72

SILESIAN
UNIVERSITY
SCHOOL OF BUSINESS
ADMINISTRATION IN KARVINA

Institute of Interdisciplinary Research

Working Papers in Interdisciplinary Economics and Business Research

The Opportunities of Using the Metaverse from a Business Perspective

Radka Bauerová, Ondřej Mikšík, Lucie Vavrušková, Kateřina Gavendová, Veronika Haladejová, Pavel Vavruška

Working Papers in Interdisciplinary Economics and Business Research

Citation

Abstract

Radka Bauerová, Ondřej Mikšík, Lucie Vavrušková, Kateřina Gavendová, Veronika Haladejová, Pavel Vavruška: **The Opportunities of Using the Metaverse from a Business Perspective**

Metaverse is a word so resonant in recent literature, yet so overlooked by many entrepreneurs. Despite the vast possibilities that the metaverse offers, its almost limitless nature is also responsible for the confusion that entrepreneurs may feel in connection with it. Despite the fact that it may be difficult for some to navigate the tangle of terms such as NFT, blockchain, avatar, and web 3.0, entrepreneurs should keep in mind that the metaverse is envisioned as the future evolution of the Internet, which will bring new opportunities for their businesses. The aim of this working paper is therefore to present the possibilities of the metaverse from the perspective of business opportunities. The contents of this paper are review studies on the current use and future possibilities of using the metaverse in marketing and business activities. The outcome of these studies is the definition of research directions within the research area that the authors believe are worth exploring in the future to increase knowledge that will contribute to the likelihood of metaverse acceptance as a platform for business.

Key words

avatar, metaverse, NFT, web 3.0, metaverse retailing

JEL: M1, M3

Contacts

Radka Bauerová, Department of Business Economics and Management, School of Business Administration, Silesian University, Univerzitní nám. 1934/3, 733 40 Karviná, Czechia, e-mail: bauerova@opf.slu.cz.

Kateřina Gavendová, Department of Business Economics and Management, School of Business Administration, Silesian University, Univerzitní nám. 1934/3, 733 40 Karviná, Czechia, e-mail: gavendova.katerina@icloud.com.

Veronika Haladejová, Department of Business Economics and Management, School of Business Administration, Silesian University, Univerzitní nám. 1934/3, 733 40 Karviná, Czechia, e-mai: veronika.haladejova@icloud.com.

Lucie Vavrušková, Department of Business Economics and Management, School of Business Administration, Silesian University, Univerzitní nám. 1934/3, 733 40 Karviná, Czechia, e-mail: vavruskova@opf.slu.cz

Pavel Vavruška, Department of Informatics and Mathematics, School of Business Administration, Silesian University, Univerzitní nám. 1934/3, 733 40 Karviná, Czechia, e-mail: vav0119@slu.cz.

Ondřej Mikšík, Department of Business Economics and Management, School of Business Administration, Silesian University, Univerzitní nám. 1934/3, 733 40 Karviná, Czechia, e-mail: miksik@opf.slu.cz.

Introduction

The area of the metaverse is attracting more and more attention as its meaning is continuously growing. Knowledge of the metaverse is needed to better understand how scientists, businesses, and consumers may use this virtual space for their work, education, entertainment, and other activities now or in the near future. Indeed, the space of the metaverse is only as limited as our imagination and, of course, the limits of current technology. However, what are we to understand by the term metaverse? Going back to the absolute beginning, the first who used this term was Neal Stephenson in his novel "Snow Crash" in 1992[1]. For the protagonist of his book, a near-broken computer hacker and pizza delivery man, the metaverse is an escape in which he acts as a customized avatar. The meaning of metaverse has been defined and reinterpreted several times. In this paper, the term metaverse, according to Matthew Ball, will be used to refer to *"a massively scaled and interoperable network of real-time rendered 3D virtual worlds which can be experienced synchronously and persistently by an effectively unlimited number of users with an individual sense of presence, and with continuity of data, such as identity, history, entitlements, objects, communications, and payments"*[2].

The current virtual reality world is worth $6.30 billion but is predicted to grow to $84.09 billion by the end of 2028[3]. Therefore, the aim of this paper is to present the possibilities of the metaverse in terms of business opportunities. This paper provides an overview of the possibilities of exploiting the metaverse environment in terms of business opportunities and outlines possible future research directions on this topic.

The present study is expected to contribute to our understanding of what opportunities the metaverse environment offers and how it can be used in future business activities. This working paper consists of five review studies on the themes of web presence, online grocery shopping, women's entrepreneurship on maternity leave, product innovation, and regional brands, all situated in the metaverse.

1. Overview studies of selected areas

The following subsections present review studies in selected areas and outline suitable questions for future research in the metaverse. First, attention is given to the Metaverse in the field of web presentation, where its possible applications are presented. Subsequently, the focus is on grocery shopping in the Metaverse as a possible future major category within Metaverse Retailing. The potential benefits of using the Metaverse for women entrepreneurs on maternity leave are discussed. Other areas explored include the use of the metaverse in product innovation and regional brand management.

---

[1] CNBC [online] [Accessed 9. July 2022] Available from: https://www.cnbc.com/2021/11/03/how-the-1992-sci-fi-novel-snow-crash-predicted-facebooks-metaverse.html

[2] Framework for the Metaverse [online] [Accessed 9. July 2022] Available from: https://www.matthewball.vc/all/forwardtothemetaverseprimer

[3] Virtual Reality Market Share, Growth|Research Report [online] [Accessed 28. December 2021] Available from: https://www.fortunebusinessinsights.com/industry-reports/virtual-reality-market-

1.1.   Metaverse in the web presentation domain

From the very beginning, the purpose of the site was to convey information in a static form, especially in the university world. However, since 1993, the web has evolved in such a way that websites have become a focal point of information for civilization, whether it be for various businesses, institutions, or individuals themselves, increasing the demands on the information presented (it must be dynamic and change over time) and the appearance itself (Kristof, 2011).

Web 3.0 has become the very precursor of the metaverse, enabling a new way of looking at the Internet. The main idea is to harness the intelligence of both the individuals who are responsible for creating websites and applications and the software itself. Data is not stored in one place, blockchains, shared servers or crypto-financial protocols are used. (Gupta and Singh, 2022)

Nowadays, the possibility of using the space outside the universe - the so-called Metaverse - is opening up, using already known technologies. Marc Zuckerberg says: "The metaverse is a set of virtual spaces that you can create and explore with other people who are not in the same physical space as you. You'll be able to hang out with friends, work, play, learn, shop, create, and much more." This idea is very innovative and changes the way we look at any presentation using the web. Although this idea still seems to be in its infancy, its development is accelerating all the time. Thus, any podcasts could present their information in different ways where the actual interaction with the potential customer must not be left out. Compared to today's website, where a product is presented with a description, a photo, a 360° view, or a video, in the future, it can be presented with an exact model that people will use in the real world. Thus, one will not have to physically visit the company's office or store but will be able to buy the product instantly using the aforementioned blockchains and cryptocurrencies. Since it is an open site, the metaverse must address its security, just like any website today. One of the problems that can happen in the multiverse is deepfake, which can be exploited, for example, when you pay a person you think is real, but on the other side, using fake models or videos, the wrong person appears. Another problem can be, for example, impersonal communication that can be spied on. Unfortunately, specific information gets to the wrong people who can further dispose of it in any way (Nath, 2022). Unless the metaverse becomes a purely commercial thing for selected companies (today it is mainly Meta or Microsoft), the future of any presentation may be the metaverse, where there will be almost no barriers.

Future research should focus on how potential customers react to the services and goods presented. Subsequently, it is necessary to answer the question of whether the "presenter" himself can correctly present the required information, what is the difficulty and cost of this activity, and for which companies this presentation is suitable in relation to the expected benefits.

1.2.   Grocery shopping in the Metaverse

Digitalisation in grocery shopping has accelerated in recent years, which has of course been compounded by the impact of covid-19. In the US alone, the number of online and delivery orders increased by around 50 percent during the covid-19 pandemic and is expected

to grow further in 2022[4]. Globally, online grocery sales are then estimated to increase to almost double the 2021 figure in 2026, implying around a 7.6% share of online sales in total grocery sales[5]. The popularity of online grocery shopping has been growing significantly in recent years and therefore the predictions for this method of shopping are very optimistic. Perhaps, for this reason, retailers such as Adidas, Gucci, Tommy Hilfiger, Samsung, Nike, Burberry and Louis Vuitton[6] are now turning their eyes to the metaverse as another environment in which they can reach potential customers and make sales of their products. Bourlakis, Papagiannidis and Li (2009) even consider metaverse retailing as an evolution of e-retailing. Thus, it is possible that within the metaverse, we may make food purchases as routinely in the future as more than 70% of U.S. households already routinely buy online through e-stores in 2021[7]. Moreover, compared to traditional online stores, virtual reality creates a more advanced customer experience, enables better trust building (Papadopoulou, 2007), and has a positive impact on customer engagement, enjoyment, and satisfaction (Papagiannidis et al., 2013).

Although there has been an acceleration of online grocery shopping in recent years, this method of obtaining food has its barriers, including the inability to choose the goods oneself, the lack of enjoyment of shopping, and the lack of a social aspect (Ramus and Nielsen, 2005), and the lack of trust in the e-retailer and the payment system (Seitz et al., 2017). However, some of these barriers can be overcome just by using the virtual environment. How is it possible that the barriers to online grocery shopping via an e-store can be overcome in the case of grocery shopping in the metaverse? This is due to the specific environment of virtual reality, which makes it possible to create a similar customer experience to shopping in a physical store, only from the comfort of home. Grocery shopping can also be seen as a social activity in which we interact, but online shopping has deprived us of some aspects of social interaction[8]. However, Metaverse Retailing brings a key advantage and that is the unique creation of experiences whereby customers´ digital representatives (avatars) interact with other avatars enclosed in the metaverse space (Papagiannidis and Bourlakis, 2010). Thus, in the metaverse, social interaction in shopping can be realized through the interaction of avatars - customers with each other, or a customer avatar and an "employee" avatar. The most significant barriers to online grocery shopping are definitely the inability to physically view the goods and the associated lack of tactile connection. However, even this barrier can be overcome through virtual reality with haptic feedback, which would add a tactile dimension to the shopping experience that has been lacking[9]. Although metaverse shopping can overcome some of the barriers of current online shopping, it also has its own limits. Some of the limits of metaverse shopping include that it does not display a person's true identity,

---

[4] McKensey&Company Insights [online] [Accessed 27. June 2022] Available from: https://www.mckinsey.com/industries/retail/our-insights/the-next-horizon-for-grocery-ecommerce-beyond-the-pandemic-bump

[5] Statista Food&Beverage [online] [Accessed 28. June 2022] Available from: https://www.statista.com/statistics/1268769/global-edible-grocery-store-based-and-e-commerce-sales/

[6] BBC News Business [online] [Accessed 27. June 2022] Available from: https://www.bbc.com/news/business-61979150

[7] Insight Grocery Business [online] [Accessed 1. July 2022] Available from: https://www.winsightgrocerybusiness.com/retailers/more-70-us-households-ordered-groceries-online-2021

[8] Fast company [online] [Accessed 4. July 2022] Available from: https://www.fastcompany.com/90728051/nobody-really-knows-how-were-going-to-shop-in-the-metaverse

[9] Same as previous reference

creates opportunities for misbehaviour, or other limitations arising from the technology used at the same time (Papagiannidis and Bourlakis, 2010).

In the context of selling food in the metaverse, people are talking about Walmart. The latter has plans to create its own blockchain-based world. The company has even already applied for several trademarks and wants to create its own NFT (non-fungible token)[10] and cryptocurrency[11]. At the time of writing, Walmart is even using virtual reality to train its employees, who are learning how to handle everyday situations (managing the fresh area) to exceptional ones (Black Friday)[12].

The involvement of food retailers in the metaverse is certainly a market opportunity that can bring them many benefits in terms of addressing staff shortages and increased demand caused by the growing acceptance of online grocery shopping globally or generating more profit by reaching a new customer segment. However, it is questionable how the virtual environment will influence customers to shop for food online. Could some aspects of metaverse grocery shopping have a negative impact on customers? After all, grocery shopping in the metaverse can be seen as gamification of our normal activities that are required to buy groceries in the physical world or in an e-shop. Won't grocery shopping in the metaverse then become shopping for the sake of shopping?

1.3.   Metaverse and entrepreneurship of women on maternity leave

Every country has a goal of long-term sustainable economic growth, which depends not only on labour productivity. Women potentially make up half of this workforce, and if we focus on the role of women leaders in business, we may discover the untapped potential for long-term growth (Fang et al., 2022). However, according to Bosma et al. (2012), in most countries in the world, there are more men than women entrepreneurs. Specifically, in the Czech Republic, in the first quarter of 2022, 1.8 times more men than women were involved in entrepreneurship (MIT, 2022). Bosma et al. (2012) cite as a reason that women face more obstacles than men. These obstacles include motherhood, as mothers may experience strong feelings of guilt for having career ambitions (Guendouzi, 2006). Metaverse is one of the avenues where women can find employment while on maternity or parental leave.

The notion of a virtual world that Metaverse offers breaks down the barriers between motherhood and entrepreneurship, creating a favourable environment that encourages entrepreneurial inclinations. This environment is characterised by low barriers to entry, which mainly involve the acquisition of digital products. Furthermore, it is characterized by a rapidly expanding user base, a certain degree of anonymity, and a huge number of new activities for which products and services could be offered (Papagiannidis, 2008). In particular, the possibility of partial anonymity may be found as an attractive advantage by mothers on maternity and parental leave, since due to factors such as gender, women are more disadvantaged in entering the market than men (Rivo-López et al., 2022). Moreover, virtual

---

[10] NFT is a new kind of cryptographic token that represents ownership over digital or physical assets (Marswood, 2022)

[11] Business Standard [online] [Accessed 7. July 2022] Available from: https://www.business-standard.com/article/companies/walmart-reveals-plans-to-enter-blockchain-based-metaverse-sell-nfts-122011700262_1.html

[12] Walmart official website [online] [Accessed 7. July 2022] Available from: https://corporate.walmart.com/newsroom/opportunity/from-football-to-retail-virtual-reality-debuts-in-associate-training

reality environments allow users to shape their ideas through virtual objects, thus inducing a sense of deep immersion in virtual reality (Cortés Rodríguez, 2022).

Given these possibilities, the Metaverse for mothers of entrepreneurs can be used in several ways. One opportunity to leverage this world is e-commerce. Thus, even during maternity leave, the Metaverse provides mothers with a direct connection to customers through chat and an environment for marketing communication from the comfort of home (Jeong et al., 2022). At the same time, they can use this environment to sell their products themselves. This allows users to view the object of sale better than in an online store using only pictures or product slideshows (Shen et al., 2021). Another potential use is the creation of tokens themselves. For example, a relatively new phenomenon is the NFT market, which opens up offerings for businesses, investors and fans. Authors of cryptographically signed digital images thus have the potential to make money by creating them (Khan et al., 2022). There are of course many other ways to use Metaverse for business, but given its rapid development, the topic is still relatively unexplored in the literature, especially in the context of motherhood and parenthood.

As part of future research in this area, it is worth addressing several questions: how much money do mothers need to spend to use Metaverse for their business? Are there any courses or training on the Metaverse or NFT that would help mothers better understand the virtual environment and teach them how to navigate it? What percentage of mothers on maternity leave have previous experience with Metaverse?

1.4. Metaverse in product innovation

Nowadays, it is important to create innovations that also emphasize environmental sustainability (Behnam, Cagliano and Grijalvo, 2018). There is interest in environmentally sustainable product innovations, and the virtual world can help to make innovation green. (Zubeltzu-Jaka et al., 2018)

It is therefore a suitable technology to create a new product innovation. First of all, this reality generates a virtual environment in which the user can explore the new innovation or interact with people who are trying the innovation themselves (Guo et al., 2018).

In the past, it was mainly about creating innovations only in the physical environment. The actual process of developing a new or innovative product has shifted and consists of several phases. The most important phase can be classified as manufacturing strategy. Among the main achievements of the strategy is to get the manufacturing process itself correctly specified to ensure minimal waste that affects the environment. That is why innovators try to create innovations in an online environment, i.e. the Metaverse. (Gonçalves da Silva, Gomes and Winkler, 2022)

Today, product designers are trying to bring innovation into virtual reality, where the innovated product is to be modeled. With this reality, managers are able to create a three-dimensional product that customers can even try out. (Zou and Tao, 2021)

Users thus become virtual tourists who participate in testing the VR world they are in. This area should be primarily playful innovative and social. These worlds should be accessible to anyone who wants to either create or try out innovation in VR. So with this connection, innovation diffusion is created, which uses the very theory of product innovation creation, both through practice and as it happens in the VR world (Kim, Lee and Preis, 2020).

Currently, there are no precise guidelines or methodologies for designers to create products in virtual reality. In the actual design activity, it is important to develop a methodology that should be repeatable, transferable, and systematic (Dozioa et al., 2022).

The creation itself is costly both in terms of waste and money, so designers try to convert everything into a virtual model that occurs in virtual reality. The virtual model of the product, in fact, reduces the time and cost of production. Virtual simulations related to virtual reality and digital human technologies can also help to create a new product. Thus, it is a valuable tool to create a new or innovative product (Gonçalves da Silva, Gomes and Winkler, 2022).

Future research in this area should focus on the effectiveness and functionality of performing product innovation in a virtual world. In terms of the functionality of implementing innovation in the metaverse, it would be useful to investigate what the barriers to the acceptance of applications for creating innovation may be.

1.5.   Regional brands in the Metaverse

A brand is a concept for which there are many definitions. Perhaps one of the most well-known is the American Marketing Association (AMA) definition, which considers a brand to be a name, designation, symbol, or design, or a combination of these terms, used to identify a brand of products and services.

In contrast, Keller (2007) points out that practitioners perceive the brand as something more. It is something that has already penetrated the human consciousness and has an important position in the commercial sphere. Kotler and Keller (2013) also state that a brand has value and highlight that it is one of the most valuable intangible assets, with strong brands having a positive effect on customer loyalty.

Of course, the concept of the brand is also linked to regional brands. In the problem under study, attention is paid to regional brands in the Czech Republic, which are managed by the Association of Regional Brands, which currently manages 30 regional brands in 29 regions. Each of these regions has its own brand for products, which, in addition to their quality and environmental friendliness, guarantees their link and origin to a specific exceptional area.

From the above, it can be seen that it is possible to encounter markings and signs mainly in the physical world. However, technology is still evolving and thanks to the advances it is now possible to look into the virtual world. As a result, brands are also slowly moving beyond the physical world and are being worked with in the virtual world, the metaverse. An example is Facebook, which is now called Meta. Other brands that are penetrating the metaverse include Nike with its Nikeland, Louis Vuitton, and Coca-Cola.

Jeong, Yi and Kim (2022) came up with an innovative business model for a new e-commerce platform. With this new platform, it will be possible for customers to 'feel' the brand and try out the product features in a virtual world. This should lead to a greater shopping experience. By leveraging the metaverse, retailers can create innovative content and design conceptual spaces to ensure brand awareness and loyal customers.

Metaverse can also be linked to luxury clothing brands. Joy, Zhu, Peňa and Brouard(2022) come up with questions such as whether young consumers will buy more fashion products in the digital world than in the real world or how the fashion industry can strategically address the coexistence of digital collections and physical goods.

All of the above examples are related to the connection between the brand and the virtual world. In the field of regional branding, no literature has been written on linking regional

brands to the metaverse. However, as these technologies become more accessible, such a link could be made and virtual reality could perhaps also be used by SMEs with regional brands.

Future research in this area should focus on the question of how much financial resources and time SMEs will have to spend to be able to present their brands and products in the metaverse. It will also be necessary to find out how the composition of consumers is changing, and whether regional brands are also being sought out by younger consumers who tend to be more inclined toward new technologies.

Conclusion

Taken together, these findings suggest that the future of the metaverse is to see it as a digital universe in which consumers will move as 3D avatars through which we can perform many common activities such as shopping, working, traveling, and going to school, or having fun. For companies, the metaverse creates a space for easier and more efficient product creation, development and innovation, or brand management.

References

[1]   Beham, S., R. Cagliano and M., Grijalvo, 2018. How should firms reconcile their open innovation capabilities for incorporating external actors in innovations aimed at sustainable development? *Journal of Cleaner Production*, vol. 170, no. 1, pp. 950-965.

[2]   Berg, K., 2008. *Äitiys kulttuurisina odotuksina* [Motherhood as cultural expectations]. The Population Research Institute publications series D48/2008. Helsinki: The Family Federation of Finland.

[3]   Bosma, N., Wennekers, S. and J. E. Amoros, 2012. *Global Entrepreneurship Monitor*. 2011 Extended Report. Entrepreneurs and Entrepreneurial Employees Across the Globe. Available from: www.gemconsorium.org.

[4]   Bourlakis, M., Papagiannidis, S. and F. Li, 2009. Retail spatial evolution: paving the way from traditional to metaverse retailing. *Electronic Commerce Research*, vol. 9, no. 1, pp. 135-148.

[5]   Cortés Rodríguez, F., Dal Peraro, M. and L. A. Abriata, 2022. Online tools to easily build virtual molecular models for display in augmented and virtual reality on the web. *Journal of Molecular Graphics and Modelling*. vol.114, no. 1, pp. 1-8.

[6]   Devashish Gupta, Dr. Sunil K. Singh, 2022. *Evolution of the Web 3.0: History and the Future* [online]. [cit. 2022-05-29]. Available from: https://insights2techinfo.com/evolution-of-the-web-3-0-history-and-the-future/.

[7]   Dozio, N., F., G., Marcolin Scurati, L., Wally, F., Ulrich, E., Nonis, , G., Vezzetti, A., Marsocci F.,, La Rosa and F., Ferrise, 2022. A design methodology for affective Virtual Reality. *International Journal of Human-Computer Studies*, vol. 162, no.1,

[8]   Fang, S., Goh, Ch., Roberts, M., Xu L., C. and A. Zeufack, 2022. Female entrepreneurs and productivity around the world: Rule of law, network, culture, and gender equality. *World Development*, vol. 154, no. 1, pp. 1-13.

[9]   Gonçalves da Silva, A., M., Vinius Mendeles Gomes, and I., Winkler, 2022. Virtual Reality and Digital Human Modeling for Ergonomic Assessment in Industrial Product Development: A Patent and Literature Review. *Applied Sciences*, vol. 12, no. 4, pp. 1084.

[10] Guendouzi, J., 2006. 'The guilt thing': balancing domestic and professional roles. *Gender and Society*, vol. 68, no. 4, pp. 901-909.

[11] Guo, Z., D., Zhou, J., Chen J., Geng, Ch., Lv, and S., Zeng, 2018. Using virtual reality to support the product's maintainability design: Immersive maintainability verification and evaluation system. *Computers in Industry*, vol. 101, no. 1, pp. 41-50.

[12] Jeong, H., Yi, Y. and D. Kim, 2022. An innovative e-commerce platform incorporating metaverse to live commerce. International *Journal of Innovative Computing, Information and Control*, vol. 18, no. 1, pp. 221-229.

[13] Joy, A., Zhu Y., Peňa C., and M. Brouard, 2022. Digital future of luxury brands: Metaverse, digital fashion, and non-fungible tokens. *Strategic Change*, vol. 31, no. 3, pp. 337-343.

[14] Keller, K. L. 2007. *Strategické řízení značek*. Praha: Grada Publishing.

[15] Khan, F., Kothari, R., Patel, M. and N. Banoth, 2022. Enhancing Non-Fungible Tokens for the Evolution of Blockchain Technology. In: Giovanni Pau, ed. *Proceedings of International Conference on Sustainable Computing and Data Communication Systems (ICSCDS)*. Bologna: University of Bologna. pp. 1148-1153.

[16] Kim Ja, M., Lee Ch. and M. Press, 2020. The impact of innovation and gratification on authentic experience, subjective well-being, and behavioural intention in tourism virtual reality: The moderating role of technology readiness. *Telematics and Informatics*, vol. 49, no. 1. pp. 1-16.

[17] Kotler, P., and K. L. Keller, 2013. *Marketing management*. Praha: Grada Publishing

[18] Krištof, T., 2011. Web 2.0 - *nové trendy dnes, zejména CSS3 a HTML5* [online]. [cit. 2022-05-29]. Available from: https://is.ambis.cz/th/irczj/.

[19] Marswood, M. J., 2022. *Metaverse and NFT investing.* Great Britain: Amazon.

[20] MPO, 2022. 2022 – I. Q. – *Počty podnikajících fyzických osob a živnostenských oprávnění dle pohlaví* [online]. Praha: Ministerstvo průmyslu a obchodu. Available from: https://www.mpo.cz/cz/podnikani/zivnostenske-podnikani/statisticke-udaje-o-podnikatelich/pocty-podnikajicich-fyzickych-osob-a-zivnostenskych-opravneni-dle-pohlavi--225455/.

[21] Nath, K., 2022. Evolution of the Internet from Web 1.0 to Metaverse: The Good, The Bad and The Ugly. *Tec hRxiv*. Preprint.

[22] Papadopoulou, P., 2007. Applying Virtual Reality for Trust-building E-commerce Environments. *Virtual Reality*, vol. 11, no. 2, pp. 107-127.

[23] Papagiannidis, S. and M. Bourlakis, 2010. Staging the New Retail Drama: At a Metaverse Near You! *Journal of Virtual Worlds Research*, vol. 2, no. 5, pp. 425-446.

[24] Papagiannidis, S., Bourlakis, M. and F. Li, 2008. Making real money in virtual worlds: MMORPGs and emerging business opportunities, challenges and ethical implications in metaverses. *Technological Forecasting and Social Change*, vol. 75, no. 5, pp. 610-622.

[25] Papagiannidis, S., Pantano, See-To E., and M. Bourlakis, 2013. Modelling the Determinants of a Simulated Experience in a Virtual Retail Store and Users´ Product Purchasing Intentions. *Journal of Marketing Management*, vol. 29, no. 13-14, pp.1462-1492.

[26] Ramus, K. and A. N. Nielsen, 2005. Online grocery retailing: What do consumers think? *Internet Research*, vol. 15, no. 3, pp. 335-352.

[27] Rivo-López, E., J. F., Lampón, M. Villanueva-Villar, and C. Míguez-Álvarez, 2022. The impact of visual narrative formats on women's entrepreneurship training. *The International Journal of Management Education*, vol. 20, no. 2, pp. 1-17.

[28] Seitz, C., J. Pokrivčák, M. Tóth, and M. Plevný, 2017. Online grocery retailing in Germany: an explorative analysis. *Journal of Business Economics and Management*, vol. 18, no. 6, pp. 1243-1263.

[29] Shen, B., W., Tan, J., Guo, L. Zhao, and P. Qin, 2021. How to Promote User Purchase in Metaverse? A Systematic Literature Review on Consumer Behavior Research and Virtual Commerce Application Design. *Applied Sciences*, vol. 11, no. 23, pp. 2076-3417.

[30] Xiaosong, Z., and T., Tao, 2021. Dynamic Modeling and Simulation Analysis of Virtual Product Design and Creation Based on OSG Artificial Intelligence Platform. Discrete Dynamics in Nature and Society, vol. 2022, no. 1, pp. 1-11.

[31] Zubeltzu-jaka, E., A., Erauskin-Tolosa, and I., Heras-saizarbitoria, 2018. Shedding lignt on the determinansts of eco-innovation: A meta-analytic study. *Business Strategy and the Environment*, vol. 27, no.7, pp. 1093-1103.