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## Peculiarities of product policy in the internet of things

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**Abstract.** A marketing analysis of the Internet of things problem was carried out, which showed that the development of the Internet of things will have in the near future a significant impact on the markets for goods and services, product policies in a number of industries, and, above all, the trade industry. The conceptual foundations of the development of the Internet of things have been explored. It is shown that an element of the “thing” interaction system will become an active participant in business processes, information and social processes in the future, and will be able to interact and exchange information about the environment, respond to and influence processes occurring in the outside world, without human intervention. The development of the Internet of things implies significant changes in the formation of product policies, enterprises producing various goods, trade, services. It is recommended to consider the Internet of things during formation of development strategies as an integral part of the innovative assortment policy, aimed at creating new products, imparting new properties and characteristics to the manufactured goods. Opportunities for entering new markets are defined within the framework of the interaction marketing and the Internet of things concept. Structural changes in the product policy have been revealed under the influence of the development of the Internet of things that determine that the formation of development strategies within the concept of the Internet interaction of things should be viewed as an innovation trend in product policy, mainly focused on: the creation of new “smart” goods and services; imparting new functions to the traditional products within the framework of the “product-external environment” interaction; the formation of new markets for devices, equipment, systems of interaction of various objects. The peculiarities of the communicative policy, aimed at the formation of a new everyday culture, focused on the ecology of technological innovations based on the understanding of the deep interrelation of human, natural and technological, have been defined.

### 1. Introduction

The modern world features an active transition of various elements of life from the real environment into the virtual environment. These changes occurring before our eyes are of fundamental importance for all spheres of public life and have received a capacious name – the “fourth industrial revolution”



[1]. It is impossible to achieve competitive advantages in the modern economy in terms of improving product policies, product mix structure and product safety without the use of information and communication technologies (ICT), computer networks, digital communications, automated enterprise management systems and other new innovative technologies.

The transition to digital economy is characterized by the expansion of the functions of all departments of an enterprise and involves the constant updating and innovative development of technological, commercial and marketing tools based on the latest achievements in the field of ICT.

The purpose of this work is to study the problems and challenges of the Internet of things as a tool to increase the competitiveness of the development of Russian enterprises, aimed at optimizing product policies and the range of consumer goods and increasing their security.

To achieve this goal, the following tasks have been solved:

- conducting a marketing analysis of the problems of the Internet of things;
- revealing significant changes in the marketing activities of enterprises producing various goods, trade, services under the development of the Internet of things;
- proposing to consider the Internet of things as an integral part of the innovative product policy aimed at creating new products, imparting new properties and characteristics to the manufactured goods, a way to enter new markets when shaping the development strategies of organizations.

The methods of analysis and synthesis have been used in the course of work on the study.

The definition of the role of the Internet of things in solving business problems of the organization was the result of the study.

## **2. Marketing analysis of Internet of things problems**

A rapid growth of the Internet audience and the connection of various devices to the global network has become one of the key moments in the development of the modern information economy. The study [2] notes that the number of devices connected to the Internet has exceeded the population of the Earth. This allowed experts to say that the Internet as a worldwide network that connects people has actually turned into the “Internet of things”.

According to Cisco [2, 3] the trend of the development of the Internet of things will continue. According to researchers the number of devices connected to the Internet will reach 50 billion in 2020. It is noted that the largest number of them will not be laptops, smart phones or tablets connecting people, but cars, buses, solar batteries, electric motors, robots, pumps, etc. connecting machines (things) with each other without direct human intervention. The Internet of things market will reach a capacity of \$19 trillion.

In our opinion the development of the Internet of things will have in the near future a significant impact on the markets for goods and services, innovation and product policies in a number of industries and, above all, in the trade industry. Therefore, it is necessary to determine the possibility of using the Internet of things to improve the competitiveness of enterprises.

## **3. Conceptual basis for the development of the Internet of things as an instrument of product policy**

It seems relevant to analyze the definitions of the “Internet of things” that were formulated by the expert community and determine its role in the element of the “Product” marketing mix as well as product policy.

The International Telecommunication Union (ITU) at the UN has defined the Internet of things (IoT) in the context of project for the global standardization of initiatives, as follows: “A global infrastructure for the information society, enabling advanced services by interconnecting (physical and virtual) things based on, existing and evolving, interoperable information and communication technologies” [4]. Actually, the very phrase “Internet of things” emerged from the title of the presentation that Kevin Ashton, the founder of the Research Center for Automatic Identification (Auto-ID Center) at the Massachusetts Institute of Technology, made for Procter & Gamble in 1999 [5]. Ten years later, the Internet of things became the reality of a modern high-tech society.

The authors of publications on the Internet of things [6] suggest that an element of the “thing” interaction system will become in the future an active participant in business processes, information and social processes, and will be able to interact and exchange information about the environment, respond and influence processes occurring in the outside world, without human intervention. The result will be a change in ideas about engineering systems, health, safety, interaction with the environment and the properties of things. According to the worldwide PwC Digital IQ® survey in 2017, the Internet of things ranks first among eight breakthrough technologies that can change the business models of companies or entire industries, ahead of artificial intelligence and a number of others [7].

It seems equally relevant to determine the role of the Internet of things as an instrument of product policy and improvement of the quality of goods in terms of ensuring the safety of goods. We have made analysis of the transformation of an element of the “product” marketing complex under the influence of the Internet of things in our work [8], which shows that equipping a product with the embedded technologies of interaction with other products or with the external environment makes it possible to impart new properties and characteristics to it that are of value to the consumer. Thus, using the concept of marketing spatial interaction [9], the Internet of things should be regarded as an innovative direction in product and marketing policies, focused on the creation of new products and/or on imparting new properties to the goods based on their interaction with each other or with the external environment.

#### **4. Structural changes in product policy influenced by the development of the Internet of things**

We believe that the formation of development strategies in the framework of the concept of the Internet interaction of things should be viewed as an innovative trend in product policy, mainly focused on: creation of new “smart” goods and services; imparting new functions to the traditional products in the context of the “product-external environment” interaction; formation of new markets for devices, equipment, systems of interaction of various objects.

The analysis of existing publications [10, 11] makes it possible to introduce a number of changes in the organization of marketing activities for the formation of product policies, in the introduction and approval of the market for new products related to the Internet of things.

Firstly, the development of the tendency to unite the traditional stages of the innovation process [8], which can contribute to the creation of fundamentally new services and new markets.

Secondly, there are problems in choosing the type of cooperation between development agencies, manufacturers and users of new products and services.

Companies such as AT&T, Cisco, GE, IBM have created the Industrial Internet Consortium, aimed at overcoming barriers between different technologies and the integration of physical and digital environments [12]. It is assumed that providing all possibilities of interaction in cyberspace to physical objects the Internet industry will provide significant changes in the communications of people and technologies. Such interaction will be aimed at creating new jobs in “smart” production, healthcare, transport and other industries. The review of the global Internet of things market of 05/2018 [13] provides a number of forecasts for the development of the industry and gives examples of cooperation between companies.

The transformation of the “Internet of people” towards the “Internet of things” signals the orientation of technologies to the post human communication, which focuses on objective events in the physical world, data collection and processing, control decisions, etc.

The wide spread of “machine vision” allows consumers to get a new functionality of traditional products and change the traditional situation of buying household goods. The development of the “smart things” market requires the formation of a new, everyday culture oriented towards the ecology of technological innovations, based on an understanding of the deep interconnection of human, natural and technological. According to this principle, the electronic trading platform Madrobots.ru has been created, where it is possible to buy goods related to the Internet of things in the following areas:

“smart home”, quantified self; digital health; smart watch; 3D printing and scanning; solutions for mobile transport; connected devices [14].

Thirdly, the creation of the infrastructure for the development of the Internet of things, equipment, devices, sensors, software, etc. [2, 3] plays a key role in shaping the product policy that improves the quality of goods.

Proceeding from these examples we can conclude that the development of innovative directions in the company's product policy should be carefully analyzed taking into account the evolution of the Internet of things and the understanding that the development of the Internet of things involves a number of changes in other elements of the marketing mix.

## 5. Results

1. Marketing analysis of the Internet of things shows significant changes in the activities of enterprises producing various goods, trade, services.

2. The Internet of things should be considered when shaping development strategies an integral part of the innovation product policy aimed at creating new products, imparting new properties and characteristics to the manufactured goods, and entering new markets.

3. Participation in the formation of the Internet of things can be seen as a transition to the strategy of a technology leader seeking to capture new market segments of innovative products.

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