Peertechz


ENGINEERING GROUP

TRENDS IN Computer Science and Information Technology
OPEN ACCESS JOURNAL

ISSN: 2641-3086 DOI: https://dx.doi.org/10.17352/tcsit

Short Communication

# Metaverse and Virtual Worlds of Science

**Elena F Sheka***

Institute of Physical Researches and Technology, Peoples' Friendship University of Russia (RUDN University), 117198 Moscow, Russia

**Received:** 18 November, 2024
**Accepted:** 27 November, 2024
**Published:** 28 November, 2024

***Corresponding author**: Elena F Sheka, Institute of Physical Researches and Technology, Peoples' Friendship University of Russia (RUDN University), 117198 Moscow, Russia,
E-mail: efsheka@mail.ru; sheka@icp.ac.ru

**ORCiD:** https://orcid.org/0000-0003-0308-6260

**Keywords:** Digital technologies and ecosystems; Digital twins; Virtual worlds; Self-organization; Metaverse



https://www.engineegroup.us

Check for updates

## Abstract

Information is presented on the emergence of a new meaning for the existence of the human community, which could be characterized by the word "hyperrealization". Virtual worlds of digital twins, digital ecosystems, quasi-metaverse, and, finally, the metaverse – this is the path that everything existing in the world, including science, must take.

For the whole of 2020, the word «metaverse» was typed in the Yandex search bar less than 5,000 times, but in November 2021, the Russian search engine recorded almost 76,000 such requests. The surge was associated with the announcement of the Meta project, which started from the Facebook platform. Many commentators have labeled this event with the word «rebranding», devaluing its true meaning. In fact, the Greek word Meta gave a symbolic start to a technological stage that few people have yet understood.» This is how Vladimir Shabason and Sergey Malaykin's book «Reasonable Metaverse. From digital applications to a new environment» begins [1]. It is echoed by Matthew Ball's book "The Metaverse. How it changes our world" [2]. Both books were released in July 2022 a week apart and immediately became bestsellers. At the end of 2021, it was announced the creation of two new scientific and educational journals - Journal of Metaverse and Metaverse. The process of organizing these funds turned out to be extremely fast, and already in 2023, the first of them regularly earned the status of Q1 magazine. Today, the bibliometrics of the state of metaverse research is showing exponential growth [3].

The authors of both books convincingly show that the arrival of the metaverse is inevitable and that, unlike previous technological stages of community development, the metaverse is not another stage of development, it is about a new sense of existence of human communities, which could be characterized by the word "hyperrealization" [1]. The metaverse is a space that creates opportunities for hyperrealization (self–realization of communities). According to the authors, the boundary between virtual and physical realities will disappear in the metaverse, and information will acquire an energy equivalent. There is no metaverse yet. If it appears, it will be in the singular. The authors believe that its emergence is a matter of the next 25-30 years.

If we accept the above as an inevitable reality, it becomes obvious a complete change in the habitat of modern humanity, the rejection of familiar and already ingrained views, and a series of questions to the main pillars of modern society, including economics, politics, and science. To understand what the above introduction has to do with science, let us follow, together with the authors of the book [1], the chain of



**Citation:** Sheka EF. Metaverse and Virtual Worlds of Science. Trends Comput Sci Inf Technol. 2024;9(3):103-105.
Available from: https://dx.doi.org/10.17352/tcsit.000088

events preceding the establishment of the metaverse, which is more widespread in world literature as the metaverse. Despite today's absence, the metaverse has already been announced. However, what is commonly called this word today is not yet a metaverse. The authors propose to attribute Facebook, Microsoft, NVIDIA, Roblox, and similar platforms to quasi-metaverses, or quasi-verses, the prologue to the emergence of the metaverse. These are separate islands of a new way of being, slowly rising from the outgoing waters of the old world, a new environment for the existence of the world, providing a new way of self-organization of communities.

Quasivers are preceded by digital ecosystems that have become an everyday reality [1]. Perhaps everyone can name 2 to 3 businesses that have decided to go beyond the usual framework for the active development of adjacent territories using digital technologies. Digital ecosystems are the result of combining digital products into large entities. They're about a new way of life. Digital ecosystems have become a familiar part of the modern business landscape. Their account goes to many thousands. Large business companies, such as banks, invest in them.

Within this trajectory of the arrival of the metaverse, one can try to predict the future of science. An analysis of the history of its development convincingly leads us to the conclusion that in this chain from the object of application of digital technologies to the metaverse, science can claim the place of an ecosystem. Indeed, both applied science, little distinguishable from real business, and pure science – anti-business in goal setting, are addressed to a large number of users and throughout their development actively go beyond the usual framework and explore adjacent territories using digital technologies from the simplest "accounting" to digital twins [4-6].

It is enough to look, for example, at structural chemistry and crystallography. Both of these branches of materials science are aimed at studying the atomic structure of real substances, and the first exit of both beyond the real limits was marked by the recording of a chemical formula indicating the composition of the substances under study. In reality, there is no $C_6H_6$ molecule or a corpuscle with the compound formula $SiO_2$. In reality, we are dealing with a colorless liquid with a pungent odor in the first case and admiring the sand on the sea beaches in the second. But today, materials scientists all over the world know that when mentioning the above formulas, we are talking about benzene and silica. So chemical formulas became the first digital counterparts of matter.

As analytical techniques improved, formulas were gradually replaced by tables containing certain digital information about the substance, including the number of atoms composing the substance according to the periodic table, the number of atoms of each variety, and the geometry of the arrangement of atoms in three-dimensional space. The digital double matured and gradually turned into bright, beautiful images, such as, for example, a sixty-peaked truncated icosahedron representing the $C_{60}$ fullerene molecule. This is how the virtual world of visual images of corresponding digital counterparts was born. And today, a structural chemist or crystallographer, having received a set of digital data corresponding to the interaction, for example, of a beam of some type of elementary particles with a substance of interest to him, plunges into the abyss of digits, from which there is no way out in the absence of digital counterparts of the substance under study. At the dawn of structural chemistry and crystallography, no one could have imagined that chemical formulas and single digital doubles based on them meant the first steps of materials science into the metaverse.

The philosophical and analytical view of the metaverse by V. Shabason and S. Malaykin [1] under the view of a highly professional information technology practitioner M. Ball receives powerful support. As Ball writes, "the metaverse is a scalable and interoperable network of 3D virtual worlds, visualized in real-time, that can be accessed synchronously and continuously by an almost unlimited number of users with an individual sense of presence and continuity of data such as identity, history, rights, objects, communications and payments" [2]. And despite the fact that Ball's book takes us further into the problems of the technological implementation of metaverse and the assessment of the costs it generates for humanity on a commercial basis, Ball, like Shabason and Malaykin, talks about the virtual worlds that underlie metaverse and without which it is impossible. "Stylistically, virtual worlds," continues M. Ball, "can accurately reproduce the real world (be so-called digital twins) or represent an artistically imaginative version of reality." Thus, painting the future of the world as "the implementation of a 3D version of the Internet and information technologies as such" (M. Ball) or as "the habitat of *homo informaticus*, a new human species capable of solving tasks inaccessible to *homo sapiens*" (V. Shabason and S. Malaykin), the authors unanimously point to virtual worlds as the basis for the coming transformation.

In the hierarchy of stages of metaverse development, the creation of virtual worlds is given a place in ecosystems, putting them in place of the main task. In light of this, it becomes obvious that the main direction that modern science will follow is the creation of virtual worlds for each of its branches. Although such a statement of the question may seem unrealistic today, it is impossible to cancel the arrival of the metaverse and the objective laws of its development [1]. Therefore, there is simply no other way for science.

It is impossible not to agree with the authors of the book [1] that a metaverse is a child who has already been born and that homo informaticus already exists. The above example of structural chemistry and crystallography shows that the development of these branches of science steadily followed the task of creating virtual worlds of the structure of matter.

The development of new technical capabilities that facilitate the development of adjacent territories using digital technologies is accompanied by an increase in the complexity of the virtual worlds being created, which means that it generates new scientific tasks and new virtual worlds. The logic of the development of virtual worlds provides for deadlocks [1] in which virtual worlds become unstable. Mandatory adherence to objective laws of development will lead this system either



**Citation:** Sheka EF. Metaverse and Virtual Worlds of Science. Trends Comput Sci Inf Technol. 2024;9(3):103-105.
Available from: https://dx.doi.org/10.17352/tcsit.000088

to self-destruction, as a result of which the relevant field of science will cease to exist, or to its transformation into forms not peculiar to it before. Obviously, such a situation is most likely for the humanities, and therefore the conflict between classical historical science and new chronology [7] can be imagined as an attempt to break the deadlock that resulted from the widespread use of digital technologies in this branch of knowledge.

## Conclusion

Today, the word metaverse is still associated with the distant future. However, it is enough to look closely at the world around us to notice the obvious shoots of this future already now. The author, as a scientist with many years of experience, tried to look at science from this point of view. The response was not long in coming and announced itself with silver bells of digital twins, opening virtual worlds of each of the scientific disciplines.

## References

1. Shabason VE, Malaykin SN. Razumnaya metavselennaya. Ot tsifrovykh prilozheniy k novoy srede obitaniya. [Reasonable metaverse. From digital applications to a new environment]. Moscow, LitRes Publ. 2022.
2. Crompton B. Ball M. The Metaverse: And How It Will Revolutionize Everything. New York: Liveright; 2022. Available from: https://www.scribd.com/document/648591034/Ball-M-the-Metaverse-and-How-It-Will-Revolutionize-Everything-2022
3. Li H, Li B. The state of metaverse research: a bibliometric visual analysis based on CiteSpace. J Big Data. 2024;11:14. Available from: https://journalofbigdata.springeropen.com/articles/10.1186/s40537-024-00877-x
4. Liu M, Fang S, Dong H, Xu C. Review of digital twin about concepts, technologies, and industrial applications. J Manuf Syst. 2021;58:346-361. Available from: http://dx.doi.org/10.1016/j.jmsy.2020.06.017
5. Lv Zh. Handbook of Digital Twins. Boca Raton: CRC Press, Taylor and Francis; 2024. Available from: https://doi.org/10.1201/9781003425724
6. Sheka EF. Digital twins in graphene technology. In: Lv Zh, editor. Handbook of Digital Twins. Boca Raton: CRC Press, Taylor and Francis. 2024; 19. Available from: https://www.taylorfrancis.com/chapters/edit/10.1201/9781003425724-56/digital-twins-graphene-technology-elena-sheka
7. Fomenko AT. History: Fiction or Science? Chronology 1. Paris, London, New York: Delamere Publishing; 2003. Available from: https://ia800500.us.archive.org/3/items/AnatolyFomenkoBooks/History-FictionOrScienceByAnatolyFomenkoVol.1.pdf





**Citation:** Sheka EF. Metaverse and Virtual Worlds of Science. Trends Comput Sci Inf Technol. 2024;9(3):103-105.
Available from: https://dx.doi.org/10.17352/tcsit.000088