

THE METAVERSE PROJECTS FOR CITIES – THE THEORETICAL AND PRACTICAL PERSPECTIVE OF BUILDING THE COMPETITIVE ADVANTAGE

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Purpose: In recent years, the rapid growth of virtual reality has opened up new possibilities for creating an immersive virtual world known as Metaverse. With advancements in technology, such as virtual reality headsets, and the emergence of applications with social interaction, Metaverses offer exciting opportunities for cities to build the future and a competitive advantage. The paper focuses on analyzing the theoretical and practical aspects of the Metaverse, particularly in the field of city development. This paper aims to discuss the potential benefits and challenges of the Metaverse projects for building cities' competitive advantage.

Design/methodology/approach: The article comprehensively describes the use of Metaverse as a project created to build the city's competitive advantage in a technology-based future. Therefore, in the article, we asked a research question: What is the potential of Metaverse projects for cities as a tool for building competitive advantage? The method used was an in-depth literature study based on an electronic basis, e.g., SCOPUS for theory background. In the empirical part, we have done the qualitative research using the multiple case study (Three selected cities: Seoul, Tampere, and Dubai) associated with bibliographic and documentary research.

Findings: Metaverse has become one of the hot topics in society and, consequently, is the theme of scientific research worldwide. The development of the Metaverse world will inject new vitality into modern cities, open up more application scenarios for smart cities, and push them forward. It can also be stated that the fundamental concept of Digital Twins emerged with a Digital twin of a person (DToP) and a Digital twin of a customer (DToC). The Metaverse is an entirely new concept, and there are still too many unknowns and uncertainties about its development direction.

Originality/value: This article comprehensively describes using the Metaverse as the project for building a city's competitive advantage. The cross-sectional case study and comparison of three cities provided valuable insights into cities' challenges in creating a metaverse project. The main contribution is identifying repeatable decision-making areas that scops become future potentials of Metaverse for cities in building competitive advantages.

Keywords: Metaverse, Metaverse city, competitive advantage.

Category of the paper: Case study.

1. Introduction

The city is not only a place but also a way of organizing human life that maximizes the number and quality of connections between individuals and collective social and economic entities. Until recently, this required proximity in physical space. The last few years have shown that technology has reached a level that allows these contacts to be moved beyond physical, real space. Cities worldwide are trying to find ways to turn the pandemic disruption into opportunities to capture value offered by the new medium of the broader Web 3.0 technologies and industrial and urban Metaverses (Metaverse Institute, 2023).

Territorial competitiveness has become a topic of great importance at the beginning of the third decade of the 21st century. The competition between the territories and the geographical areas is the main reason for applying new tools and technologies, which give different values to all stakeholders.

The Metaverse is a virtual space parallel to and independent of the real world, an online virtual world that maps the real world, and an increasingly realistic digital virtual world (Wang, 2022). Opportunity also exists for firms in various industries such as financial services (e.g., decentralized finance supported by blockchain and cryptocurrency that may not rely on traditional banks), healthcare (e.g., telemedicine and collaborative R&D), and manufacturing (mixed reality enabled factory floor) to employ the Metaverse (McKinsey & Company, 2022).

The Metaverse is part of the new internet generation known as Web 3.0, which also includes AI, blockchain, and other digital innovations.

The state of the art shows the impact of the formation and development of the Metaverse in various fields already. Still, there is a relative lack of research exploring the path of Metaverse realization from the perspective of city or territory – the research gap. This research context related to urban areas and their specificity as a research subject seems exciting and has excellent scientific potential. Another interesting research context is cities' adaptation of the Metaverse to build their competitive advantage.

The paper focuses on analyzing the theoretical and practical aspects of the Metaverse, particularly in the field of city development. This paper aims to discuss the potential benefits and challenges of the Metaverse projects for building cities' competitive advantage.

We conducted an exploratory study to achieve the article's purpose and answer the research question: (RQ) *What is the potential of Metaverse projects for cities as a tool for building competitive advantage?* The type of qualitative research was selected. A multiple case study was chosen as the research method. By presenting and comparing three different cases of cities (1) Seoul, (2) Tampere, and (3) Dubai, we can gain a deeper and broader understanding of the phenomenon and uncover its underlying mechanisms, causes, and effects. The choice of these cities resulted from the identified advancement of these cities in the Metaverse implementation process and the described slightly different experiences in this process.

The cross-sectional case study and comparison of three cities provided valuable insights into cities' challenges in creating a metaverse project. The main contribution is the identification of repeatable decision-making areas that scops become future potentials of Metaverse for cities in building competitive advantages: (1) Strategic importance and role in building competitive advantage, (2) Necessary resources, (3) Effects and benefits for Stakeholders, (4) Limitations and challenges, (5) Future Directions of Development.

This Metaverse technology can significantly reshape, offering an immersive and interactive platform for stakeholders to create the city's diversity effectively. On the other hand, the Metaverse is still in its early stages, and some city municipalities have shared concerns about governance, ethics, privacy protection, and data reliability and accuracy.

2. Metaverse – theoretical background

The term "Metaverse" first appeared in the 1992 science fiction novel "Snow Crash" by the famous American science fiction writer Neal Stephenson. Metaverse refers to a three-dimensional space that is detached from and parallel to the real world. Users can live and work in the virtual world through "avatar" digital images, realizing online virtual world interaction (Wang, 2022). Through the publicity of "Snow Crash", a virtual network world parallel to the real world, the "Metaverse", was gradually accepted by science fiction writers.

Metaverse has arguably been the word of 2023, and there are many reasons that the media, business, and science are interested in searching for and using this technology. According to Bloomberg, the metaverse market will reach \$800 billion by 2024, while PwC estimates that the metaverse market will reach \$1.5 trillion by 2030. The metaverse-related topics are rapidly breaking the circle, and the market and social attention are extremely high. This shows that the Metaverse has become one of the hot topics in society and, consequently, is the theme of scientific research around the world. The era of the "metaverse" is not in the future but in the present (Wang, 2022).

The topic of "Metaverse" conveys different meanings to different people and firms since the Metaverse is not fully developed and is constantly evolving. For some, the Metaverse conjures up a futuristic three-dimensional (3D) - environment where customers can interact with each other and brands from any virtual location. For others, the Metaverse is simpler and is just the next version of the internet that enables 3D experiences (Lu, Mintz, 2023). The lack of certainty on what precisely the Metaverse is, what it will look like, what users will do on it, and how firms will interact with users on it has greatly impeded consumers' and firms' Metaverse use (Atske, 2022; Dwivedi et al., 2023; Ravenscraft, 2022).

There is also no doubt that the subject of the Metaverse has been of great interest to researchers from various fields. For the purposes of this article, we performed a bibliometric analysis of the SCOPUS electronic database (keywords – "Metaverse"). The results show a drastic increase in the number of articles in the last two years - 3556 document results in 2000-2024 (Fig. 1).

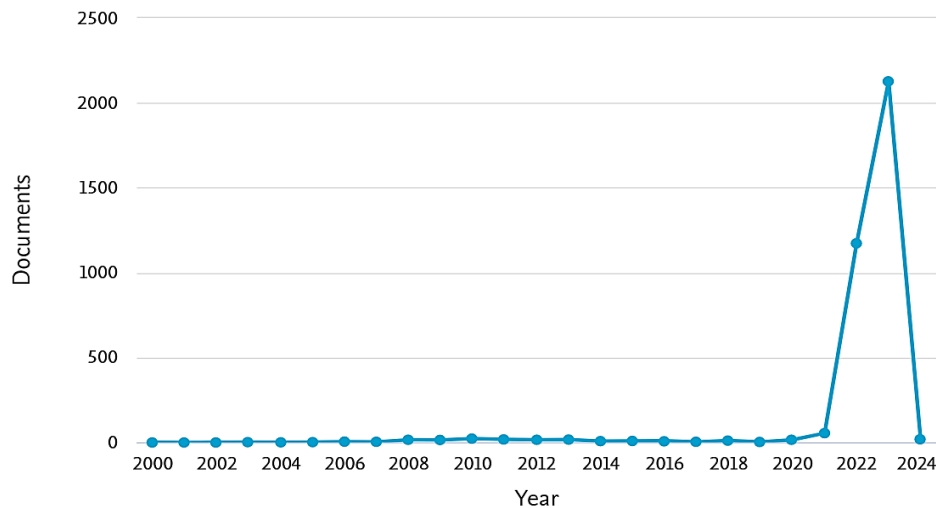


Figure 1. Word "Metaverse" – documents by the year (3556 document results in 2000-2024).

Source: <https://www.scopus.com/term/analyzer.uri?sort=plf-f&src=s&sid=6f96226e10495d43d6f19158c1c0c907&sot=a&sdt=a&sl=24&s=TITLE-ABS-KEY%28Metaverse%29&origin=resultslist&count=10&analyzeResults=Analyze+results>

Analyzing documents by subject area (Fig. 2) shows that articles in Computer Science and Engineering dominate (48.3% in total). However, it is interesting that the remaining share comprises over nine fields, including business and management, with a share of 5.7%.

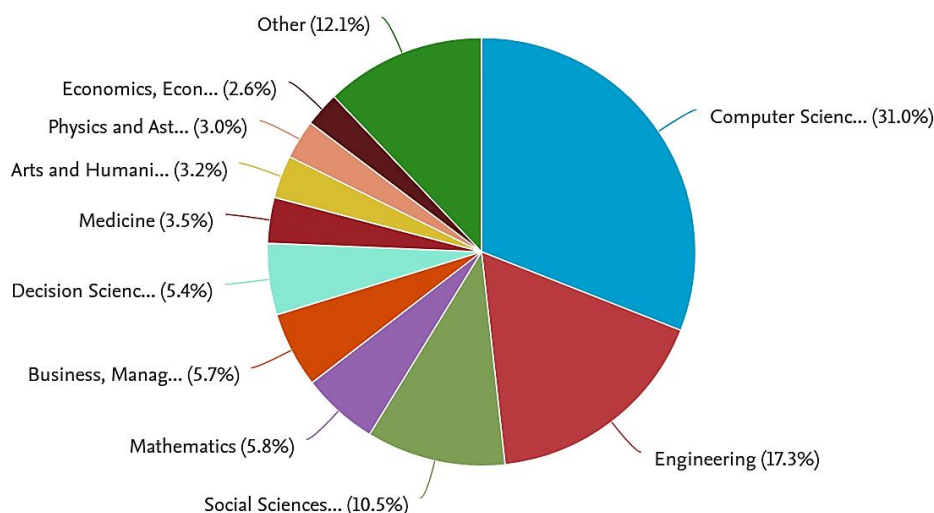


Figure 2. Word "Metaverse" – documents by subject area (3556 document results in 2000-2024).

Source: <https://www.scopus.com/term/analyzer.uri?sort=plf-f&src=s&sid=6f96226e10495d43d6f19158c1c0c907&sot=a&sdt=a&sl=24&s=TITLE-ABS-KEY%28Metaverse%29&origin=resultslist&count=10&analyzeResults=Analyze+results>

Literature analysis also indicated that there is no unified concept of what the Metaverse is. According to Lu and Mintz (2023), definitions from scientific articles and those considering practitioners' perspectives differ significantly, as shown in Table 1.

Undoubtedly, the Metaverse is a virtual space parallel to and independent of the real world, an online virtual world that maps the real world, and an increasingly realistic digital virtual world (Wang, 2022). Opportunity also exists for firms in various industries such as financial services (e.g., decentralized finance supported by blockchain and cryptocurrency that may not rely on traditional banks), healthcare (e.g., telemedicine and collaborative R&D), and manufacturing (mixed reality enabled factory floor) to employ the Metaverse (McKinsey & Company, 2022).

Table 1.
Representative definitions of the Metaverse

Author	Definition
Definitions from academic papers	
Davis et al. (2009)	Immersive 3D virtual worlds where people interact as avatars with each other and with software agents.
Dionisio et al. (2013)	An integrated network of 3D virtual worlds that allows users to interact in real-time with a computer-generated environment and with each other using avatars or agents.
Ryskeldiev et al. (2018)	A persistent and constantly updated collection of XR spaces mapped to different geospatial locations.
Kim (2021)	An interoperated persistent network of shared virtual environments where people can interact synchronously through their avatars with other agents and objects.
Hennig-Thurau et al. (2022)	A new computer-mediated environment consisting of virtual worlds where people use avatars to act and communicate with each other.
Ahn et al. (2022)	Where multiple interconnected virtual worlds exist for large numbers of users to interact simultaneously in embodied forms.
Hadi et al. (2023)	A network of digitally mediated spaces that immerse users in shared, real-time experience.
Barrera and Shah (2023)	A technology-mediated network of scalable and potentially interoperable XR environments merging the physical and virtual realities to provide experiences characterized by their level of immersiveness, environmental fidelity, and sociability.
Yoo et al. (2023)	An online collaborative shared space built of 3D environments that leverage high consumer immersion techniques to reduce the perception of technological mediation alongside transferrable and unique digital assets while allowing user-generated digital personas to interact with each other.
Definitions from practitioners	
Tucci (2022)	A single, shared, immersive, persistent, 3D virtual space where humans experience life in ways they could not in the physical world.
Stackpole (2022)	It's actually many Metaverses, or digital spaces, which typically are decentralized, incorporate AR and VR, store information on the blockchain, and allow users to own digital goods.
Ball (2022)	A massively scaled and interoperable network of real-time rendered 3D virtual worlds and environments that 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.
McKinsey Company (2022)	At its most basic, the Metaverse will have three features: (1) a sense of immersion, (2) real-time interactivity, and (3) user agency. Ultimately, the full vision of the Metaverse will include the following: (1) platforms and devices that work seamlessly with each other, (2) the possibility for thousands of people to interact simultaneously, and (3) use cases well beyond gaming.
Gartner (2022)	Technically, a Metaverse is a collective virtual shared space created by the convergence of virtually enhanced physical and digital reality. For simplicity's sake, think of a

	Metaverse as the next iteration of the internet, which started as individual bulletin boards and independent online destinations. Eventually, these destinations became sites on a virtual shared space — similar to how a Metaverse will develop.
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Source: Lu, Mintz, 2023, pp. 151-166, <https://doi.org/10.1007/s13162-023-00255-5>; What Is a Metaverse? And Should You Be Buying In? <https://www.gartner.com/en/articles/what-is-a-Metaverse>

According to Wang (2022), Metaverse refers to a new type of Internet application and social form that integrates virtual space technology, artificial intelligence technology, interaction technology, blockchain technology, and other new technologies. But the Metaverse is not a technology per se. Still, an idea and a concept that requires the integration of different new technologies, and the main core technologies of the Metaverse are the following:

- Games: the initial landing scene for the Metaverse.
- Blockchain: the underlying architecture to achieve a decentralized economic system.
- Network and computing technologies: 5G/6G and edge computing for low latency.
- Interaction technology: improve user immersion, Metaverse must go through.
- Artificial intelligence: a supporting technology for building virtual worlds.
- IoT technology: meeting the demand for diversified ways to access the Metaverse.

Considering the analysis of the literature and available research on Metaverse idea and development, it can be stated that the fundamental concept of Digital Twins emerged. A Digital twin of a person (DToP) not only mirrors a unique individual but is also a near-real-time synchronized multipresence, with the ability to be present in multiple places at the same time in both digital and physical spaces. A Digital twin of a customer (DToC), a subset of DToP, is a dynamic virtual representation of a customer that simulates and learns to emulate and anticipate behavior. Customers can be individuals, personas, groups of people or machines (Gartner, 2023). Xiaohui Yu, President of China Academy of Information and Communication Technology, said in the 2022 World Economic Forum Report that Fourth Industrial Revolution technology – represented by the digital twin approach, together with policy and mechanism reform, which helps us to understand systems better and intervene more effectively – is being used by cities to reshape and optimize their urban planning and operations, governance and service models, and planning method. Managing the city as a system focused on delivering better outcomes for people, society, and nature requires integration across the industries that serve the built and natural environments. It also requires connecting the physical, digital, and human worlds (WEF Report, 2022).

It can be concluded that although the extant literature has yet to reach a consensus on a vision for the Metaverse, studies have articulated a similar roadmap to the mainstream acceptance of the internet with its early adopters as well as laggards who are slow to see the potential benefits or are reticent to use the technology for safety or security reasons (Dwivedi et al., 2022). Digital technology and the digital twin concept have become essential choices cities make (Zhang et al., 2022), and trends in urban digital transformation will be explained in the next section.

3. Metaverse projects for cities - opportunities and challenges

3.1. Research context

As mentioned earlier, the Metaverse is frequently characterized as the internet's successor, in which users can interact with each other and digital objects in three dimensions rather than simply browsing websites or using social media platforms. Thanks to its direct effect on user satisfaction, it provides various new opportunities for entertainment, social interaction, education, and commerce (Suanpang et al., 2022). Since the first year of the Metaverse, scholars have conducted extensive research on the Metaverse, which mainly covers three aspects: (1) The study of the Metaverse ontology, (2) Theoretical study of the Metaverse, (3) Applied research of the Metaverse. This third aspect is very significant due to the adopted purpose of the article (Wang, 2022). The state of the art shows the impact of the formation and development of the Metaverse in various fields already. Still, there is a relative lack of research exploring the path of Metaverse realization from the perspective of city or territory – the research gap. This research context related to urban areas and their specificity as a research subject seems exciting and has excellent scientific potential. Another interesting research context is cities' adaptation of the Metaverse to build their competitive advantage.

The literature analysis regarding the context of using Metaverse in cities indicated that this is a relatively new problem. The search in the SCOPUS database by keywords: (a) Metaverse AND city - this resulted in a surprisingly small number of 120 publications, with the first article only appearing in 2010 (in 2023 - 60 do documents); (b) Metaverse AND project AND city - 16 documents ((in 2022, the first five publications; in 2023 - 10 publications; in 2024 - 1 publication). The in-depth study of the literature shows that Metaverse AND city documents described the scopes: Sustainability and urban planning and development (e.g. Dorostkar, Najarsadeghi, 2023; An, 2023), Cities and Territorial Brand in The Metaverse (e.g. de Almeida, 2023), Metaverse applications in smart cities and in smart hospitality or tourism (e.g. Yaqoob, Salah, Jayaraman, Omar, 2023; Buhalis, O'Connor, Leung, 2023).

In practice, more and more cities are increasingly piloting different technologies within the Metaverse ecosystem to provide more inclusive city development to ensure the needs of diverse community groups are fully represented and proactively engaged at all levels. The cities from Dubai to Seoul are rushing to announce their pilots that help serve citizens in the Metaverse, expand their local and global presence, and attract Web 3.0-focused businesses. How cities can use the Metaverse to develop a more people-centered strategy to maximize the positive impact of various technologies and minimize their risks is becoming increasingly important (Tampere Metaverse Vision 2040, 2023).

There is, therefore, an absence of a more formal concept for a Metaverse city in a competitive advantage context, and this study is an opportunity to create one.

3.2. Research method

We conducted an exploratory study to achieve the article's purpose and answer the research question: (RQ) *What is the potential of Metaverse projects for cities as a tool for building competitive advantage?*

The type of qualitative research was selected. A multiple case study was chosen as the research method. A case study is "an empirical study that examines a contemporary phenomenon in depth and a real context, especially when the boundaries between the phenomenon and the context are blurred" (Yin, 2009). Considering the specificity of the city context and its characteristic opportunities and limitations, the study was cross-sectional.

The main reason for using multiple cases in this study is that it allows us to explore the complexity and richness of the Metaverse phenomenon under investigation and to capture its various dimensions, perspectives, and facets. By presenting and comparing three different cases of cities (1) **Seoul**, (2) **Tampere**, and (3) **Dubai**, we can gain a deeper and broader understanding of the phenomenon and uncover its underlying mechanisms, causes, and effects. The choice of these cities resulted from the identified advancement of these cities in the Metaverse implementation process and the described slightly different experiences in this process.

The basis for a cross-sectional case study research is information collected from various sources, including strategic documents of cities regarding future development published as PDF files or as information posted on websites, World Economic Forum reports, reports and studies of organizations related to the development of the Metaverse, e.g., materials published by the Metaverse Institute. The Metaverse Institute is made up of a group of pioneers in the Metaverse, Digital Twins, AI, Smart Cities, and related technologies. The Metaverse Institute works collaboratively with UN agencies, Governments, NGOs, private sector companies, and research institutions to define Metaverse strategies, business models, target operating models, and governance and compliance audit controls (Assembly Outcomes Report, 2022). Additionally, reports from research institutions such as the China Academy of Information and Communication Technology the Tampere Institute, and consulting companies such as PwC were used.

3.3. Analysis of selected case studies

The cross-sectional case study and comparison of three cities provided valuable insights into cities' challenges in creating a metaverse project. The analysis of the collected documents indicates the importance of specific activities undertaken by city offices and their partners. This allows us to identify repeatable decision-making areas that become future potentials of Metaverse for cities (Tab. 2):

- Strategic importance and role in building competitive advantage - cities create strategic documents of long-term visions, which include models and directions of city development using Metaverse. Target competitive advantages in this area are also indicated.
- Necessary resources - Required technological resources are mentioned here, but human and knowledge resources are also necessary to implement the city development strategy's assumptions in the Metaverse.
- Effects and benefits for Stakeholders - Cities identify a complex network of benefits for all Metaverse participants and partners involved in the project implementation.
- Limitations and challenges - There are also limitations related to the level of digitization of project participants, e.g., residents, tourists, and enterprises. In addition, trust, security, and adequate legislation are essential issues.
- Future Directions of Development - Consequently, city authorities declare that they will take further steps, work, and financial outlays that will increase the effectiveness of Metaverse, also in terms of gaining a competitive advantage over other cities.

The efforts presented in Table 2 are undoubtedly making the place/city competitiveness, administrative efficiency, transactional transparency, and futuristic vision — factors that global investors, talents, and brands gravitate toward. Although metaverse cities have many advantages, they have weaknesses, including digital exclusion, disconnection from reality, technological dependence, security and privacy concerns, difficulty representing physical space, and digital and economic inequalities (Almeida, 2023). However, no consensus yet exists on how the Metaverse will evolve, leaving researchers to articulate a vision of how the Metaverse could work and operate and debate the implications for individual users, businesses, and society (Dwivedi et al., 2022).

Table 2.

Metaverse projects for cities - Case studies summary

Scope of analysis	Findings		
	Seoul	Tampere	Dubai
Strategic importance and role in building competitive advantage	<ul style="list-style-type: none"> - Seoul Vision 2030, the master plan of the basic directions of the city's administrative operation for the next decade until 2030 - The top vision presented in Seoul Vision 2030 is "Seoul, up and running again for fairness". The four future visions to be established by 2030 to realize the top vision are Seoul as a city of coexistence, a global leader, a safe city, and a future emotional city. - Seoul wants to be the first global Metaverse city, the first city to use real public services, and the first city to create a Metaverse city market. 	<ul style="list-style-type: none"> - Tampere Metaverse Vision 2040 - We have developed one reasonable and likely scenario per the identified priority: Happiness, Equality, Governance, Sustainability, Well-being, and Health. - Putting the well-being and happiness of people at the very center of its Metaverse strategy, Tampere will work closely with citizens, businesses, universities, research institutes, NGOs, and governments worldwide to explore, identify, and optimize its Metaverse vision 2040 for the benefit of Tampere, Finland, the EU and the international community alike. 	<ul style="list-style-type: none"> - Dubai Metaverse Strategy with the aim for Dubai - to "be one of the leading Metaverse economies, and a major hub for the global Metaverse community" by 03 Developing Metaverse use cases and applications in Dubai Government 02 Cultivating Metaverse talent through education and training 04 Adopting, scaling, and globally advocating for safe platforms - We aim to develop a new model for technological advancement and futuristic sciences, explicitly focusing on digital technologies and the Metaverse. It aligns with our broader strategy to promote digital growth, foster innovation, and achieve the objectives of the Dubai Metaverse Strategy.
Necessary resources	<ul style="list-style-type: none"> - Four policy directions have been decided to realize these visions through policies: the restoration of Seoul's hierarchical mobility ladder, the enhancement of Seoul's global city competitiveness, the realization of a safe urban environment, and the improvement of the city's dignity with elegance. Under the four policy directions, there are 16 strategic targets and 78 policy tasks to be pursued. - about \$200 million to fund metaverse projects, giving out grants to universities and companies to help expand their technologies. 	<ul style="list-style-type: none"> - We should look at the convergence technologies that may influence technological, economic, social, political, legal, and environmental development trajectories. - Cities need help to ensure that the urban Metaverse is more people-centered than our current political and governance systems. - Education, effective top-down and bottom-up communications, and fully facilitated dialogue at all levels will be required to ensure broad-based ownership and buy-in. - The social, economic, and ethical challenges associated with the urban Metaverse will require strong leadership on behalf of Tampere municipality. 	<ul style="list-style-type: none"> - Dubai Metaverse Strategy aims to foster innovation in new technology. Dubai is already home to over 1,000 companies operating in the Metaverse and blockchain sectors, contributing \$500 million to our national economy. - The strategy's key pillars revolve around extended reality (VR), augmented reality (AR), virtual reality (VR), mixed reality, and digital twins. Leveraging real-time data, machine learning, IoT, AI simulation, and blockchain, these pillars enhance human thinking processes and facilitate a more connected and interactive digital world. - Virtual Cities of the Future: A \$54 Million Leap Into the Future of Dubai

Cont. table 2.

<p>Effects and benefits for Stakeholders</p>	<ul style="list-style-type: none"> - Metaverse Seoul aims to preemptively respond to citizens' desire for new virtual experiences and provide better public services. - It will be an essential communication tool for citizens in the new normal. It is an inclusive administrative service that everyone can take advantage of without any time and space obstacles. - The beta version of Metaverse Seoul presents Seoul City Hall in a 3D virtual space, where users can visit the lobby and the mayor's office as avatars, interact with other users, and even submit actual petitions to the local government - The pioneering use of public services in the Metaverse environment, aiming to eliminate bureaucracies existing in the face-to-face environment. 	<ul style="list-style-type: none"> - With well-planned physical and Metaverse components, the city enjoys the trust of its inhabitants and shares its experience with global audiences. - Stakeholder education and engagement will be crucial to overcoming resistance to change and ensuring that public policies can keep abreast of rapid technological advancements. 	<ul style="list-style-type: none"> - We saw key themes emerge around what stakeholders must do to be successful in embracing the Metaverse: Collaboration, Regulations, Openness, Business use cases - The first of several hyper-realistic virtual cities, Dubai will provide a wide range of attractions, offerings, and possibilities that will make you feel like you are there. - The Dubai Metaverse will include everything from universities and events to shopping malls and business districts.
<p>Limitations and challenges</p>	<ul style="list-style-type: none"> - Seoul Vision 2030 brings positioning: "Seoul, functioning again for justice." This positioning highlights that justice was part of the city, suggesting that justice stopped functioning due to some previous fact. The strategies of Seoul Vision 2030 and Metaverse Seoul also try to recover and restore justice in the city. 	<ul style="list-style-type: none"> - Rethink and readjustment of societal norms, including what constitutes such significant cultural differences as notions of personal space, acceptable behaviors in public spaces, and other social norms. - Some may wish to escape reality altogether and exist solely via their digital twins. This could have profound implications for human society. - From retail to culture, from healthcare to education, our cities are ill-prepared for the disruption that the Metaverse will bring upon them. 	<ul style="list-style-type: none"> - The region is undergoing digitalization and economic growth, with businesses and governments actively developing the Metaverse. Saudi Arabia, the UAE, Bahrain, and Qatar have regulations to promote the adoption of web3 technologies as part of their digital economic transformation programs. The UAE and Saudi Arabia are leading the way by making substantial investments in Metaverse ecosystems.

Cont. table 2.

<p>Future Directions of Development</p>	<ul style="list-style-type: none"> - In the future, Seoul plans to actively establish a global leadership position as a smart city based on its urban competitiveness, but in another environment, the Metaverse. - The intention is to position the city as a global city that values justice and co-prosperity, trying to build the image of a city of dreams and opportunities - Advancing Seoul's Future Forward with innovation - Seoul Metaverse. The goals of this visionary pillar include a futuristic urban ecosystem, smart transportation infrastructure, digital transformation, and urban sustainability. - The city's authorities have wanted to focus on the health sector, with leading technologies to alleviate the effects of bad air quality or develop a smart and digital health system, which includes monitoring tools based on advanced telecommunication and information systems. - We are yet to see how Metaverse Seoul will develop and, above all, what new uses will emerge in a future with various levels of urban reality. 	<ul style="list-style-type: none"> - Tampere will continue to work closely with stakeholders at home and overseas to review the above strategies and proposals on an ongoing basis. These partnerships will help sustain efforts towards its Metaverse projects and inform interactions with vendors in a nuanced and people-focused manner. - Tampere should become a Metaverse learning laboratory and platform devoted to sharing knowledge, expertise, and experience for the benefit of humankind. 	<ul style="list-style-type: none"> - Dubai's Metaverse Strategy marks a bold step towards the future of the digital economy. With its visionary approach and emphasis on innovation and growth, it aims to position Dubai as a global leader in the Metaverse community while fostering a vibrant and interconnected digital landscape for its citizens and businesses. - Aimed at creating 40,000 virtual jobs and adding \$1.09 billion (AED 4 billion) to the economy over the next five years, the ambitious national-level strategy is arguably the first of its kind globally. - The Middle East and North Africa could experience a significant economic boost, with the Metaverse contributing over \$50 billion to the region's GDP by 2035, as reported by Arabian Business.
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Source: Authors based on the collected documents.

4. Conclusions

Metaverse is moving from conceptual construction and theoretical exploration to the rapid development stage of practical exploration and practical application in parallel. From the perspective of the current situation of Metaverse research, this paper allowed us to identify what Metaverse is for cities today and what challenges it poses in the future. When considering building a competitive advantage, modern cities must use the potential of new technologies. Since users in the Metaverse will interact in the digital space as virtual images, many problems in the real world can be avoided. The advantages of Metaverse cities include (1) better accessibility, so that users in different physical locations can enjoy the same information and experience; (2) better diversity, so that different user groups can enjoy a space to get along with each other free from physical resources; (3) better equality, so that users of different races, colors, and languages can enjoy equal development opportunities; (4) better humanity so that human culture to be passed on more healthily and perpetually (Wang, 2022).

The development of key technologies within the Metaverse is growing fast, and its rapid spread has stimulated numerous discussions about its potential to transform society, nations, and the world. Supporters of the Metaverse describe it as an innovation that will significantly impact people's lives and the city in the long run. This technology can significantly reshape, offering an immersive and interactive platform for stakeholders to effectively create the city's diversity. The Metaverse is still in its early stages, and some city municipalities have shared concerns about governance, ethics, privacy protection, and data reliability and accuracy. In conclusion, we hope that the technology and the creation of city Metaverses will have exhibited promising outcomes in revolutionizing the dynamics of city development, creating their competitive advantage.

References

1. Almeida, G.G.F. (2023). Cities and Territorial Brand in the Metaverse: The Metaverse SEOUL Case. *Sustainability*, 15, 10116, <https://doi.org/10.3390/su151310116>.
2. An, A. (2023). Adopting Metaverse-related Mixed Reality Technologies to Tackle Urban Development Challenges: An empirical study of an Australian municipal government. *IET Smart Cities*, 5(1), pp. 64–72,
3. *Assembly Outcomes Report* (2022). Dubai Future Foundation. Retrieved from: <https://www.dubaifuture.ae/reports/assembly-outcomes-report/>, 20.09.2023.

4. Atske, S. (2022). *The Metaverse in 2040*. Pew Research Center: Internet, Science & Tech. Retrieved from: <https://www.pewresearch.org/internet/2022/06/30/the-metaverse-in-2040/>, 22.03.2023. <https://doi.org/10.1049/smc2.12051>
5. Buhalis, D., O'Connor, P., Leung, R. (2023). Smart hospitality: from smart cities and smart tourism towards agile business ecosystems in networked destinations. *International Journal of Contemporary Hospitality Management*, 35(1), pp. 369-393.
6. *Digital Twin Cities: Framework and Global Practices*. (2022). Insight Report. World Economic Forum In collaboration with the China Academy of Information and Communication Technology. Retrieved from: <https://www.weforum.org/publications/digital-twin-cities-framework-and-global-practices/>, 20.09.2023.
7. Dorostkar, E., Najarsadeghi, M. (2023). Sustainability and urban climate: How Metaverse can influence urban planning *Environment and Planning B: Urban Analytics and City Science*, 50(7), pp. 1711-1717.
8. Dwivedi, Y.K., Hughes, L., Wang, Y., Alalwan, A.A., Ahn, S.J., Grace, Balakrishnan, J. et al. (2023). Metaverse marketing: How the Metaverse will shape the future of consumer research and practice. *Psychology & Marketing*, 40(4), 750-776. DOI: 10.1002/mar.21767
9. Koos, S. (2021). Artificial Intelligence as Disruption Factor in the Civil Law: Impact of the use of Artificial Intelligence in Liability, Contracting, Competition Law and Consumer Protection with Particular Reference to the German and Indonesian Legal Situation. *Yuridika*, 36(1), pp. 235-262, <https://doi.org/10.20473/ydk.v36i1.24033>
10. Koos, S. (2021). Machine Acting and Contract Law—The Disruptive Factor of Artificial Intelligence for the Freedom Concept of the Private Law. *UIR Law Review*, 5, pp. 1-18. [https://doi.org/10.25299/uirlrev.2021.vol5\(1\).6890](https://doi.org/10.25299/uirlrev.2021.vol5(1).6890)
11. Lu, S., Mintz, O. (2023). Marketing on the Metaverse: Research opportunities and challenges. *AMS Review*, 13, pp. 151-166, <https://doi.org/10.1007/s13162-023-00255-5>.
12. McKinsey & Company (2022a). *Meet the Metaverse: Creating real value in a virtual world*. Retrieved from: <https://www.mckinsey.com/about-us/new-at-mckinsey-blog/meet-the-metaverse-creating-real-valuein-a-virtual-world>, 20.09.2023.
13. Suanpang, P., Niamsorn, C., Pothipassa, P., Chunhapatragul, T., Netwong, T., Jernsittiparsert K. (2022). Extensible Metaverse implication for a smart tourism city. *Sustainability*, vol. 14, no. 21, p. 14027.
14. Patter, R. (2023). *Exploring Dubai's Metaverse Strategy and its Impact on the Digital Economy*. Retrieved from: <https://www.linkedin.com/pulse/exploring-dubais-metaverse-strategy-its-impact-digital-robin-patter/>, 20.09.2023.
15. Ravenscraft, E. (2022). What is the Metaverse, exactly? *Wired*. <https://www.wired.com/story/what-is-the-metaverse/>, 23.03.2023.
16. *Tampere Metaverse Vision 2040 The World's First People-Centered Metaverse Strategy* (2023). The Metaverse Institute. Retrieved from: <https://www.tampere.fi/en/current/>

- 2023/08/11/tampere-Metaverse-vision-2040-unveils-potential-future-city-leveraging, 20.09.2023.
17. Wang, J., Medvegy, G. (2022). *Exploration the future of the Metaverse and smart cities*. Proceedings of the 22nd International Conference on Electronic Business. ICEB, Bangkok, Thailand, October 13-17. <https://doi.org/10.1016/j.iot.2023.100884>
 18. *What is a Metaverse*. Gartner. Retrieved from: <https://www.gartner.com/en/articles/what-is-a-Metaverse>, 25.09.2023.
 19. Yaqoob, I., Salah, K., Jayaraman, R., Omar, M. (2023). Metaverse applications in smart cities: Enabling technologies, opportunities, challenges, and future directions. *Internet of Things (Netherlands)*, 23, 100884
 20. Yin, R.K. (2009). Case Study Research. Design and Methods. London/New Delhi: SAGE Publications.
 21. Zhang, J., Chen, C., Xu, Y. (2022). *The Framework and Practices of Digital Twin City*. ICEIE Proceedings of 2022 IEEE 12th International Conference on Electronics Information and Emergency Communication, 111-116.