

## **INTERNET OF THINGS AS SEMIOTIC PHENOMENON**

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### **Abstract**

“Internet of Things” is a concept of computer network of devices and objects. “Things” can exchange information between themselves and between the environment, regulate their functioning. Moreover, in the framework of the Internet of Things can be implement a digital marking of the world. The trends of the development are so high, that virtual reality extends to many areas of reality and through labelling is trying to include the largest possible number of objects in the universe of information.

This work is related to the semiotic analysis of the concepts and components of the Internet of things. In this context, we can consider the exchange of information between "things" as a kind of message interchanging. As part of this approach we analyse the phenomenon of the digital marking and identification of objects of various natures with special RFID tags. We distinguish and describe the principle of iconicity in the framework of the Internet of things. The semiotic analysis of the technology and the phenomenon of the Internet of things is very relevant in today's society in a situation of erosion of the foundations of social life, increasing attention to the "things" of reality as such, and their peculiarities.

**Keywords:** Internet of Things, Information technologies, Digital marking, Semiotic, Computer technologies

### **1. INTRODUCTION**

The life of modern man cannot be imagined without information technologies today. The increasing role among information technologies in everyday life and in industrial production begins to play the Internet of Things (IoT). Internet of Things is a concept of computer network facilities, which involves the exchange of data between devices- “things” (may take place the data exchange between the devices and the technological chain nodes and the external environment, the interaction with the environment - informational or physical) with the use of network technologies mainly the Internet. This exchange of data often doesn't involve human intervention, or is minimized; the person serves as a designer of technological processes, or as the user.

In industrialized countries, Internet of Things concept is used in industrial production. Many theorists and practitioners noted that the introduction of this technology already had made a revolution in the field of

construction of the technological chain of production and logistic processes, or make it in the near future [1, p.11]. In the frame work of Internet of Things are used different technological platforms and paradigms. For example in the industrial Internet of Things B2B paradigm is used, and in "civil" sector, the paradigm is known as B2C. The last involves the use of Internet of Things in daily life, management of urban infrastructure elements, residential facilities. These include the so-called «smart» houses, equipped with temperature sensors, illumination, state of the locks, engineering infrastructure of the house in the framework of which the kind of self-regulation of the modern human dwellings takes place. It involves the regulation of climate, lighting, and the possibility of remote control of electronic devices and actively uses the Internet to exchange data. To this segment can be also attributed, such gadgets as smart watches, fitness bracelets that monitor in real-time basic biological parameters, the state of the body's systems, the level of consumed calories, followed by data collection and analysis in the framework of special applications for smartphones. The great prospects for development of the Internet of things in such areas as, for example, medicine and transportation are obvious. Thus, within the framework of the Internet of Things can take place the data exchange between objects in relative independence from the man, "things" (here it is possible to think over the obvious connotations of the philosophical concept of "thing" as the substantial and often sensible component of the reality).

We can say that things form a specific network of interactions in which people can act as one of the nodes of the network. Internet things in this respect can be regarded as a kind of ontological and social phenomenon, as it creates a new configuration of people's and thing's being. Socio - ontological meaning of this phenomenon is seen in the two modes.

First, a person is acting as an integral part of the structure or network among the "things". To some extent, the man also becomes a "thing", an element in the system of information flow. The principle of functioning of the Internet of Things resembles transmission of essential and relevant information, which using a data transfer protocol should be clearly understood and used by network nodes. It is appropriate to draw a parallel with the semiological notion of code as the principle that determines the place of the sign in sign system, the rules of symbols combining for creating semantic integrity and creating messages.

We should notice that the impact of information technologies reached such level that the man himself is now trying to exchange only with relevant information, all that is "semiotic excess data" may be rejected. Perhaps that is why the slang of gamers, hackers and IT-specialists not only abound in technical terms and jargon, but also tend to sense capacitance and, often, lack lyrical digressions. One reason for this situation can be almost ubiquitous information noise accompanying the exponential increase of information flows in the modern world. In a situation of strong noise on the information space, a person has consciously rebuild the mode of perception and generation of the information.

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If we turn to the deeper ontological foundation of this phenomenon, it is possible to detect the deformation of the ontological image of modern man. Now we are increasingly turning into a formal set of identification characteristics and parameters, we do not always think through the deeper aspects of life, do not deal with reflections on existential questions that predicted by M. Heidegger, argues that people are increasingly giving the most important considerations at the mercy of "other" "people" (das Man), dissolving its existence in an environment of generally accepted worldview and behavioral patterns [6, p.126-130].

Referring to the semiotic tradition in the spirit of the semiotics of Pierce, within these concept a person is seen as a sign, that as something referring to something else. We should mention that Pearce analyzed as a sign a kind of complex formation, the main feature of which is a reference to other signs (as a signs he understood a variety of phenomena) [9, c. 18-22]. The man, in this sense, serves as a sign too, as a complex set of "hyperlinks" cultural contact points, behavioral, philosophical models [2, p. 194]. Perhaps this is one of the reasons of identity crisis in the social aspect and of the destruction of social ontology as an unshakable belief in the existence of social relations.

Secondly, as part of the Internet of things, a person himself creates the network and tries to control them. In this respect man-actor represent a scientist who in the Actor-network concept of B. Latour creates a whole scientific and socio-cultural network of interactions. Even in the "Pasteurization of France" Latour described the discovering of bacteria by L. Pasteur [11]. He noticed that a scientific discovery – is a combined result of "forces" actions, including, in addition to purely research interest - unsatisfactory level of hygiene development, economic interest of agricultural producers "activity" of the microbes themselves that are actively breeding in established researchers favorable laboratory environment.

Persuading various social groups in reality of microbes, hygienists, headed by Pasteur achieved that microbes came to be regarded as a dangerous reality. Moreover, they moved the scientific "network" laboratories in real life - actively used methods of pasteurization, the hotels began to monitor the cleanliness of bed linen, etc. In his works, Latour develops idea of the network as a combination of elements of various natures that interact and ensure sustainability of the network. For example the facts, confirming the conclusions of the scientific principles and practical achievements in the application of technologies, scientific and Publication apparatus of theoretical science as a totality of views of the scientists, making opposition to the "theoretical" network against costly and unpromising by some theorists who have undertaken to refute the theoretical concepts, financial support from foundations and the state, and etc. [10, p.259]. Very important in this theory is the concept of "machine" or a device (as an example we can mention the diesel engine) as a black box, which through its successful operation provides stability of the entire network [3, p. 282-333]. If you try to extrapolate these thoughts on the peculiarities of Internet of things, it may be noted that many, if not all, elements of the Internet of Things, are important nodes, many of them have an "artificial intelligence" in the process of information exchange and management of interactions with other elements [1, p.11]. The network acts as a kind of self-regulating structure that supports a number of aspects of the functioning of its elements.

Science Network as a public institution is stable thanks to a number of factors: the universality of the language (especially natural sciences), verifiability and reproducibility on the empirical level, many of the provisions, and systemic support to the scientific tradition.

If we try to extrapolate the model of scientific network on the Internet of things, it may be noted that the Internet of things now receives such a development, in many ways, thanks to the universality of the protocols (B2B, B2C), to provide data exchange within its "civil" and industrial sectors. In the industrial segment of the Internet of Things are developed software products that enable not only the automatic control, but also to determine the possibility of reorganization of the production process on the basis of the so-called algorithms predictive analytics (predictive analytics), and large numbers of neural computation theory. The possibility of integration of electronic equipment, which also provides rapid development and stability of the network structure of the Internet of Things, seems promising for us.

Finally, there is the interest of the political structures in the implementation of the Internet of Things, as it improves control over segments of society and realizes the bio-political control mechanisms associated with data analysis, correlated with the needs and interests of the people, what is technologically possible in the field of statistical analysis, for example, web serfs of a user. In this respect, the technology of Internet of Things is interested not only for the government, but also for business, and, above all, for the large companies that use advanced information technologies in the advertising and PR-strategies.

Another reflection concerning correlation of actor-network theory and the concept of Internet of Things is the translation problem. Within the framework of his theory Latour talks about "translating" of what that "inform" the objects with which deals the science. First the translation is made to the science language with the use of terminology, graphical tools, and other things, and then it is translated into a general cultural context [3, p. 179-233], in which the results of the research have the status of "reality" and begin to be recognized in non-scientific circles. For example, complex investigations in the field of genetics, requiring huge financial investments, qualified staff, an extensive network of scientific communication continues to function as an ordinary representation and segments of the scientific picture of the world in the mass consciousness, some are used in marketing strategies (such as labeling, indicating the absence of "genetically modified organisms"), focused on the patterns formed by the perception of everyday consciousness.

Latour, in his theory, tries to justify the idea that the reality in which man lives, is a multilevel, hybrid, it mixed different subject perspectives, correlated with the areas of study of various sciences [4]. In this he is close to Shchedrovitsky, who noted in human activity the source of the breakdown in the different regions and subject field, if we talk about the "positive" science [7, 8] - the origin of the different ontologies and reflexive position. Latour on the contrary evaluates human activities "for sketching" the validity of the field meanings in a negative sense. That means that the "things" are often unable to speak for themselves and, as a rule, scientists and thinkers, carrying hermeneutic activity interpret "physis" on their own. This can be applied to both: to the natural sciences, which generalize and empirical evidence conceptualized and to humanities, where the hermeneutic work is noticeable and can be very ambiguous, for example, in a situation of interpretation of the results of sociological research. Developing the idea of interactions within society, Latour reflects on the social world as a totality of "human" and "non-human" actions, i.e. things, objects which are embedded in networks of social interaction.

Latour suggests the idea of the “parliament of things” in which “things” should be considered as a social and networking elements of natural and cultural interactions [12, p. 166-180]. As a rule, scientists and thinkers represent them in acts of interpretation, semantic and practical positioning in the system of the activities. Latour proposes to make the process transparent, so to develop methods for the representation of the complex structure of social situations in the framework of which will be displayed a complex natural-social character of many urgent problems of reality. We think this means the need for restructuring of thought and the leaving the strict opposition of “nature”, “culture” in the classic sense, understanding the mechanisms of inclusion of “things” in the development of socio-hermeneutical procedures, the formation of a strong culture of social reflection.

Of course, there are many questions about the possibility of forming a culture of thinking and the use of such practices, for example, in real-existing institutions of political representation. However, attention to the “things”, a sort of sociological and socio-philosophical twist to the ontology of “things”, which cannot be subject to the ontology of social relations (as in the classical concept) is quite symptomatic and reflects the deep ontological changes in the modern world, in the scientific and philosophical practices of rethinking. In this sense, the Internet of Things is a good example of the potentialities of “things” that begin to play an increasingly important role in the real world, and not in the abstract and philosophical sense, but as a social actors, which are rebuilding the contours of social ontology. As part of the Internet of Things “things” themselves, i.e. devices often manage without “logos” in cooperation with each other and only in the situation of human contact is required verbal language, and even then not in all cases.

It is significant that now many gadgets have visual-sensory interfaces that correlate with the iconic principle of the interaction. Itself the Internet of Things involves that the gadgets and technical devices are equipped by sensors that collect information and transmit it to other devices. Russian word “датчик” can be translated into English as “sensor”. Can be thought that the “things”, like a technical devices interact with the surrounding space through the “touch contact” (i.e., by means of sensors capacity) and data transfer. A special case of sensory contact – is a contact with a finger or with other part of the body while using the touch screen, for example of the smartphone. Things thus interact directly with each other, transforming the data into binary code. The human communication involves verbal code, culture is almost completely logocentric.

### **3. CONCLUSIONS**

This problem itself - the dialectic of verbal and iconicity is complicated and requires a separate study. We can note that the reduce of culture in modern society, the approach of the daily practices of communication to the type of information transmission in the network connecting device, in some measure is due to the impact of technologies on the lives, and on the contours of the human being. But the culture continues to base on powerful logocentric foundations, which can't disappear in the near future.

Thus, the actor-network theory is a methodological concept and, at the same time, provides an ontological component associated with an attempt to give a new ontological contour to the network socio-cultural hybrid reality ontology as a totality of people and “things”. In this regard, some approaches can be used to describe the concept of the Internet of Things and simulated some general or particular technological aspects. The Internet of Things are often reinterpreted, mostly by engineers or experts who argue in the spirit of scientific and technological optimism, not paying attention to the social and ontological aspects of the introduction of the Internet of Things. We believe that the analysis of socio-technological phenomena of the Internet of Things ontological offers the prospect of a better understanding of the place and the impact of information technologies on the various segments of society, understanding the causes and consequences of the transformation of the socio-ontological foundations of modern society.

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