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THE PROSPECTS OF RETAIL PAYMENT DEVELOPMENTS IN THE METAVERSE

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Abstract. In the age of technological development, rapid technological progress, and the metaverse development in which humans interact with each other and with the environment using virtual real-world metaphors, payment systems may also need to be re-considered. The study aims to find an answer to the question of what should be retail payments in the metaverse and to begin interdisciplinary discussions about their implementation in this environment. The author reviews the literature which shows that i) socio-economic relations are being implemented in the metaverse, but they still require the money to participate in the exchange relationships, as well as to support such a system; ii) it is impossible to abandon all forms of physical exchange, which is the basis of modern society; iii) the metaverse is an environment usually of anonymous users, who do not have the right to make significant purchases without their identification; iv) accounting of transactions remains the basis of payments in the metaverse as well.

Keywords: metaverses, payment, retailing

JEL Classification: E42, J33, L81

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1. Introduction

The latest technologies cover more and more areas of our daily lives and are getting closer to everyone. Today, we see that most people almost never part with a smartphone which concentrates most of our digital private and professional information. This is not surprising given how much information and activities each of us stores in this device. Today, a smartphone is a gadget that we can keep closest to us, touch them, and use them in a variety of everyday and professional circumstances from ordering a pizza to confirming financial or other transactions. At the same time, we should have a reliable protection of sensitive and vital data which are necessary for our lives or at least the illusion of such protection which is based on the belief that the corporations that created our smartphone really do not have access to our data or at least will not or cannot use it.

Technology is evolving much faster than ever and today our smartphone warns us about the weather change, in the nearest future it will be able to immediately offer us clothes that we should put on today, given what plans we have for today (it is written in the smartphone's calendar), what climatic conditions await us during the day and what things we have in the closet. Technology will be much better at what we actually have in the closet, as we may forget what we bought last summer, while the history of financial transactions stored in the banks' and stores' apps will be securely stored and used at the right time by our virtual assistant. If it turns out that last summer we did not buy the right clothes or it is outdated, and in our bank account we have enough money to buy them after settling all the necessary payments, such an assistant will offer us to buy the necessary wardrobe item. Or it can buy them immediately by transferring the required amount from our account to a seller.

This scenario is becoming more realistic and partly automation is already firmly embedded in our daily lives. The issue that remains unresolved is the payment instruments and payment technologies that will be used in the era of continuous digitalisation. Thus, recently, payment methods based on facial recognition technology have become one of the most popular payment methods in China (Zhong, Oh, Moon, 2021). Such a payment method does not involve any equipment or payment tools by the buyer. This reduces the transaction maintenance time and increases the cashiers' efficiency, security, and customer satisfaction. The customer just scans their face and then the captured image is linked to a specific digital payment system or bank account.

Thus, more and more advanced technologies are used from the different industries in the implementation of retail payments. However, the scientific literature does not pay enough attention to promising tools and methods of payment to answer the question of what awaits the payment industry in the future. This study tries to find an answer to it.

The need for payment is one of the most fundamental in the world of modern economic relations, which are based on monetary settlement. Payment using bank cards, payment terminals, smartphones, and other equipment for implementation, verification, and confirmation of payments in the real world is a necessary condition for transactions. Instead,

the virtual world or metaverse requires other ways to implement payment transactions. And if the system of monetary values in the metaverse economic relations remains a necessary component in trade, new forms of money transfer will be needed.

2. Background

The modern world of economic relations can be divided into a two-dimensional one, where there are two participants in the relationship like in the example of a traditional online store, and a three-dimensional virtual environment, or metaverse (Gadalla, Keeling, Abosag, 2013), where avatars are active on behalf of users in the real world, and mutual communication is possible both in the real and in the virtual world, creating and participating in socio-economic life both in the virtual world and in the real world (Suzuki et al., 2020). A three-dimensional environment is one in which vendors can work simultaneously in three different spaces: physical (offline), web-based or web-based Internet environments using a computer or other technology (online), and virtual (metaverse), where economic and social life exists without its physical embodiment (Bourlakis, Papagiannidis, Li, 2009).

"Metaverses are immersive three-dimensional virtual worlds (VWs) where people interact with each other and their environment, using the metaphor of the real world but without its physical limitations" (Owens, Mitchell, Khazanchi, Zigurs, 2011).

3. Literature Review

The dynamics of publishing (Fig. 1) indicates a gradual increase in the interest of scientists in this topic. Despite the fact that the first article on the metaverse was published in 1995 (in the Scopus database), and its peak was in 2010 (22 papers), there has been a growing interest in it recently in the business community and among scientists.

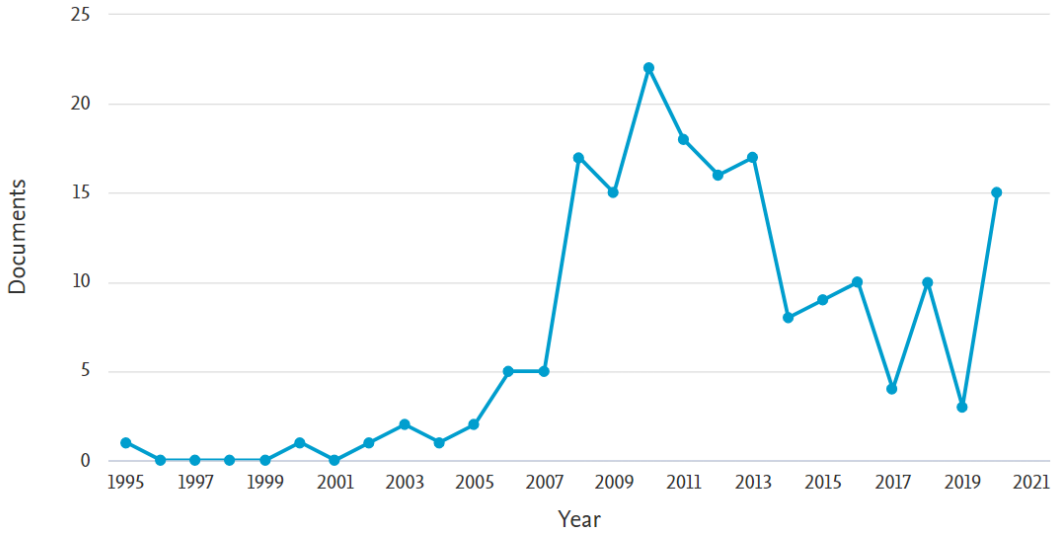

Figure 1. Dynamics of publications on financial security by years
Sources: developed by the author

These trends are partly related to the gradual and dynamic spread of digitalisation in all socio-economic life spheres, the technology development, and sometimes to the replacement of traditional relationships with virtual and digital ones. These studies have been conducted in 16 areas of research, and more than 95% of publications are related to computer science and engineering.

The bibliometric analyses results conducted by VOSviewer tools show the relationship of the metaverse with a number of economic categories (Fig. 2), in particular, such as retail and micropayments, which are closely related.

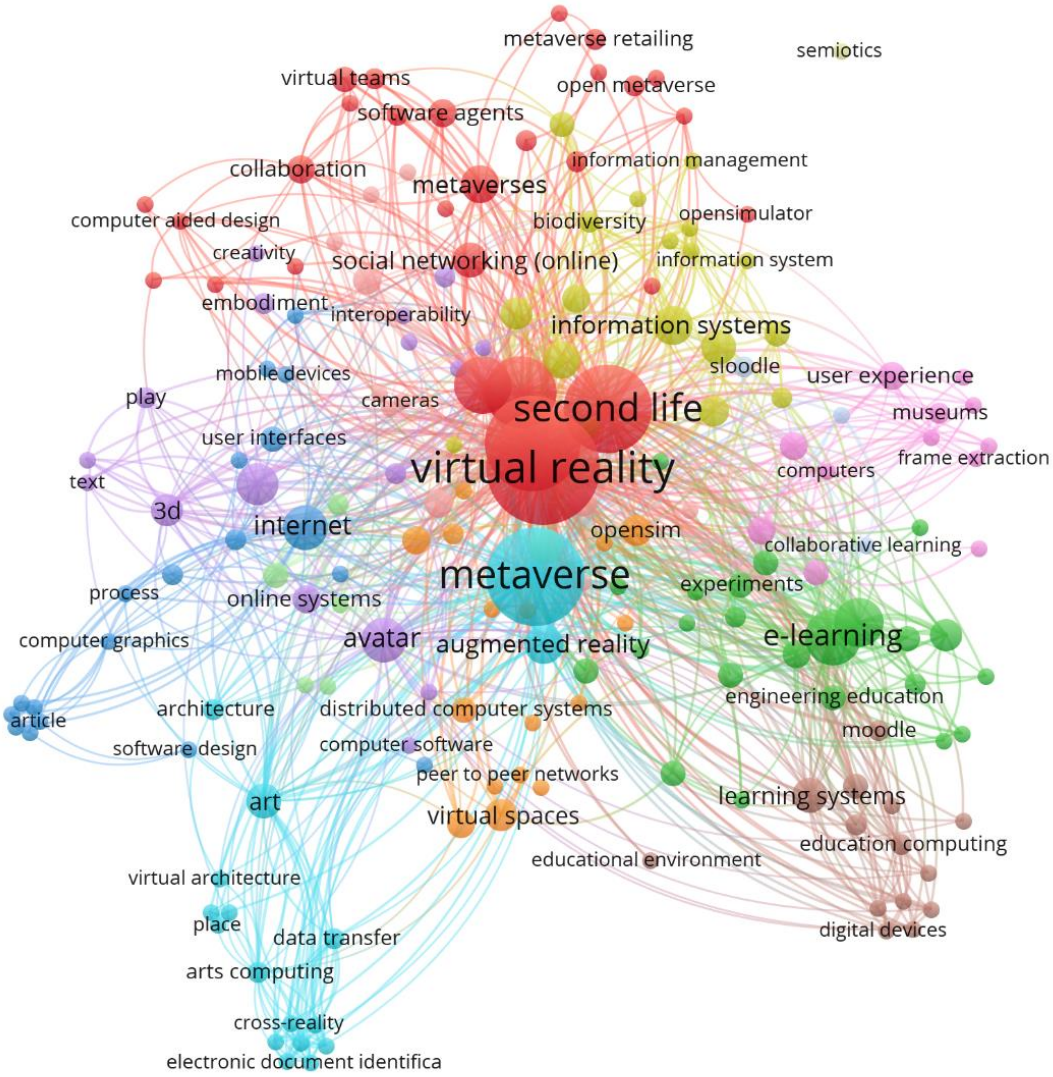

Figure 2. The network visualization of the connection between financial security of a business and other economic categories
Sources: developed by the authors based on the Scopus database

Thus, the issues of the virtual world and the circulation of values in it are covered by the innovative works of scientists who prove that there is an open virtual world in which virtual

wealth can be measured (Guo, Gong, 2011). In such a world there is a virtual money market based on a common value system in which the total intrinsic value of the virtual currency is equal to its total exchange value (Guo, Chow, Wigand 2011). Since retail in the virtual world is considered “an evolution of the traditional web store” (Hassouneh, Brengman, 2015), the question of what the evolution of retail payments is in the virtual and metaverse needs to be answered.

Thus, the purpose of this study is to find an answer to the question of what retail payments in the metaverse should be.

4. Methodology and research methods.

In this research, the traditional literature review was used, which aims to report on the state of a particular field of knowledge. The SCOPUS database to develop the review protocol was used. Initially, a research plan was outlined that included the purpose of the study, questions, keywords, and a set of inclusion and exclusion criteria on the metaverse. The inclusion criteria were defined as academic peer-reviewed publications written in English that meet the objectives of the study.

Initially, the search returned a total of 182 publications, including journal articles and conference proceedings in English between 1995, when the first papers on the subject were published, and 2020. The final set of relevant articles included only 23 by subject areas of business, management, accounting, economics, and finance, which were reread, peer-reviewed, classified, and analysed. The authors belong to 15 countries, the majority being from the United States, Japan, Turkey, and the United Kingdom.

In the next step, the author's work focused on writing and presenting conclusions related to the definition of the concept of retail payments in the metaverse. In particular, the process of synthesis, selection, and combination of different elements for the formulation of this concept was carried out. At this stage, other publications on the subject have also been integrated as additional supporting literature to better understand the problem and develop relevant results. The total number of peer-reviewed publications was 43.

5. Research results

Suzuki et al. are explaining the proposed concept of the learning system in the metaverse (Suzuki et al., 2020), in which its participants visit shops, museums, theatres, travel, etc. using modern technologies of augmented or virtual reality. Therefore, there is no need to distinguish, say, participation in conferences, classes or other events using the application "remotely" or "online" – all feelings and consequences, in particular, economic and legal in the metaverse are the same for each form of involvement.

At the same time, there is still that part of the real world that today is difficult to transfer to the virtual within the metaverse concept. According to Swilley, the acquisition of items such

as brick and cement creates an interaction of brand experience, excitement and opportunities for "more experiential shopping" (Swilley, 2016). Additionally, retail in the metaverse can help expand traditional online shopping and make it more attractive with better product verification capabilities (Hassouneh, Brengman, 2015).

The problem of payments in the virtual world is primarily related to the ownership right, which is usually realised by its transfer from the seller to the buyer after payment and the execution of relevant documents in the real world. However, in the virtual world, "the rights ordinarily attached to such transactions are not clearly apparent" (Zhou, Leenders, Cong, 2018). Although, this problem is partially solved by blockchain technology, in which each transaction confirmation is recorded in a distributed database, and information about the ownership transfer is stored forever (Melnychenko, Hartinger, 2017), this technology has not yet found application in retail payments due to a number of shortcomings related to the cost of time and energy to make payments, for example, using cryptocurrencies (Melnychenko, 2021; Osadcha, Melnychenko, Spodin, 2021).

Payment transactions, which are realised today with the help of technical means while using cash operation, payment cards, biometric payer verification methods and the whole system of payment and banking operations require a very real physical implementation. Instead, in the virtual world or in the metaverse, it is needed to use mechanisms that do not require physical form. In the first case it is not possible, and in the second, the very essence of the metaverse involves a combination of terrestrial and digital. Therefore, it is necessary to find those retail payments methods that will allow society to continue the usual way of life in the new conditions. One of them may be emotions-based which are completely extra-physical or even supra-physical and which, however, have some expression in the real world such as increased blinking, heart rate, pressure, etc. (Barry et al., 2015). This approach can be used to detect transactions' anomalies that are important in detecting fraudulent activities and other irregularities with payment instruments.

Another problem with payments in the metaverse is the anonymity of users, because in the metaverse avatars interact with each other, not people or users who tend to remain anonymous (Kappe, Steurer, 2010). This is not a problem for small purchases, when electronic money or other bearer values can be used, but their volume and number of transactions are limited by law (Melnychenko, Vlasova, 2018). Instead, making more expensive purchases requires a different solution, which can be a cryptocurrency or a virtual currency. However, the combination of all three worlds in the technological singularity (Corrêa, de Oliveira, 2021) will require the regulation of both virtual and real money circulation. At the same time, according to Johannessen and Sætersdal (Johannessen, Sætersdal, 2020), "money and goods are prioritized over people and democracy".

The payments development in the metaverse can be implemented in two scenarios:
1. rejection of the monetary payment form and the use of another payment method adequate to the environment. Such values may include energy, computing power, information, data, virtual values and virtual benefits;

2. non-cash transfers and digital cash payments exclusively to the virtual plane. In such circumstances, it is necessary to understand what the monetary policy will be and whether it will be needed at all.

Each of the scenarios differs from each other in a number of parameters. Instead, for both of them, there remains unchanged the need for a reliable transaction accounting system that will ensure the reliable and equitable functioning of the metaverse in a socially and economically heterogeneous environment. Such an accounting system can be implemented in the classic centralised scenario, when a bank is the centre role of accounting for financial transactions, central bank or payment system in the form of an institution or artificial intelligence (Melnychenko, 2020). It can also be implemented on the example of distributed databases, such as blockchain.

4. Conclusions

This paper reviews the literature to find answers to the question of what retail payments should be in the metaverse. It was found that life in the metaverse continues as in the real world, although without physical limitations. It implements socio-economic relations that require the money participation which appeared as an evolution result of exchange operations and labour division, as well as to support such a system. The author noted the problems associated with the metaverse existence, which are, in particular, the impossibility of address all issues without a physical presence in the real world with all the consequences. In addition, the metaverse is an environment usually of anonymous users, who do not have the right to make significant purchases without their identification. This study emphasises the need to develop the retail payment system to the level when civilisation reaches the technological singularity level and all settlements, as well as all other interpersonal relationships will be implemented in a digital-real environment.

Further research should focus on the study of whether energy, computing power, information, data, virtual values and benefits or their combination could be used as a common equivalent in the modern real world and metaverse.

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