# Economic Transformation from Physical to Digital: A Bibliometric Analysis of the Metaverse Economy

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Abstract— The metaverse is a virtual ecosystem formed by the combination of innovative technologies such as augmented reality (AR), virtual reality (VR) and blockchain, which are reshaping global trade, consumption patterns and cross-sector collaboration. This ecosystem offers a new economic structure that combines the physical and digital worlds with elements such as the appreciation of digital assets, the proliferation of NFTs and the integration of decentralised finance (DeFi) applications. This new economic structure is the subject of interest and research both in the business world and in the academic world. In this study, the data obtained from the Scopus database covering the period between 2018-2024 were analysed by bibliometric analysis method. The institutions, countries, cited studies and keyword links that produced the most works were evaluated in detail. The key findings of this study indicate that research on the metaverse economy has experienced exponential growth, with significant contributions from the United Kingdom, China, and the United States. Additionally, performance analysis reveals that blockchain, metaverse, NFT, and digital transformation are the most frequently explored topics in the academic literature.

#### Keywords— Metaverse economy, metanomics, digital transformation, blockchain, NFT, virtual reality

# I. INTRODUCTION

As one of the last major technological changes of today's world, the metaverse has the potential to create significant changes in many areas of society, especially in the economy. In the historical process, the term "metaverse" was first used to describe the fictional universe in a science fiction novel titled "Snow Crash" by Neil Stephenson in 1992 [1]. The metaverse economy is rapidly developing as a field where physical and digital worlds come together to create a new economic structure and redefine technology and human experience [2, 3]. Technologies such as digital currencies, NFTs, blockchain, augmented reality (AR) and virtual reality (VR) play a critical role in this new economic order and offer innovative opportunities for businesses and consumers [4, 5]. The metaverse transcends the boundaries of the physical world and transforms into a global business, education and socialisation platform. In this context, this ecosystem, which reshapes consumer behaviour and offers businesses opportunities to develop different business models, challenges the traditional economic system [6].

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The metaverse economy is not only a product of technological innovation, but also an environment in which economic systems are being restructured. It leads to comprehensive changes at both the microeconomic and macroeconomic levels in sectors such as health, education, retail and international trade [7, 8]. For example, applications such as virtual hospitals or educational platforms offer a wider reach by overcoming geographical barriers, while digital retailing and avatar-based commerce are radically changing the consumer experience [9, 10]. In short, the integration of the digital and physical worlds is about to place the metaverse economy at the centre of the global economic system.

In this study, bibliometric analysis method was used to examine the literature in the field of metaverse and blockchain economics. Despite the increasing number of studies on the metaverse economy, there is a lack of research explicitly addressing how the transition from the physical to the digital economy impacts global economic structures, business models, and value creation processes. This study aims to fill this gap by formulating the following research question: "How does the transformation created by the metaverse economy in the global economic system, business models, value creation processes and scientific collaborations between countries?" This study aims to analyse the historical development of research on the Metaverse Economy and to identify prominent researchers and institutions in this field.

Data were obtained from the Scopus database using key terms such as "metaverse", "metaverse economy", "blockchain economy" and "blockchain economics". Only articles, reviews and conference proceedings published in English were included. The dataset was visualised with VOSviewer v1.6.20 software to analyse important themes of the field, collaboration networks between authors and the most influential studies. Within the scope of the study, the distribution of publications by years, institutions and countries producing the most works, keyword networks, citation analyses and linkage maps between countries were examined to reveal the general trends of academic production in the field of metaverse economy and blockchain.



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# II. METAVERSE ECONOMY

The Metaverse is a next-generation internet universe supported by technologies such as blockchain and artificial intelligence, which enables users to have interactive and immersive experiences in a three-dimensional digital environment by combining physical and virtual realities [11]. This universe creates brand new opportunities in almost every sector with its qualities that make it possible to go beyond the traditional economic patterns in the physical world. Therefore, besides providing economic transformation, the metaverse creates sector-specific opportunities and challenges, and leads to macroeconomic and financial impacts.

JP. Morgan (2022) expressed the economic structure of the Metaverse as metanomics by quoting Bloomfield [12] in his report titled "Opportunities in the Metaverse" in which he revealed the growth opportunities related to the Metaverse for businesses. Metanomics refers to an economic structure in which the virtual needs of people and virtual assets are met in virtual universes, production, distribution and finance processes are designed for this purpose, and which interacts with the real universe [1].

# A. Metaverse and Economic Transformation

The metaverse economy refers to a transformation in which economic activities are redefined in a virtual environment created by blending digital and physical realities. This economy is shaped by the use of digital currencies and the integration of innovative technologies such as blockchain technology and augmented reality [2]. The appreciation of digital assets and the transformation of consumption models are among the main characteristics of this new economy [3].

According to Ball [13], the Metaverse consists of 8 components: Hardware, Networking, Computing, Virtual Platforms, Exchange Tools and Standards, Payments, Metaverse Content, Services and Assets, and User Behaviour. However, Tapscott [14], while mentioning the importance of these technologies, states that the basic building block of the Metaverse is blockchain, especially because it brings the phenomenon of decentralisation. Digital currencies and blockchain technology are among the elements that form the basis of the metaverse economy. Blockchain increases security, privacy and transaction speed by enabling a decentralised structure [15]. It also provides a transparent framework for protecting property rights and increasing the security of economic systems. This technology allows the ownership and transfer of digital assets to be tracked transparently, while at the same time reducing the dependence of transactions on intermediary institutions [4]. Decentralised applications and smart contracts contribute to a wider acceptance of these technologies within the metaverse [5]. In particular, luxury brands within the metaverse are integrating elements such as unique ownership and digital scarcity using NFT technology. It can be said that NFTs enable consumers to have new experiences in the digital space by ensuring the uniqueness and rarity of digital luxury, and in this context, they contribute to the virtual transformation of luxury brands [16]. For example, Gucci's offering its digital products for sale through the metaverse is a typical example of the commercial application of such innovations [5].

Technologies such as Extended Reality (XR), Augmented Reality (AR) and Mixed Reality (MR) play a critical role in transforming the consumer experience of the metaverse economy. These technologies enable users to interact more deeply and interactively with the metaverse [17]. At the same time, these platforms offer businesses opportunities to interact directly with their customers and develop innovative business models. For example, virtual business meetings, training platforms and shopping experiences have become more accessible thanks to these technologies [3].

The effects of the metaverse economy on the global economic structure are quite extensive. The integration between digital and physical assets leads to changes at both microeconomic and macroeconomic levels [2]. This change brings new business models and value creation mechanisms to the agenda with the integration of the physical and digital worlds. Mancuso et al. [6] state that the metaverse economy develops innovative "physital" business models by combining physical and virtual elements, and that the transition from the physical world to virtual reality means a radical change in business models and value creation processes. V-commerce stands out as an important element of this transformation. Damaševičius [18] states that virtual reality technologies reshape consumer behaviour and make shopping processes more personalised and interactive. This new trade model allows users to make more informed choices in their shopping decisions, while enabling companies to interact with consumers more effectively.

The metaverse not only reshapes economic structures within national borders but also plays a crucial role in redefining global economic relations. It accelerates digital trade, decentralises financial transactions, and creates new economic actors beyond traditional state and corporate entities [19]. However, this transformation also deepens existing inequalities in technological access and digital financial literacy between developed and developing countries [20]. The digital divide manifests in disparities in blockchain adoption, virtual real estate investments, and accessibility to metaversebased financial services, potentially exacerbating global economic stratification [21].

The metaverse opens new horizons for economic activities in different sectors. Koohang et al. [7] stated that metaverse technologies enable innovative applications in various fields such as marketing, healthcare and education and provide a level of interaction beyond physical borders. At the same time, Saridakis et al. [8] emphasise that the metaverse facilitates inter-firm interaction by eliminating geographical barriers in the context of international trade and paves the way for the reevaluation of traditional trade theories.

The possibilities offered by avatar-based commerce in the transformation of value creation processes have attracted attention. For example, theoretical frameworks such as Avatar Business Value Analysis (ABV Analysis) have been developed for the strategic management of economic activities carried out with digital identities through virtual platforms such as Second Life [22]. This analysis allows to empirically assess the business value of virtual commerce initiatives by measuring the interaction rates of virtual stores. Moreover, the





interactions of avatars with virtual stores are considered in line with strategies that increase brand awareness and transform the consumer experience [22]. Of course, personalisation and avatar-based interactions can be said to influence consumer behaviour and differentiate shopping experiences [10]. In this context, the dynamic nature of the metaverse platform reveals the necessity to strategically utilise the innovative opportunities of virtual environments by expanding the boundaries of traditionally defined business models in the physical world.

# B. Sectoral Impacts, Opportunities, Challenges

Metaverse, as a digital ecosystem shaped by the combination of augmented reality (AR) and virtual reality technologies, offers (VR)vast opportunities for entrepreneurship and investment. This environment provides opportunities for digital entrepreneurs to develop innovative business models and increase user engagement. For example, creating digital twins, gamification elements and collaborative spaces in the metaverse technology makes virtual environments more attractive [23]. It is emphasised that technology, design and immersive experiences are critical for entrepreneurship in the metaverse. In particular, digital twins highlight the potential for companies to improve customer service and provide sectoral diversification by developing technically complex platforms [23]. Innovations that make user experiences in the Metaverse real-time and interactive provide an important foundation for digital entrepreneurship [24].

Applications in different sectors demonstrate the huge potential of the metaverse platform. For example, in the field of education, immersive learning environments are created with the use of VR and AR, and student engagement and learning outcomes are improved through simulations of historical events or biological processes. Adopting an inclusive approach by overcoming geographical barriers, the metaverse provides access to disadvantaged individuals through distance learning platforms and reshapes individual and collective learning by creating global collaborative communities [25].

In healthcare, the metaverse is increasing access to care for individuals in rural and underserved areas by creating virtual hospitals and clinics [9, 26]. It is also revolutionising medical education with realistic simulations of surgical procedures and clinical scenarios. These simulations allow medical professionals to practice and improve their skills in a risk-free environment [27]. Metaverse also provides patient education and psychosocial support by allowing patients to receive peer support and access health information through virtual communities. These virtual environments provide emotional support and empowerment, reducing isolation and stigmatisation, especially for individuals affected by chronic or rare diseases [28]. These innovative digital platforms make healthcare services more accessible and effective for both individuals and communities.

It is observed that brands in retail and marketing use the metaverse platform to create innovative shopping experiences that increase customer interaction [7]. In this context, it is stated that investment in technological infrastructure, especially the development of AR, VR and mixed reality

technologies, is critical to improve the quality of metaverse experiences [29]. In addition, developing platforms that increase the motivation of users, taking into account social connections and psychological needs, strengthens the social benefits of the metaverse platform [24].

Cultural and social dynamics have been transformed as metaverse technology blurs the boundaries between the virtual and the real, creating a new cultural landscape. Leshkevich [30] argues that metaverse technology encourages the emergence of multiple identities and enables the preservation of digital cultural heritage. Florido-Benítez [31], with the concept of "MetaTourPolis", revealed that the metaverse platform offers innovative applications focused on sustainability and accessibility in tourism cities, especially improving the quality of life of disabled people.

The metaverse economy also offers significant advantages in terms of environmental sustainability. Studies by Zhao and You [32] have shown that metaverse technology can significantly reduce greenhouse gas emissions by reducing the need for physical travel. For example, it was suggested that it is possible to reduce 10 gigatonnes of CO2e in the United States by 2050. In addition, Go and Kang [33] stated that metaverse tourism expands tourism resources and supports sustainable development in line with the United Nations Sustainable Development Goals.

There are also various challenges related to the adoption of Metaverse technology. Inadequate technological infrastructure and high investment costs pose a significant barrier for smallscale retailers [7, 29]. At the same time, concerns about data privacy and security are critical to ensuring consumer trust [34, 7]. In addition, the psychological effects of virtual shopping experiences and possible negative consequences for social interactions are also among the factors to be considered [24]. In particular, problems such as the effect of the customisable structure of avatars on body perception and the difficulty of users to establish a balance between the real world and the virtual environment come to the fore [24, 34].

# C. Macroeconomic and Financial Impacts

The rise of the metaverse economy represents a transition from the physical economy to a new economic structure that integrates virtual and real world elements. This transformation has led to the obsolescence of traditional economic patterns and has reshaped economic behaviours such as production, consumption and money supply in virtual environments. Castronova et al.'s [35] study on a large-scale virtual world revealed that economic behaviour closely follows physical world patterns.

Metaverse has important effects in the macroeconomic field. First of all, productivity will increase and growth rates will increase [1].

One of the macroeconomic areas that will be affected by the Metaverse is labour and employment. The Metaverse creates new business areas and professions and creates the need for appropriate labour force. The Metaverse also has an impact on the way work is done. It creates opportunities such as





working in virtual environments, working, meeting, and breaks the work from being tied to the place [1].

Metaverse technology will also have effects on unemployment. Although every new technological development until today firstly creates technological and structural unemployment problems, after a while, new occupations and employment areas required by new technologies have brought along the solution of unemployment problems. With the metaverse technology, some professions disappear and some employees become unemployed. However, in today's technological environment where artificial intelligence technology and automation are increasingly intensified, artificial intelligence and intelligent robots are gradually replacing humans. As a result, it seems likely that the employment-enhancing effect of metaverse technology will be very limited and an intense unemployment is likely to emerge [1].

As an emerging digital ecosystem, the metaverse economy has the potential to have profound impacts on income distribution and economic inequality. This potential may increase or decrease existing inequalities depending on the structure, accessibility and governance models of metaverse technology. In particular, the distribution of economic power in the metaverse is shaped by the ownership of virtual assets and digital entrepreneurship opportunities. Turner [19] analysed the political-economic aspects of the metaverse platform from four different perspectives and emphasised the importance of understanding the social impacts of this structure. In this framework, the digital divide, wealth inequalities and differences in technological access stand out as key elements that reinforce the potential of the metaverse economy to exacerbate existing inequalities.

In a world where the digital divide exists, the metaverse can create access problems for individuals and communities with limited access to infrastructure. Zhou et al. [20] highlight how digital literacy and infrastructure limitations can affect global inequalities. In particular, these limitations can increase marginalisation in the metaverse economy and reinforce patterns of wealth accumulation that become evident in virtual world economies. Fuchs and Thurner [21] found that in virtual worlds , early adopters and those with strong social networks have higher wealth accumulation, which resembles the dynamics of wealth inequality in the real world. Such a structure may further deepen economic inequalities by limiting access to economic opportunities within the metaverse.

However, the metaverse economy also offers opportunities to reduce economic inequalities. The integration of blockchain technology can increase financial inclusion by enabling the decentralisation of economic control and transparent transactions [36]. Moreover, decentralised finance (DeFi) applications increase access to financial services and provide new opportunities for individuals who do not have access to the banking system. In the study of Weking et al. [37], it is stated that metaverse-based entrepreneurship enables individuals to generate income from digital content and services and provides economic opportunities for individuals who do not have access to traditional labour markets. Such innovative models can reduce barriers to economic participation and contribute to a more equitable distribution of income.

The social and cultural impacts of metaverse technology also play an important role for economic equality. Lim et al.'s [38] research has shown that avatar customisation and selfpresentation practices in the virtual workplace can contribute to the empowerment of marginalised groups in virtual spaces. Black individuals and women exhibit higher motivation to customise their avatars in virtual workplaces. This points to the potential for self-expression in virtual worlds to balance social inequalities by increasing diversity. Indeed, the metaverse economy can become an important tool in achieving both economic and social equality through technological and social innovations.

# III. METHODOLOGY

## A. Research Objectives and Significance

Metaverse economy is a rapidly developing field of digital transformation. This study was carried out to contribute to the accumulation of knowledge in this new field, to contribute to scientific development in the field, and to identify new research trends in the field. The study is aimed to contribute to academics to develop new research questions by having knowledge about the scientific productivity and themes related to the Metaverse economy; sectoral professionals to understand the effects of digital transformation and blockchain technologies on business models; and policy makers to develop regulatory policies by evaluating the macroeconomic effects of the Metaverse economy. In this context, this research seeks an answer to the question "How does the transformation created by the Metaverse economy in the global economic system exhibit an orientation in the context of business models, value creation processes and scientific collaborations between countries?".

# B. Bibliometric Analysis Approach

Bibliometric analysis is an effective method for studying and analysing large scientific datasets and for understanding the evolution of scientific knowledge production. This method aims to reveal the evolution of a particular research area from past to present and its future trends. In cases where classical methods of analysis are insufficient due to the growing volume of scientific data, bibliometric analysis provides an overview of the field by evaluating objective criteria such as scientific articles, citations, keywords and authors. This method, which consists of two basic components such as performance analysis and scientific mapping, evaluates the contributions of research components on the one hand and analyses the relationship networks between these components on the other. Techniques such as citation analysis, co-citation analysis, bibliographic linking, keyword and co-authorship analysis are among the methods commonly used in the bibliometric analysis process [39].

## C. Data Collection and Analysis Process

In this study, a bibliometric analysis of the literature on metaverse and blockchain economics was carried out. The data were downloaded from the Scopus database. The reason for limiting the research to Scopus is that the filtering options are





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more advanced, the number of indexed journals in which studies in this field are published is relatively high, the number of studies that can be accessed with the same search parameters as Web of Science is both low and common with Scopus.

In the search process, terms such as "metaverse", "metaverse economy", "blockchain economy", "blockchain economics" were used to identify studies between 2018-2024; only articles, reviews and conference proceedings were included by focusing on the field of economics. A total of 523 publications were analysed in this study. The selection criteria excluded books, book chapters, editorials, and non-peerreviewed documents. Only articles, reviews, and conference proceedings were included in the analysis. Furthermore, only publications written in English were considered to ensure consistency in bibliometric data collection and analysis. The reason for selecting articles, reviews and conference proceedings published between 2018 and 2024 is that metaverse economics and blockchain technologies started to appear rapidly in the academic literature during this period. These document types provide peer-reviewed and scientifically reliable sources on the subject. In the analysis, works published in English were selected and keywords related to (but not limited to) "Blockchain", "Metaverse", "Cryptocurrency", "Virtual Reality", "Artificial Intelligence" and "NFT" were used. The search parameters can be found in Appendix 1. The data set, excluding the references to the authors' own works, was analysed with VOSviewer v1.6.20. The distribution of the literature by years, the most influential countries, institutions and studies were analysed; the network connections between keywords and studies were visualised.

## **IV.** FINDINGS

# A. Annual Publication Trends (2018–2024)

Figure 1 shows the annual increase in the number of documents from 2018 to 2024. From only 2 documents in

2018, the number of documents reached 271 in 2024. Among the standout years, it is seen that the number of documents reached 154 in 2023, a big leap compared to previous years. In 2024, this growth accelerated further, reaching 271 documents. It can be stated that the awareness created by the pandemic period in digital transformation is reflected in academic publications and new technologies are being researched more. The rate of increase in publications over the years also reveals how high the momentum has developed.



FIGURE I: NUMBER OF DOCUMENTS BY YEAR

#### B. Institutions Producing the Most Works

Figure 2 shows the institutions that produced the most artefacts. RMIT University ranks first with 11 artefacts, while the University of Oxford ranks second with 9 artefacts. Symbiosis International Deemed University and University College London share third place with 8 artefacts each. The College of Business and Law and Lebanese American University are the other prominent institutions with 7 works each.



FIGURE II: INSTITUTIONS WITH THE MOST STUDIES



#	Country	Number of	Citation	Total
		Documents	Count	Connection
				Power
1	United	74	1259	114
	Kingdom			
2	China	80	776	98
3	United States	68	1859	63
4	Australia	41	593	56
5	Malaysia	20	222	40
6	France	23	483	37
7	India	34	344	37
8	Canada	22	300	35
9	Czech Republic	11	181	33
10	Germany	32	584	32

TABLE I: Countries Producing the Most Artefacts by Total Connection  $\operatorname{Power}^\ast$ 

\* There are two standard link weight attributes: Links attribute and Total link strength attribute. For a given item, these attributes refer to the number of links the item has with other items and the total strength of those links, respectively. For example, in the case of co-authorship links between researchers, the Links Attribute indicates the number of co-authorships links a researcher has with other researchers. The Total Tie Strength Attribute refers to the total strength of a researcher's co-authorship ties with other researchers [40].

# C. Countries with the Most Studies

Table 1 shows the countries producing the most artefacts by total link strength. The United Kingdom ranks first with 74 documents, 1259 citations and 114 total linking power. China ranks second with 80 documents and 98 total linking power, while the United States ranks third with 68 documents, 1859 citations and 63 total linking power. Australia (41 documents, 56 linkages) and Malaysia (20 documents, 40 linkages) rank fourth and fifth, respectively. While the table reveals the scientific cooperation and productivity levels of the countries, it shows that the United Kingdom and the United States stand out with their high citation rates.

When Figure 2 and Table 1 are taken into consideration together, it can be said that countries and, of course, economies where the technological environment and human capital are strong in this direction come to the fore. On the other hand, the fact that the UK has three institutions in the top ten in the list of institutions that produce the most artefacts has brought the highest total connection power in Table 1.

Figure 3 shows the linkage map between countries that have contributed to at least 5 studies. The United Kingdom, which leads the studies in the field of metaverse economy, is in the Green Cluster together with European countries such as Spain, Ireland, France, Poland and Ukraine. China, on the other hand, carries out joint studies with countries such as Malaysia, Pakistan, Kuwait, Jordan, United Arab Emirates in the red cluster. The purple cluster includes countries close to each other such as Russia, South Korea, Taiwan and Singapore, while the yellow cluster includes countries in the southern hemisphere such as Australia, South Africa and Thailand. In the blue cluster, there are developed countries such as the USA, Germany and Switzerland.



FIGURE III: INTER-COUNTRY CONNECTIVITY MAP\*

\*: Link map between countries contributing at least 5 articles



Figure 4 shows the linkage map between countries that contributed to at least 5 studies in terms of years. Accordingly, while Australia and Belgium started their studies in this field in 2022, countries such as the UK, Germany and Switzerland

started their studies in 2023. The most recent studies were carried out in countries such as Iran, South Korea, France, Spain and Iran, including Türkiye.



FIGURE IV: CONNECTION MAP BETWEEN COUNTRIES BY YEAR\*

\*: Link map between countries contributing at least 5 articles

# D. Most Cited Works

Table 2 shows the studies with more than 100 citations after book citations and self-citations are removed. Thakor [41], which ranked first and received 469 citations, examined the interaction between financial technology (fintech) and banking and addressed innovations in payment systems (including cryptocurrencies), credit markets (especially peer-to-peer [P2P] lending) and the insurance sector. In second place is Huang and Liao's [42] study examining the acceptance of augmented reality interactive technologies (ARIT) by users and the impact of this acceptance on sustainable relationship behaviours, with 275 citations. In third place is the study of Bourlakis et al. [43], which examines the evolution of retailing from traditional to electronic and metaverse retailing with 149 citations.

When the studies in Table 2 are analysed, it can be seen that the metaverse and digital technologies are fundamentally transforming individuals' social interactions, management processes and financial ecosystems. Virtual reality-based social interactions can improve users' interaction quality by providing a more intense sensory experience compared to traditional internet environments [44]. However, the effectiveness of these interactions is determined by contextual factors and mediating variables. While the proliferation of digital technologies enables the development of strategies based on data utilisation, it also creates new tensions around individual privacy [45]. Efforts to protect consumers' personal data and regulatory frameworks shape firms' data policies, and this process is directly related to consumer awareness and firm transparency. Centralised and decentralised governance models also play an important role





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in this transformation, and the balance between blockchainbased decentralised platforms and semi-centralised models is considered a critical factor for the sustainability of platforms [46].

TABLE II: STUDIES WITH MORE THAN 100 CITATIONS  $^{*}$ 

## Article

Thakor, A. V. (2020). Fintech and banking: What do 469 we know?. *Journal of financial intermediation*, *41*, 100833.

Huang, T. L., & Liao, S. (2015). A model of 275 acceptance of augmented-reality interactive technology: the moderating role of cognitive innovativeness. *Electronic Commerce Research*, *15*, 269-295.

Bourlakis, M., Papagiannidis, S., & Li, F. (2009). 149 Retail spatial evolution: paving the way from traditional to metaverse retailing. *Electronic commerce research*, 9, 135-148.

Chen, Y., Richter, J. I., & Patel, P. C. (2021). 139 Decentralised governance of digital platforms. *Journal* of Management, 47(5), 1305-1337.

Quach, S., Thaichon, P., Martin, K. D., Weaven, S., & 135 Palmatier, R. W. (2022). Digital technologies: tensions in privacy and data. *Journal of the Academy of Marketing Science*, 50(6), 1299-1323.

Hennig-Thurau, T., Aliman, D. N., Herting, A. M., 132 Cziehso, G. P., Linder, M., & Kübler, R. V. (2023). Social interactions in the metaverse: Framework, initial evidence, and research roadmap. *Journal of the Academy of Marketing Science*, *51*(4), 889-913.

Vidal-Tomás, D. (2022). The new crypto niche: NFTs, 121 play-to-earn, and metaverse tokens. *Finance research letters*, 47, 102742.

Allen, F., Gu, X., & Jagtiani, J. (2022). Fintech, 112 cryptocurrencies, and CBDC: Financial structural transformation in China. *Journal of International Money and Finance*, *124*, 102625.

\*: Self-citations and book citations are excluded.

The governance of digital platforms affects the transformation of not only governance structures but also sectors. The retail sector is developing new spatial dynamics by evolving from traditional and online retailing to metaversebased retailing [43]. Augmented reality has become an important factor shaping consumer behaviour, and it is seen that consumers with high cognitive innovativeness focus on factors such as utility, aesthetics and service excellence in using these technologies [42]. Financial technologies are also developing in interaction with traditional financial structures by offering innovations in banking and payment systems [41]. Crypto-assets and decentralised finance are becoming increasingly critical in the global economy, especially central bank digital currencies (CBDCs) are accelerating the transformation of financial systems [47]. In the gaming industry, metaverse and win-win systems offer attractive opportunities for investors, while at the same time increasing the risk of speculation [48, 49].

# E. Keyword Analysis

Table 3 shows the most frequently used keywords in the authors' works. According to the data in the table, *Blockchain* stands out among the most frequently used keywords with 113 uses and 156 total link strength, followed by *Metaverse* (140 link strength) with 116 uses. *Cryptocurrency* and *Virtual Reality* rank first in terms of link strength with 48 and 36 uses respectively. Other important terms include *NFT*, *Artificial Intelligence*, *Augmented Reality*, *DeFi*, *Bitcoin* and *Technology*.

TABLE III. TOP 10 MOST USED KEYWORDS BY TOTAL LINK STRENGTH

#	Keyword	n	Total Link Strength
1	Blockchain	113	156
2	Metaverse	116	140
3	Cryptocurrency	48	74
4	Virtual Reality	36	64
5	NFT	28	58
6	Artificial Intelligence	32	50
7	Augmented Reality	17	44
8	DeFi	13	36
9	Bitcoin	26	35
10	Technology	19	35

Figure 6 shows the network map of keywords. Based on map of keywords, following analysis can be made:

Yellow Theme: "Blockchain Technology, Banking and Technology Adoption" This color group includes concepts such as 'digitalization', 'blockchain technology', 'banking', 'technology adoption' and 'decentralization'. Here, the adoption of decentralized blockchain structures with the digitalization process of the financial sector (especially banking) is emphasized. How digital financial environments that replace physical transactions are shaped by decentralized models and how this process contributes to the metaverse economy can be examined under this theme.

Green Theme: "Socio-Technical Dimensions of the Metaverse" This color group highlights the concepts of 'metaverse', 'virtual reality', 'artificial intelligence', 'digital marketing', 'technology acceptance', 'privacy', 'trust', 'big data' and 'consumer behavior'. Drawing attention to both the technological and societal implications of the metaverse ecosystem, this theme will explore how elements such as privacy, trust and big data management will be shaped within the metaverse.

Red Theme: "Blockchain, Cryptocurrencies and Decentralized Finance" In this cluster, concepts such as 'cryptocurrency', 'bitcoin', 'NFTs', 'smart contracts', 'web3', 'decentralized finance (DeFi)' and 'digital assets' come to the fore. This theme particularly highlights blockchain-based financial instruments, the potential of NFTs



to change ownership processes, and how decentralized finance (DeFi) is shaping new investment and business models. The transfer of value through cryptoassets is expected to play an important role in the future vision of the metaverse economy.

Blue Theme: "Digital Transformation and Artificial Intelligence at the Macro Level" Concepts such as 'artificial intelligence (AI)', 'economic growth', 'bibliometric analysis', 'smart city', 'digital transformation' and 'digital economy' feature heavily in this color group. The focus here is on the impact of technological developments on economic growth, smart city applications supported by artificial intelligence and the transformation of the digital economy in general. The evolution of the metaverse economy from physical to digital can be considered as part of this macro-level transformation.

Purple Theme: "Innovation, Governance and Marketing in the Metaverse" This cluster is dominated by concepts such as 'innovation', 'marketing', 'virtual worlds', 'ethics', 'governance', 'accountability' and 'extended reality'. Innovation, marketing strategies and ethics in the Metaverse and similar virtual worlds fall under this heading. Governance and accountability emphasize not only the economic but also the social responsibility dimension of technological developments.



FIGURE V: NETWORK MAP OF KEYWORDS\*

\*: Keywords used at least 5 times are included.

# V. DISCUSSION AND CONCLUSION

This study examines the digital transformation created by the metaverse economy through bibliometric analysis. The findings reveal that the metaverse ecosystem is growing rapidly, with research centred around innovative technologies such as blockchain, NFT and digital transformation being at the forefront. This observation coincides with the findings of Türkmen and Sürmeli [3] on the acceleration of metaverse studies in recent years and the acceleration of digital transformation, especially with the pandemic process. Similarly, Ding et al. [4] and Catherine et al. [5] state that technologies such as blockchain, NFT and virtual reality have recently created new opportunities in the fields of entrepreneurship and investment. Therefore, the increasing awareness of these technological innovations can be directly observed in bibliometric aggregation.

At the global level, it is seen that countries such as the UK, China and the USA are the leaders in academic production in



this field, and the metaverse economy offers important opportunities for interdisciplinary cooperation and innovation. The fact that the UK, China and the USA are in the leading position shows that despite the decentralised structure of the metaverse economy, countries that have a say in the global economy also stand out in this field [2, 35]. In particular, the fact that the UK's academic institutions are in the top ten seems to be related to the relatively high level of interaction between mainstream banking, fintech initiatives and the digital technology ecosystem in this country. Moreover, Koohang et al. [7] emphasised that large-scale universities play a leading role in developing metaverse-based projects, especially in sectors such as retail, marketing, finance and education.

Keyword analyses show that the economic structures emerging from the convergence of digital and physical worlds are not only transforming user experiences, but also leading to radical changes in business models and value creation processes. The Metaverse is accelerating the evolution towards a new model of economy and social interaction, especially centred on digital assets (NFT, cryptocurrencies, DeFi) [16, 5]. However, technological infrastructure, data security, and the uncertainty of the regulatory framework are cited among the main challenges facing the metaverse economy [34]. In addition, the digital divide, inequality and possible transformations in labour markets are topics that research should focus on [20, 19]. In the face of sectoral impacts, opportunities and challenges, new research questions and collaborations are expected to emerge both at the micro level (business models, value creation mechanisms) and at the macro level (political-economic governance, income distribution, employment).

From a policy perspective, governments and regulatory bodies must establish clear guidelines on digital asset ownership, taxation, and intellectual property rights within the Metaverse Economy. Furthermore, ensuring financial inclusion and reducing digital divides should be key priorities to prevent economic inequalities from being exacerbated by metaverse-based economies. Policymakers should also focus on cybersecurity regulations to protect digital identities and assets. Data privacy laws must be adapted to virtual environments where user interactions and transactions occur on decentralised platforms. Additionally, fostering publicprivate partnerships for infrastructure development can support the widespread adoption of Metaverse technologies while maintaining ethical governance.

In conclusion, in line with the findings obtained, it is possible to say that metaverse economy studies are attracting more and more attention every year. The academic, commercial and social dimensions of the metaverse ecosystem will continue to be shaped by innovative technologies such as AR/VR, blockchain, NFT and artificial intelligence.

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# AUTHORS` CONTRIBUTIONS

All authors have participated in drafting the manuscript. All authors read and approved the final version of the manuscript.

# CONFLICT OF INTEREST

The authors certify that there is no conflict of interest with any financial organization regarding the material discussed in the manuscript.

#### DATA AVAILABILITY

The data supporting the findings of this study are available upon request from the authors

## ETHICAL STATEMENT

In this article, the principles of scientific research and publication ethics were followed. This study did not involve human or animal subjects and did not require additional ethics committee approval.

## DECLARATION OF AI USAGE

No AI tools were used in the creation of this manuscript.

#### REFERENCES

- Şanlısoy, S. & Çiloğlu, T. (2024). Two Sides of the Medallion in the Global Workforce as the Metaverse Evolves: New Job Opportunities and Technological Unemployment. In O. Meçik (Ed.), *Reskilling the Workforce for Technological Advancement* (pp. 111-140). IGI Global Scientific Publishing. https://doi.org/10.4018/979-8-3693-0612-3.ch006
- [2] Egliston, B., & Carter, M. (2024). 'The metaverse and how we'll build it': The political economy of Meta's Reality Labs. New Media & Society, 26(8), 4336-4360. https://doi.org/10.1177/14614448221119785
- [3] Türkmen, N. C., & Sürmeli, D. (2024). The Metaverse Virtual Economy: A Comprehensive Overview. MANAS Sosyal Araştırmalar Dergisi, 13(4), 1320-1335. https://doi.org/10.33206/mjss.1350087
- [4] Ding, Y., Huang, W., Liang, H., Wang, Y., Yang, C., & Wang, H. (2024). A Fast Cross - Chain Protocol Based on Trusted Notary Group for Metaverse. *International Journal of Network Management*, e2302. https://doi.org/10.1002/nem.2302
- [5] Catherine, S., Rani, M. N., & Suresh, N. V. (2024). The Metaverse Economy: Transforming Money With Digital Currency. In B. Singla, K. Shalender, & N. Singh (Eds.), *Creator's Economy in Metaverse Platforms: Empowering Stakeholders Through Omnichannel Approach* (pp. 202-209). IGI Global Scientific Publishing, DOI: 10.4018/979-8-3693-3358-7.ch012
- [6] Mancuso, I., Petruzzelli, A. M., & Panniello, U. (2023). Digital business model innovation in metaverse: How to approach virtual economy opportunities. Information Processing & Management, 60(5), 103457. https://doi.org/10.1016/j.ipm.2023.103457
- [7] Koohang, A., Nord, J. H., Ooi, K. B., Tan, G. W. H., Al-Emran, M., Aw, E. C. X., ... & Wong, L. W. (2023). Shaping the metaverse into reality: a holistic multidisciplinary understanding of opportunities, challenges, and avenues for future investigation. Journal of Computer Information Systems, 63(3), 735-765.
- [8] Saridakis, G., Khan, Z., Knight, G., Idris, B., Mitra, J., & Khan, H. (2024). A Look into the Future: The Impact of Metaverse on Traditional Theories and Thinking in International Business.





Management International Review, 64(4), 597-632. https://doi.org/10.1007/s11575-024-00550-8

- [9] Curtis, C., & Brolan, C. E. (2023). Health care in the metaverse. Medical Journal of Australia, 218(1), 46-46.
- [10] Gadalla, E., Keeling, K., & Abosag, I. (2013). Metaverse-retail service quality: A future framework for retail service quality in the 3D internet. Journal of Marketing Management, 29(13-14), 1493-1517.
- [11] Razzaq, A., Zhang, T., Numair, M., Alreshidi, A., Jing, C., Aljaloud, A., Ghayyur, S. A. K., Ahmed, S., & Qurat Ul Ain, M. (2024). Transforming academic assessment: The metaverse - backed Web 3 secure exam system. *Computer Applications in Engineering Education*, 32(1), e22797. https://doi.org/10.1002/cae.22797
- [12] Ju, A. (2007). Students Get a'second life' in first'metanomics' course. Retrieved November, 1, 2007.
- [13] Ball, M. (2022). *The metaverse: and how it will revolutionize everything*. Liveright Publishing.
- [14] Tapscott, D. (2022). *How to build the digital economic system of the Metaverse.*
- [15] Yadav, M., Singh, P., & Baral, S. K. (2024). Exploring the Synergy of Blockchain Technology and the Metaverse. In *Green Metaverse* for Greener Economies (pp. 306-320). CRC Press.
- [16] Bao, W., Hudders, L., Yu, S., & Beuckels, E. (2024). Virtual luxury in the metaverse: NFT-enabled value recreation in luxury brands. *International Journal of Research in Marketing*. Doi : 10.1016/j.ijresmar.2024.01.002.
- [17] Yazici, A. M., Özkan, A., Özkan, H. (2024). Meta: XR-AR-MR and Mirror World Technologies Business Impact of Metaverse. Journal of Metaverse. 4(1), 21-32. https://doi.org/10.57019/jmv.1344489
- [18] Damaševičius, R. (2023). From E-commerce to V-commerce: Understanding the Impact of Virtual Reality and Metaverse on Economic Activities. *Journal of Information Economics*, 1(3), 55-79. doi: 10.58567/jie01030005
- [19] Turner, C. (2023). The Metaverse: Virtual metaphysics, virtual governance, and virtual abundance. *Philosophy & Technology*, 36(4), 67. https://doi.org/10.1007/s13347-023-00666-z
- [20] Zhou, Q., Wang, B., & Mayer, I. (2024). Understanding the social construction of the metaverse with Q methodology. *Technological Forecasting and Social Change*, 208, 123716. https://doi.org/10.1016/j.techfore.2024.123716
- [21] Fuchs, B., & Thurner, S. (2014). Behavioral and network origins of wealth inequality: Insights from a virtual world. PloS one, 9(8), e103503. https://doi.org/10.1371/journal.pone.0103503
- [22] Arakji, R. Y., & Lang, K. R. (2008). Avatar business value analysis: a method for the evaluation of business value creation in virtual commerce. *Journal of Economic Commerce Research*, 9(3), 207-218.
- [23] Calandra, D., Sadraei, R., Jafari-Sadeghi, V., & Biancone, P. (2023). Metaverse meets digital entrepreneurship: A practitioner-based qualitative synthesis. *International Journal of Entrepreneurial Behaviour & Research*. https://doi.org/10.1108/IJEBR-01-2023-0041
- [24] Riva, G., Villani, D., & Wiederhold, B. K. (2022). Humane Metaverse: Opportunities and Challenges Towards the Development of a Humane-Centered Metaverse. *Cyberpsychology, Behavior, and Social Networking*. https://doi.org/10.1089/cyber.2022.29250.cfp
- [25] Lin, H., Wan, S., Gan, W., Chen, J., & Chao, H. C. (2022, December). Metaverse in education: Vision, opportunities, and challenges. In 2022 IEEE International Conference on Big Data (Big Data) (pp. 2857-2866). IEEE. DOI: 10.1109/BigData55660.2022.10021004
- [26] Wang, G., Badal, A., Jia, X., Maltz, J. S., Mueller, K., Myers, K. J., ... & Zeng, R. (2022). Development of metaverse for intelligent

healthcare. Nature machine intelligence, 4(11), 922-929. https://doi.org/10.1038/s42256-022-00549-6

- [27] Kataria, S., Kedia, A. K., & Ravindran, V. (2023). Metaverse: Evolving role in healthcare delivery and implications. *Journal of the Royal College of Physicians of Edinburgh*, 53(3), 186-191. https://doi.org/10.1177/14782715231189900
- [28] Hasei, J., Ishida, H., Katayama, H., Maeda, N., Nagano, A., Ochi, M., ... & Ozaki, T. (2024). Utilizing the metaverse to provide innovative psychosocial support for pediatric, adolescent, and young adult patients with rare cancer. *Cancers*, 16(15), 2617. https://doi.org/10.3390/cancers16152617
- [29] Dohler, M., Kim, Y. G., Franco, M. G., & West, T. (2023). Making the MetAverse A Reality: Challenges And Opportunities. *IEEE Communications Magazine*, 61(9), 14-15. DOI: 10.1109/MCOM.2023.10268119
- [30] Leshkevich, T. G. (2024). Metaverse as a Macroshift of Modern Culture. VOPROSY FILOSOFII, (4).
- [31] Florido-Benítez, L. (2024). Metaverse cannot be an extra marketing immersive tool to increase sales in tourism cities. International Journal of Tourism Cities, 10(3), 974-994. DOI 10.1108/IJTC-01-2024-0001
- [32] Zhao, N., & You, F. (2023). The growing metaverse sector can reduce greenhouse gas emissions by 10 Gt CO 2 e in the united states by 2050. Energy & Environmental Science, 16(6), 2382-2397. DOI https://doi.org/10.1039/D3EE00081H
- [33] Go, H., & Kang, M. (2023). Metaverse tourism for sustainable tourism development: Tourism agenda 2030. Tourism Review, 78(2), 381-394. https://doi.org/10.1108/TR-02-2022-0102
- [34] Donvito, R., Acuti, D., & Song, S. (2024). Fashion and the metaverse: Implications for consumers and firms. *Journal of Global Fashion Marketing*, 15(1), 1-5. https://doi.org/10.1080/20932685.2023.2293290
- [35] Castronova, E., Williams, D., Shen, C., Ratan, R., Xiong, L., Huang, Y., & Keegan, B. (2009). As real as real? Macroeconomic behavior in a large-scale virtual world. *New Media & Society*, *11*(5), 685-707. https://doi.org/10.1177/1461444809105346
- [36] Cai, W., Zhao, J., Gui, X., Msahli, M., & Leung, V. C. (2023). Guest Editorial Special Issue on Social Studies, Human Factors, and Applications in Metaverse. *IEEE Transactions on Computational Social Systems*, 10(5), 2160-2164. doi: 10.1109/TCSS.2023.3313199
- [37] Weking, J., Desouza, K. C., Fielt, E., & Kowalkiewicz, M. (2023). Metaverse-enabled entrepreneurship. *Journal of Business Venturing Insights*, 19, e00375. https://doi.org/10.1016/j.jbvi.2023.e00375
- [38] Lim, C., Ratan, R., Foxman, M., Meshi, D., Liu, H., Hales, G. E., & Lei, Y. S. (2024). An Avatar's worth in the metaverse workplace: Assessing predictors of avatar customization valuation. Computers in Human Behavior, 158, 108309. https://doi.org/10.1016/j.chb.2024.108309
- [39] Donthu, N., Kumar, S., Mukherjee, D., Pandey, N., & Lim, W. M. (2021). How to conduct a bibliometric analysis: An overview and guidelines. Journal of Business Research, 133, 285–296. https://doi.org/10.1016/j.jbusres.2021.04.070
- [40] Van Eck, N. J. & Waltman, L. (2022). VOSviewer Manual. https://tinyurl.com/mywjrs9b
- [41] Thakor, A. V. (2020). Fintech and banking: What do we know?. Journal of financial intermediation, 41, 100833. https://doi.org/10.1016/j.jfi.2019.100833
- [42] Huang, T. L., & Liao, S. (2015). A model of acceptance of augmented-reality interactive technology: the moderating role of cognitive innovativeness. Electronic Commerce Research, 15, 269-295. DOI 10.1007/s10660-014-9163-2
- [43] Bourlakis, M., Papagiannidis, S., & Li, F. (2009). Retail spatial evolution: paving the way from traditional to metaverse retailing.



*Electronic commerce research*, 9, 135-148. DOI 10.1007/s10660-009-9030-8

- [44] Hennig-Thurau, T., Aliman, D. N., Herting, A. M., Cziehso, G. P., Linder, M., & Kübler, R. V. (2023). Social interactions in the metaverse: Framework, initial evidence, and research roadmap. Journal of the Academy of Marketing Science, 51(4), 889-913. https://doi.org/10.1007/s11747-022-00908-0
- [45] Quach, S., Thaichon, P., Martin, K. D., Weaven, S., & Palmatier, R.
  W. (2022). Digital technologies: tensions in privacy and data. Journal of the Academy of Marketing Science, 50(6), 1299-1323. https://doi.org/10.1007/s11747-022-00845-y
- [46] Chen, Y., Richter, J. I., & Patel, P. C. (2021). Decentralized governance of digital platforms. Journal of Management, 47(5), 1305-1337. https://doi.org/10.1177/0149206320916755
- [47] Allen, F., Gu, X., & Jagtiani, J. (2022). Fintech, cryptocurrencies, and CBDC: Financial structural transformation in China. *Journal of International Money and Finance*, 124, 102625. https://doi.org/10.1016/j.jimonfin.2022.102625
- [48] Vidal-Tomás, D. (2022). The new crypto niche: NFTs, play-to-earn, and metaverse tokens. *Finance research letters*, 47, 102742. https://doi.org/10.1016/j.frl.2022.102742
- [49] Katterbauer, K., Syed, H., & Cleenewerck, L. (2022). Financial cybercrime in the Islamic Finance Metaverse. Journal of Metaverse, 2(2), 56-61. https://doi.org/10.57019/jmv.1108783



#### **APPENDIX 1. SCOPUS SEARCH PARAMETER**

ALL ( metaverse OR "metaverse economy" OR "metaverse economics" OR "blockchain economy" OR "blockchain economics" ) AND ( LIMIT-TO ( SUBJAREA , "ECON" ) ) AND ( LIMIT-TO ( DOCTYPE , "ar" ) OR LIMIT-TO ( DOCTYPE, "re") OR LIMIT-TO (DOCTYPE, "cp")) AND (LIMIT-TO (LANGUAGE, "English")) AND (LIMIT-TO "Blockchain" ) OR LIMIT-TO ( EXACTKEYWORD , "Metaverse" ) OR LIMIT-TO ( ( EXACTKEYWORD , EXACTKEYWORD, "Cryptocurrency") OR LIMIT-TO (EXACTKEYWORD, "Virtual Reality") OR LIMIT-TO ( EXACTKEYWORD, "Artificial Intelligence") OR LIMIT-TO (EXACTKEYWORD, "NFT") OR LIMIT-TO ( EXACTKEYWORD, "Bitcoin" ) OR LIMIT-TO ( EXACTKEYWORD , "Digital Economy" ) OR LIMIT-TO ( EXACTKEYWORD, "Augmented Reality") OR LIMIT-TO (EXACTKEYWORD, "Blockchain Technology") OR LIMIT-TO (EXACTKEYWORD, "Cryptocurrencies") OR LIMIT-TO (EXACTKEYWORD, "Artificial Intelligence (AI)") OR LIMIT-TO (EXACTKEYWORD, "Augmented Reality (AR)") OR LIMIT-TO (EXACTKEYWORD, "Banking") OR LIMIT-TO (EXACTKEYWORD, "Big Data") OR LIMIT-TO (EXACTKEYWORD, "Block-chain") OR LIMIT-TO ( EXACTKEYWORD, "Decentralised") OR LIMIT-TO (EXACTKEYWORD, "Decentralisation") OR LIMIT-TO ( EXACTKEYWORD, "Decentralised Finance") OR LIMIT-TO (EXACTKEYWORD, "Decentralised Finance (DeFi)") OR LIMIT-TO (EXACTKEYWORD, "Decision Making") OR LIMIT-TO (EXACTKEYWORD, "Digital Currencies") OR LIMIT-TO (EXACTKEYWORD, "Digital Assets") OR LIMIT-TO (EXACTKEYWORD, "Digital Finance") OR LIMIT-TO (EXACTKEYWORD, "Digital Marketing") OR LIMIT-TO (EXACTKEYWORD, "Digital Technologies") OR LIMIT-TO (EXACTKEYWORD, "Digital Transformation") OR LIMIT-TO (EXACTKEYWORD, "Digitalisation") OR LIMIT-TO (EXACTKEYWORD, "Digitization") OR LIMIT-TO (EXACTKEYWORD, "Economic Analysis") OR LIMIT-TO ( EXACTKEYWORD , "Economic And Social Effects" ) OR LIMIT-TO ( EXACTKEYWORD , "Economic Development" ) OR LIMIT-TO ( EXACTKEYWORD , "Economic Growth" ) OR LIMIT-TO ( EXACTKEYWORD , "Efficiency" ) OR LIMIT-TO ( EXACTKEYWORD , "Ethereum" ) OR LIMIT-TO ( EXACTKEYWORD , "Explainable Artificial Intelligence" ) OR LIMIT-TO ( EXACTKEYWORD , "Extended Reality" ) OR LIMIT-TO ( EXACTKEYWORD , "Finance" ) OR LIMIT-TO ( EXACTKEYWORD , "Financial Inclusion" ) OR LIMIT-TO ( EXACTKEYWORD , "Financial Literacy" ) OR LIMIT-TO ( EXACTKEYWORD , "Financial Market" ) OR LIMIT-TO ( EXACTKEYWORD , "Financial Performance" ) OR LIMIT-TO ( EXACTKEYWORD , "Financial Markets" ) OR LIMIT-TO ( EXACTKEYWORD , "Fintech" ) OR LIMIT-TO ( EXACTKEYWORD , "Metaverses" ) OR LIMIT-TO ( EXACTKEYWORD , "Machine Learning" ) OR LIMIT-TO ( EXACTKEYWORD , "Internet Of Things" ) OR LIMIT-TO ( EXACTKEYWORD "Innovation" ) OR LIMIT-TO ( EXACTKEYWORD , "Information And Communication Technology" ) OR LIMIT-TO ( EXACTKEYWORD, "Governance") OR LIMIT-TO (EXACTKEYWORD, "Governance Approach") OR LIMIT-TO ( "Green Economy" ) OR LIMIT-TO ( EXACTKEYWORD EXACTKEYWORD . , "NFTs" ) OR LIMIT-TO ( EXACTKEYWORD, "Natural Language Processing") OR LIMIT-TO (EXACTKEYWORD, "Non-fungible Token") OR LIMIT-TO ( EXACTKEYWORD , "Non-fungible Tokens" ) OR LIMIT-TO ( EXACTKEYWORD , "Non-fungible Tokens (NFTs)" ) OR LIMIT-TO ( EXACTKEYWORD , "Smart Contracts" ) OR LIMIT-TO ( EXACTKEYWORD , "Smart Contract" ) OR LIMIT-TO ( EXACTKEYWORD , "Smart City" ) OR LIMIT-TO ( EXACTKEYWORD , "Second Life" ) OR LIMIT-TO (EXACTKEYWORD, "Supply Chain Management") OR LIMIT-TO (EXACTKEYWORD, "Supply Chain") OR LIMIT-TO (EXACTKEYWORD, "Supply Chains") OR LIMIT-TO (EXACTKEYWORD, "Sustainability") OR LIMIT-TO (EXACTKEYWORD, "Sustainable Development") OR LIMIT-TO (EXACTKEYWORD, "Taxation") OR LIMIT-TO (EXACTKEYWORD, "Taxonomy") OR LIMIT-TO (EXACTKEYWORD, "Technological Development") OR LIMIT-TO ( EXACTKEYWORD , "Technological Development" ) OR LIMIT-TO ( EXACTKEYWORD "Technological Innovation" ) OR LIMIT-TO ( EXACTKEYWORD , "Technology" ) OR LIMIT-TO ( EXACTKEYWORD , "Technology Acceptance" ) OR LIMIT-TO ( EXACTKEYWORD , "Technology Acceptance Model" ) OR LIMIT-TO ( EXACTKEYWORD, "Technology Adoption") OR LIMIT-TO (EXACTKEYWORD, "Text Mining") OR LIMIT-TO (EXACTKEYWORD, "Tokenomics") OR LIMIT-TO (EXACTKEYWORD, "Tokens") OR LIMIT-TO ( EXACTKEYWORD , EXACTKEYWORD, "Virtual World") OR LIMIT-TO ( EXACTKEYWORD , "Virtual Worlds") OR LIMIT-TO ( EXACTKEYWORD, "Web3") OR LIMIT-TO (EXACTKEYWORD, "XR"))



