TYPES OF ANTHROPOMORPHIC METAPHOR IN IT DISCOURSE[*]

Marina I. ABDYZHAPAROVA[1], Tatyana V. FEDOSOVA[2], Tatyana Yu. SOMIKOVA[1], Irina V. BARANOVA[1], Lyudmila I. HARCHENKOVA[3]
[1]Higher School of Linguistics and Journalism, Institute of Humanity Studies, Yugra State University, Yugra, Russian Federation
[2]Department of Foreign Languages and Teaching Methods, Gorno-Altaisk State University, Gorno-Altaysk, Russian Federation
[3]Department of Russian Language and Literature, Russian State Hydrometeorological University, St. Petersburg, Russian Federation

Abstract: *New scientific knowledge, appearing in the sphere of computer technology, gives birth to new ways of a human life style, where smart machines, built in everyday life and helping people solve everyday problems (a usual telephone call or solving a business problem), play a big role. The given paper studies metaphors in the computer discourse of scientific and popular science articles in contemporary English. The object of the research is an anthropomorphic metaphor in modern computer discourse. The objective is to describe examples of anthropomorphic metaphor, define its role, and present types of anthropomorphic metaphor in modern computer discourse. The following methods were used in the research: the method of semantic definition, the method of observing linguistic phenomena, the descriptive method, the elements of interpretation, conceptual and contextual analysis. This research systematizes metaphors, represented in the scientific works as the following: functional metaphor, mental metaphor, communicative metaphor, emotional-motivational metaphor, body metaphor, metaphor of human age, traditions and character. It was concluded that all objects and properties connected with the human world is a source for such metaphors, which can be explained by identification of the IT sphere with a human and its intellect.*

Keywords: IT discourse, metaphor, digital technology, anthropomorphic metaphor, IT metaphor, types of metaphors.

New scientific knowledge, appearing in the sphere of computer technology, gives birth to new ways of a human life style, where smart machines, built in everyday life and helping people solve everyday problems (a usual telephone call or solving a business problem), play a big

role[1]. The existence of a human being in this new technogenetic world creates a need in new notions that will help people interact more efficiently[2]. In this situation metaphor as an instrument of knowledge acquisition and cognition may be of great help[3]. The digital world, being connected with a large amount of data, referring to the sphere of their storage and functioning, is very abstract and complex for the average person for whom it is actually created[4,5].

However, a human has both the ability to identify objects, find analogy between them, and also every individual is able to find common things between concrete and abstract things. Sensor mechanisms and their interaction with psychics allow people to compare apples to oranges. In this respect metaphor, if it is successful, helps to reproduce an image that is not given in the real experience[6]. These mechanisms give an opportunity to create new abstract concepts on the basis of practical human experience[7].

Some scientists consider that metaphor is almost the only way to define abstract concepts, which allows it to specify the object for a short period of time and introduce the listener into a certain worldview. This feature of metaphor is widely used as an explanatory means in computer discourse. The given paper studies metaphors in the computer discourse of scientific and popular science articles in contemporary English. Modern IT technologies and ways of data storage allow to read scientific articles in such systems as a collection of Springer Journals, Cyberleninka, Academia

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[1] E. Akhmetshin, I. Ilyina, V. Kulibanova, T. Teor, "Special aspects of master data-based integrated management of region reputation in modern IT environment", in *IOP Conference Series: Materials Science and Engineering*, 2019, vol. 497, no. 1, article no. 012022.

[2] L.A. Reingold, "Information technology metaphors in modern society", in *Applied Computer Science*, 2017, vol. 12, no. 6, p. 24-39.

[3] G.V. Anatolyevna, S. Butt, G.R. Thakur, S. Zaheer, Y.F.M. Kra, N.K. Baah, B.K. Baffour, M. Usman, "Using mobile technology in modern teaching", in *International Journal of Mechanical Engineering and Technology*, 2018, vol. 9, no. 9, p. 1550-1556.

[4] V. Kulikov, K. Iklassova, A. Kazanbayeva, "Entropy based decision making method in managing the development of a socioinformational system", in *Journal of Theoretical and Applied Information Technology*, 2020, vol. 98, no. 1, p. 92-102.

[5] A.S. Kazanbayeva, K.E. Iklassova, V.P. Kulikov, "Development of a method for assessing learning outcomes through automated testing management", in *Periodico Tche Quimica*, 2019, vol. 16, no. 33, p. 784-800.

[6] N.D. Arutunova, *Metaphor and discourse. Theory of metaphor*, Progress, Moscow, 1990.

[7] T.V. Portnova, "Historical aspects of project technologies development and opportunities for their use in scenic arts", in *Space and Culture, India*, 2018, vol. 6, no. 4, p. 48-56.

and others which allow to receive new knowledge and read the articles of scientists from all over the world.

The materials of such authors as Gordon M.U.[8], Hachman M.[9], McKinsley[10], Nicolescu R., Huth M., Radanliev P., De Roure D.[11], Walsh B.[12], Wilson J.[13] and others were studied. Due to such new IT technologies as electronic dictionaries (Multitran, Casio) there was a possibility to get professional help in translation which helped better understand the contexts under study.

Search engines like Google, Chrome, and Yandex give an opportunity to search the terms, authors, IT topics for discussion. The object of this research is an anthropomorphic metaphor in modern computer discourse. The following linguistic methods were used in the research: the method of semantic definition, the method of observing linguistic phenomena, the descriptive method, the elements of interpretation, conceptual and contextual analysis.

Characteristics of IT discourse

Computer discourse (internet discourse or virtual discourse) represents a complex phenomenon and it has not yet acquired a status of a term with a specific definition. There are variations of this term such as

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[8] M.U. Gordon, "Acer's latest laptops go all-AMD with ryzen and radeon inside", 2019. Available at: https://www.pcworld.com/article/3397084/acers-latest-laptops-go-all-amd-with-ryzen-and-radeon-inside.html.

[9] M. Hachman, "Windows sandbox: how to use Microsoft's simple virtual Windows PC to secure your digital life", 2019. Available at: https://www.pcworld.com/article/3338084/how-to-use-windows-sandbox-microsoft.html.

[10] J. Bughin, J. Manyika, "Internet matters: essays in digital transformation McKinsley Global Institute", 2012. Available at: https://www.mckinsey.com/business-functions/digital-mckinsey/our-insights/essays-in-digital-transformation.

[11] R. Nicolescu, M. Huth, P. Radanliev, D. De Roure, "Mapping the values of IT", in *Journal of Information Technology*, 2018, vol. 33, no. 4, p. 345-360.

[12] B. Walsh, The surprisingly large energy footprint of the digital economy, 2013. Available at: http://science.time.com/2013/08/14/power-drain-the-digital-cloud-is-using-more-energy-than-you-think/.

[13] J. Wilson, Symantec Norton utilities, PcMag. Com, 2017. Available at: https://www.pcmag.com/roundup/333310/the-best-wordpress-web-hosting-services; J. Wilson, The best tune-up utilities for 2019, 2019. Available at: https://www.pcmag.com/roundup/255899/the-best-tune-up-utilities. Linar R. Yusupov, Dmitry N. Demyanov, „Technological process modeling for castings according to specified parameters of output production quality based on production-frame model of knowledge representation," in *Astra Salvensis,* V (2017), no. 12, p. 410.

communication in virtual reality or communication on IT topics. Among Russian researchers, working on the problems of IT discourse, one can name Galichkina E.N. She specifies the following characteristic features of IT discourse: 1) an electrical signal becomes a channel of communication; 2) virtuality; 3) being distant in space and time; 4) high degree of permeability; 5) hypertext; 6) its texts include literal, image, sound components; 7) the participants are equal; 8) emotions and feelings can be expressed with emoticons; 9) different types of discourse can be united; 10) there exists a specific computer ethics[14].

IT discourse is considered a combination of texts united by the topic of IT technologies. This discourse, being very abstract by its nature, gave birth to a large amount of metaphors from different spheres of human life. O.G. Melnik[15] names such metaphors as 1) botanic – clover key; 2) zoomorphic – weasel, black widow, tortoise (site); 3) anthropomorphic – female (connection), male (connection), (Net) head, (blue) tooth; 4) medical – virus, antidote, hygiene. There are also dictionaries of IT metaphors and areas in linguistics, connected with IT technologies that are reciprocal. Computational linguistics in particular views a computer as an effective and convenient means with its main goal – to study language in every bit of it[16], and linguistic computer science studies language as a means of dialogue optimization between man and a computer. Specialists in computer processing of the natural language work on the questions of automatic recognition and analysis of metaphor expressions on the grounds of marked groups of texts and also they use methods of corpus-based linguistics in metaphor analysis.

Cognitive scientists studied conceptual metaphor and they found that a human body is the main source-sphere of it. They also state that in some languages parts of a human body are taken as a foundation for the conceptualization of space[17]. Among the main features of Cognitive Linguistics for the last 10-15 years one can name its zeal to join the existing scientific paradigm, find points where it can cooperate with other fields of linguistic research: Lexicography, Stylistics, Poetics, Discourse Analysis,

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[14] E.N. Galichkina, "Characteristics of computer discourse", in *Journal of Orenburg State University*, 2004, vol. 10, p. 55-59.

[15] O.G. Melnik, "Computer metaphor in modern English discourse". *News of Southern Federal University. Problems of Modern Philology*, 2011, vol. 1, p. 37-41.

[16] M.R. Munos, *Looking Toward the Future of Cognitive Translation Studies, the Handbook of Translation and Cognition*, John Wiley and Sons, Toronto, 2017.

[17] T.G. Skrebtsova, "Cognitive linguistics after thirty years", in *Bulletin of the St. Petersburg University. Language and Literature*, 2018, vol. 3, p. 465-480.

Social Linguistics, and others[18]. There are such research works as "Genre in Language, Discourse and Cognition"[19], "Cognitive Linguistics and Critical Discourse Analysis"[20], "Cognitive Sociolinguistics"[21]. This research is done across Cognitive Linguistics and Discourse Analysis. In this paper anthropomorphic metaphor is studied and a new classification within this type of metaphor is represented. Among the main metaphors of IT discourse L. Reingold specifies digitalization, virtual territory, digital economics[22], internet of things, blockchain, cloud computing, industry 4.0, big data[23].

Such metaphors as digitalization, digital economics, internet of things, big data are described in the following study. The usage of anthropomorphic metaphor with other IT discourse metaphors is not included in the article. Possibly, they will serve as a material for other studies in this sphere. A large number of metaphors of this kind occurring in the IT discourse can be explained by the significance of a human being as an intellectual individual when speaking about artificial intelligence and identification of artificial intelligence with a human mind[24]. One can mention that anthropomorphic metaphor in IT discourse is determined by the fact that a large amount of modern devices are made to make people's life easier and to fulfill certain tasks in place of a person, that means that they can obtain a certain characteristic and fulfill certain cognitive operations. Thus such terms as smart home, smart phone, Smart

[18] T.G. Skrebtsova, "Cognitive linguistics after thirty years", in *Bulletin of the St. Petersburg University. Language and Literature*, 2018, vol. 3, p. 465-480.

[19] N. Stukker, W. Spooren, G. Steen, *Genre in language, discourse and cognition*, Mouton de Gruyter, Berlin; New York, 2016.

[20] C. Hart, Cognitive linguistics and critical discourse analysis, 2010. Available at: https://www.academia.edu/2950646/Cognitive_Linguistics_and_Critical_Discourse_Analysis

[21] K. Jensen, Review of Putz, "Cognitive sociolinguistics: social and cultural variation in cognition and language use", 2015. Available at: https://www.academia.edu/11210640/Review_of_Pütz_et_al._eds_Cognitive_Sociolinguistics_Social_and_Cultural_Variation_in_Cognition_and_Language_Use_2014_.

[22] I.G. Kuznetsova, L.V. Goloshchapova, N.S. Ivashina, R.A. Shichiyakh, L.I. Petrova, B.P. Tkachev, "The paradigm of human capital development capable of adapting innovations in the transition to a digital economy", in *International Journal of Civil Engineering and Technology*, 2019, vol. 10, no. 2, p. 1408-1417.

[23] L.A. Reingold, "Information technology metaphors in modern society", in *Applied Computer Science*, 2017, vol. 12, no. 6, p. 24-39.

[24] I. Mikhailov, "Modeling intelligence: is awareness without representations possible?" in *Philosophical Problems of Information Technologies and Cyberspace*, 2018, vol. 14, no. 1, p. 92-102. DOI 10.17726/philIT.2018.1.6

Wi-Fi, Smart Lighting, Smart Parking, Smart Transport[25], Smart Education smart cities, smart beds; artificial intelligence, ambient intelligence (Internet of Things), business intelligence (Digital Economy) appear, a digital laboratory can be a living thing. (Living Lab (Internet of Things)).

The appearance of anthropomorphic and other kinds of metaphor is determined by the processes which occur in human consciousness. As cognitive linguists state, mentality is not the only characteristic of the brain, but it is a result of interaction between the brain and the surrounding world[26]. Consciousness is a result of such an interaction. Language is an instrument of interaction and acquisition[27]. These scientists pay much attention to context which is a dynamic entity and promotes a variety of meanings existing in particular periods of time. So, while speaking about the "context" one cannot but mention the word "meaning".

Linguists M.R. Munos and A.M. Roso Lopes define meaning as a process that happens in the head as a person process the signs which are perceived through feelings in the context of any communicative intention. Meaning takes place only in the consciousness[28]. Researcher M. Reddy states that meaning never leaves the consciousness. He says that neither words, nor books or libraries have ideas, but only people carry them in their heads[29]. Any meaning carries a personal component inside which means that while perceiving a specific meaning two people may have slight differences. A meaning is a social phenomenon which influences the

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[25] E.M. Akhmetshin, V.D. Sekerin, A.V. Pavlyuk, R.A. Shichiyakh, L.M. Allanina, "The influence of the car sharing market on the development of ground transport in metropolitan cities", in *Theoretical and Empirical Researches in Urban Management*, 2019, vol. 14, no. 2, p. 5-19.

[26] A.V. Alekseev, A.V. Lenets, "Directive abbreviations as a component of modern virtual communication (as exemplified in English and German languages)", in *Novosibirsk State Pedagogical University Bulletin*, 2017, vol. 7, no. 2, p. 98-110.

[27] M.R. Munos, *Looking toward the future of cognitive translation studies, the handbook of translation and cognition*, John Wiley and Sons, Toronto, 2017.

[28] M.R. Munos, A.M. Roso Lopes, *Meaning. The Routledge handbook of translation and culture*, Routledge, London, 2018.

[29] M.J. Reddy, The conduit metaphor: a case of frame conflict in our language about language, in A. Ortony (ed.), *Metaphor and Thought*. Cambridge University Press, Cambridge, 2012, p. 164-201. Cf. Galina Yu. Bogdanovich, Elena A. Konovalova, Natalija A. Segal, Olga I. Neyelova, Anna Y. Martynyuk, „Metaphorization of the Past in the Russian-Language Media Discourse (Based on the Material of Transport Lexis)," in *Astra Salvensis,* VI (2019), Supplement no. 1, p. 83.

formation of common ideas received by people as a result of some common experience[30][31].

Anthropomorphic metaphor appears in the language due to the presence of some ideas and meanings in the consciousness formed as a result of human activities. These meanings accumulate common ideas in people's minds which gives them a chance of being transferred into IT sphere, when there is a need to define a property or function of an IT device or phenomenon. Anthropomorphic metaphor embraces everything connected with a human being: actions, mental characteristics, emotional, psychological, and physiological processes, the ability to communicate and act. Experiments, led by A.R. Luriya in the villages of Uzbekestan show that when adults are not under the conditions where abstract mental skills can be effectively developed, do not obtain them[32].

Thus, one should say that the existence of metaphors and anthropomorphic metaphors in particular shows that modern society is placed in such conditions where there is a need in a great amount of notions connected with the IT discourse and the ability to obtain abstract mental skills is a key for an educated contemporary individual. Cognitive researchers mention that cognition processes, a human is involved in, include his interaction with the society as a whole and he states that inside the speaking society there is a tendency to learn new patterns and language changes are connected with the changes in human society. All these things reflect certain orientations in the language cognition and social cognition[33].

Presentation of the classification of IT metaphors based on the analysis

The articles with IT metaphors connected with human activities were studied. This research systematizes metaphors represented in the scientific works as the following: functional metaphor, mental metaphor, communicative metaphor, emotional-motivational metaphor, body metaphor, metaphor of human age, traditions and character.

[30] M.R. Munos, A.M. Roso Lopes, *Meaning. The Routledge handbook of translation and culture*, Routledge, London, 2018.

[31] D. Pylypenko, "Editorial", in *Astra Salvensis*, 2019, vol. 7, p. 9-10.

[32] A.R. Luriya, *Stages of the path traveled. Scientific autobiography,* Moscow University Press, Moscow, 1982.

[33] K. Jensen, Review of Putz, "Cognitive sociolinguistics: social and cultural variation in cognition and language use", 2015. Available at: https://www.academia.edu/11210640/Review_of_Pütz_et_al._eds_Cognitive_Sociolinguistics_Social_and_Cultural_Variation_in_Cognition_and_Language_Use_2014_.

1. Functional metaphor which is a metaphor that transfers the meaning of functions and operations fulfilled by the objects of IT technologies and which may also be fulfilled by man. Such cases were studied:

1) a smart home can provide help for the people with disabilities and elderly people. One key application of a smart home is to provide assistance for those with disabilities and elderly individuals (Internet of Things);

2) smart beds can adjust themselves in a particular state: some hospitals have begun implementing "smart beds" that can detect when they are occupied and when a patient is attempting to get up. It can also adjust itself to ensure appropriate pressure and support is applied to the patient without the manual interaction of nurses (Internet of Things);

3) specialized sensors can control human health and also help people bring back motion functions and control implants and infrastructure for the purposes of safety.

Specialized sensors can also be equipped within living spaces to monitor the health and general well-being of senior citizens, while also ensuring that proper treatment is being administered and assisting people regain lost mobility via therapy as well (Internet of Things). These health monitoring devices can range from blood pressure and heart rate monitors to advanced devices capable of monitoring specialized implants, such as pacemakers, Fitbit electronic wristbands, or advanced hearing aids (Internet of Things) IT devices can also be used to control critical infrastructure like bridges to provide access to ships. Usage of IT devices for monitoring and operating infrastructure is likely to improve incident management (Internet of Things).

4) Internet of Things equipment can use sensors to help protect the environment: Environmental monitoring applications of the IT typically use sensors to assist in environmental protection by monitoring air or water quality, atmospheric or soil conditions. (Internet of Things)

5) industrial Internet of Things can give birth to such a huge flow of business ideas that can cause the Forth industrial revolution: Industrial IT (IIT) in manufacturing could generate so much business value that it will eventually lead to the Fourth Industrial Revolution (Internet of Things), and internet itself can create innovative intellectual models: how the Internet is creating new playing fields with "Big Data", "nowcasting", and innovative models of competitive intelligence[34].

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[34] J. Bughin, J. Manyika, internet matters: essays in digital transformation McKinsley Global Institute, 2012. Available at: https://www.mckinsey.com/business-functions/digital-mckinsey/our-insights/essays-in-digital-transformation.

6) Internet of Things can realize integration and optimize safety conditions at a factory and the living labs can share knowledge for the purpose of creation of technologic products: the IT can realize the seamless integration (Internet of Things); operator tools and service information systems to optimize plant safety and security are within the purview of the IT (Internet of Things); there are currently 320 Living Labs that use the IT to collaborate and share knowledge between stakeholders to co-create innovative and technological products (Internet of Things); cyber-physical systems can process information and as a result optimize certain processes: it (Cyber-physical systems) will transform the collected data into actionable information, and eventually interfere with the physical assets to optimize processes (Internet of Things).

7) Microsoft software can keep in safety your digital life: Windows Sandbox: How to use Microsoft's simple virtual Windows PC to secure your digital life[35].

Big Data, like humans, can fulfill more advanced tasks, such as making a decision, minimize risks, and save money for the budget: 1) it (business intelligence) helps them make strategic decisions[36]). The authors state that a machine with business intelligence can help them solve strategic problems; 2) this data can be used to automate farming techniques, take informed decisions to improve quality and quantity, minimize risk and waste, and reduce effort required to manage crops (Internet of Things). Big Data can automatize farm equipment, make decisions, based on specific information that will improve quality and quantity; they can minimize risks and efforts needed for crop distribution. 3) Internet of Things devices can save money for the budget (IT devices can save the US more than $300 billion in annual healthcare. (Internet of Things)); and they also can help in solving serious problems (It (IT) can help in taking faster decisions and save money with Real-Time Data Analytics (Internet of Things)).

Social networking services, smartphones, Internet of Things can revolutionize the lives of people: Social media is revolutionizing[37]; the

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[35] M. Hachman, Windows sandbox: how to use Microsoft's simple virtual Windows PC to secure your digital life, 2019. Available at: https://www.pcworld.com/article/3338084/how-to-use-windows-sandbox-microsoft.html.

[36] The new digital economy. How it will transform business. an executive summary produced in collaboration with SAP. Oxford Economics, 2018. Available at: https://web.archive.org/web/20140706101452/http://www.myclouddoor.com/web/documents/The%20New%20Digital%20Economy.pdf

[37] *Ibidem,* 2018.

smartphone revolution. Internet of Things promises to revolutionize a wide range of appliances (IT technology promises to revolutionize a broad range of applications[38]). IT technology can play an important role in certain processes: Industrial big data analytics will play a vital role in manufacturing asset predictive maintenance (Internet of Things).

There are a number of metaphors that also demonstrate "human" character of IT technologies: 1) they can allow people of a definite profession get access to information: IMT in the healthcare industry is now permitting doctors, patients, and others involved (i.e. guardians of patients, nurses, families, etc.) to be part of a system, where patient records are saved in a database (Internet of Things); 2) they can also trace human behavior: This includes sensor-based solutions such as biosensors, wearables, connected health devices, and mobile apps to track customer behaviour (Internet of Things); 3) they can open doors for new opportunities in business (based on such a highly integrated smart cyberphysical space, it opens the door to create whole new business (Internet of Things)).

2. The next type is mental metaphor. Mental metaphor can be met when IT technology devices fulfill mental actions similar to those of men (remembering, analysis, counting, understanding, translating). For example: 1) these sensors create a network of intelligent sensors that are able to collect, process, transfer, and analyse valuable information in different environments, such as connecting in-home monitoring devices to hospital-based systems (Internet of Things) – the actions of collecting, processing, analysis; 2) to count the number of fish on a conveyor belt, analyze the number of fish, and deduce the effectiveness of water flow from the data the fish provide (Internet of Things) – the mental actions of counting, analyzing, formulating conclusions; 3) digital object memory (Internet of Things) – the mental action of remembering; 4) business intelligence – understanding your customer better, your business better[39] – the action of understanding; 5) drills into how Internet technologies at large (that is, the Web, social technologies, cloud computing, etc.) enhance competitive stance, translating into significant macro-economic

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[38] R. Nicolescu, M. Huth, P. Radanliev, D. De Roure, "Mapping the values of IT", in *Journal of Information Technology*, 2018, vol. 33, no. 4, p. 345-360.

[39] The new digital economy. How it will transform business. An executive summary produced in collaboration with SAP. Oxford Economics, 2018. Available at: https://web.archive.org/web/20140706101452/http://www.myclouddoor.com/web/documents/The%20New%20Digital%20Economy.pdf

performance in both mature and developing economies[40] – translating terms.

3. Emotional-motivational metaphor. Emotional-motivational metaphor is a metaphor that demonstrates actions fulfilled by IT technologies that carry a certain emotional meaning. It is represented in the following examples: 1) devices can cultivate a desire to be healthy: other consumer devices to encourage healthy living, such as connected scales or wearable heart monitors, are also a possibility with the IT (Internet of Things); 2) firms reorganize to be able to welcome digital economics: firms reorganize to fully embrace the digital economy[41]; 3) devices can have a serious determination to be present in the people's lives: the IT concept has faced prominent criticism, especially in regards to privacy and security concerns related to these devices and their intention of pervasive presence (Internet of Things).

4. Communicative metaphor. Communicative metaphor shows that different computer technologies can interact with each other like humans. 1) devices can communicate and interact like humans: embedded with electronics, Internet connectivity, and other forms of hardware (such as sensors), these devices can communicate and interact with others over the Internet (Internet of Things); 2) among the companies there can be a competition on a digital level: Every company can be a digital competitor[42].

5. Metaphor of a human character. This type of anthropomorphic metaphor can transfer information about the characteristics of a device or the computer world as a whole. 1) thus i-net devices can be flexible: moreover, IT-based systems are patient-centered, which involves being flexible to the patient's medical conditions (Internet of Things); 2) the circle of technology and growth may be endowed with virtues: The

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[40] J. Bughin, J. Manyika, Internet matters: essays in digital transformation McKinsley Global Institute, 2012. Available at: https://www.mckinsey.com/business-functions/digital-mckinsey/our-insights/essays-in-digital-transformation.

[41] The new digital economy. How it will transform business. An executive summary produced in collaboration with SAP. Oxford Economics, 2018. Available at: https://web.archive.org/web/20140706101452/http://www.myclouddoor.com/web/documents/The%20New%20Digital%20Economy.pdf

[42] The new digital economy. How it will transform business. An executive summary produced in collaboration with SAP. Oxford Economics, 2018. Available at: https://web.archive.org/web/20140706101452/http://www.myclouddoor.com/web/documents/The%20New%20Digital%20Economy.pdf.

virtuous circle of technology and growth[43]; 3) site and software may appear doubtful: suspicious software or sites[44].

6. Body metaphor. The source of such metaphor is a human body, its parts, and processes: 1) when information is embodied in atoms (Digital Economy) – information can be present in atoms; 2) the process of fast growth of human body is a foundation for the following metaphor: the ever-changing global marketplace, fueled by fast-growth economies and new technology, has accelerated the speed of most business activities[45]. The following context specifies that business infrastructure has grown fast due to new technologies and changing market processes; 3) a term "Energy Footprint of the Digital Economy" in one of the titles was found: the surprisingly large energy footprint of the digital economy[46]; 4) digital Data, according to Bughin, J, Manyika, J., may produce voices appealing to people, asking them to use opportunities that these devices offer: Listening to Digital Voices[47]; 5) there are programs which are able to determine functional conditions of a computer and this state can metaphorically be called "health condition": dashboard displays your PC's health[48]; 6) there are also programs that can bring to life a dysfunctional computer that may be considered dead: the right app can make a lethargic PC feel new again[49].

7. Metaphor of human age can also be met in IT discourse. For example, IT market of Internet of Things may be in a condition of early childhood,

[43] *Ibidem,* 2018.

[44] M. Hachman, Windows sandbox: how to use microsoft's simple virtual windows pc to secure your digital life, 2019. Available at: https://www.pcworld.com/article/3338084/how-to-use-windows-sandbox-microsoft.html.

[45] The new digital economy. How it will transform business. An executive summary produced in collaboration with SAP. Oxford Economics, 2018. Available at: https://web.archive.org/web/20140706101452/http://www.myclouddoor.com/web/documents/The%20New%20Digital%20Economy.pdf

[46] B. Walsh, *The surprisingly large energy footprint of the digital economy*, 2013. Available at: http://science.time.com/2013/08/14/power-drain-the-digital-cloud-is-using-more-energy-than-you-think/.

[47] J. Bughin, J. Manyika, Internet matters: essays in digital transformation McKinsley Global Institute, 2012. Available at: https://www.mckinsey.com/business-functions/digital-mckinsey/our-insights/essays-in-digital-transformation.

[48] J. Wilson, Symantec Norton utilities, PcMag. Com, 2017. Available at: https://www.pcmag.com/roundup/333310/the-best-wordpress-web-hosting-services.

[49] J. Wilson, The best tune-up utilities for 2019, 2019. Available at: https://www.pcmag.com/roundup/255899/the-best-tune-up-utilities.

as in the following example: IT markets are in their infancy[50]. The following context tells about "veterans of personal computers" which means that they worked and "lived" for a long period of time: that hand-holding may not appeal to PC veterans[51].

8. The last type is metaphor of human traditions which brings traditions and rituals of people into the IT sphere. Thus legacy transfer is described in the following example: although science, technology, and society arguably inherit a common core of problems and methods[52]. The presence of a large amount of laptops at the market can be called a parade like the ones that can traditionally take place in human life: computex is still days away but the parade of notebooks has already begun[53]. The main function of all the metaphors mentioned above (as in other types of scientific discourse that was studied[54] is "objectification" of abstract terms and writers are trying to explain new terms with the help of those that the readers already know.

A necessity to metaphorize reality was explained by many scholars including Russian scientists, such as F.A. Eloyeva, E.V. Perehvalskaya, E. Sausverde and others who state that a small amount of metaphors shows that in a certain society there is a discourse in which there is no need to speak on abstract topics and there is no need to verbalize objects of the surrounding world. Any language has such types of discourse. The cultures, where abstract discourses are developed show that metaphor and metonymy are widely spread mechanisms of word-formation[55]. Metaphor appears when people need to name something that has no name yet, thus serving as a tool of "objectification" of abstract ideas and helping to define a meaning in a more exact way.

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[50] R. Nicolescu, M. Huth, P. Radanliev, D. De Roure, "Mapping the values of IT", in *Journal of Information Technology*, 2018, vol. 33, no. 4, p. 345-360.
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A digital sphere is a new intellectual sphere and in order for it to develop and exist there should appear new notions and concepts. The digital world iconically reflects all things that happen in a human world; that is why one can create terms based on the real human world which function in the digital one. As a person works with the objects of a digital world, interacts with them, uses them in everyday life and as they have certain intellectual mechanisms, he interacts with them; that is why anthropomorphic metaphor is widely employed in the IT discourse. It can transfer functions of the digital world, their interaction with people, and the ways they (IT objects) influence human life and the society as a whole.

Thus it can be said about a number of types represented in this type of discourse: functional metaphor, mental metaphor, communicative metaphor, emotional-motivational metaphor, body metaphor, metaphor of human age, traditions and character. Its main function can be called as "objectification" of abstract terms and explanation of new terms with the help of those that are already known. All objects and properties connected with the human world is a source for such metaphors, which can be explained by identification of the IT sphere with a human and its intellect. It can be said that this sphere of study can be defined in a broader way: one can study different genres of IT discourse and find those that can be closer to a human; different types of anthropomorphic metaphor can be diversified according to their usage in certain genres; one can study later IT contexts and compare them to the IT discourse of the 21st century in order to see how much a person is identified with IT objects.