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Meeting Ourselves or Other Sides of Us?—Meta-Analysis of the Metaverse

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Abstract: We were promised that the Metaverse would revolutionize our lives, social interactions, work, and business. However, how and when will this happen? We have seen the growth and development of technology, but there is no agreement or prediction about a specific time, and we can only follow the how question. To investigate more leads about this concept, we considered a main research question: How is the Metaverse actually being perceived? This question is connected with three objectives: to verify how the Metaverse is being represented and characterized, identify the main dimensions that facilitate or influence the acceptance of the Metaverse, and identify the leading technologies that suit the Metaverse concept. This study consisted of a documental analysis—or meta-analysis—of fifty of the most relevant scientific papers (taking into account some inclusion criteria) published in the last three years, using the Leximancer software to create concept maps to illustrate the main concepts and themes extracted from the articles to understand their associations or relations with the Metaverse concept. This study provided us with essential findings about how this concept has been perceived and allowed us to answer our objectives, contributing to a scientific discussion on the topic, and provided some valid suggestions for future research, which is already in progress. It also provided new leads on approaching this concept in development.

Keywords: Metaverse; virtual reality; animation; digital games; gaming

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1. Introduction

From the moment we wake up until we return to sleep, our (physical) lives are dependent on, or interconnected with, technology, from the more mechanical, basic form (for example, using a toaster) to more sophisticated technology (intelligent washing machine). Our social lives are being potentialized to the maximum, which is only possible through technology and will probably be extended further in the future. This is all due to our ambition, as humans, to discover new ways to communicate, socialize, and potentialize our daily routines.

However, we should not forget an essential part of our lives, present since the primitive cavemen—that is, leisure through playing games. This could have been board games long ago, but now, with the evolution of digital gaming, we can do it virtually, with a cellphone, computer, gaming console, or another digital set. The gaming world has been among us for a long time [1] and can respond to all of our wishes [2]. This evolution implies that gaming is becoming a social and shared experience [3], with continuous growth. With technological development, animated digital techniques make it possible for the players to achieve the pleasure of attaining dynamic universes, putting to their senses and experiences to the test [4]. Animation, with the help of games, makes the creation of virtual worlds possible. For these reasons, gaming is considered the funder of the Metaverse concept.

The Metaverse depends on virtual and augmented reality to create a 3D experience [2], and joining these experiences for the users makes the creation of virtual worlds possible [5]. However, we must remember the importance of social connection and the representations

in and between people as we look at this concept through the Metaverse of Mind concept [6]. Virtual reality allows the Metaverse to become a type of communication, using a computer as a simulation, allowing the construction of our virtual realities [7]. If virtual reality is considered a dream [8], then the Metaverse is responsible for gathering all possible dreams, creating a world for them to live through and for us.

In addition, this continuous evolution of concepts such as virtual reality, virtual worlds, the Metaverse—and even the multiverse—becomes the center of all attention. However, how is the Metaverse being perceived and represented? What are the main dimensions and concepts associated with the representation of the Metaverse? What has been researched and stated about this concept?

This documental or bibliographical study is part of more extensive research focused on the Metaverse concepts, virtual reality, and gaming. In this context: How is the Metaverse actually being perceived?

We aim to: (1) verify how the Metaverse is being represented and characterized; (2) identify the main dimensions that facilitate or influence the acceptance of the Metaverse; and (3) identify the leading technologies that suit the Metaverse concept.

We have selected fifty articles published in indexed scientific journals in the last three years on the main scientific database platforms (B-On, Scopus, and Google Scholar). We began our research using the sections of Titles, Keywords, Abstracts, Introductions, and Conclusions. The qualitative data selected from each section of the papers were analyzed using the Leximancer software to perform textual or content analysis of the text documents and identify high-level concepts, giving us key ideas and actionable insights through graphic models.

We aimed to identify, analyze, and create a map highlighting the emerging concepts and dimensions of the Metaverse based on the qualitative data analysis using Leximancer and centering our attention on how the previous studies described this concept in each method section. The Leximancer tool, as a qualitative research Computer-aided Qualitative Data Analysis (CAQDA) software, not only helps us observe the connection between main ideas and the Metaverse, but also to derive and explore possible studies that can be conducted in the future, to go deeper and discover more about this emerging concept.

The present study is framed in a general introduction and a brief literature review. Subsequently, we present a detailed explanation of the methodology applied to the most frequent themes and main concepts from the articles we analyzed. Then, we highlight the findings of this study, followed by a discussion considering the results and a conclusion (including suggestions for future work).

2. Background

2.1. Metaverse

The Metaverse concept was proposed by Neal Stephenson, in 1992, in the scientific novel Snow Crash. Since then, the search to understand and define it has taken a big step. The Metaverse is a layer between reality and us [9], referring to a 3D, virtual, shared world where all the activities are possible due to augmented and virtual reality technologies [10]. It can be considered as a compound word of "meta" and "universe" that brings us a meaning of transcendence and the world, defined as a digital world where daily life and economic activities are possible [11]. It is a three-dimensional virtual world based on the physical world, but with no physical limitations, enabling interaction between people through avatars [12] and engaging in social, economic, and cultural activities [13]. It is also considered a post-reality universe and a multi-user environment, capable of merging physical and digital virtuality, that brings multisensory interactions and networked environments that are compatible with massively multiplayer online video games [14]. The Metaverse is also considered a mix of elements, including: online games, social networking, augmented reality, and virtual reality, which all allow digital engagement [15].

It is also expected to fundamentally change digital communication and significantly impact entertainment, education, health care, the economy, information, and services [16].

The gaming and education areas were also the first areas in which the Metaverse was considered and solutions arrived [17].

Nevertheless, it is essential to understand that the Metaverse is only possible because of technological development. This technological development came as a result of the success of the gaming world through virtual and augmented reality technologies and the animation evolution. The Metaverse is therefore considered to be a combination of technologies, depending on different concepts—such as gaming and other tools—and techniques for its development [18].

2.2. Virtual World versus Virtual Reality

Ralph Waldo Emerson once said that "All life is an experiment. The more experiments you make, the better" [19], and if we think about how technologies have invaded our lives and transformed them into these alternative realities, we have certainly embraced them. Therefore, it is essential to understand what these virtual worlds and virtual reality have and will continue to bring for us to experience, as a Metaverse component or as a concept by itself.

For some authors, virtual worlds may be seen as computer games that can be persistent and dynamic, supporting rich social interactions, attracting an ever-increasing number of participants, and providing a parallel alternative to the existing legal systems [20]. Making friendships and buying and selling properties is also possible [21]. Virtual worlds are computer-mediated, networked, and spatially navigable multi-user environments [22], giving us a perspective of social spaces, virtual environments, or performative environments. They are online spaces for socializing [23], and, at present, they have capabilities in areas such as education and leisure [24]. They can also be shared, simulated framework spaces that are inhabited and transformed by their inhabitants, represented by avatars, mediating the experience of space as we move and interact with objects or other users [25]. Virtual worlds can be understood as online computer-generated environments used by multiple users in remote physical locations, in real-time, either for work or play purposes [26]. Computer-generated simulations with three-dimensional objects or environments with seemingly real, direct, or physical user interactions have been considered a subset of the virtual reality [26]. It is also added that they are non-pausable virtual environments [27].

What about virtual reality? Some authors consider it an illusion made by a computer [28]. However, others believe virtual reality is real because we can interact with objects [28] with virtual realism. It is regarded as a new medium, brought about through technology, to become a practical and effective way of communication [29]. Virtual reality can also be described as virtual environments because participants can view other participants as being in the same environment and interact with them [30]. Virtual environments are ongoing experiences in time, considered for a large population, and have a world of social interactions [30]. Virtual reality uses computer graphic systems combined with displays and interface devices that provide an immersion in a 3D computer-generated environment [31]. Virtual reality convinces a participant that they are in another place, substituting the primary senses with a computer [32]; it is an electronic simulations environment [33], enabling users to gain experiences of real things that are similar to those from the physical world [34] by simulating a realistic environment [35]. Virtual reality brings us high expectations to revolutionize how we interact and deal with the digital world [36].

Virtual reality is seen as having a profound impact on daily human life and as allowing participants to continue to challenge the limits of the existing technology and optimize the combination of resources in pursuing scientific progress and technology [37]. In this way, virtual tools provide a variety of means to access, view, and analyze data, offering spatiality immersion and interaction [38].

2.3. Related Work—A Comprehensive Review of Main Concepts

To better understand the relationships between the key concepts, in this section, we connect these concepts with the questions and objectives of the present study. Tables 1–5

were structured to help us to observe the definitions of the studied authors according to our objectives, which are to: (1) verify how the Metaverse is being represented and characterized; (2) identify the main dimensions that facilitate/influence the acceptance of the Metaverse; and (3) identify the leading technologies that suit the Metaverse concept.

Table 1. Related Work—Concept Metaverse.

Article	Description	Concept Relation	Objective Alignment
[9]	"The Metaverse can be defined as a layer between us and reality"	Metaverse	(1)
[11]	"considered as a compound word of "meta" and "universe" that brings us a meaning of transcendence and the world, defined as a digital world where daily life and economic activities are possible"	Metaverse	(2)
[14]	"considered a post-reality universe and a multi-user environment capable of merging physical and digital virtuality that brings multisensory interactions and networked environments compatible with massively multiplayer online video games"	Metaverse	(1) (2)

Table 2. Related Work—Concept Metaverse vs. other concepts.

Article	Description	Concept Relation	Objective Alignment
[2]	"The Metaverse depends on virtual and augmented reality to create a 3D experience"	Metaverse vs. virtual reality	(2)
[5]	"joining these experiences for the users makes possible the creation of virtual worlds"	Metaverse vs. virtual worlds	(1)
[10]	"3D virtual shared world where all the activities are possible due to augmented and virtual reality technologies"	Metaverse vs. virtual reality	(2) (3)
[12]	"three-dimensional virtual world based on the physical world but with no physical limitations enabling interaction between people through avatars"	Metaverse vs. Virtual world	(1)
[15]	"a mix of elements: online games, social networking, augmented reality, and virtual reality, allowing digital engagement"	Metaverse vs. virtual reality vs. other technologies	(1) (2) (3)
[7]	"Virtual reality allows the Metaverse to become a type of communication using a computer as a simulation, allowing the construction of our virtual realities"	Virtual reality vs. Metaverse	(2) (3)

Table 3. Related Work—Concept virtual world.

Article	Description	Concept Relation	Objective Alignment
[19]	"Virtual worlds are computer-media-ted, networked, and spatially navigable multi-user environments"	Virtual world	(2) (3)
[20]	"They are online spaces for socializing"	Virtual world	(2)
[22]	"They can also be shared, simulated framework spaces inhabited, and transformed by their inhabitants who care represented by avatars, mediating the space experience as we move, and interact with objects or other users"	Virtual world	(3)

Table 4. Related Work—Concept virtual reality.

Article	Description	Concept Relation	Objective Alignment
[8]	"virtual reality is considered as dreams"	Virtual reality	(2)
[25]	"Some authors consider it an illusion made by a computer"	Virtual reality	(2) (3)
[25]	"others consider virtual reality as real because we can interact with objects"	Virtual reality	(2)
[26]	"It is regarded as a new medium, brought by technology, to become a practical and effective way of communication"	Virtual reality	(3)
[27]	"Virtual reality can also be described as virtual environments because participants can view other participants as being in the same environment and interact with them"	Virtual reality	(2)
[27]	"Virtual environments are ongoing experiences in time, considered for a large population, and having a world of social interactions"	Virtual reality	(2)
[29]	"convinces a participant to be in another place, substituting the primary sensory by a computer"	Virtual reality	(2)
[30]	"electronic simulations environments"	Virtual reality	(2)
[31]	"enabling users to get experiences on real things similar to those from the physical world"	Virtual reality	(2)
[32]	"simulating a realistic environment"	Virtual reality	(2)
[33]	"Virtual reality brings us high expectations to revolutionize how we interact and deal with the digital world"	Virtual reality	(2)
[28]	"Virtual reality uses computer graphics systems combined with displays and interfaces devices providing immersion in a 3D computer-generated environment"	Virtual reality vs. technology	(2) (3)

Table 5. Related Work—Concept virtual world vs.gaming.

Article	Description	Concept Relation	Objective Alignment
[17]	"virtual Worlds may be seen as computer games that can be persistent and dynamic, supporting rich social interactions, attracting and ever-increasing participants, providing a parallel alternative to existing legal systems"	Virtual world vs. gaming	(2) (3)
[23]	"can be comprehensible as online computer-generated environments used by multiple users in remote physical locations, in real-time, either for work or play purposes"	Virtual world vs. gaming	(2) (3)
[23]	"Computer-generated simulations with three-dimensional objects or environments with seemingly real, direct, or physical user interactions have been considered a subset of virtual reality"	Virtual world vs. virtual reality	(2)

Through analyzing the referenced papers (cf. Tables 1–5), we better understand how the Metaverse is characterized. It is described as something more abstract (for example: "considered a post-reality universe" [9]) or as something more literal (for example: "considered as a compound word of "meta" and "uni-verse" that brings us a meaning of transcendence and the world" [11]).

We can also verify that the acceptance and influence of the Metaverse are the result of the technology that supports its existence. This technology comes from a simple device (example: "Some authors consider it an illusion made by a computer" [28]) or something made by machines as virtual reality (example: "The Metaverse depends on virtual and augmented reality to create a 3D experience" [2]; "3D virtual shared world where all the activities are possible due to augmented and virtual reality technologies" [10]), or other existing technological realities, such as the gaming area (example: "a mix of elements: online games, social networking, augmented reality, and virtual reality, allowing digital engagement" [15]).

It is also possible to realize that the leading technology that suits the Metaverse is all that makes it possible to exist. We identified concepts such as virtual reality, virtual world, gaming, social networks, or others that allow digital engagement.

The Metaverse encompasses all of these concepts because if they did not exist, the idea of the Metaverse as something with multiple existences would be impossible.

Regarding our research question, "How is the Metaverse actually being perceived?", we can now elaborate that the Metaverse is perceived as technology in development, as all the technology around it is constantly evolving, and that it depends on concepts such as virtual reality and the virtual world because they are the core of this concept—which is, itself, virtual. It also demands digital engagement, obtained by gaming and social networks, positioning itself as a new form of communication.

2.4. Qualitative Research

Qualitative research was the natural approach to understanding which concepts, ideas, or dimensions we may find in relation to our central themes; it allows us to investigate the relationships between categories that can be subject to change during the research process [39]. This way, we can observe and worry less about measuring things [40]. Whether we opt for a more naturalist model, observing voice and subjectivity, or a more construction-

ist model, by following features of the social world that emerge naturally, the importance is in whether you can make extraordinary features out of ordinary life [41].

Qualitative research helps us understand what is important for people [32], giving us access to more subjective meaning than other approaches. Over the years, this has become known as the pluralization of life worlds [42]. Qualitative research is an umbrella term that makes a united research program possible, with different aims and procedures [42]. It also follows two basic principles: coding and categorization, on one hand, and text in context on the other [42].

Nevertheless, it is essential to note that qualitative research—specifically in our case, with a documental study using textual analysis—has also evolved due to technological development. This technological change influences the type of qualitative research [42]. At present, Qualitative Data Analysis (QDA) and Computer-aided Qualitative Data Analysis Software (CAQDAS) are fundamental not only for analyzing data, but also for supporting the qualitative data analysis process [43]. QDA software is a word processor that makes it easy for the researcher to write text, which in turn supports the qualitative research [42]. Depending on the program, it also facilitates the representation of data, structures in the data, and findings through graphic maps. Through these, we can increase the quality of qualitative research. The QDA software increases the validity of analyses [44,45], allows consolidation of the research [43,46], and facilitates the sampling decisions [47].

With the QDA software, data management becomes more manageable, and a series of techniques are supported, using the definition of pointers to: retrieve indexed text segments; construct electronic cross-references, which can be used to jump between linked passages; facilitate the comments of the researchers; define linkages between index worlds' use of variables and a filter; facilitate the retrieval of text segments with relations to each other; and facilitate the retrieval of quantitative attributes of the database [48]. Thus, we have seen the significant impact and help of the technology software and, even with the concern of some authors that it may distract researchers from the real analytic work, the help of reading, understanding, and contemplating the texts and others [42]. The computer can dramatically affect the research process and outcome, from unacceptable analysis restrictions to the unexpected opening of new possibilities [49].

2.5. Leximancer Tool

For this study, we decided to use the CAQDA software Leximancer(4.5 version, Leximancer Pty Ltd., Queensland, Australia), which is a typical data mining tool that enables a textual analysis of documents, identifying high-level concepts and giving us key ideas and actionable insights through models, interactive visualizations, and data exports. Leximancer can search, add, remove, and merge terms, as well as extract semantic (meaning) and relational information [50]. It can also detect key concepts based on their similarity and association with other words, using machine learning to generate and classify its glossary for each data set [51]. It has been used in an academic research setting in business, public sector, social, cultural, education, leisure, and tourism studies [50]—showing an extensive range of research in which this software has helped with data analysis.

Leximancer does not need research input as it can show us the merging concepts automatically generated from the text [50,52]. As a text mining tool, it provides concept maps using well-established methods to extract key concepts from texts [53]. Concept maps are very effective in identifying document trends and giving a rapid understanding of the new domain, allowing it to explore, in detail, within the global scope of the textual corps [53].

Leximancer has proven that its analysis is reliable [54] and stable, being equivalent to intercoder reliability [55], producing stable maps for the studies [53]. It allows us to profoundly analyze the data gathered and the results obtained, providing qualitative research, theoretical analyses, substantive content, and certainty [56,57], which are very important for any researcher.

3. Methods

3.1. Data Gathering—Articles

To gather the data in this study, we searched indexed scientific articles on the leading scientific database platforms, namely B-On, Scopus, and Google Scholar, considering, initially, three main keywords: Metaverse, virtual reality, and gaming.

For the selection of the 50 articles—scientific papers—, we took into account the following inclusion criteria: papers published in the last three years (2021 to 2023); papers with at least one of the main keywords considered for this research, as previously mentioned; and papers in which the concept is aligned with the goal of our study. For the exclusion criteria, we took into account: (1) papers that do not meet the inclusion criteria already mentioned; (2) papers that do not provide access to the full paper; (3) scientific papers that do not have the structure needed for the posterior analysis, namely titles, keywords, abstracts, introductions, and conclusions. The articles used are referred to in the references and in Table S1 (see Section Supplementary Materials). The majority were from 2022 (86%), and the remaining were from 2021 (12%) and 2023 (2%) (Table 6). Of the 50 articles, 37 were Journal Papers (74%), 10 Conference Papers (20%), and 3 PrePrints (6%) (Tables 6 and 7).

Table 6. Articles Year Information.

Type Articles	Count	%
2021	6	12
2022	43	86
2023	1	2

Table 7. Type Articles Information.

Type Articles	Count	%
Conference Paper	10	20
Journal Paper	37	74
Pre-Print	3	6

We observe that there is a diversity of publishers, perhaps because of the novelty of the theme, but the most recurrent are IEEE (12%), ResearchGate (10%), DergiPark (10%), CNKI (6%), and ScienceDirect (6%) (Table 8).

3.2. Preparing and Analysing Data—Procedure

After selecting the 50 articles, considering the mentioned inclusion criteria, we gathered all the downloaded free pdfs into a folder. Then, we extracted all the data from the titles, abstracts, keywords, introduction, conclusions, year of publication, published as, and published by from each article in a single Excel spreadsheet, using these descriptions as columns. Titles because they are essential from a marketing view [58], abstracts because they focus on the crucial issues shown in the papers [54], keywords because they are critical for searching any article [59], introductions because they give us significant findings about the concepts, and conclusions because they synthesize the results of the studies [60].

After the collection of all the data, a total of five text files were created with the names, titles, abstracts, keywords, introductions, and conclusions, where we merged all the data from the articles accordingly with the titles of the files, resulting in all the titles in the title file, and the same for the other files, respectively. The text files were uploaded and analyzed one by one through Leximancer, giving special attention to merging similar words (or reducing those that have singular and plural forms) or words with the same semantic root (e.g., world and worlds) and removing others—such as definite and indefinite articles—not significant for this study (e.g., a, an, or the). After this procedure, the concept maps were created so we could analyze them according to our research question, objectives, and theoretical-conceptual literature reviews. These concept maps can be repeated as needed [57]. It is important to note that the concept maps produced by Leximancer illustrate the main

concepts extracted from the articles (Figures 1–5), and a cluster of concepts is considered a theme with some standard text [57].

Table 8. Published By Information.

Published By	Count	%
IEEE	6	12
ResearchGate	5	10
DergiPark	5	10
CNKI	3	6
ScienceDirect	3	6
ARXIV	2	4
Multidisciplinary Digital Publishing Institute	2	4
Springer	2	4
Addleton Academic Publishers	1	2
Atlantis Press	1	2
BioMed Central	1	2
Ceur	1	2
Elsevier	1	2
Emerald Insight	1	2
First Monday	1	2
Information Systems Frontiers	1	2
International Journal of Research Publication and Reviews	1	2
International Journal of Security and Privacy in Pervasive Computing	1	2
International Research Journal of Modernization in Engineering Technology and Science	1	2
IRJMETS	1	2
ASME	1	2
Advance Institute of Convergence Information technology research Center	1	2
KIPS Transactions on Software and Data Engineering	1	2
Mary Ann Liebert, Inc., publishers	1	2
MDPI	1	2
New media and Society	1	2
SAGE	1	2
Sciendo	1	2
Social Science Research Network	1	2
Studies in Digital Heritage	1	2

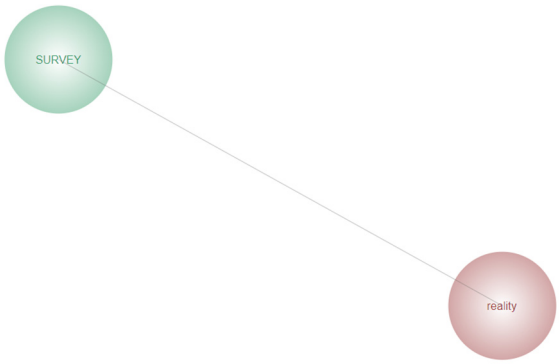

Figure 1. Title's main themes.

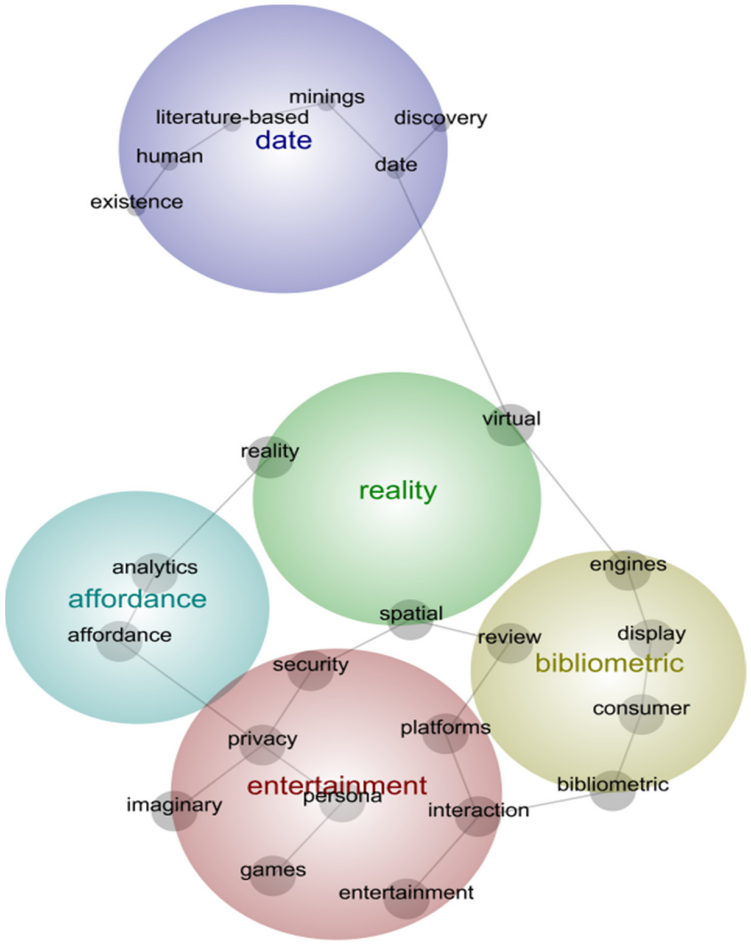

Figure 2. Keyword's main themes and concepts.

Figure 3. Abstracts main themes and concepts.

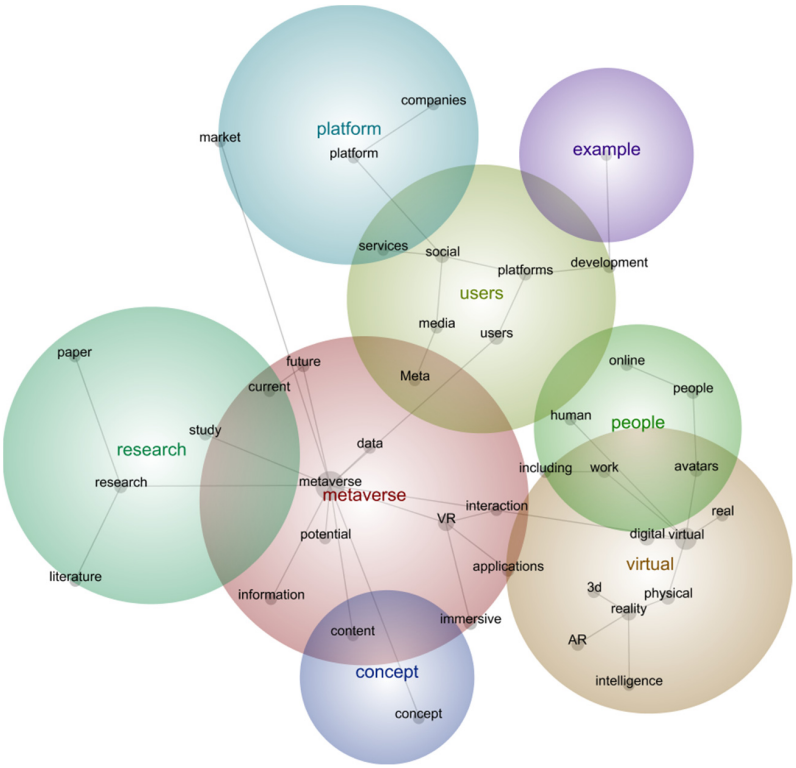

Figure 4. Introduction's main themes and concepts.

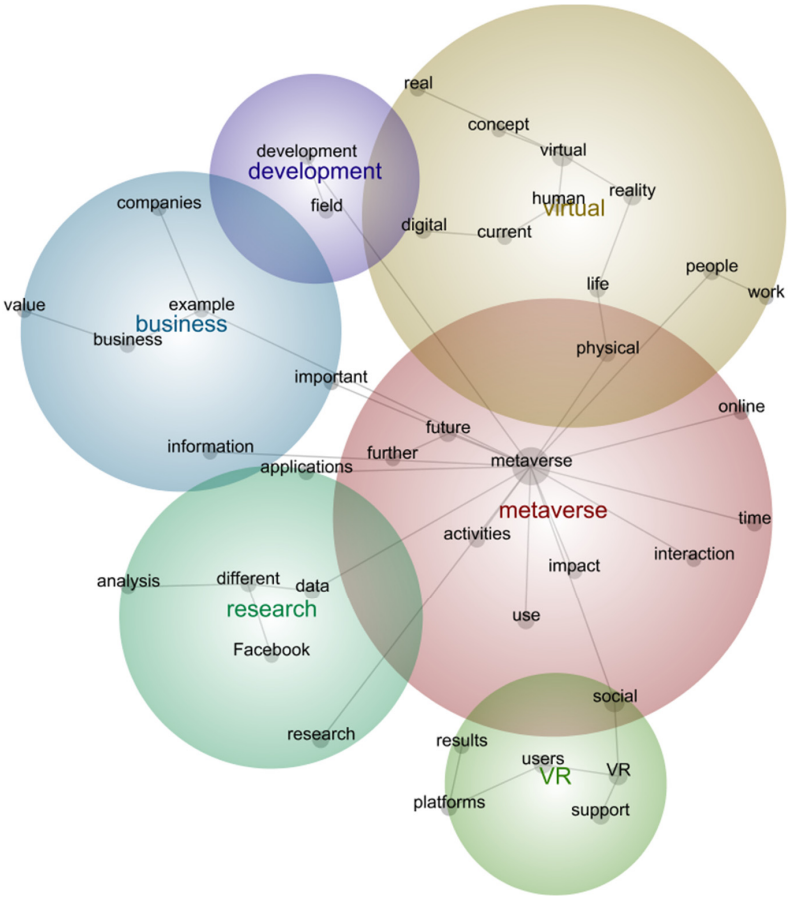

Figure 5. Conclusion's main themes and concepts.

3.3. Gathering Data—Results

Regarding the extracted titles (Figure 1), we observe that Leximancer produced two main themes with similar relevance (Table 9), meaning that these were the main concepts expressed from all the titles of the 50 articles. The use of a survey was the basis for many of the empirical studies, and several studies were focused on reality or, more precisely, on the relationship between the Metaverse and different realities, as the Metaverse is defined as a layer between us and reality [9]. We can also analyze the fact that this concept must evolve and how it is positioned in our lives, and therefore more research (surveys) needs to occur to see its future reality.

Table 9. Titles analysis information.

Concepts	Count	Relevance
Survey	7	100
Reality	7	100

Considering the keywords extracted from the articles, we observe (Figure 2) five main themes: Date, Reality, Affordance, Bibliometric, and Entertainment. In Table 10, we can observe that the percentage of the relevance of the concepts Reality and Virtual share the same high relevance. We can see that the Metaverse, through its existence as a reality, is present in our daily life. As this reality occurs through virtual and augmented reality, the technologies that make up this concept of the Metaverse evolve and exist.

Table 10. Keywords analysis information.

Concepts	Count	Relevance
Reality	9	100
Virtual	9	100
Affordance	8	89
Analytics	8	89
Bibliometric	8	89
Consumer	8	89
Display	8	89
Engines	8	89
Entertainment	8	89
Games	8	89
Imaginary	8	89
Interaction	8	89
Persona	8	89
Platforms	8	89
Privacy	8	89
Review	8	89
Security	8	89
Spatial	8	89
Date	2	22
Discovery	2	22
Existence	2	22
Human	2	22
Literature-based	2	22
Minings	2	22

It is possible to observe these realities with the information available (Date, Bibliometric) in the present study through the available research and literature; however, it is also important to consider that the function of the Metaverse is easy to identify without any previous explanation (Affordance), because its main objective is entertainment through games, potentializing the imagination, and interactions between people. We can also understand the central core of the entertainment area regarding the Metaverse concept, specifically the gaming world. Without this world, the Metaverse could not enter the user's personal life

and position itself as an interaction and communication tool. Let us dive more into this Metaverse/games relation. If the former is true, we can deduce that the gaming world was the best way for this concept to rise because it is based on the entertainment area and, therefore, is a well-being promoter for its users. The Metaverse developed through creating the perfect ground for a new idea. For this reason, the gaming world should be considered as the founder of this concept.

According to the analysis of the abstracts, we can observe six main themes: Metaverse, Virtual Reality (VR), Virtual, Research, Current, and Important (Figure 3). Table 11 represents the relevance percentage of the main concepts, which are Metaverse (100%) and Virtual (41%) (Figure 3).

Table 11. Abstracts analysis information.

Concepts	Count	Relevance
Research	38	17
Social	37	16
Immersive	36	16
Future	30	13
Users	25	11
Paper	25	11
Online	24	10
Platforms	22	10
Worlds	21	9
People	21	9
Physical	19	8
Data	19	8
Experiences	17	7
Healthcare	17	7
Current	17	7
Real	16	7
Analysis	16	7
Environments	15	7
Life	15	7
Use	14	6
Impact	13	6
Using	12	5
Provide	12	5
Applications	12	5
Review	12	5
Software	11	5
Information	11	5
Framework	10	4
Important	10	4
Process	9	4

These results show that the Metaverse provides immersion in virtual reality, connecting people as online users (as if they were in a social environment) and providing access to different applications and facilities. The Metaverse is, on one hand, a means to accessing current information, and, on the other hand, it points to future research and the need to better understand its impact on our lives. The Metaverse simulates a social platform that supports virtual environments or worlds, providing immersive experiences that almost seem real, as if they were lived in the physical world.

Observing the results for the extracted introductions, eight of the main themes remain: Platform, Example, Users, People, Virtual, Metaverse, Research, and Concept (Figure 4). The concepts with the highest percentage of relevance are Metaverse (100%) and Virtual (45%) (Table 12).

Table 12. Introductions analysis information.

Concepts	Count	Relevance
Metaverse	698	100
Virtual	311	45
Virtual Reality (VR)	150	21
Users	113	16
Digital	108	15
Reality	107	15
Social	93	13
Physical	88	13
Research	85	12
Immersive	65	9
People	61	9
Future	59	8
Development	53	8
3D	49	7
Augmented Reality (AD)	46	7
Data	47	7
study	47	7
Avatars	46	7
Real	46	7
Online	46	7
Platforms	45	6
Information	43	6
Work	42	6
Concept	42	6
Applications	39	6
Content	38	5
Literature	37	5
Paper	37	5
Media	36	5
Platform	34	5
Human	32	5
Potential	32	5
Companies	32	5
Meta	27	4
Interaction	31	4
Current	30	4
Market	29	4
Example	25	4
Including	24	3
Services	23	3
Intelligence	22	3

These results show—confirming what we previously found—the Metaverse as a means to accessing the current information and the need to understand its impact on our lives through future research. The Metaverse is useful for user communication, providing a new communication method as social networking through virtual reality interactions.

The relationship between the Metaverse and virtual reality is only possible due to the technological evolution of 3D and augmented reality. This relationship aims to create a virtual world that is as real as our physical one. It is only because the barriers of the frontier have been broken by the social capability of the Metaverse that new means of social communication are expected to emerge, and companies will create new possibilities, markets, and services. The Metaverse may also be used through avatars, reinforcing the need for some human form to interact in a social and media way, opening a possibility for companies and new markets to develop new services.

For the conclusions analysis, we observe six main themes: Business, Development, Virtual, Metaverse, Research, and Virtual Reality (Figure 5). The concepts with the highest percentage of relevance are Metaverse (100%) and Virtual (24%) (Table 13).

Table 13. Conclusions analysis information.

Concepts	Count	Relevance
Metaverse	553	100
Virtual	130	24
Social	112	20
Virtual Reality	88	16
Reality	81	15
Users	81	15
Future	74	13
Support	67	12
People	62	11
Research	58	10
Use	53	10
Digital	50	9
Human	49	9
Physical	46	8
Platforms	42	8
Different	42	8
Online	41	7
Real	41	7
Development	41	7
Activities	39	7
Life	39	7
Data	38	7
Time	37	7
Companies	37	7
Business	36	7
Analysis	33	6
Applications	32	6
Example	32	6
Impact	31	6
Facebook	25	5
Results	28	5
Important	28	5
Further	25	5
Field	25	5
Information	24	4
Interaction	23	4
value	23	4
Current	22	4
Concept	22	4
Work	21	4

The research thus far has shown us the significant impact of the Metaverse and keeps leading us to the need for further future investigation. This impact is evident within our lives and physical world, which will no longer be the same or be viewed in the same way. The increase in the development—not only on the technological levels, but also on business—will become a new field for exploring and creating new opportunities.

It also brings us a new way of living and socializing as the interaction with virtual reality creates new realities and possibilities for our needs or dreams that would not have been possible in the past. Humans are constantly creating new ways of communicating and socializing, and the virtual worlds provide us with alternative realities, or new opportunities, to keep in touch or be creative.

4. Discussion

Our findings provided us with an essential understanding of the representations of the Metaverse concept and its relation to other concepts, such as virtual reality and the gaming world. The results also offer answers to the objectives proposed in this study.

Regarding the objective of verifying how the Metaverse is being represented and characterized, we demonstrated that this concept is described as a new reality, a new means for human socialization, and the creation of new possibilities.

The Metaverse relates to the Reality theme, our reality, and how we perceive or comprehend it. Comparing reality with games, the truth is hard to obtain. On the contrary, games motivate us to participate more in whatever we do [61]. Virtual reality also comes naturally as it is a computer-generated environment [5] that forms the integration and connection between the Metaverse and the users, allowing interaction via avatars [62]. Quantitative and qualitative research data using virtual reality are a medium [62] that creates immersive virtual environments.

The User and People themes and their relevant concepts, such as the Social, are other main themes that show up with relevance, with no surprise. The social aspects of the Metaverse are vital because of its ability to allow interactions between people [12] and also enable social, economic, and cultural activities [13]. It is also important to note that this is only possible by representing each person as a player and, primarily, as an avatar [12]. One goal is to form a social community [63], shaping the future of online social networks [64]. The Metaverse concept also assumes an essential relationship with the entertainment concept, as the leisure dimension is considered to be a mix of online games and social networking [15]. We must recall that the gaming world is the founder of the Metaverse [2], and a game can also affect real lives; alternative realities are becoming increasingly important, and even unavoidable, and need to be considered in the future [61].

Other relevant themes in our findings were Affordance, Business, and Development. We can only perceive these through the technology concept because it is continually being developed and combined with the gaming area, which will continue to evolve. The Metaverse is considered a technological set of capabilities, communication, rendering, interaction, and team processes that is dynamic and allows avatars to interact in the Metaverse [12]. On an industry business level, it can increase productivity along with multiple phases of a product's life cycle [64]. The Metaverse world is going to show us incredible growth at an economic level [65] and is expected to be able to bring new opportunities for new companies, products, and services [66], meaning new job opportunities will arise [67].

Regarding the objective of identifying the main dimensions that facilitate/influence the acceptance of the Metaverse, our results showed: the gaming world as a means of entertainment; virtual reality as a means of technological engagement and immersion; and socialization, made available through interaction and communication.

Some studies have highlighted the Metaverse concept as a virtual reality platform where people can play games and connect with friends [16]. The entertainment industry is also believed to benefit the most as the Metaverse is considered an entertainment experience [16]. This concept also relies on the shared virtual spaces that promote interaction between users [68]. Therefore, socialization will be a central dimension.

Through the growth of the Metaverse concept, a significant investment in technology is expected because online gaming platforms are a vital aspect of this concept [16], and the more entertainment the gaming world provides through more immersive experiences, the higher the acceptance of new technological development towards the Metaverse concept will be.

As for the last objective, to identify the leading technologies that suit the Metaverse concept, it is clear that they are virtual reality, 3D, and augmented reality. The Metaverse is considered a layer between reality and us [9], existing as a shared 3D virtual world where everybody can experience activities through virtual and augmented reality [10].

Although the Metaverse concept has existed for the past two decades, it still needs a proper definition of what we will expect from it in the near future. Many researchers have

been conducting studies to understand where this concept will evolve. However, as this is a relatively new concept (in the general sense), the development of the ambitions that authors put on what will be may differ due to the rapid technological evolution. This is how we represent this concept through the technologies available in the present. Perhaps, in the future, we may have an even broader perspective about the interconnection of what we may imagine as multiverses—as long as fiction becomes close to what we call reality.

5. Research Limitations

In terms of the number of papers selected, a broader sample could probably reinforce our results and provide additional concepts about the Metaverse. Nevertheless, 50 papers are considered a good sample for a meta-analysis. In addition, the bigger the data to analyze, the more difficult it could be to categorize it (in themes and concepts). Another limitation could be the keywords that we used; this study is part of a Ph.D. project, and perhaps having fewer keywords would result in a broader range of studies—and, therefore, scientific papers—in relation to the theme.

6. Conclusions

Technology will continue to guide us in amazing virtual adventures, which may sometimes be disappointing or surprising, but always revealing a new face of the Metaverse as it evolves in its progressive definition. The type of experience provided by technology is different from the past, and it will be different in the future, because we are curious and intelligent beings, and will not stop progressing. However, the evolution of technology is not only made by curiosity. We also have to consider crucial factors, such as the leisure area of our lives. Leisure through games has lived in us since the cavemen times, and it will continue to exist because it is a part of us that we need. This entertainment area is mainly responsible for bringing us more immersive and enjoyable experiences and, therefore, provides technological innovations capable of giving us these experiences and other things we never imagined possible.

Answering our main question, "How is the Metaverse being perceived?", according to the main concepts we found (Reality, Virtual Reality, Users and People, Affordance, Business, Development, and Entertainment) and the observed connections between them, we conclude that the Metaverse will be part of our lives, creating new forms of communication and interactions through immersive experiences, potentializing a development of new means of services and entertainment.

The Metaverse is perceived as being supported by technology, including virtual and augmented reality, that allows the creation of virtual worlds with new opportunities in significant aspects of our lives, such as entertainment, social, services, or work, keeping in mind the social user's interaction either between them or with the virtual world within the Metaverse universe. This concept will continue to be in unceasing development as long as technologies become more perfect. We confirmed that our perceptions are influenced by new technologies [69]. However, the Metaverse perspective points to an entertainment gaming view and considers the social needs of these users to grow.

This study offers a deep understanding of the Metaverse concept, highlighting its main concepts and looking deeply at its connection to the gaming world through virtual reality. The main themes gathered from this study give us more leads on how the Metaverse is perceived by researchers, leading us to a better definition of how the evolution of the concept is being approached, technologies that make this possible, and which aspects we cannot neglect. Future studies should include more defined areas in order to explore, more profoundly, their meaning and interactions with this concept.

Our real and virtual worlds are increasingly intrinsically linked by (social) networks of information and knowledge [70]. Using the gaming area, this linkage is formed by animation and offers new perspectives about our (social) reality and way of thinking [71], and also allows the exploration of severe issues without the pressure of things [7]. The Metaverse concept will probably not survive without the play aspects of our lives, as the

gaming area cannot live without the animation that permits the user to see, listen, feel, and play a digital game. The gaming area provides us all with new worlds of possibilities to live beyond our imagination and fantasies, so the Metaverse cannot be less than a multiverse where all our dreams may, somehow, come true.

Supplementary Materials: The following supporting information can be downloaded at: https://www.mdpi.com/article/10.3390/informatics10020047/s1, Table S1: Useful literature information; Refs. [72–104] are cited in Supplementary Materials.

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