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The role of government in metaverse development in China and South Korea: A Comparative Analysis

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Abstract

As the development of augmented reality technologies has accelerated in recent years, it became a catalyst for the growth of projects in the field of metaverse. Despite the fact, that the concept of metaverse is not completely new, only during the past years it became the center of attention of different social stratum. While various institutions and think-tanks are still in the process of defining the term, the rapid technological development dictates the implementation of the metaverse and its key technologies into the economic, social and cultural spheres of life. Among the countries being in the forefront of this process are China and South Korea.

To conduct this research, the exploratory research design was chosen. Based on literature review, this thesis deliberates on the theoretical discussion related to the term "metaverse" and illustrates the process of its evolution in the past and the current development status. In the work we show the roadmap of metaverse development in China and South Korea. Using thematic analysis, we point out the trends in governmental regulations of the industry. Next, we use comparative analysis in order to highlight main similarities and differences in national metaverse strategies in two countries. Also, the paper explores the shift towards a "middle ground" - the area of compromise between two countries, who follow different strategies, when it comes to the governance of metaverse, including the positions and choices of governance subjects, goals and means.

This thesis is aimed to illustrate main features of the metaverse governance in China and South Korea and provide assistance for further research focused on national Metaverse strategies.

Key words: metaverse, metaverse regulation, China, South Korea

前言

随着近年来增强现实技术的发展加快，它成为了元宇宙领域项目增长的催化剂。 尽管事实上，大都市的概念并不是全新的，只是在过去的几年里，它成为了不同社会阶层关注的中心。 虽然各种机构和智囊团仍在界定这一术语,但技术的迅速发展决定了大都市及其关键技术在经济、社会和文化生活领域的实施。 处于这一进程最前沿的国家包括中国和韩国。

为了进行这项研究，选择了探索性研究设计。 本文在文献综述的基础上，对"元宇宙"一词的理论讨论进行了探讨，并说明了其过去的演变过程和当前的发展现状。 在工作中，我们展示了中国和韩国大都市发展的路线图。 通过专题分析,我们指出了该行业政府法规的发展趋势. 接下来，我们使用比较分析来突出两个国家大都市战略的主要相似之处和差异。 此外，该文件探讨了向"中间地带"的转变-两个国家之间的妥协领域，他们遵循不同的战略，当涉及到 metaverse 的治理时，包括治理主体，目标和手段的立场和选择。

本文旨在阐述中韩两国之间大都市治理的主要特点，并为进一步研究国家大都市战略提供帮助。

2021 年，数字现实的想法迅速进入公共空间。 在将"Facebook"重命名为 Meta 之后，我们可以看到对这个术语的兴趣越来越大，甚至是炒作。 尽管如此，它的定义仍然不清楚。 事实上，有一个大规模的讨论，互联网将如何发展，它的形式和形状会是什么样子，在 2021 中很明显，在许多公司中，元宇宙被认为是互联网的未来。

中国作为世界第二经济体，以趋势驱动着称，因此第一个元宇宙相关项目出现只是时间问题。在这些公司中，他们在数字世界迈出的第一步是阿里巴巴，字节跳动，百度和腾讯。 作为元宇宙的最大贡献者，这些公司也是第一批提出元宇宙定义问题的公司之一。 中国 IT 巨头的代表指出，元世界不仅是一个交流和娱乐的空间，也是一个工具，可以提高工业能力，将无污染产业提升到一个新的水平，并支持国家经济的全面发展。 虚拟现实的推广与中国对数字化和生态议程的关注不谋而合，这也是政府从一开始就密切关注这一领域的原因。 例如，早在 2021 年

12 月，中国中央纪委就提出了大都市的国家定义，并在同年有效禁止加密货币，明确表示中国的行业将受到国家的严格观察。

另一个亚洲国家，韩国被认为是全球强国之一，当谈到数字技术。作为世界上最肥沃的数字发展土壤之一，韩国有最大的雄心和潜力成为世界上最大的创新中心。根据 Mind The Bridge 咨询公司的报告，9 月 2022 韩国有 1.214"scaleups"，这是科技公司，募集资金超过 1 百万美元，其中包括 53"scaler"和 7"super scaler"。该国的大都市发展在前几年受到政府的观察，最近在现任总统推动的 110"国家任务"中担任了 10 职位。

作为世界上最大的经济体之一和世界上最大的数字强国不断投资于大都市领域，比较各国对新兴数字产业的做法变得有趣。

论文的主要研究问题旨在找出政府在元宇宙发展中的作用有哪些差异。

本文的主要目标是突出主要的相似之处，并指出政府参与大都市发展的差异。

目标以下目标为前提:

1.　解释元宇宙概念的理论和方法框架；它在过去和现在的发展状态中的演变

2.　概述中国和韩国大都市产业的情况，突出政府支持和私营部门参与大都市发展的领域

3.　利用专题分析获取和分析负责的技术部门官方网站上的出版物

4.　提供与官方各部出版物有关的主要调查结果

5.　为中国和韩国国家大都市战略的进一步研究提供见解

该论文的新颖之处在于，大都市国家战略的主题尚未得到很好的研究。通过研究这个主题，我们可以描绘出对大都市国家战略以及可能出现的机遇和挑战的更深层次的理解。此外,我们还可以为进一步的研究应用构建一个更清晰的框架. 这种方法以前没有被其他脊柱侧弯使用，它

允许我们更详细地比较我们选择的两个国家。 通过密切观察中国和韩国的例子，我们还可以为其他国家提供预测，这些国家正计划将大都市纳入其国家议程。

在工作的第一部分，我们讨论了元界概念的演变和不同的方法来定义这个术语，基于对相关文献的回顾。我们还讨论了中国和韩国的大都市发展状况。 在工作的第二部分，我们对数据进行专题分析，从 2021 发布到 2023 开始。

Introduction

In 2021 the idea of digital reality entered the public space rapidly. After the renaming of "Facebook" into Meta we could see an increasing interest and even hype around this term. Nevertheless, it's definition remained unclear. In fact, there was a massive discussion, how will the Internet develop and what will its form and shape look like, in 2021 it became evident that among many companies, metaverse is considered to be the future of the Internet.

China, as the second economy in the world, is very well known for being trend-driven, therefore it was just a matter of time until first metaverse related projects will appear. Among the companies, making their first steps in the digital world were Alibaba, ByteDance, Baidu and Tencent. As biggest contributers into the metaverse, these companies were also among the first to rise the question of the definition of metaverse. Representatives of the Chinese IT-giants note that the world of meta is not only a space for communication and entertainment, but also a tool that will make it possible to increase industrial capacity, to bring non-polluting industries to a new level and to support all-round development of the country's economy. The promotion of virtual reality coincides with China's focus on digitalization and ecological agenda, which is the reason for the government's close attention to this field from the beginning. For instance, as early as in December 2021, China's Central Commission for Discipline Inspection proposed the state definition of the metaverse[1] and by effectively banning cryptocurrencies during the same year, made it clear, that the industry in China will be under strict observation of the state.

Another Asian country, South Korea is considered to be one of the global powerhouses, when it comes to the digital tech. As one of world's most fertile grounds for digital development, South Korea has greatest ambitions and potential of becoming world's biggest innovation hub. According to the report from Mind the Bridge advisory firm, in September 2022 South Korea had 1.214 "scaleups", which are tech companies with more than 1 million dollars in raised fundings, including 53 "scalers" and 7 "super scalers". The Metaverse development in the country was under governmental observation during the previous years and recently took 10 positions in 110 "national tasks" promoted by the current president[2].

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[1] 1.Jiang, Yaling. 2023. "China's Metaverse Is All About Work." WIRED, April 25, 2023.
    https://www.wired.com/story/china-metaverse-work-health-care/.
[2] Karim, Alessandra. 2022. "Tech Scaleup South Korea - Report 2022." Mind the Bridge. September 19, 2022.
    https://mindthebridge.com/tech-scaleup-south-korea-report-2022/.

As one of the biggest economies in the world and world's biggest digital powerhouse keep investing into the metaverse sphere, it becomes interesting to compare the approaches of the countries towards the emerging digital industry.

The main research question of the paper aims to find out **what are the differences in the role of the government in the development of metaverse.**

The main **goal** of current thesis is to highlight the main similarities and point out the differences in governmental involvement into the metaverse development.

The goal presupposes the following **objectives**:

1. To explain the theoretical and methodological framework regarding the concept of metaverse; its evolution in the past and current state of development
2. To overview the circumstances of metaverse industry in China and South Korea, highlight the areas of governmental support and the participation of the private sector in metaverse development
3. To obtain and analyze publications available on the official websites of the responsible technology oriented ministries using thematic analysis
4. To provide key findings, related to the publications made by the official ministries
5. To provide the insights of further research of the national metaverse strategies in China and South Korea

The **novelty** of the thesis lies in the fact, that the topic of metaverse national strategies is not well studied yet. By researching this topic, we can depict a deeper level of understanding of metaverse national strategies and the opportunities and challenges, that may arise. Besides, we can construct a clearer framework for further research application. The methodological approach, was not previously used by other scolars and allows us to compare two countries of our choices in greater details. By closely observing the examples of China and South Korea we can also provide forecast for other countries, who are planning to implement the metaverse into their national agenda.

In the first part of the work we discuss the evolution of the metaverse concept and different approaches taken to define the term, based on the review of relevant literature.Also we discuss the state of metaverse development in China and South Korea. In the second part of the work we conduct thematic analysis of the data, published from 2021 to the beginning of 2023.

Literature review

Based on the literature review, this thesis attempts to demonstrate that there is an increasing trend towards the research of Metaverse, nevertheless scholars are mainly focused on researching the technology implementation in different spheres, rather than policy regulations of the Metaverse in different countries. Papers, where national Metaverse strategies are the main scope of attention are quite rare and do not provide deep understanding of country's governance of Metaverse.

Among useful sources I would like to highlight article under the title "The adoption of the metaverse concepts in Romania". Despite the fact, that the article summarizes the online survey research results, it also provides valuable information about the emergence of the metaverse concept all over the world. At present times scholars divide metaverse into 4 main categories, according to the technologies that are primarily used: augmented reality, lifeligging, Mirror World and Virtual Reality. In the paper these technologies are defined along with the products leading to the metaverse.

The article under the title "Metaverse: Virtual and Augmented Reality Presence" discusses the problem of terminology diversity related to the virtual world. Authors provide literature review and critical review of literature defining "the Metaverse" concept and its key technologies. As the metaverse topic is in the focus of interest, authors compare the evolution of terms, concepts and perception of metaverse and its technologies in different countries of the world.

Among the sources used for this thesis not only works directly dedicated to the metaverse were chosen. For instance, "Future developments and Regulations of Metaverse and NFT in China" is a valuable source, as it focuses not only on the development of metaverse, but also discusses the state policy towards NFT sector, which is the driver of Metaverse economy.

Another useful material is the article under the title "The technological essence and philosophical significance of the Metaverse". It sheds light not only on the past research of metaverse, but also discusses the disputes over its conceptualization.

"A Survey on Metaverse: the State-of-the-art, Technologies, Applications, and Challenges" article introduces the technical framework of Metaverse. It also discusses the areas of Metaverse implementation and argues the problems and challenges brought by it. The article presents significant value, as national policies are in the scope of discussion. Authors highlight key points of national metaverse policy implementation in various countries of the world, including China and South Korea.

Among the works focused on the conceptualization of the term Metaverse "What is the metaverse? Definitions, technologies and the community of inquiry" article should be highlighted. Au-

thors point out, that despite the active discussion, surrounding the term nowadays there is still an open discussion, when it comes to identifying the term, no consenus has been reached. It also argues what technologies should be considered a part of metaverse and highlights five major types of technologies, related to the proposed 4 key elements of metaverse.

Many scholars nowadays highlight the endless opportunities and goals, that would be possible to achieve with the help of the Metaverse. Nevertheless, there are certain challenges and obstacles that will rise as the metaverse is rapidly developing. In the article "The Rise of Metaverse and Interoperability with Split-Protocol" authors address the issue of security and privacy threats, as well as point out potential solutions in security defense and privacy preservation fields.

There are a lot of papers focusing on the economic and technological opportunities being presented by the Metaverse, but it is required for different countries to analyze not only the potential opportunities being brought, but also the negative effect the digital world might have on humans. In the article under the title" A Comprehensive Study on Metaverse and Its Impacts on Humans" authors focus on the physical, mental and physiological consequences of the newly emerged technology. Analyzing this article, it is possible to determine the further directions of Metaverse implementation into the social sphere of our lives.

Analysing the statements of the leading It-enterprises one might notice the significant difference when it comes to the definition of digital key technologies and the Metaverse term itself. In "What is the Metaverse and who seeks to define it? Mapping the site of social construction" research paper by Mateusz Dolata and Gerhard Schwabe the problem of terminology is discussed. Authors point out the differences and key similarities of the concept definition presented in the public media and connect them with individual's political, social or economic interests. Authors also focus on the outcome of the tension, caused by different perspectives on the "Metaverse" term in the world. The paper also sheds light on the etymology, past research and current developments of the topic.

In order to understand what is the situation with scholars and leading think-tanks conducting the research on Metaverse topic, I used an article "An analysis of the current status of metaverse research based on bibliometrics" by Xin Feng, Wu Wand and Ying Su. The research analyses more than 200 objects from the World of Web core collection since 2000. The paper provides systematic overview or the past research findings, current stage of the topic development, along with challenges and obstacles rising in the field. Also, the article highlights main institutions and researches, who continuously promote the development of Metaverse.

Another useful article is "Worldwide Overview and Country Differences in Metaverse Research: A Bibliometric Analysis". The article provides an analysis based on articles and research papers published from 2012 to 2021 from Scopus database. It also highlights the leading countries, when it comes to conducting research on Metaverse topic.

Article under the title "National Metaverse Strategies" by Nir Kshetri examines the strategies of China, Saudi Arabia, South Korea and United Arab Emirates in growing the Metaverse industry. The article provides an overview of measures taken by the government of mentioned above countries in implementing Metaverse in different spheres and reviews the key components of metaverse strategies. This article is extremely valuable for this research as not many scolars focus their attention on the national metaverse strategies.

Among the sources, that were of great importance we can also point out reports, published Deloitte Center of the Edge, Fabernovel Agency, Mind the Bridge and Daxue Consulting. These reports include a lot of fresh data and provide great coverage of different aspects of metaverse development in China and South Korea, such as core technologies and infrastructure, overview of governmental regulations and key players of the field.

Research design and methodology

In order to conduct this research exploratory research design was chosen. Most of the time such a design is used in order to investigate a research problem that has not been clearly defined. Following this design we can conduct a research, that will give us a better understanding of the existing research problem[3]. At the moment it is fair to say, that the metaverse regulations topic only starts to develop. The term "metaverse" itself was proposed to the general public around 2021. As the implication of metaverse is expanding, the questions regarding its regulations just start to rise. Therefore, following the exploratory research design we can deepen our knowledge in the subject of metaverse and observe what policies and initiatives being suggested by the government of two countries, that are at the forefront of industry development.

Conducting this research descriptive research method was used. As its main goal is to precisely describe a situation or phenomenon[4], it can be used in this research in order to gather better understanding of metaverse concepts and the process of metaverse policy implementation in China and South Korea. It allows us to provide an overview of the evolution of metaverse concept in the past and also describe what initiatives, governmental regulations or policies were proposed towards the metaverse industry in China and South Korea with the support of literature review. The extensive study of articles, books, research papers and other documents related to the research problem is required. This process is of great importance, as it sheds light on whether the research problem has been identified or solved before. It also allows us to understand the status of the problem, meaning how deeply it has been researched and what techniques and approaches has been used by other researches to investigate the problem. The concept of metaverse is not new, nevertheless for the last 5 years we can say a so-called boom of publications related to the topic. Among the subjects, being discussed, are not only technologies supporting metaverse, but also the business opportunities, security challenges and regulation measures needed to be implemented towards the industry. Hence, discussing all these matters in the thesis is valuable in order to fully cover the research topic.

As governments of both countries have come to realize the political, economic and social implications of the Metaverse field and associated challenges and opportunities brought by its technologies, the digital world is becoming a space gathering governmental attention. As the technological development and implementation continues, the competition between countries deepens. This causes the appearance of different models for governmental regulations of Metaverse, which also influences the

[3] Bhat, Adi. 2023. "Exploratory Research: Types & Characteristics." QuestionPro, March. https://www.questionpro.com/blog/exploratory-research/.

[4] McCombes, Shona. 2022. "Descriptive Research | Definition, Types, Methods & Examples." Scribbr, October. https://www.scribbr.com/methodology/descriptive-research/.

further development of the field in China and South Korea. This thesis argues that despite China and South Korea started with different approaches, when it comes to Metaverse regulation, there are certain similarities in their strategies and there is a tendency towards "middle ground" metaverse governance in China and South Korea[5].

The concept of middle ground deserves special attention in this work. According to Cambridge dictionary, middle ground is "a position between two opposite opinions in an argument, or between two descriptions"[6]. The dictionary of Merriam-Webster defines the middle ground as "a standpoint or area between extreme or opposing positions, options, or objectives"[7]. In this thesis "a middle ground" refers to the area of compromise between two countries, who follow different strategies, when it comes to the governance of metaverse, including the positions and choices of governance subjects, goals and means[8].

This thesis focuses on the Metaverse trend and key technologies related to the metaverse world, how researchers from different countries identified the concept in the past and what stage of development has been achieved lately. It also argues the evolution of the Metaverse concept and its implementation in the world today.

In order to highlight similarities and differences in policies and regulations of China and South Korea towards the metaverse comparative analysis has been used. This method allows us to identify complex casual relationships[9]. Specifically, a comparative approach was used to analyze:

1. The subjects involved in the governance of Metaverse in China and South Korea, such as governmental structures and IT enterprises
2. The goals pursued in the governance and regulations of Metaverse in China and South Korea
3. The means and measures implemented into the governance of Metaverse in China and South Korea

Based on the comparative analysis of the elements mentioned above, the paper is aimed to highlight main features in the governance of Metaverse platforms in China and South Korea and provide assistance for further research focused on national Metaverse strategies.

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[5] Cai, Cuihong, and Tianchan Wang. 2022. "Moving toward a 'Middle Ground'? —The Governance of Platforms in the United States and China." Policy & Internet 14 (2): 243–62. https://doi.org/10.1002/poi3.303.
[6] "Middle Ground." 2023. In. https://dictionary.cambridge.org/dictionary/english/middle-ground.
[7] "Definition of Middle Ground." 2023. In Merriam-Webster Dictionary. https://www.merriam-webster.com/dictionary/middle%20ground#dictionary-entry-1.
[8] Cai, Cuihong, and Tianchan Wang. 2022. "Moving toward a 'Middle Ground'? —The Governance of Platforms in the United States and China." Policy & Internet 14 (2): 243–62. https://doi.org/10.1002/poi3.303.
[9] Heather Kane, Leila Kahwati,Mixed methods and qualitative comparative analysis,Editor(s): Robert J Tierney, Fazal Rizvi, Kadriye Ercikan,International Encyclopedia of Education (Fourth Edition),Elsevier,2023,Pages 581-587.

Nowadays many countries of the world invest into the development of metaverse industry. Early metaverse platforms are being used by many consumers in Asia. Gaming, socializing and purchasing through digital platforms became a routine for many people. Roblox, Decentraland and Zepeto entered the life of the general public quite successfully and allow users to expand the limits of the real world by using them. It is obvious, that such a rapid development and popularity of emerging digital industries gathered attention of central government in various countries, as it become obvious, that economic and political sectors could become an area of metaverse achievemens' implementation. Hence, People's Republic of China and South Korea already included metaverse into their economic plans. Various scholars argue, that Chinese metaverse will be isolated, independent and will have nothing in common with Western metaverses. It is thought so, as Chinese government already have strict regulations towards the key component of metaverse – the Internet. The alleged totalitarian approach of Chinese government might potentially "freeze" the development of the industry, as certain technologies, such as cryptocurrencies are being banned. When it comes to South Korea, many researchers believe, that the country will lead the whole industry, as the government provides more freedom and support, when it comes to metaverse related projects. In fact, South Korean government also develops certain measures in order to regulate the industry. For instance, in 2021 the government banned play-to-earn blockchain games, which were considered to be the moving force of the industry. The country has created a state-backed "Metaverse alliance" to coordinate the actions of companies in the field. Besides, just like Chiniese authorities, South Korea is not keen to implement cryptocurrencies into the metaverse.

From these examples we can see, that despite different regimes and regulation measures the countries follow similar paths in terms of metaverse regulations. Hence, it becomes very interesting to look at precise subjects, goals and means of the authorities in China and South Korea, regulating the metaverse.

While analyzing documents published by the responsible ministries thematic analysis has been used. This method is helpful in the process of identifying themes or patterns within qualitative data. The approach proposed by Braun & Clarke is considered to be one of the most popular ones, as it provides very useful and clear framework for conducting thematic analysis. The main goal of this analysis is to highlight patterns or themes related to the topic of our research, in order to address the research

problem[10]. When applying this method to the analysis of the official documents published in China and South Korea we are not only able to summarize the data, but also interpret it.

This thesis was designed to explore Metaverse governance strategies in China and South Korea in order to highlight similarities in their policies and point out the main differences. To be precise, the analysis of Metaverse regulations in China and South Korea are based on the following resources:

1. Government policies and administrative regulations of Metaverse and its key technologies, which represent the reaction and attitude of the state towards Metaverse.

2. Activities of the leading IT-companies, their interaction with the state in terms of governance and regulations of the Metaverse

3. Third party assessments, which discuss the Metaverse regulation measures from the perspective of academic literature as well as think tank publications, including leading innovation consulting agencies.

The research methodology of this paper also includes documentary analysis. Document analysis is an analytical method in qualitative research, which allows to gain new level of understanding and develop empirical knowledge. There are different document types, that could be potentially used for analysis, including books, diaries, letters and so on[11]. In this thesis mainly press releases published on the official websites of technology related ministries have been analyzed. Among the document analyzed were publications available on the website of the Ministry of Industry and Information Technology of the People's Republic of China and the official webpage of the Ministry of Science and ICT of South Korea.

The paper first reviews the academic literature on Metaverse research, provides an overview of Metaverse concept evolution and development. Next, it points out the differences in understanding of this concept in China and South Korea and analyzes the governance regulation trends in both countries in terms of subject, goals and measures. The paper then explores the shift towards a "middle ground" in the regulations of Metaverse in China and South Korea, specifically multiple governance subjects and common pragmatic goals and means.

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[10] Maguire, M., & Delahunt, B. (2017). Doing a Thematic Analysis: A Practical, Step-by-Step Guide for Learning and Teaching Scholars. AISHE-J, 9, 3351. http://ojs.aishe.org/index.php/aishe-j/article/view/3354

[11] Bowen, Glenn. (2009). Document Analysis as a Qualitative Research Method. Qualitative Research Journal. 9. 27-40. 10.3316/QRJ0902027.

Another aspect, that need to be described is the definition of governmental regulations. According to the Cambridge dictionary this term refers to "a law that controls the way that a business can operate, or all of these laws considered together"[12]

[12] "Government Regulation." 2023. In . https://dictionary.cambridge.org/dictionary/english/government-regulation.

Theoretical discussion

1.1 History and evolution of the concept of Metaverse

For the past couple of years, the term "Metaverse" became very popular. At first, it may seem as if this is an extremely new, groundbreaking concept, that evolved lately and just started gathering people's attention. The idea of the shift towards the digital, more advanced and complicated world became a controversial topic of the discussion among different circles of the society. In fact, the concept of metaverse was proposed a long time ago, but remained enclosed.

2021 truly became the year of a new round of discussions over metaverse. For instance, Roblox that was known as the first stock of metaverse was finally listed on the New York Stock Exchange, following this example Facebook, Baidu, Sony and other companies have launched their own metaverse platforms[13]. As worldwide companies were making announcement regarding new platform launches, disputes over the definition of metaverse developed again not only in academic and business circles, but also among general audience.

From the etymological point of view, we can see that "metaverse" word's root, *verse*, is short for universe, which could be translated from the Latin *universus* as all together, all in one, whole and so on. The prefix "meta" has its roots in Greek language, where it is used in such words as *metaphysics,* factually meaning *after the things of nature*. Through the concept of metaphysics, later on *meta* was shaped and received another meaning. Among them were *transcending*, *pertaining to a level above* and *distinct from but about other things of the same type* or *self-referential[14]*.

To summarize all the information given above, *metaverse* can be identified through several similar or even sometimes overlapping meanings:

1. It can be a space transcending the real world from the perspective of time and space
2. It can be a space, exceeding the limits of the physical world, but at the same time refer to it by depicting different aspects of the real world.
3. It can be a space, which is a possible alternative to the existing universe[15].

As it was stated earlier, the concept of metaverse is not new at all, in fact it firstly appeared in literature in the end of the 20-th century. It is widely accepted that the term "metaverse" appeared in

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[13] Feng, Xin, Xu Wang, and Ying Su. 2022. "An Analysis of the Current Status of Metaverse Research Based on Bibliometrics." Library Hi Tech, December. https://doi.org/10.1108/lht-10-2022-0467.

[14] Dolata, Mateusz, and Gerhard Schwabe. 2023. "What Is the Metaverse and Who Seeks to Define It? Mapping the Site of Social Construction." Journal of Information Technology, February, 026839622311599. https://doi.org/10.1177/02683962231159927.

[15] Ibid

Neal Stephenson's novel under the title "Snow Crash". There metaverse was pictured as a space, that provides to the users an immersive, embodied experience via special hardware[16]. This was the era, when the Internet just started emerging, so the author took the initiative to create a network virtual world, that was operating in a parallel to the real environment and called it Metaverse. Despite the fact, that at that time science fiction was very popular, the audience of the book was not broad at all. The novel did not exert strong influence on the society in general[17].

Stephenson was not the only writer, who imagined the development of the digital world in the future. Before him, in 1984, American writer William Gibson wrote the Neuromancer trilogy, that was focused on computers and pictured the development of artificial intelligence in the future. The author was also among the first writers to introduce the concept of cyberpunk to the general public[18].

Starting from 1990s Internet became an essential part of the social field and was shaped into more or less global network. At this time period Bill Gates wrote "the road to the future", which pictured the future development of the digital space and network world. Another great contributor was Nikola Ponti, who focused on the implementation of the networked life into people's day to day activities in the future[19].

With the development of science and technology during the 20-th century, followed by the technological revolution in 21-st century, the foundation for metaverse development has been finally established. Another factor, that exerted great influence on the development of metaverse was the promotion of Internet enterprises[20]. The fact, that multiple leading IT-enterprises started opening their own metaverse platforms lead the topic to become the main focus of public discussion. In fact, another round of theoretical discussion rose, when the imaginary concept, that was being discussed by the academics finally received practical implementation.

After the announcement of the chief executive of Facebook, Mark Zuckerberg, the topic of metaverse gathered massive public attention. The company was planning to change its name and be-

[16] Dolata, Mateusz, and Gerhard Schwabe. 2023. "What Is the Metaverse and Who Seeks to Define It? Mapping the Site of Social Construction." Journal of Information Technology, February, 026839622311599. https://doi.org/10.1177/02683962231159927.
[17] Huang, Xinrong. 2021. "The Technological Essence and Philosophical Significance of the Metaverse." Metaverse 2 (2): 10. https://doi.org/10.54517/met.v2i2.1786.
[18] Ibid
[19] Ibid
[20] Feng, Xin, Xu Wang, and Ying Su. 2022. "An Analysis of the Current Status of Metaverse Research Based on Bibliometrics." Library Hi Tech, December. https://doi.org/10.1108/lht-10-2022-0467.

come a "metaverse company"[21]. It was clear, that the company was in the forefront of technological development, nevertheless the concept of metaverse, used during the speech, was not clear.

Another company, Roblox, was listed on the New York Stock Exchange (NYSE). It was not the fact, that the company was listed, gathering public attention, but the fact, that the value of a game company skyrocketed from 1 billion US dollars to almost 40 billion US dollars only in one day. Moreover, the company defined itself as a metaverse enterprise and even mentioned it in their prospectus. People believed that such a popularity of Roblox was caused by its innovative positioning, which caused the spread of the metaverse term even broader[22].

From these 2 examples we can see that in 2021 the term metaverse caught attention of absolutely different circles of the society. If Roblox listing mainly was in the scope of attention among investment community[23], then the announcement made by Facebook, brought the meta to the general public, to the ordinary citizens.

As we can see, overtime an imaginary concept, which firstly appeared in a science fiction novel, was shaped thanks to the technological development and gaming industry, nevertheless the interpretation of the term is still in discussion. The metaverse is currently interpreted in different ways by various enterprises, think-tanks and currently there is no strict and clear common definition of the term[24]. Despite this fact, the technologies related to the metaverse did receive a relatively clear definition. Therefore, before starting discussion on the metaverse definition, it is important to highlight and define its core technologies, such as Virtual Reality, Augmented Reality, Mixed Reality, Distributed Ledger Technology (or Blockchain) and others. These terms are of great importance not only fir further metaverse defining discussion, but also in terms of the perception of official documents analyzed in the course of this thesis.

1. Virtual Reality

Virtual Reality (VR) is among the key technologies supporting the metaverse. It can be identified as an environment, which is fully a product of computer creation. This space is fully digital and

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[21] Mac, Ryan, Sheera Frenkel, and Kevin Roose. 2022. "Inside Mark Zuckerberg's Metaverse Struggles." The New York Times, October 10, 2022. https://www.nytimes.com/2022/10/09/technology/meta-zuckerberg-metaverse.html.

[22] Huang, Xinrong. 2021. "The Technological Essence and Philosophical Significance of the Metaverse." Metaverse 2 (2): 10. https://doi.org/10.54517/met.v2i2.1786.

[23] Ibid

[24] Dolata, Mateusz, and Gerhard Schwabe. 2023. "What Is the Metaverse and Who Seeks to Define It? Mapping the Site of Social Construction." Journal of Information Technology, February, 026839622311599. https://doi.org/10.1177/02683962231159927.

artificial, which allows users to fully share it with others and submerge into it, while being located in different places. It also provides an opportunity to operate things in the real, physical world[25].

2. Augmented Reality

Augmented Reality (AR) is the placement of digital objects into the physical world. It is achieved through viewing the virtual objects in real-time mode through a special device, which allows the users to interact and manipulate digital objects into the physical world[26]. AR can be viewed as a tool to excess the limits of the real world[27], as it allows to expand users experience, but only by implementing additional settings to the real world environment.

It is important to note that VR and AR technologies do have certain similarities, for instance, both of them could be aceessed via virtual/augmented reality glasses[28]. Nevertheless, they have significant differences. AR allows the user to interact with the real world, its physical environment, whether VR is a fully digital space and a relatively independent environment. If looking at it from the commercial perspective, AR is a solution, that can offer more than VR. If implemented in a mobile app, it turns into a desired, affordable and multifunctional technology. For instance, such practices are widely popular for training pilots and medical staff. It allows to simulate crisis situations and prepare people for its solving, reducing the time required for problem solving and improving staff performance[29].

3. Mixed Reality

Mixed Reality (MR) and Augmented Reality (AR) are often mutually used[30]. It is related to the fact, that MR is sometimes considered to be an advanced version of AR technology with a higher level of interaction with the real world[31].

4. Distributed Ledger Technology

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[25] M. S. Schlichting, S. K. Füchter, M. S. Schlichting and K. Alexander, "Metaverse: Virtual and Augmented Reality Presence," 2022 International Symposium on Measurement and Control in Robotics (ISMCR), Houston, TX, USA, 2022, pp. 1-6, doi: 10.1109/ISMCR56534.2022.9950565.

[26] Kirner, Claudio, and Tereza Gonçalves Kirner. 2008. "Virtual Reality and Augmented Reality Applied to Simulation Visualization." In IGI Global EBooks, 897–921. https://doi.org/10.4018/978-1-59904-955-7.ch055.

[27] Kye, Bokyung, Na-Ra Han, Eunji Kim, Yeonjeong Park, and Soyoung Jo. 2021. "Educational Applications of Metaverse: Possibilities and Limitations." Journal of Educational Evaluation for Health Professions 18 (December): 32. https://doi.org/10.3352/jeehp.2021.18.32.

[28] Feng, Xin, Xu Wang, and Ying Su. 2022. "An Analysis of the Current Status of Metaverse Research Based on Bibliometrics." Library Hi Tech, December. https://doi.org/10.1108/lht-10-2022-0467.

[29] Ibid

[30] S. Zucchi, S. K. Füchter, G. Salazar and K. Alexander, "Combining immersion and interaction in XR training with 360-degree video and 3D virtual objects," 2020 23rd International Symposium on Measurement and Control in Robotics (ISMCR), 2020, pp. 1-5, doi: 10.1109/ISMCR51255.2020.9263732. [Accessed 05 July 2022]. Available on: Combining immersion and interaction in XR training with 360-degree video and 3D virtual objects | IEEE Conference Publication | IEEE Xplore

[31] Speicher, Maximilian, Brian J. Hall, and Michael Nebeling. 2019. What Is Mixed Reality? https://doi.org/10.1145/3290605.3300767.

Distributed Ledger Technology (DLT) or Blockchain is a technology that allows to track the provenance and ownership of digital and physical objects. According to the World Bank distributed ledgers are supported by the use of independent computers, which allows to share and synchronize transactions online, with the electronic ledgers [32]. With the implementation of this technology, there is no need to keep the data centralized, using traditional ledger[33]. DLT is also considered to be a platform, which is not under strict governmental observation or massive corporate control. This leads us to the idea, that due to decentralization features, the technology grands more opportunities and control to the individuals over ownership of objects and completing transactions, that could be stored in the digital ledger[34].

5. The Internet

According to the website of the World Wide Web Consortium (W3C) led by Tim Berners-Lee, "the Internet is a network of networks, defined by the TPC/IP standards"[35]. Among the staple principles of the Web, according to Tim Berners-Lee, is decentralization, which states that the Web space is not under the control of any authorities, meaning that there is no permission required in order to post anything in the Internet[36]. This conception also grands the users with freedom of speech and supposed to allow avoiding censorship[37].

6. NFT

NFT is an abbreviation, which stands for "non-fungible token".NFT are tokens that were tokenized through the blockchain. They are digital assets and could be represented as photos, videos, audio files or any other digital format. Each of them has its own digital signature that distinguish them from one-another[38].

7. Cryptocurrency

Cryptocurrency is can be characterized as digital asset, based on blockchain technology. The security of cryptocurrencies with cryptography makes it practically impossible to perform any illegal manipula-

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[32] World Bank Group. 2018. "Blockchain & Distributed Ledger Technology (DLT)." World Bank. https://www.worldbank.org/en/topic/financialsector/brief/blockchain-dlt.

[33] Ibid

[34] World Bank Group. 2018. "Blockchain & Distributed Ledger Technology (DLT)." World Bank. https://www.worldbank.org/en/topic/financialsector/brief/blockchain-dlt.

[35] "Help and FAQ - W3C." n.d. https://www.w3.org/Help/#webinternet.

[36] Ibid

[37] Ibid

[38] "What Are NFTs and How Do They Work?" 2023. Www.Kaspersky.Com. April 19, 2023. https://www.kaspersky.com/resource-center/definitions/what-is-an-nft.

tions with it. The decentralized structure of the blockchain allows cryptocurrencies to exist independently, outside of governmental control[39].

8. Web 3.0

Web 3.0 is a concept of the next stage of the evolution of the World Wide Web. This concept is relatively new and lies at the junction of the real and digital world. The precise definition is yet to be accepted in the world, nevertheless it is well accepted that the concept will be strongly correlated with decentralized applications and will strongly rely on the blockchain technology[40].

As we can see the majority of key technologies, which are supporting the metaverse has a relatively clear meaning. The definition of the metaverse, on the other hand, is still blured and raises theoretical discussion and dispute among scholars and businesses.

There were several attempts to define the Metaverse. From a literal point of view, it is a digital space, which coexists with the natural universe and allows people to cross its limits and reach new level of freedom[41]. If we look at this concept from the technical point of view, the metaverse can be identified as a virtual world with survival vision, which started with the development of gaming platform, and is supported by the latest developments of the digital technology and hardware solutions, with the high level of human life involvement[42]. From the perspective of economic development, metaverse is viewed as an interconnective platform, that was designed by the circular, closed-loop economy. Mostly it is characterized with the high level of integration with the real world, sustainable development and closed-loop operations[43]. Social media sphere characterizes metaverse as a platform for cooperation, co-creation and co-existing of people in different physical spaces[44].

To summarize all the information given above, it is fair to say, that a lot of concepts related to the digital world were put forward, following the rising popularity of big data and mobile Internet in the 21st century. First, data space, data world and intelligent society was discussed in the social discourse. Later on they were followed by the addition of VR, AR and other virtual reality technologies to

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[39] Frankenfield, Jake. 2023. "Cryptocurrency Explained with Pros and Cons for Investment." Investopedia, April. https://www.investopedia.com/terms/c/cryptocurrency.asp.

[40] Juan M. Silva, Abu Saleh Md. Mahfujur Rahman, and Abdulmotaleb El Saddik. 2008. Web 3.0: a vision for bridging the gap between real and virtual. In Proceedings of the 1st ACM international workshop on Communicability design and evaluation in cultural and ecological multimedia system (CommunicabilityMS '08). Association for Computing Machinery, New York, NY, USA, 9–14. https://doi.org/10.1145/1462039.1462042

[41] Feng, Xin, Xu Wang, and Ying Su. 2022. "An Analysis of the Current Status of Metaverse Research Based on Bibliometrics." Library Hi Tech, December. https://doi.org/10.1108/lht-10-2022-0467.

[42] Ibid

[43] Ibid

[44] Fernandez, P. (2022), "Facebook, Meta, the metaverse and libraries", Library Hi Tech News, Vol. 39
No. 4, pp. 1-5, doi: 10.1108/LHTN-03-2022-0037.

the discussion[45]. As digital technologies greatly matured during the years, people managed to become a part of much more immersive and interactive virtual world. Step by step the digital environment entered the vision of regular people. Nevertheless, an important question remains open: why all these concepts and ideas, which were put forward, received public response and remained in discussion, when the metaverse itself remained in the shadow, as an imaginary concept, which was not shaped for almost 30 years?

It is thought, that many concepts, even those which were brought to public attention after the introduction of metaverse, received a significant public response, as they were revolutionary. For instance, cyberspace, data world or digital space reflect a specific new technology, which also addresses "the changes it brings to people's world outlook and epistemology at a specific level"[46]. For instance, cyberspace is reflecting online lifestyle, which could be achieved by the emerging network technology. Data world exists in a strong cooperation between human and electronic machinery, while digital space correlates with data world, which was shaped by the emerging digital or digitalized technology[47]. As many concepts relate to one particular technology, they were more popular and widespread. As for metaverse, we can say that as it was much more complex, sophisticated and required more technical support. Hence, the concept of metaverse was basically unknown until 2021.

Based on the information given above we can see that metaverse is not a subversive new technology. Therefore, raises the question: What is the nature of metaverse? Metaverse can be understood as a space for comprehensive integration of various information and digital technologies that have already existed[48]. It should be perceived as a space to integrate single-function technologies into a broader system and allow to fully realize the potential of these technologies through it[49]. It is obvious, that new information technologies had a strong impact independently and brought great changes to the economy and society. Nevertheless, metaverse should become a space for the full demonstration of digital technologies' potential and stimulation of their interdisciplinary implementation.

The fact that Metaverse meanings have certain differences raises risks of potential misunderstandings, misconception of the term and appearance of different perspectives and point of views. Various forces may be tempted to modify the meaning of the term more for their own benefit, rather than

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[45] Huang, Xinrong. 2021. "The Technological Essence and Philosophical Significance of the Metaverse." Metaverse 2 (2): 10. https://doi.org/10.54517/met.v2i2.1786.

[46] Huang, Xinrong. 2021. "The Technological Essence and Philosophical Significance of the Metaverse." Metaverse 2 (2): 10. https://doi.org/10.54517/met.v2i2.1786.

[47] Huang, Xinrong. 2021. "The Technological Essence and Philosophical Significance of the Metaverse." Metaverse 2 (2): 10. https://doi.org/10.54517/met.v2i2.1786.

[48] Ibid

[49] Ibid

its further development. Potentially, the ultimate definition of metaverse will appear through the public discourse. Nevertheless, it is crucial to highlight which aspects and points of view are associated with term of metavers and who are the actors shaping this concept at the moment.

Further sustainable development of Metaverse is strongly tied with academia, as without a clear definition it will be hard to reach mutual understanding and create a global perception of the term . It is of great importance to highlight the countries, think tanks and researchers, who are at the frontier of the Metaverse research development. As it was stated in the article "Worldwide Overview and country Differences in Metaverse Research: A bibliometric analysis", the topic became extremely "hot" in 2021. Based on the data from Scopus database, compared to 2012, when 2528 documents were published, in 2021 there were more than 7000 publications made[50]. It should be noted, that in every decade the number of conference papers outnumbered the articles. This fact indicated that the academic development of the Metaverse topic started earlier, then massive public interest to the topic.

If we analyze the top 3 scholars, who made massive contribution to the development of Metaverse research, during the past decade, it is necessary to name Billinghurst M., whose papers on technologies in the field of augmented reality are the most cited[51]. The second and third biggest contributors are Steinicke F.and Latoschik M.E., whose research are mostly dedicated to head-mounted displays[52].

It is also important to emphasize the leading institutions, researching in the direction of Metaverse area. Two leading positions in the list are occupied by academic institutions in China and France: Chinese Academy of Sciences (CAS) and Centre National de la Recherche Scientifique (CNRS). The remaining eight positions are taken by universities, the majority of which are located in PRC. Among the leading think-tanks are Beihang University, Beijing University of Posts and Telecommunications, Shanghai Jiao Tong University and Tsinghua University. Second biggest share consists of American universities: University of Southern California and University of Central Florida. The last two shares belong to the Technical University of Munich, located in Germany and the Japanese University of Tokyo[53].

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[50] Shen, Jinlu, Xiangyu Zhou, Wei Wu, Liang Wang, and Zhenying Chen. 2023. "Worldwide Overview and Country Differences in Metaverse Research: A Bibliometric Analysis." Sustainability 15 (4): 3541. https://doi.org/10.3390/su15043541.
[51] Shen, Jinlu, Xiangyu Zhou, Wei Wu, Liang Wang, and Zhenying Chen. 2023. "Worldwide Overview and Country Differences in Metaverse Research: A Bibliometric Analysis." Sustainability 15 (4): 3541. https://doi.org/10.3390/su15043541.
[52] Ibid
[53] Ibid

Ever since the Metaverse became a newly emerging topic around the globe, scholars all over the world have taken part in publishing research papers and articles on metaverse topic. Based on the Scopus database, more than 140 countries participated in primary research of Metaverse, while approximately 50 countries have more then 100 publications made from 2012 to 2021 and only 13 countries surpassed the mark of 1000 publications made on the topic. These states are responsible for more than 80% of worldwide publications made since 2012[54]. The top-3 leading countries in terms of publications partially correlate with the list of greatest contributors. China and America are the countries with the worldwide biggest share of publications on Metaverse, while Germany is on the third place. Among other countries, whose input is also relatively significant are UK, Japan, Italy and South Korea[55].

Based on the national contribution index proposed in the article "Worldwide Overview and Country Differences in Metaverse Research: A Bibliometric Analysis", it is also clear that USA has the worldwide biggest research scale, with a national contribution index of 20.37%, while China is ranked second, with its 16.5%. The remaining countries' total contribution is approximately 10%[56]. Based on this data we can assume that there are basically two main countries, with the greatest research potential: USA and PRC. It also reflects the growing competitive advantage of conducting research in the Metaverse field in both countries.

If analyzing the publications made in Web of Science data base, one can find almost 200 publications related to the Metaverse topic since 2000. Chinese scholars proposed three steps division of Metaverse research[57]. The first stage is marked from 2000 to 2007, when the exploration of the Metaverse topic started. During this period of time the emergence of Second Life and Roblox to certain extend reinforced the interest of very few scholars towards the Metaverse. During the second phase, from 2008 to 2019, the number of publications significantly increased and showed steady development[58]. Specifically during this period the technology of bitcoin, blockchain and other key technologies forming the Metaverse were introduced, which could potentially be the main reason of such gradual research trend.

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[54] Ibid

[55] Shen, Jinlu, Xiangyu Zhou, Wei Wu, Liang Wang, and Zhenying Chen. 2023. "Worldwide Overview and Country Differences in Metaverse Research: A Bibliometric Analysis." Sustainability 15 (4): 3541. https://doi.org/10.3390/su15043541.

[56] Ibid

[57] Feng, Xin, Xu Wang, and Ying Su. 2022. "An Analysis of the Current Status of Metaverse Research Based on Bibliometrics." Library Hi Tech, December. https://doi.org/10.1108/lht-10-2022-0467.

[58] Ibid

About half of the total amount of publications made on a topic of Metaverse were made since 2020[59], as starting from that time Metaverse finally became a focus of interest among scholars all over the world. If talking about main scholars, who contributed into the research of Metaverse, Ayiter E. should be mentioned. Being the top-1 contributor, he published six articles, which were mainly focused on the influence of Metaverse on architecture and art fields[60]. Barry, Fukumura and Kanematsu had more than 3 papers published, which were mainly related to the implementation of the Metaverse technologies in the education field. The remaining positions in the list belong to Arroyo, exploring the potential use of metabots and Bourlakis, researching the finance and commerce technologies' adoption into the Metaverse[61].

Based on the collected information, we can say that the discussion of metaverse concept's definition is among the most popular topics in the technology research community. Many scholars, researchers and affiliated institutions are working on providing more clear framework to define metaverse. As the metaverse supporting technologies reached significant level of development, the representatives of the digital business community also take part in the discussion regarding the matter. Given that, metaverse should not be seen as another trend or hype in the technological world[62], but a new type of energy or moving force of the course towards the digitalization of the society. Although, metaverse is in fact a virtual world, it is still based on technologies adopted in the real world, it also requires sustainable support of VR, AR and other machinery. So far, the world did not accept a global and unified definition of the term, which can cause misunderstanding and the spread of misconceptions. Nevertheless, we can see that lack of worldwide accepted definition does not stop the implementation of the metaverse into different spheres of society. It is thought, that the development of metaverse is a long-lasting process and only social discourse will finally define the term. When the best from the digital world and the physical reality will be combined, we will achieve a new style of life and new level of human civilization. Among the countries, actively developing in that direction and implementing the term are China and South Korea. Next, we will talk about the experience of People's Republic of China and South Korea in adopting metaverse and its key technologies into its economic, social and other spheres.

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[59] Ibid
[60] Ibid
[61] Ibid
[62] 陶子惠. n.d. "The New Buzzword in China's Capital Market." - Beijing Review. https://www.bjreview.com/Opinion/Voice/202109/t20210918_800258648.html.

1.2 Chinese government support for the Metaverse

The emerging phenomenon of Metaverse in China is among the hottest topics being discussed nowadays. And it is obvious, as the People's Republic of China was among the first countries to start researching the digital world and implement its achievements into different spheres of life, such as economy, social sphere and education.

According to Nir Kshetri article, in October 2021 China launched the Chinaverse initiative, under the supervision of China Institute of Contemporary International Relations (CICIR). Later on, "The Metaverse and National Security" report was published. Mainly, it focused on the the challenges metaverse might cause to the national security. The report stated that Metaverse could not only potentially have great impact on political and economic sphere, but also cause massive changes in the social structure[63].

Probably, the phrase that reflects China's strategy towards the Metaverse development is "use the virtual to enhance real, use the virtual to strengthen the real". Reportedly, it was used for the first time by the assistant director of Shanghai Economic and Information Technology Commision in March 2022. This approach could be considering as a step away from the overemphasis of the entertainment sector, that was a prioritized direction in Metaverse development for a significant period of time[64].

China is actively working in the direction of implementing the Metaverse technologies into the industrial sector of their economy. For instance, among the leading concept is building a virtual factory[65]. It will be possible to create a twin-factory in the digital world and duplicate the manufacturing process in details. Such a simulation will allow to analyze the production process, identify potential crises and avoid any damage in the real world by preventing any force-major situation in the digital world[66].

Another field of potential Metaverse implementation is education. The leading governmental structure, the Chinese Academy of Governance is already using the system in order to provide access to party conference activities and history lessons for CCP members[67].

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[63]   Kshetri,   Nir.   2023.   "National   Metaverse   Strategies."   IEEE   Computer   56   (2):   137–42. https://doi.org/10.1109/mc.2022.3227681.

[64]   Kshetri,   Nir.   2023.   "National   Metaverse   Strategies."   IEEE   Computer   56   (2):   137–42. https://doi.org/10.1109/mc.2022.3227681.

[65] Ibid

[66]   孙 迟 .   n.d.   "Companies   Race   to   Build   Chinese-Style   Metaverse."   Chinadaily.Com.Cn. https://global.chinadaily.com.cn/a/202212/13/WS6397b690a31057c47eba408e.html.

[67]   Kshetri,   Nir.   2023.   "National   Metaverse   Strategies."   IEEE   Computer   56   (2):   137–42. https://doi.org/10.1109/mc.2022.3227681.

Many scholars argue, that the concept of Metaverse in China is different from the "Western" understanding of the term. Therefore, it is expected, that the digital world being shaped in the PRC will be more controlled and reach a higher level of governmental control[68]. Some of them even argue, that such traditional doctrines as Confucianism and Daoism could shape the further development and implementation of metaverse in the country. The long living concepts of creating a harmonic society could be among the justification of putting the industry under strict governmental observation[69].

Zuo Pengfei as one of the representatives of the Chinese Academy of Social Sciences mentioned that "huge opportunities and revolutionary effects brought by the metaverse are worth looking forward to"[70]. He pointed out that there is a huge room for potential expansion of the industry, therefore he encouraged local enterprises and companies to use that opportunity and earn their place on the global arena[71].

Tsinghua University's professor Shen Yang also mentioned the positive influence of the metaverse for the country. According to him the development of metaverse is a solution for deeper integration of the real and virtual economies[72].

According to Pan Helin, the executive Dean of the Zhonghan University of Economics and Law, who is also the member of the Information and Communication Economics Expert Committee in the Ministry of Industry and Information Technology of PRC, the development of metaverse is inseparable from the support and acknowledgment of the central government[73].

Thus, we can see the seriousness and the readiness of the Chinese Government to adopt policies towards the metaverse regulations. We see it through many reports, made by the leading think-tanks of the country, establishment of committees and launch of various initiatives focused on the metaverse field.

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[68] Warner, David Scott (2022) The Metaverse with Chinese Characteristics: A Discussion of the Metaverse through the Lens of Confucianism and Daoism. Master's Thesis, University of Pittsburgh. (Unpublished)

[69] Warner, David Scott (2022) The Metaverse with Chinese Characteristics: A Discussion of the Metaverse through the Lens of Confucianism and Daoism. Master's Thesis, University of Pittsburgh. (Unpublished)

[70] " 最 近 大 火 的 元 宇 宙 到 底 是 什 么 ？ ." 2021. September 13, 2021. Accessed May 14, 2023. http://finance.people.com.cn/n1/2021/0913/c1004-32224985.html.

[71] Ibid

[72] "China is eyeing the metaverse as the next internet battleground" n.d. https://finance.yahoo.com/news/china-eyeing-metaverse-next-internet-101446632.html.

[73] Warner, David Scott (2022) The Metaverse with Chinese Characteristics: A Discussion of the Metaverse through the Lens of Confucianism and Daoism. Master's Thesis, University of Pittsburgh. (Unpublished)

For instance, the Ministry of Industry and Information Technology (MIIT) and Cyberspace Administration of China (CAC) named the blockchain, which is among the core metaverse technologies, to be a strategic economic anchor[74].

In 2020 the Chinese government considered the digital economy to be the supporting element of the real economy. In his speech at the seventh meeting of the Central Financial and Economic Affairs Commission General Secretary Xi Jinping confirmed the importance of the digital economy, nevertheless he highlighted that the real economy is still the basis of all[75].

Next year, in 2021 Xi Jinping stated that developing digital economy is of great importance and a strategic matter. It will allow the country to reach new heights in terms of science and technology development, which will lead to a new round of industrial reforms[76].

As the topic of metaverse was firstly discussed in the academic circles, then on the governmental level, it finally reached the common people of the PRC. In September 2021, CCTV Financial Channel covered the topic in one of the programs. This event was followed by an increasing number of videos, appearing on Duoyin and Kuaishou platforms, which were designed for educational purposes in order to teach people, how to invest into metaverse projects[77].

Later during the year, in October 2021 the China Institute of Contemporary International Relations (CICIR) released "The Metaverse and National Security". The document can be considered the first official publication of the Chinese Communist Party related to the subject. The document clearly stated the will of the government to supervise and guide the industry. It was stated, that due to the international nature of the metaverse, various challenges and potential issues may arise. In order to navigate the metaverse, the central government suggests to provide necessary supervision and guidance; it also encourages the international community to deepen constructive cooperation and communication and prepare regulatory norms and ethical principles for metaverse[78].

During the next month a metaverse industry development symposium was held in Zhenjiang province. The central government decided, that the area should become the leading province, develop-

[74] https://jingdaily.com/china-metaverse-players-alibaba-tencent-baidu/
[75] Ibid
[76] "Translation: Xi Jinping's Speech to the Politburo Study Session on the Digital Economy – Oct. 2021 - DigiChina." 2022. DigiChina. January 28, 2022. https://digichina.stanford.edu/work/translation-xi-jinpings-speech-to-the-politburo-study-session-on-the-digital-economy-oct-2021/.
[77] 看理想编辑部. n.d. "说好的星辰大海，你却只给了我'元宇宙.'" Weixin Official Accounts Platform. https://mp.weixin.qq.com/s?__biz=MzA3MDM3NjE5NQ==&mid=2650906246&idx=1&sn=3eed223f8a9cbb99b3bc1b0a52328ab2&chksm=84c8f0eab3bf79fcd2dab91f0766d39bb4c302f883f3be72730c9a762b877de7f2d2b38414b1#rd.
[78] 美国研究所. n.d. "元宇宙与国家安全." Weixin Official Accounts Platform. https://mp.weixin.qq.com/s/hlN7k-_4ZSftpyE2qNAGeA.

ing metaverse technologies, as it is also the home to Alibaba Group[79]. The same month China announced the establishment of the Metaverse Industry Committee (MIC), which was formed to coordinate metaverse development. The MIC has been established under the China Mobile and Communications Association (CMCA) in collaboration with China's biggest enterprises in the sphere of Internet and Communication Technology (ICT) and so far is the only organization of national level, which is involved in the field of Chinese mobile communication industry. According to the executive director of the committee, Yu Jianing, the main tasks of the organization include deepening technological innovation, implicating further development of the industry, organizing training sessions and promoting new perspectives on metaverse subject[80].

In December 2021 the implementation of metaverse policy occurred in Shanghai. First, it was discussed during an economic meeting on the city level, later on it was mentioned in the governmental five-year plan. There Shanghai Municipal Commission for Economy and Information technology confirmed their plans to incorporate metaverse technologies into the social, economic and cultural fields[81].

In the beginning of 2022 the Provincial Digital Economy Development Leading Group Office issued "Guiding Opinion on the construction of Zhejiang Province's Future Industrial Pilot Zones". In this publication Zhejiang is viewed as a space for further creation and implementation of innovative technologies, based on artificial intelligence, blockchain and metaverse[82].

Around the same time Hefei and Wuhan included metaverse into their "Government Work Report". Hefei government plans to implement the metaverse into different aspects of province's life, while also creating a union of leading enterprises. Wuhan focused on the expansion of the emerging digital industry as well, stating its readiness to create a technological part with the support of Xiaomi company along with other 5 digital economy industrial parks during the upcoming 5 years[83].

In total, at least 10 Chinese cities and provinces added metaverse related elements to their economic development plans by January 2022. Among them are Shanghai, Beijing, Wuhan, Hefei, Wuxi

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[79] Warner, David Scott (2022) The Metaverse with Chinese Characteristics: A Discussion of the Metaverse through the Lens of Confucianism and Daoism. Master's Thesis, University of Pittsburgh. (Unpublished)

[80] Jerome Siacor.2022." China Creates Metaverse Industry Committee" Open Gov, March. https://opengovasia.com/china-creates-metaverse-industry-committee/

[81] Cheng, Evelyn. 2021. "Shanghai Doubles down on the Metaverse by Including It in a Development Plan." CNBC, December 31, 2021. https://www.cnbc.com/2021/12/31/shanghai-releases-five-year-plans-for-metaverse-development.html.

[82] 浙江工人日报." n.d. http://epaper.zjgrrb.com/html/2022-01/06/content_2778906.htm?div=-1.

[83] "地方政府跑步入局元宇宙 谁能建立先发优势？ - 21财经." n.d. https://m.21jingji.com/article/20220112/herald/ce5353dab94ebb24bb709891ddb03626.html.

and so on[84]. Based on the examples given above we can see that Chinese government are taking actions in standard setting of the industry that is still in the process of active development, while many other countries are yet to acknowledge metaverse as an element of potential catalyst for further development.

Despite the very optimistic approach and various initiatives, the actions of Chinese government raise awareness among the digital experts. According to the analyst of Daxue Consulting, Chinese metaverse will be much more centralized then in the West. Hanyu Liu expects the Chinese metaverse to be extremely isolated and controlled. It is known that the Internet in the country is under the protection of China's "Great Firewall", which can be considered a s a tool of control, censorship and surveillance. The analyst expects metaverse development move in the fairway of the same policy[85]. Despite the governmental observation, it is thought that Chinese metaverse will evolve faster. Among the fundamental concepts of metaverse is the idea of integration of the digital world into the real one. Chinese sitizens are already familiar with such apps as Alipay and WeChat, which fully replaced cash money transactions. Hence, Chinese potential users are already familiar with some kind of seamless operations, that are viewed as a foundation of a virtual world[86].

Brady Wang, the associate director of Counterpoint tech market research firm also mentioned, that metaverse, in case of China, is a "government-led concept"[87]. The criticism regarding the regulation measures of metaverse in China is coming not only from the western scolars, but also from local experts. The head of CMCA metaverse industry committee argues that emerging digital industries, including the metaverse, are regulated from the very beginning, unlike the internet businesses, that were firstly developed and only later on – regulated[88].

Other experts argue, that China's alleged authoritarian approach will slow down the development of metaverse industry in the country and eventually "stifle [metaverse's]growth"[89]. It is also important to note that cryptocurrencies, that are among the staples of western metaverses are absent in China. In 2021 they were banned, in order to avoid environmental damage, fraud and money launder-

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[84] Dudarenok, Ashley. 2023. "Are China and the West on the Same Page When It Comes to the Metaverse and Web3?" Dao Insights, April. https://daoinsights.com/exclusives/are-china-and-the-west-on-the-same-page-when-it-comes-to-the-metaverse-and-web3/.

[85] "The Metaverse with Chinese Characteristics." 2022. POLITICO. July 13, 2022. https://www.politico.com/newsletters/digital-future-daily/2022/07/13/the-metaverse-with-chinese-characteristics-00045647.

[86] Ibid

[87] Jiang, Yaling. 2023. "China's Metaverse Is All About Work." WIRED, April 25, 2023. https://www.wired.com/story/china-metaverse-work-health-care/.

[88] Baptista, Eduardo. 2022. "Analysis: A Metaverse with Chinese Characteristics Is a Clean and Compliant Metaverse." Reuters, January 26, 2022. https://www.reuters.com/markets/funds/metaverse-with-chinese-characteristics-is-clean-compliant-metaverse-2022-01-25/.

[89] Ibid

ing[90]. Instead, the manifold forms that the population of the country is well acquainted with are adopted[91].

Among other reasons, that make experts believe that the development of metaverse in China will not be as intense is the fact, that the gaming industry, which is considered to be the gateway technology of the metaverse is under strict regulations in PRC. Any game should be approved by the government and must not indicate any violent content[92].

Many Western experts consider that Metaverse in China will become a field for CCP propaganda and agenda placement[93]. The government already established a teaching center, which is aimed to promote CCP values in the digital space. The facility was designed in order to provide necessarily training, using immersive technologies[94]. The well-known Xuexi Qiangguo app, which is a source of mandatory reading for the CCP officials published an article, stating that metaverse should be used for the improvement of mandatory ideological education quality in schools[95].

In January 2022 during the meeting of Beijing political advisory body a registration system for metaverse was discussed. According to the officials, its aim is to prevent the potential increasing influence of metaverse communities towards the public, which can cause major economic or financial issues[96].

In the end of 2022 the first state-level publication, discussing the development of metaverse key technologies was published. The Virtual Reality and Industry Application Integration Development Action Plan (2022-2026) is a complex set of policies to be developed in China for further sustainable development of the metaverse[97]. Despite the fact, that the document did not directly mention the term, it was fully dedicated to its key technologies. According to the plan, the five key tasks for the

[90] "Into the Chinaverse: How the Meta wave is hitting China." n.d. Fabernovel. https://asia.fabernovel.com/2022/05/13/into-the-chinaverse-how-the-meta-wave-is-hitting-china/

[91] Baptista, Eduardo. 2022. "Analysis: A Metaverse with Chinese Characteristics Is a Clean and Compliant Metaverse." Reuters, January 26, 2022. https://www.reuters.com/markets/funds/metaverse-with-chinese-characteristics-is-clean-compliant-metaverse-2022-01-25/.

[92] Ibid

[93] The Economist. 2022. "Building a Metaverse with Chinese Characteristics." The Economist, November 24, 2022. https://www.economist.com/china/2022/02/05/building-a-metaverse-with-chinese-characteristics.

[94] Kshetri, Nir. 2023. "National Metaverse Strategies." IEEE Computer 56 (2): 137–42. https://doi.org/10.1109/mc.2022.3227681.

[95] Baptista, Eduardo. 2022. "Analysis: A Metaverse with Chinese Characteristics Is a Clean and Compliant Metaverse." Reuters, January 26, 2022. https://www.reuters.com/markets/funds/metaverse-with-chinese-characteristics-is-clean-compliant-metaverse-2022-01-25/.

[96] Baptista, Eduardo. 2022. "Analysis: A Metaverse with Chinese Characteristics Is a Clean and Compliant Metaverse." Reuters, January 26, 2022. https://www.reuters.com/markets/funds/metaverse-with-chinese-characteristics-is-clean-compliant-metaverse-2022-01-25/.

[97] Arendse, Huld. 2022. "Virtual Reality in China - The New Action Plan for Metaverse Technology." China Briefing News. November 14, 2022. https://www.china-briefing.com/news/virtual-reality-in-china-new-action-plan-for-developing-industry/.

VR, AR and MR industries are promoting integrated innovation of key technologies, improving the supply capacity of the industry chain, accelerating interindustrial applications, strengthening the construction of industrial public service platform and building an integrated application standards system[98].

1.3. Chinese companies support for the Metaverse

Chinese IT-giants were among the first companies to turn metaverse vision into reality. Some of them even suggested their own definition for the metaverse term. According to Huateng Ma, the Chairman and the CEO of Tencent, the metaverse is supposed to bring the virtual experience into the real environment, promoting mutual integration[99]. Jie Ma, Vice President of Baidu characterized the development of metaverse as a long-lasting process, consisting of three main stages: the realization of identity and immersion, construction of economic system and finally the achievement of a value for the civilization[100]. The CEO of Bilibili Rui Chen underlined that metaverse should be seen as a concept, not an independent product; he also mentioned, that metaverse require massive cooperation, as it cannot be fully built just by one company[101].

Among Chinese tech giants, embracing the metaverse trend are Alibaba, Baidu, ByteDance and Tencent. In August 2021 acquired the leading Chinese VR manufacturer Pico. It is expected, that the company will continue to focus on the local consumer market. At the same time ByteDance invests into Reworld game, which is the Chinese competitor of Roblox, with its own platform. To increase the social engagement, ByteDance launched its own social networking app called "Party Island" that allows users to engage in virtual communication using avatars[102].

Tencent Group invests into the gaming industry as well: it partnered with Roblox to announce its Chinese version "LuobuLesi" and develop its educational features for the local consumers. As for the social engagement, the IT-company launched the first virtual music festival in China on the 21 of December 2022. Users were allowed to develop their own avatars and communicate with the musicians. Tencent Group also invests into the field of Smart Cities. In April 2020 the company published its first smart city solution, the so-called CityBase. The company is adopting 7 projects in 4 different

[98] 《虚拟现实与行业应用融合发展行动计划（2022—2026 年）》解读_政策解读_中国政府网." http://www.gov.cn/zhengce/2022-11/01/content_5723274.htm.
[99] "Into the Chinaverse: How the Meta wave is hitting China." n.d. Fabernovel. https://asia.fabernovel.com/2022/05/13/into-the-chinaverse-how-the-meta-wave-is-hitting-china/
[100] Ibid
[101] "Into the Chinaverse: How the Meta wave is hitting China." n.d. Fabernovel. https://asia.fabernovel.com/2022/05/13/into-the-chinaverse-how-the-meta-wave-is-hitting-china/
[102] "Into the Chinaverse: How the Meta wave is hitting China." n.d. Fabernovel. https://asia.fabernovel.com/2022/05/13/into-the-chinaverse-how-the-meta-wave-is-hitting-china/"

Chinese cities. For instance, in Shenzhen Tencent CityBase was used to establish a digital copy of Nanchan Tech Park, which dynamically restores all the information from the real world on the web[103].

Among the companies, which have the ambitions to develop projects in the metaverse field we can highlight Baidu. In 2021 the company launched its own metaverse, which received the name Xi'Rang or the so-called "Land of Hope". As the first video content company to develop a VR ecosystem, it also launched "Baidu VR 2.0" for education, marketing and training purposes. The Xi'Rang metaverse, mentioned above, can be accessed through various VR devices. It allows users to create personalized avatars and interact with others. Another direction of development for the company is cloud computing. Baidu has developed its own core AI engine Baidu Brain, which is supported by their unique deep learning platform and smart hardware[104].

Alibaba Group is developing different projects in metaverse. It already implemented its VR-solution into a shopping experience with Buy+. It allows the costumers to shop and browse through 3D images and conduct real-time payments in a digital mall. The company investes into the development of various advanced avatar technologies; in September 2021 the Metahuman AYAYI was launched as a first digital employee. In the future the company plans to provide digital human solutions in live streaming scenarios. Alibaba is also involved into the NFT sector. For instance, in 2021 the company launched the Metaverse Art Exhibition, which allowed the users to combine art with online shopping experience[105].

1.4 South Korean government support of the metaverse

According to Deloitte Center for the Edge, South Korea is the first major economy to create a complex and comprehensive plan in order to boost its metaverse industry[106]. The country developed its own blueprint, defining the development of the industry in the state. Korean ambitious national metaverse plan is the key element in the digital transformation of the country. The metaverse roadmap in South Korea includes various directions, such sectors as arts, culture, education, K-pop and tourism, as the country has been creating the image of global trendsetter for a significant amount of time[107].

In 2020 the government of South Korea launched the "Digital New Deal" initiative, which started as a national innovation project, designed to overcome the difficulties of the COVID-19 pan-

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[103] Ibid
[104] Ibid
[105] "Into the Chinaverse: How the Meta wave is hitting China." n.d. Fabernovel. https://asia.fabernovel.com/2022/05/13/into-the-chinaverse-how-the-meta-wave-is-hitting-china/
[106] "The Metaverse in Asia." n.d. Deloitte Singapore. https://www2.deloitte.com/sg/en/pages/about-deloitte/articles/the-metaverse-in-asia.html.
[107] Ibid

demic and increase the level of digitalization in the country. During the year the government adopted 34 policy measures towards the emerging digital industries, created a legal and institutional framework and modified certain regulations, related to the participation of the private sector in the development of innovation technologies.[108]

In September 2021, "Seoul Vision 2030" plan was announced by the city mayor. The 4 key elements of the program are "a city of coexistence", "a global leader", "a safe city" and "a future emotional city". The city also working on adopting the five-year plan "Metaverse Seoul Basic Plan", which will allow to build city's own metaverse platform called "Metaverse Seoul". The platform is meant to present various social services and tourism activities. For instance, "Metaverse Seoul" will have a digital mayor office and general civil service office "Metaverse 120 Center", where people can receive consultations and file complaints, while interacting with the avatars of administrative representatives. As for the tourist field, people will be able to visit city's most popular attractions and participate in city festivals, held in the metaverse.[109]

In 2021 South Korean government announced the launch of the "Metaverse Alliance", which consists of more than 200 entities[110]. According to the MSIT, this organization plays a central role on the way of creation a metaverse ecosystem in the country, with the enthusiastic approach of the private sector and support of the central Korean government[111].

In 2022 the Ministry of Science and ICT announced an investment of approximately 166 million US dollars to promote a Metaverse ecosystem. Later this year, the establishment of "Digital New Deal 2.0" was announced. The Ministry of Science and ICT announced a governmental strategy, which views metaverse as an essential part of Digital New Deal 2.0 initiative. This metaverse strategy mainly focused on four key elements: activating the ecosystem for metaverse platforms, nurture experts in the field of metaverse, encourage companies to develop projects in sphere and create a safe environment for metaverse platforms[112].

Among the ambitious plans of the government is the aim to nurture 40.000 metaverse professionals and create an environment allowing foreign companies and startups to enter the Korean market.

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[108] Ministry of Science and ICT. 2021." Digital New Deal Harness the Winds of Change, Bringing Innovation!". Press release. June 22, 2021. https://www.msit.go.kr/bbs/view.do?sCode=eng&mId=4&mPid=2&bbsSeqNo=42&nttSeqNo=523
[109] https://mindthebridge.com/tech-scaleup-south-korea-report-2022/
[110] Kshetri, Nir. 2023. "National Metaverse Strategies." IEEE Computer 56 (2): 137–42. https://doi.org/10.1109/mc.2022.3227681.
[111] Ministry of Science and ICT. 2022." Korea's Digital New Deal 2.0 Action Plan 2022". Press release. January 26, 2022. https://www.msit.go.kr/bbs/view.do?sCode=eng&mId=4&mPid=2&bbsSeqNo=42&nttSeqNo=626
[112] https://www.msit.go.kr/eng/bbs/view.do?sCode=eng&mId=4&mPid=2&pageIndex=&bbsSeqNo=42&nttSeqNo=621&searchOpt=ALL&searchTxt=

Also, the opening of a" K-Metaverse academy" is planned. It is expected to become a base for the co-operation of global startups and local content companies[113].

1.5. Private sector support of metaverse in South Korea

Among the key players developing the metaverse in South Korea is Naver conglomerate. In 2018 the company launched its own metaverse platform called "Zepeto", which allowed users design their own avatars and interact in the digital world. The key idea of the platform is to allow people to have alternative experience in the digital world: "another me in another universe" is the moto of the company, which also reflects its vision.Naver managed to gather attention of multiple large investors and created a ground for big international collaborations. For instance, in December 2021 Softbank invested 150 million US dollars in the platform. During the same year Zepeto collaborated with Ralph Lauren fashion brand, that used the platform for the realization of its digital clothes collection. Moreover, the same year Hyundai used the Korean metaverse platform to replicate the real-world Huyndai Motorstudio in Seoul. In 2022 the company added a second floor to its digital studio and enlarged the functionality of it by adding the opportunity of virtual mobility experience[114].

Samsung, as the largest conglomerate in South Korea, is also following its own path in the metaverse. In 2022 the company used Zepeto as a platform to launch their metaverse service called "My House". The service gives the users the opportunity to decorate their digital houses with various electronic solutions and interior items. The launch created a sensation among users, as three weeks after the launch "My House" had more than 4 million cumulative visitors. Samsung also pays attention to international metaverses. For instance, the company build "Samsung 837X" on Decentraland platform. "Samsung 837X" is a digital replica of company's flagman store located in New York. The virtual space allows users to interact with each other and earn rewards, while participating in various activities.[115]

South Korean internet giant Kakao plans to develop their own "Kakao Universe", based on the flagman product "Kakaotalk", which allows people sharing same values and hobbies gather and communicate. The company plans to launch a special service, called "OpenLink", in order to implement it

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[113] "The Metaverse in Asia." n.d. Deloitte Singapore. https://www2.deloitte.com/sg/en/pages/about-deloitte/articles/the-metaverse-in-asia.html.

[114] Karim, Alessandra. 2022. "Tech Scaleup South Korea - Report 2022." Mind the Bridge. September 19, 2022. https://mindthebridge.com/tech-scaleup-south-korea-report-2022/.

[115] Karim, Alessandra. 2022. "Tech Scaleup South Korea - Report 2022." Mind the Bridge. September 19, 2022. https://mindthebridge.com/tech-scaleup-south-korea-report-2022/.

into the metaverse field. It is expected, that Kakao Universe will provide various options for communication, such as text, images, video and VR.[116]

Based on the information given above we can see, how nowadays the metaverse gains its momentum in the world. Despite major issues related to the definition discussion and lack of regulation mechanisms it is being implemented in various spheres, such as economy, social sphere, education and so on. China and South Korea, being in the forefront of metaverse, follow different approaches, but have very similar goals and means.

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[116] Ibid

Data collection & Analysis

In order to analyze the metaverse regulation strategies implemented in China and South Korea and highlight the main themes in the official documents, published by the central government we use thematic analysis. The data to analyze, was collected from the official websites of the Ministry of Industry and Information Technology of People's Republic of China and the Ministry of Science and ICT of Republic of Korea. These two institutions are in charge of the development of the innovation systems of both countries. Hence, their mission is to promote technological development and implement policies and regulations in the sphere, in order to increase the technological competitiveness level of their country on the global arena.

In order to collect the data from the website of the Ministry of Industry and Information Technology of People's Republic of China we used the search engine, available on the website. For conducting the search, we had to use only Chinese language, as the majority of publications, made by the Ministry are not translated to English. In order to search for publications, the keyword "元宇宙" (yuá nyǔzhòu) was selected.

The total of 10 publications made by the Ministry were found. There is a certain number of publications, that do contain the keyword "Metaverse" in them, nevertheless, in this study we compare only publications made directly by the ministries in charge of the technological development of the country, not affiliated offices of lower levels, such as province or city level, as we cannot fully interpret the themes, that will be highlighted from that analysis. Most likely, they will not be able to give as an understanding of the attitude of the government towards metaverse development, but will just provide an overview of events and affairs, that took place in the area.

The documents, available on the website include press-releases, published from 2021 to 2023. After coding and identifying themes, the two following patterns were identified:

Themes, which were selected through the implementation of inductive coding	Quotes from the publications made by MIIT
China develops policy and regulations measures to coordinate the metaverse	"Fifth [measure to build an advanced society], accelerate the cultivation and growth of emerging industries.Accelerate the innovation and development of strategic emerging industries such as artificial intelligence, biomanufacturing, and the Internet of Things,

| | implement special actions for the development of advanced manufacturing clusters, study and formulate action plans for future industrial development, and accelerate the planning and layout of future industries such as humanoid robots, meta-universe, and quantum technology."[117]

"Research and formulate future industrial development action plans, and accelerate the planning and layout of future industries such as humanoid robots, metaverses, and quantum technology."[118] |
|---|---|
| Chinese central government supports various events and initiatives and demonstrates the will to cooperate on the global arena | "[This conference] focuses on the new technology of artificial intelligence and the new track of the metaverse development. It adopts the model of "meeting, exhibition, competition, use, and talent" to focus on the latest achievements in the development of artificial intelligence and the metauniverse, and builds a platform for cooperation and exchange between China and the global scientific and industrial circles."[119]

"The training course [organized with the support of MIIT] invited blockchain experts and scholars, relevant responsible officials of local industrial and information technology authorities, and responsible officials of subordinate units to give lectures on related topics such as blockchain technology innovation, industry application, industrial development, |

[117] "全力以赴稳工业，扎实锻造新优势——访工业和信息化部部长金壮龙." n.d. https://www.miit.gov.cn/xwdt/gxdt/ldhd/art/2023/art_f6e2223a1a654856bb34e015184be94a.html. (translated by the author)

[118] "全力推动工业经济积极恢复、稳步回升——访工业和信息化部党组书记、部长金壮龙." n.d. https://www.miit.gov.cn/xwdt/gxdt/ldhd/art/2023/art_f953de18cac54575ab9be0df38fb27eb.html. (translated by the author)

[119] "金壮龙以视频方式出席 2022 世界人工智能大会开幕式并致辞." n.d. https://www.miit.gov.cn/xwdt/gxdt/ldhd/art/2022/art_abfb67336e18472a9d6a41523b684eb4.html. (translated by the author)

| | security, standard system, emerging technology integration and development, and metaverse."[120]

"The conference gathered more than 3,500 advanced technologies and products from more than 220 companies and scientific research institutions, and covered a number of fields among emerging industries such as artificial intelligence, blockchain, digital twin, and meta-universe, as well as the latest achievements of digital reform."[121]

"The World Intelligent Connected Vehicles Conference will show new technologies, new products, and new formats of the intelligent connected vehicle industry through innovative means such as virtual reality (VR) and metaverse, so that the majority of the people can share the latest achievements of intelligent connected vehicle technology."[122]

""[123] |
|---|---|

In order to collect data from the website of the Ministry of Science and ICT of Republic of Korea, we used the search engine, available on the website. After inputting the keyword "metaverse" we receive access to all the publications, including this word. The total of 30 publications available in English were made by the Ministry has been found. The majority of the publications are press-releases, but also include few publications under the sections of photo-news (1), policies (1), science & ICT trends (2). In the table below we present the themes, which were formulated and selected after the analysis of the data:

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[120] "信息技术发展司举办区块链产业创新发展专题培训班 ." n.d. https://www.miit.gov.cn/jgsj/xxjsfzs/gzdt/art/2022/art_ce6f9aeb4cde493e837f4a1f44abb82e.html. (translated by the author)

[121] "2022世界数字经济大会暨第十二届智博会在宁波举行 ." n.d. https://www.miit.gov.cn/jgsj/xxjsfzs/gzdt/art/2022/art_30c4e5d9763242d792dd892edf95b013.html. (translated by the author)

[122] "2022世界智能网联汽车大会在京开幕 ." n.d. https://www.miit.gov.cn/xwdt/gxdt/ldhd/art/2022/art_21f3ce83989e47129b4acb3006c780d0.html. (translated by the author)

[123] "2022世界VR产业大会在南昌召开 ." n.d. https://www.miit.gov.cn/xwdt/gxdt/ldhd/art/2022/art_8539ccdd0be841dd93878b5b208fdae0.html. (translated by the author)

Themes, which were selected through the implementation of inductive coding	Quotes from the publications made by MSIT
Metaverse is among key components of Korean national agenda	"From 2023, Korea will focus its investment on R&D in the field of six major innovative digital technologies, including ①AI, ②AI semiconductors, ③5G and 6G communication, ④quantum, ⑤metaverse, ⑥cyber security"[124] "Data became the core technology in the digital economy that acts as a momentum to digitally transform society and economy. Data based new industries such as metaverse and autonomous driving is expected to grow rapidly and lead the success of national competitiveness."[125] "The areas Korea has strength in, which are semiconductors, small modular reactors (SMR), and digital emerging industries (AI, metaverse, blockchain etc.)"[126] "Global cooperation is a necessity to design the future of the digital transformation era, and to respond to changes brought by emerging technologies like 6G and metaverse"[127] "Develop metaverse platforms for industrial convergence and daily life/economy, based on private demands"[128] "Metaverse is an uncharted digital continent with

[124] Ministry of Science and ICT. 2022." Korea to Come up with the Roadmap of Digital ROK, Realizing the New York Initiative". Press release. September 28, 2022. https://www.msit.go.kr/bbs/view.do?sCode=eng&mId=4&mPid=2&bbsSeqNo=42&nttSeqNo=742

[125] Ministry of Science and ICT. 2022." MSIT to vitalize digital economy with regulation amendments!". Press release. September 15, 2022. https://www.msit.go.kr/bbs/view.do?sCode=eng&mId=4&mPid=2&bbsSeqNo=42&nttSeqNo=731

[126] Ministry of Science and ICT. 2022." MSIT to Announce Five Key Action Plans of the New Administration". Press release. July 15, 2022. https://www.msit.go.kr/bbs/view.do?sCode=eng&mId=4&mPid=2&bbsSeqNo=42&nttSeqNo=720

[127] Ministry of Science and ICT. 2022." 'Beyond 5G' to begin the Age of the Great Digital Voyage". Press release. March 02, 2022. https://www.msit.go.kr/bbs/view.do?sCode=eng&mId=4&mPid=2&bbsSeqNo=42&nttSeqNo=649

[128] Ministry of Science and ICT. 2022." The MSIT supports the creation of a metaverse ecosystem!". Press release. February 28, 2022. https://www.msit.go.kr/bbs/view.do?sCode=eng&mId=4&mPid=2&bbsSeqNo=42&nttSeqNo=657

	indefinite potential. Anyone can realize their dreams. In particular, metaverse will become a place where the youth can take up more challenges, grow and leap forward a greater world."[129] "This will lead the future digital environment in medical rehabilitation, healthcare, defense, education, metaverse and others and will serve as a growth engine of Korea's economy."[130] "A growing demand for talent with expertise in emerging technologies like software, big data, metaverse, and block chain is triggered by a fast shift to the digitization of the work environments across the industries, especially the traditional ones."[131]
South Korean central government understands the importance of metaverse industry and supports various events and initiatives to promote the concept on different levels	"Korea held an event at the Consumer Electronics Show (CES)* 2023 to help Korea's metaverse firms explore opportunities for collaboration with international investors and attract international investments"[132] "Telecommunications companies shared their future plans, pledging to collaborate to enhance the telecom ecosystem so as to provide the stable and high quality of networks. They are also considering the use of emerging technologies such as artificial intelligence and metaverse."[133] "The Ministry of Science and ICT (MSIT, Minister: Lim Hyesook) announced the plan to raise the fund

[129] Ministry of Science and ICT. 2022." MSIT to announce pan-government strategy on metaverse". Press release. January 20, 2022. https://www.msit.go.kr/bbs/view.do?sCode=eng&mId=4&mPid=2&bbsSeqNo=42&nttSeqNo=621

[130] Ministry of Science and ICT. 2021." 100 Excellent National R&D Performances 2021". Press release. November 01, 2021. https://www.msit.go.kr/bbs/view.do?sCode=eng&mId=4&mPid=2&bbsSeqNo=42&nttSeqNo=556

[131] Ministry of Science and ICT. 2021." MSIT holds a roundtable to discuss how to nurture young talent in the era of digital transformation". Press release. November 17, 2021. https://www.msit.go.kr/bbs/view.do?sCode=eng&mId=4&mPid=2&bbsSeqNo=42&nttSeqNo=567

[132] Ministry of Science and ICT. 2023." K-Metaverse presented to the global Market at CES 2023". Press release. January 1, 2023. https://www.msit.go.kr/bbs/view.do?sCode=eng&mId=4&mPid=2&bbsSeqNo=42&nttSeqNo=767

[133] Ministry of Science and ICT. 2022." MSIT to hold roundtable to present the direction on the 'Next Generation Network Development Strategy'". Press release. January 26, 2022. https://www.msit.go.kr/bbs/view.do?sCode=eng&mId=4&mPid=2&bbsSeqNo=42&nttSeqNo=625

	to support the merge and acquisition of domestic companies specializing in metaverse, so that they can obtain global competitive edges in the metaverse field"[134] "Colleges with outstanding digital courses will be established, and postgraduate courses in the digital fields such as AI, Metaverse, cyber security, and big data will be expanded"[135] "Open a Metaverse Academy to train young metaverse experts (180 students, KRW 4.6 billion); Operate Metaverse Labs to train postgraduate metaverse talent (10 labs, KRW 2.4 billion); and Create metaverse convergence graduate programs (KRW 1 billion)"[136] "Support the operation of the Metaverse Labs , which promotes the development, entrepreneurship, and commercialization of metaverse-specific technologies (10 labs, KRW 2.4 billion), and support the establishment of metaverse graduate programs that incorporate skills from engineering and arts and humanities"[137] "Operate a metaverse hub to provide domestic metaverse service/platform development SMEs and startups with metaverse testing and demonstration environments"[138]
South Korea develops policy and regulations measures to coordinate the metaverse	"to create a metaverse ecosystem that evolves together through creativity and innovation by ensuring that

[134] Ministry of Science and ICT. 2022." MSIT to announce the fund-raise plan to support the M&A of domestic companies in the metaverse field". Press release. January 23, 2022. https://www.msit.go.kr/bbs/view.do?sCode=eng&mId=4&mPid=2&bbsSeqNo=42&nttSeqNo=642

[135] Ministry of Science and ICT. 2022." Korea to nurture one million talent to lead the digital era". Press release. August 22, 2022. https://www.msit.go.kr/bbs/view.do?sCode=eng&mId=4&mPid=2&bbsSeqNo=42&nttSeqNo=725

[136] Ministry of Science and ICT. 2022." The MSIT supports the creation of a metaverse ecosystem!". Press release. February 28, 2022. https://www.msit.go.kr/bbs/view.do?sCode=eng&mId=4&mPid=2&bbsSeqNo=42&nttSeqNo=657

[137] Ministry of Science and ICT. 2022." The MSIT supports the creation of a metaverse ecosystem!". Press release. February 28, 2022. https://www.msit.go.kr/bbs/view.do?sCode=eng&mId=4&mPid=2&bbsSeqNo=42&nttSeqNo=657

[138] Ibid

	members of society deliberate the socioeconomic benefits and the ethical issues brought about by the metaverse in advance"[139] "By linking with the government's regulatory improvement policies (governance*), encourage the private sector to take the lead in identifying regulations that need to be improved in emerging digital industries (e.g. platform, metaverse) (starting 2022)."[140] "Implement pioneering projects for ten key metaverse areas for promoting the convergence of industry, culture and public sectors (2022~), establish the implementation plan and ethical principles for boosting regulatory innovation in metaverse (2022~)"[141] "Based on this, the standard ["Requirements and framework for jitter guarantee in large scale networks including IMT-2020 and beyond"] is expected to contribute to the promotion of industries related to ultra-low latency services in 5G, Internet, and the metaverse"[142] "Improve laws and regulations related to the metaverse; Develop metaverse ethics principles; Establish a self-regulation system"[143] "The MSIT laid out a policy direction to actively help domestic companies compete with global ones by supporting cooperation between companies, tech-

[139] Ministry of Science and ICT. 2023. "Ethical Principles for the Metaverse." Press release. February 9, 2023. https://www.msit.go.kr/bbs/view.do?sCode=eng&mId=10&mPid=9&bbsSeqNo=46&nttSeqNo=17.

[140] Ministry of Science and ICT. 2022." Korea to Come up with the Roadmap of Digital ROK, Realizing the New York Initiative". Press release. September 28, 2022.

[141] Ibid

[142] Ministry of Science and ICT. 2022." RRA's Five International Standard Proposals for 5G, Cloud Computing, and Quantum Cryptography Communication Technology Were Adopted by ITU". Press release. August 31, 2022. https://www.msit.go.kr/bbs/view.do?sCode=eng&mId=7&mPid=2&bbsSeqNo=44&nttSeqNo=189

[143] Ministry of Science and ICT. 2022." The MSIT supports the creation of a metaverse ecosystem!". Press release. February 28, 2022. https://www.msit.go.kr/bbs/view.do?sCode=eng&mId=4&mPid=2&bbsSeqNo=42&nttSeqNo=657

	nology development and regulatory innovation, with a focus on creating a sustainable metaverse ecosystem through the Emerging Metaverse Industry Promotion Strategy."[144]
	"Discover and support leading metaverse platforms based on decentralization and creator-economy"[145]
	"To develop hyper-connected industries including metaverse and cloud, the government is supporting and investing in platform and content creation"[146]
	"Lay the foundation for emerging industries made available by digital transformation, such as the metaverse"[147]
	"Open metaverse platform will be established for various businesses to accumulate and utilize data, and new contents and services will be developed. The platform provides comprehensive support for producing metaverse contents and developing key technologies."[148]
	"The government to actively support the growth of emerging industries that promote hyper-connectivity, including Metaverse, blockchain, cloud computing, etc."[149]
South Korean government demonstrate its readiness to lead the metaverse industry and deepen its international cooperation in the sphere	"Korea held an event at the Consumer Electronics Show (CES)* 2023 to help Korea's metaverse firms explore opportunities for collaboration with interna-

[144] Ibid

[145] Ibid

[146] Ministry of Science and ICT. 2022." Korea's Digital New Deal 2.0 Action Plan 2022". Press release. January 26, 2022. https://www.msit.go.kr/bbs/view.do?sCode=eng&mId=4&mPid=2&bbsSeqNo=42&nttSeqNo=626

[147] Ministry of Science and ICT. 2021." 2022 MSIT Work Plan Announcement". Press release. December 29, 2021. https://www.msit.go.kr/bbs/view.do?sCode=eng&mId=4&mPid=2&bbsSeqNo=42&nttSeqNo=610

[148] Ministry of Science and ICT. 2021." Digital New Deal Harness the Winds of Change, Bringing Innovation!". Press release. June 22, 2021. https://www.msit.go.kr/bbs/view.do?sCode=eng&mId=4&mPid=2&bbsSeqNo=42&nttSeqNo=523

[149] Ibid

	tional investors and attract international investments."[150]

"High-level bilateral dialogues will be followed with the Commissioner of the Federal Communications Commission of the United States, Minister of Transport and Communications of Finland, Minister of Communication and Information Technology of Indonesia, and the Vice President of the World Bank, to discuss on the diverse science and ICT areas including 5G, metaverse, and artificial intelligence"[151]

"Korea's small and medium-sized companies specializing in metaverse will be encouraged to develop new types of metaverse services, raising their competitiveness on the global stage."[152]

"Minister Lee Jong-Ho of the Ministry of Science and ICT had a bilateral meeting with Minister Josephine Teo of the Ministry of Communications and Information to present Korea's digital strategy and AI policy direction, exchange ideas on new digital technologies such as metaverse"[153]

"Under the MoU on metaverse cooperation, Korea will share information related to Korea's metaverse ecosystem development while the GSMA will spread Korea's practices to the global mobile carriers and developers to seek business collaboration opportunities."[154]

""if Korea's metaverse initiatives, including the pan- |

[150] Ministry of Science and ICT. 2023." K-Metaverse presented to the global Market at CES 2023". Press release. January 1, 2023. https://www.msit.go.kr/bbs/view.do?sCode=eng&mId=4&mPid=2&bbsSeqNo=42&nttSeqNo=767

[151] Ministry of Science and ICT. 2022." Minister Lim to attend Mobile World Congress 2022". Press release. January 26, 2022. https://www.msit.go.kr/bbs/view.do?sCode=eng&mId=4&mPid=2&bbsSeqNo=42&nttSeqNo=645

[152] Ministry of Science and ICT. 2022." MSIT to announce the fund-raise plan to support the M&A of domestic companies in the metaverse field". Press release. January 23, 2022. https://www.msit.go.kr/bbs/view.do?sCode=eng&mId=4&mPid=2&bbsSeqNo=42&nttSeqNo=642

[153] Ministry of Science and ICT. 2022." MSIT to sign AI MoU with MCI of Singapore". Press release. December 06, 2022. https://www.msit.go.kr/bbs/view.do?sCode=eng&mId=4&mPid=2&bbsSeqNo=42&nttSeqNo=756

[154] Ministry of Science and ICT. 2022." MSIT to conclude MoU on Metaverse Cooperation with GSMA". Press release. March 03, 2022. https://www.msit.go.kr/bbs/view.do?sCode=eng&mId=4&mPid=2&bbsSeqNo=42&nttSeqNo=650

	governmental strategy on metaverse released last January, and innovative business practices from the private sector can be shared with the world, this will hold significance because Korea may lead the metaverse industry, which is still in its infancy."[155]

"Global cooperation is a necessity to design the future of the digital transformation era, and to respond to changes brought by emerging technologies like 6G and metaverse. In this, Korea will lead global trends with its outstanding ICT technologies while exerting leadership in forming cross-border cooperation."[156]

"The Ministry will ensure to implement the diverse support strategies faithfully, so that South Korean can become a leading global metaverse country."[157] |
| South Korean government supports local companies and projects in the metaverse sphere | "Korea held an event at the Consumer Electronics Show (CES)* 2023 to help Korea's metaverse firms explore opportunities for collaboration with international investors and attract international investments"[158]

"The MSIT laid out a policy direction to actively help domestic companies compete with global ones by supporting cooperation between companies, technology development and regulatory innovation, with a focus on creating a sustainable metaverse ecosystem through the Emerging Metaverse Industry Promotion Strategy."[159]

"The [Deepbrain AI]company plans to expand its AI Human services to other industries, such as movies, |

[155] Ibid

[156] Ministry of Science and ICT. 2022." 'Beyond 5G' to begin the Age of the Great Digital Voyage". Press release. March 02, 2022. https://www.msit.go.kr/bbs/view.do?sCode=eng&mId=4&mPid=2&bbsSeqNo=42&nttSeqNo=649

[157] Ministry of Science and ICT. 2022." MSIT to announce pan-government strategy on metaverse". Press release. January 20, 2022. https://www.msit.go.kr/bbs/view.do?sCode=eng&mId=4&mPid=2&bbsSeqNo=42&nttSeqNo=621

[158] Ministry of Science and ICT. 2023." K-Metaverse presented to the global Market at CES 2023". Press release. January 1, 2023. https://www.msit.go.kr/bbs/view.do?sCode=eng&mId=4&mPid=2&bbsSeqNo=42&nttSeqNo=767

[159] Ministry of Science and ICT. 2022." The MSIT supports the creation of a metaverse ecosystem!". Press release. February 28, 2022. https://www.msit.go.kr/bbs/view.do?sCode=eng&mId=4&mPid=2&bbsSeqNo=42&nttSeqNo=657

	animated films, and even "metaverse," a virtual-reality space which is one of the major components in the next phase of the government's Digital New Deal project"[160]

[160] Ministry of Science and ICT. 2021." Deepbrain AI Secures a Global Presence". Press release. November 01, 2021. https://www.msit.go.kr/bbs/view.do?sCode=eng&mId=4&mPid=2&bbsSeqNo=42&nttSeqNo=558

Research findings

Based on the thematic analysis conducted we can point out certain patterns when it comes to the attitude of the government in China and South Korea towards the metaverse. As we can see, based on the publications made by the MIIT, China is mainly focused on participating and hosting various events, such as Global Digital Economy Conference, World Intelligent Connected Vehicles Conference and the World Conference of VR. It is also taking steps towards the direction of policy and regulations implementation in the metaverse sphere, but this theme is not fully covered in the press releases available on the website. Certain publications, directly related to the metaverse were not available in the results section. For instance, the Virtual Reality and Industry Application Integration Development Action Plan (2022-2026), mentioned earlier in the thesis, which is so far the most complex set of policies for the development of the metaverse in China did not appear among the search results.

When it comes to South Korea we can see, that the country is following several directions, when it comes to metaverse development. It was possible to highlight 5 themes, based on the analysis conducted. The role of the government is not only reflected through regulation measures, but also through the participation of the officials in various events and conferences, promoting the metaverse on various levels. Clearly, South Korea has an ambition to lead the metaverse field on the global arena, therefore we can see much bigger amount of publications made on the website of the MCIT and much bigger coverage of the topic from different angles, including the support of local projects and creating a ground for international collaboration.

So far we can see that China and South Korea are active members of international digital community and are among the first countries to promote metavers related initiatives on the global arena. Nevertheless, based on the thematic analysis we see, that South Korea so far exerts more influence in the metasphere, as it is already successfully collaborating with other countries and develops more concrete framework, when it comes to defining, regulating and implementing metaverse.

4. Conclusion

The current thesis, following the exploratory research design, contributed into the investigation of the metaverse topic, that is not so well developed. During the research, we discussed the concept of metaverse and the problem of its definition. The research has shown, that there is a continuous discussion in the academia, business sphere and social discourse. Also, we observed the support and regulations of the government towards the metaverse sphere and the position of the private sector in its development. Despite different approaches and different levels of governmental involvement into the metaverse regulations, we can see that China and South Korea are moving towards "the middle ground", when it comes to the state role in metaverse development.

At the moment both countries are working on the same goal: to lead the metaverse industry and set an example to other countries by creating a sufficient ecosystem of metaverse. Obviously, the governmental strategies towards national digitalization motivate the countries to develop measures to regulate and navigate the meta space not only by banning certain metaverse technologies or adopting special policies, but also through creating ethical principles and nurturing experts and specialists in metaverse field, meeting the social demand.

We met the objectives, formulated in the introduction, as we:

1. Explained the theoretical and methodological framework regarding the concept of metaverse; its evolution in the past and current state of development
2. Overviewed the circumstances of metaverse industry in China and South Korea, highlight the areas of governmental support and the participation of the private sector in metaverse development
3. Obtained and analyzed publications available on the official websites of the responsible technology oriented ministries using thematic analysis
4. Provided key findings, related to the publications made by the official ministries
5. Provided the insights of further research of the national metaverse strategies in China and South Korea

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