improve asset tracking and management. The logistics, packaging, and retail industries are the fastest growing domains to hold a huge volume of assets and make use of real-time asset tracking mechanisms to track inventories, location, supply chain and customer service altogether. Right from manufacturers, wholesalers, distributors/dealers to consumers, track status and transmit the location of the stock [1].

What concerns Belarus, the development of the Industrial Internet of things is gradually finding its application in our country. It relates primarily to the production segment. In particular, to industry, public transport, logistics, agriculture and banking. At the state level, we can talk about implemented solutions for smart cities using Wi-Fi infrastructure. The consumer segment in Belarus is mainly associated with the proposed smart home solutions. And it should be definitely noted that Belarusian IT companies, represented in local and international markets, are quite strong in the above three areas. First of all, due to the IoT solutions already developed by them and put into practice [2].

Among the achievements of Belarussian projects in this sphere we can mention the mobile operator velcom who was the first in Belarus to launch the NB-IoT network.

NB-IoT (Narrow Band Internet of Things) is a mobile communication standard developed in 2016 to exchange data between digital devices. It will help to accelerate the transition to digital meters, sensors and devices, which will facilitate the lives of people and increase the efficiency of Belarusian enterprises. One of the directions is the creation of a single platform, which can receive data from each smart device. Through a special application, you can not only monitor all processes, but also manage sensors, counters and other digital devices [3].

But it goes without saying that despite all benefits of IIoT this technology has its own disadvantages and security setback is one of them. IIoT operates over the unfathomably vast plane of the internet. Data is received, shared, maintained and analyzed over the cloud. Now, there exist certain sinister entities over the internet which try their best to hack the core systems of enterprises, and release malware or viruses in its data constitution. If the network of an industry gets hacked, it will turn the smart interconnected devices rogue and bring failures where there should be profits.

There can be compatibility issues as there are no international standards of compatibility that current exist at the macro level for the Internet of Things. This can make it difficult for some machines to speak with one another, especially if they come from different manufacturers.

We should also take into consideration that it has the potential to eliminate jobs. When technology can eliminate the human need for involvement, then a company saves money, but entry-level workers lose opportunities and paychecks as a result [4].

In conclusion we may say that Belarus has a great potential in the development of IIoT, but there are some issues that hinder its spreading in our country. Among them we can mention lack of a legislative base and a regulatory state body for the implementation of such decisions, lack of an approved set of common standards for various industrial sectors and developed cross-platform solutions, the problem of ensuring the security of IT systems of enterprises and insufficient amount of funds in IT budgets for the development and implementation of new technologies.

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## **DIGITAL TRANSFORMATION OF A COUNTRY AS A SOCIAL AND ECONOMIC PHENOMENON**

The accelerated pace of the information society requires an increasing volume of data to be presented in a concise form. The main means of doing so today is by applying digital technology. This process is increasingly interpreted as an independent phenomenon of the emergence of digital reality, or digitisation. The relevance of this study is to consider algorithm of development of concept of smart city, to analyze leading country in this direction and the Republic of Belarus and to make proposals on the basis of a comparison.

One of the most prevalent concepts at present, in which ideas about the future of cities and ways of solving their problems are reflected, is the concept of the «smart city». At the most abstract level of the paradigm of the «smart city» is an innovative way of achieving high quality of life of the city community. At the same time, it is a systemic phenomenon integrating within a single urban space such as: smart economy; smart mobility, smart environment, smart people, smart life, smart management.

Assuming that the strategic goal of realising the smart city concept is to improve the quality of life of the population and to create an attractive environment for business. The focus of all activities to introduce the elements of smart city is, firstly, the identification of quality of life parameters and the assessment of quality of life by the urban community. Secondly, the very identification of quality-of-life estimates cannot be given exclusively to the «at the expense» of the population who are prone to immediacy and emotionality. Quality of life parameters should be formulated based on a scientific study of the problem taking into account the views of the population.

Hence, the general algorithm for developing the concept of a smart city should be roughly as follows:

- formulation of parameters appropriate to the possible and desired quality of life of the population;
- verification of the identified parameters through analysis and scientific interpretation of the results of the public opinion study;
- clarification of parameters and their desirable and possible values, taking into account the level of development of the city's economy;
- formulation of a system of criteria and indicators reflecting the possible level of achievement of the quality of the smart city (the concept itself needs to be clarified);