Research Square

Preprints are preliminary reports that have not undergone peer review.
They should not be considered conclusive, used to inform clinical practice,
or referenced by the media as validated information.

# A bibliometric and content analysis of marketing in Web 3.0

**Ilan Alon**
Ariel University
**Berger Ron**
ron.berger@biu.ac.il

Bar-Ilan University
**Evgenia Gimelshtein**
Ariel University
**Shalom Levy**
Ariel University

**Research Article**

**Keywords:** Web 3.0, marketing, bibliometrics, blockchain, metaverse, MarTech

**Posted Date:** August 31st, 2026

**DOI:** https://doi.org/10.21203/rs.3.rs-10740078/v1

**License:** This work is licensed under a Creative Commons Attribution 4.0 International License. Read Full License

**Additional Declarations:** No competing interests reported.

## Abstract

The transition to Web 3.0, characterized by blockchain technology, decentralization, and the metaverse, presents a transformative paradigm for marketing strategies, yet the existing literature remains notably fragmented. To address this gap, this study systematizes the intellectual structure of Web 3.0 marketing to identify fundamental trends, key forces, and future research directions. Adhering to the PRISMA framework, a comprehensive bibliometric and content analysis was conducted on 121 articles sourced from the Web of Science Core Collection spanning 2009 to 2025, utilizing Bibliometrix, VOSviewer, and CitNetExplorer. The findings reveal a rapid surge in academic interest beginning in 2021 and identify three core thematic clusters: blockchain's role in marketing strategies, ethical and trust issues in decentralized environments, and marketing in the metaverse and digital technologies. Furthermore, the study synthesizes key theoretical foundations, including the Theory of Planned Behavior, Social Exchange Theory, Stakeholder Theory, and MarTech Theory, that are essential for interpreting these digital phenomena. By pinpointing critical research gaps such as cross-platform behavioral patterns, demographic and cultural factors, and ecosystem governance, this paper develops a cohesive conceptual framework and proposes a structured agenda to guide future scholarly investigations and practical implementations in the Web 3.0 era.


## Introduction

In the modern world of information technology and digital transformation, Web3 represents an evolutionary step in the development of the internet (Almeida et al. 2013). Digital transformation has become popular in recent years as it represents a path toward the integration of digital technologies into business processes. As a consequence, companies have undertaken various initiatives to explore new technologies and to capitalize on its related benefits. Web3 represents a new paradigm in which blockchain technologies, decentralization, and cryptocurrencies intertwine with traditional online spaces, unlocking special opportunities for various spheres. At its core, Web3 (or Web 3.0) is a vision for a new, decentralized version of the internet. Instead of relying on a few gigantic tech companies to host platforms and manage user data, Web3 is built on blockchain technology, where data is distributed across networks of computers, and users retain control over their own information and digital assets. Web3 isn't just one technology, it's a stack of different concepts working together to remove the "middleman" from digital transactions and interactions.

The promise of Web3 is to shift the internet's economic model. In the current Web2 landscape, users provide the content and the data, while platforms capture the vast majority of the financial value through advertising. Web3 aims to redistribute that value back to the creators and users through digital tokens, offering a more equitable, though currently highly experimental and volatile, digital economy. Web 3.0 allows for interactive campaigns in the metaverse. The Metaverse is a term used to describe a hypothetical virtual space where people can interact with digital environments and other users in a shared online world. Companies can create virtual showrooms where users can explore and purchase both digital and physical products. It enables consumers to engage brands directly without the involvement of middlemen, so that one can own data, control privacy, and digitally consent.

One of the key areas significantly impacted by Web3 is marketing. Marketing in Web3 offers new opportunities for brands and enterprises to interact with their audiences, grounded in the principles of decentralization, transparency, and security based on blockchain technology (Zhang et al. 2022). The increased collection of

user data by major corporations to refine advertising and improve the user experience raised notable privacy concerns. Interaction and engagement on social platforms come at cost (Popescu et al., 2025). In Web 2.0, user data is collected and subsequently marketed to other interested parties. In response to these concerns, Web 3.0 began to take shape around 2020. Powered by blockchain technology and artificial intelligence, Web 3.0 aims to establish a more equitable internet in which users could maintain control over their personal data. Web 3.0 is also called decentralized Web or Semantic Web.

Consumer behaviour in the real world may differ from that in the virtual world (Park and Lim 2023). In order to monitize on this concept, companies need to understand these differences. The metaverse concept can reshape consumer psychology, leading to an overhaul in conventional marketing strategies. With a virtual presence, businesses strive to deliver an unparalleled consumer experience. The metaverse has thus become a favoured concept following substantial investments by well- known brands. The metaverse experienced significant traction during the COVID- 19 pandemic and (Dwivedi et al. 2022). Hence, there is an increasing research interest in reassessing the viability of the metaverse )Lim, Das, et al. 2025). The development of Web 3.0 technologies, including blockchain, the metaverse, and NFTs, has revolutionized marketing by introducing innovative methods for consumer engagement and building brand loyalty (Popescu et al., 2025). By 2030, the global Web 3.0 market is projected to reach $33.53 billion, with a compound annual growth rate (CAGR) of 49.3% (Grand View Research, 2023). Despite this remarkable growth, a comprehensive understanding of the fundamental trends driving marketing strategies within Web 3.0 remains elusive, necessitating systematic exploration of the patterns and principles shaping this transformative era.

Despite the importance and potential that this new technology offers for marketing, research on the subject remains underdeveloped (Wasiq et al. 2023). To the best of the researcher’s knowledge, no reviews were undertaken on Web3 technology. We found numerous reviews on the metaverse (Wider et al., 2024; Popescu et al., 2025; and Lim et al., 2024).

While existing literature offers valuable insights into specific aspects of Web3 marketing, these perspectives often remain fragmented. Research on the virtual world began to gain momentum after the launch of the first virtual reality headset for gaming in the mid- 1990s (Steuer 1995). Barrera & Shah (2023) and Cheah & Shimul (2023) examined the metaverse's implications for marketing, with a particular focus on how immersive virtual spaces transform consumer interactions. This became increasingly relevant as over 30% of global brands are expected to implement metaverse-based marketing strategies by 2030 (PricewaterhouseCoopers, 2022). Building on this, Dwivedi et al. (2023) and Zhang et al. (2022) explore the metaverse's potential to revolutionize consumer research through real-time virtual engagement.

Blockchain's marketing impact has received specific attention through specific applications. These applications, growing at 60% annually (Brave Browser Report, 2023), emphasize transparency and relevance in reshaping consumer-brand relationships. Boukis (2019) and Gleim & Stevens (2021) further examine blockchain's implications for brand-consumer dynamics, though their focus remains primarily on isolated applications. NFTs and blockchain technologies, as crucial drivers of Web3 marketing, have garnered significant scholarly attention. However, these studies lack a unifying framework connecting their findings to broader marketing practices. Recent meta-analyses provide valuable perspective: Kukreja et al. (2023) employ scientometric approaches to map key research trends, and Kumar et al. (2021), Marthews & Tucker (2023) investigate technology's influence on marketing strategies and Wider (2024) who undertook a Metaverse

bibliometric review. These reviews highlight the field's dynamic and interdisciplinary nature while revealing the absence of systematic synthesis.

This fragmented research landscape presents a critical challenge. Despite detailed individual studies, a comprehensive understanding of the patterns shaping Web3 marketing remains lacking. This study addresses this gap through bibliometric analysis, identifying commonalities, trends, and key forces driving marketing in the Web3 era. This paper aims to develop a cohesive framework that advances the field and informs future research directions through bibliographic and content analyses. Bibliographic analysis enables a review of existing scientific works, articles, and research, providing an opportunity to gain a holistic understanding of the current state of the topic under study and to identify the main directions of development for marketing in the context of Web3.

The paper is organized as follows. In the next section, we introduce the theoretical review, methodology, and data extraction process. Then, the results of the bibliometric analysis are presented, outlining the most influential journals, articles, institutions, and authors. We also note the research clusters revealed and the conceptual structure of the literature. After that, we identify theories through the content analysis, coupled with the bibliographic techniques. Finally, we present conclusions and future research directions for studying marketing in the Web3 metaverse.

## Literature Review

Literature reviews allow researchers to enhance their understanding of prior work in their field, enabling them to identify research gaps and future research routes. To address fragmented perspectives and build a cohesive understanding of marketing strategies within the Web3 ecosystem, it is essential to examine the theoretical frameworks underpinning current research. Theories guide researchers in addressing research questions effectively and consolidating constructs and variables by establishing meaningful and tested relationships. Theoretical foundations provide a lens through which researchers and practitioners can interpret the transformative impact of blockchain, NFTs, and the metaverse on marketing practices. This study identifies key theories - such as the Theory of Planned Behavior (TPB), Social Exchange Theory (SET), Stakeholder Theory, and Martech theory, that serve as the basis for analyzing consumer behavior, loyalty programs, and decentralized governance in Web3 contexts. This study conceptualizes the literature from a macro perspective by exploring and examining the themes in the literature.

Table 1

below summarizes these theories, outlining their main tenets, assumptions, use cases in Web3, resulting insights, and notable contributions from scholars. By synthesizing these theoretical underpinnings, this study aims to provide a structured approach to understanding the complexities and opportunities of Web3 marketing.

| Theory | Main Tenets | Assumptions | Use Cases in Web3 | Results | Notable Researchers |
|---|---|---|---|---|---|
| **Theory of Planned Behavior (TPB)** | Behavior is shaped by attitudes, subjective norms, and perceived behavioral control. It is one of the oldest theories for studying technology adoption. | Humans process information rationally; intentions guide behavior. | Adoption of cryptocurrencies based on trust and perceived usefulness.<br><br>Behavioral analysis of metaverse users, particularly in gaming and virtual marketing interactions.<br><br>Motivation for NFT adoption as symbols of status and exclusivity. | Trust and response efficacy identified as critical for blockchain adoption. Psychological factors like perceived value and usability influence consumer engagement in metaverse environments. | Dionysis et al. (2022)<br><br>Sakas et al. (2022)<br><br>Taylor (2022)<br><br>Marikyan et al. (2022)<br><br>Alkhudary et al. (2023) Park 2024 Zhang et al. 2024 |
| **Social Exchange Theory (SET)** | Relationships are built on reciprocal exchanges with cost-benefit considerations. | Social interactions are transactional and involve an expectation of mutual benefit. | Blockchain-based loyalty programs allowing direct consumer-to-brand and peer-to-peer interactions.<br><br>Use of NFT communities to foster consumer participation and co-creation.<br><br>Decentralized advertising systems rewarding user engagement. | Loyalty programs evolved into interactive systems with transparency and consumer control. NFT-based systems strengthened customer-brand connections by integrating co-creation and gamification, increasing engagement and retention. | Treiblmaier & Petrozhitskaya (2023)<br><br>Yang et al. (2024)<br><br>Ding et al. (2021)<br><br>Tan et al. (2023)<br><br>Yayla et al. (2024) |
| **Stakeholder Theory** | Focuses on balancing interests and interactions of diverse stakeholders in a system. | All stakeholders contribute value, and power dynamics influence interactions. | Managing decentralized ecosystems like blockchain networks, ensuring fair governance.<br><br>Involvement of multiple stakeholders in metaverse projects for | Highlighted dominance of tech firms and the importance of equitable governance structures. Explored transparency mechanisms and their impact on stakeholder | Alkhudary et al. (2023), Meyer et al. (2023), Nadini et al. (2021), Lee et al. (2023), Ghali et al. (2024 |

| Theory | Main Tenets | Assumptions | Use Cases in Web3 | Results | Notable Researchers |
|---|---|---|---|---|---|
| | | | equitable value distribution.<br><br>Balancing consumer privacy with data transparency in NFT ecosystems. | trust in decentralized systems, with implications for both consumers and creators. | |
| **MarTech Theory** | Martech integrates emerging technologies like AI, blockchain, and AR/VR into marketing strategies to enhance customer engagement and data transparency. | Technologies can streamline marketing processes, improve personalization, and create immersive consumer experiences. | Blockchain-based loyalty programs and advertising transparency.<br><br>AI-driven consumer segmentation and virtual influencer strategies in the metaverse.<br><br>AR/VR-based product demonstrations and gamified engagement in immersive environments. | Enhanced consumer engagement through immersive experiences and transparent data-sharing mechanisms. Streamlined advertising systems and improved personalization strategies with AI and blockchain integration. | Parssinen et al. (2018), Dwivedi et al. (2022), Bilgihan et al. (2024), Sanmiguel et al. (2024), Yadav et al. (2024) |

**Table 1**

*Key theoretical frameworks used in Web 3.0 marketing research.*

Bibliometric analysis represents a methodology for analyzing research outputs, and it is born from library and information science fields. It allows scholars to objectively analyze a large corpus of studies using quantitative techniques and it combines two overarching categories of analysis: performance and science mapping. By establishing these theoretical underpinnings, we set a structured foundation for the subsequent bibliometric analysis, enabling a more nuanced evaluation of research trends, gaps, and contributions. This approach ensures that the analysis is not only systematic but also aligned with established frameworks, enhancing its relevance and rigor in identifying future research directions.

# Methodology

Researchers are increasingly using content analysis in literature reviews to evaluate existing knowledge and gain a deeper understanding of intellectual structures (Gaur & Kumar, 2018). Objectivity and reliability are considered essential traits for conducting high-quality contextual analysis (Dionysis et al., 2022; Lacy et al., 2015). Bibliometric analysis, one of the most effective quantitative approaches, uncovers connections between publications, authors, institutions, and countries (Klarin, 2024). By integrating such bibliometric mapping, we

can visualize the most productive authors, institutions, and countries within a specific field, enabling further analysis and revealing trends in literature production over time (Jing et al., 2024). In this study, we apply bibliographic coupling, citation analysis, co-citation analysis, and keyword co-occurrence, combined with content analysis to investigate our research questions as implemented in most bibliometric reviews (Castañeda et al. 2022).

The research methodology was based on the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) methodology as the founding framework for the bibliometric analysis conducted (Paul et al., 2021). It involves a structured and transparent approach to conducting and reporting the bibliometric systematic review. Based on the PRISMA protocol to identify the relevant research to review, we created a research protocol. Search keywords were used to identify the relevant literature by defining a well- structured query and combining representative keywords. To improve the quality of our research scheme, we engaged in preliminary research to discover the search keywords more representative of the field of analysis. First, we created a research protocol that specified the time period covered (2009–2025) and the types of journals included in this paper. Then the paper selection process began with the application of predefined inclusion and exclusion criteria to screen and select relevant studies, with discussion of the screening process and explicit reasons for exclusion at each stage. Data extraction was then implemented using a standardized method to ensure consistency, capturing key information. The data synthesis phase involved both narrative and quantitative methods, adhering to established statistical guidelines for pooling results (Alon et al. (2018). This rigorous approach ensured that the review is comprehensive, systematic, and transparent, thereby increasing the reliability and impact of the research findings.

For data analysis and visualization, we used the Bibliometrix R package, VOSviewer (version 1.6.20), and CitNetExplorer. Bibliometrix was used for performance analysis (e.g., most-cited authors, journals, and institutions); VOSviewer enabled network visualization of co-citations, keyword co-occurrence mapping, and coupling; and CitNetExplorer facilitated exploration of the citation network and cluster identification. The basis for our study is a collection of bibliographic data from the Web of Science (WoS) database. WoS is widely accepted in academia and includes studies published in high-quality journals. Since the research topic is just beginning to gain significant attention in the scientific community, we chose this database because it contains over 170 million records and includes journals that adhere to a rigorous peer-review process, ensuring the inclusion of high-quality research. WoS offers a comprehensive collection of bibliographic data and references, making it a valuable resource for analyzing scientific output and conducting bibliometric analyses. The WOS database is well-known for its high quality and comprehensiveness, making it an excellent choice for bibliometric research (Wider et al., 2024). It is the world's most widely used and most reliable research publication and citation database, providing comprehensive coverage of the world's leading research.

We conducted a backwards search by referring to major keywords "marketing", "Web3", and "blockchain" to avoid missing any crucial parts of the literature from the journal list derived from Clarivate. The "title- abstract-keywords" and "title" search parameters were used to identify articles that align with our research aims. There was no restriction on the year of the articles, as we wanted to maximise the understanding of the metaverse research curve. The first article we found was from 2009, hence, our review included articles from 2009 to 2025. Following Bretas & Alon (2021) and Alon et al. (2018), we implemented a detailed data search and extraction process. Table 2 illustrates the detailed data search and extraction process.

Table 2
*Keyword search in WoS.*

| Step | Keyword Search | # Articles |
|---|---|---|
| 1 | (TI=(marketing)) AND (TI=(web3) OR TI=("web 3") ) OR (AB=(marketing)) AND (AB=(web3) OR AB=("web 3")) | 28 out of 34 |
| 2 | TS=(("marketing" OR "digital marketing" OR "content marketing" OR "social media marketing" OR "marketing communications") AND ("web3" OR "blockchain" OR "cryptocurrency")) | 72 out of 306 |
| 3 | TS=(("marketing" OR "digital marketing" OR "content marketing" OR "social media marketing" OR "marketing communications" OR "advertisement" OR "advertising") AND ("web3" OR "blockchain" OR "cryptocurrency")) | 111 out 356 |
| 4 | TS=(("marketing" OR "digital marketing" OR "content marketing" OR "social media marketing" OR "marketing communications" OR "advertisement" OR "advertising" OR "influencer marketing" OR "affiliate" ) AND ("web3" OR "web3.0" OR "web 3.0" OR "blockchain" OR "block chain" OR "cryptocurrency" OR "crypto" OR "bitcoin" OR "ethereum" OR "NFT")) | 117 out 438 |
| 5 | TS=(("marketing" OR "digital marketing" OR "content marketing" OR "social media marketing" OR "marketing communications" OR "advertisement" OR "advertising" OR "influencer marketing" OR "affiliate marketing" OR "brand strategy" OR "market research" OR "e-commerce" OR "omnichannel marketing" ) AND ("web3" OR "web3.0" OR "web 3.0" OR "blockchain" OR "block chain" OR "cryptocurrency" OR "crypto" OR "bitcoin" OR "ethereum" OR "NFT" OR "non-fungible token" OR "decentralized finance" OR "DeFi" OR "metaverse" OR "DAO")) | 121 out 1237 |

To deepen the understanding a traditional content analysis of the leading articles in each research stream was conducted using cartographic analysis to identify the various research streams. This qualitative review added context and depth to the quantitative bibliometric findings, enriching the discussion and conclusions of this paper.

For the screening process, the duplicate and redundant articles from the journal database were cross- checked and removed. We restriction and limited our search to English articles to enhance the readability and accessibility of the review. The limit on English language was posed since it represents the academic lingua franca. After excluding articles from the identification and screening phase, we thoroughly reviewed each article, from its abstract and objectives, to assess its suitability for inclusion in the review. The studies that provided minimal insights on Web3 were excluded from consideration in this study.

## Bibliometric analysis

The bibliometric citation analysis revealed the most relevant journals, articles, relevant institutions, and impactful authors (Bretas & Alon, 2021, p. 4). Analysis of sources through Biblioshiny revealed that the 121 articles originated from 89 journals. Table 3 reports the 10 most relevant articles on marketing and Web 3 technologies. They had the greatest impact on total local citations (TLC). The most influential paper in this literature is Treiblmaier (2018). The most influential articles discuss the impact of Web3 technologies on various marketing tools.

Table 3
*Ranking of top 20 articles (sorted by TLC)*

| Rank | Author and year | TLC |
|---|---|---|
| 1 | (Treiblmaier, 2018) | 23 |
| 2 | (Tan & Salo, 2023) | 23 |
| 3 | (J. Kim et al., 2023) | 12 |
| 4 | (Tan et al., 2024) | 12 |
| 5 | (Cui et al., 2021) | 11 |
| 6 | (Stallone et al., 2021) | 11 |
| 7 | (Stallone et al., 2024) | 11 |
| 8 | (Marthews & Tucker, 2023) | 9 |
| 9 | (Sakas, Giannakopoulos, Kanellos, & Migkos, 2022) | 9 |
| 10 | (Sakas, Giannakopoulos, Kanellos, & Tryfonopoulos, 2022) | 9 |

Co-citation analysis involves measuring how other publications cite works together; that is, the more times the documents are cited together, the closer their relationship is, and thus they are considered to be in the same research field (Klarin, 2024). “Cluster analysis and co-citation analysis are also crucial analysis elements in bibliometric research” (Jing et al., 2024). Figure 2 shows the co-citation of our bibliography database with three delimited clusters.

The red cluster includes studies that examine how blockchain technologies can transform traditional models of interaction between brands and consumers. This cluster contains three streams: Blockchain and Consumer Relationships, Blockchain and Supply Chains, and Systematic Review of Blockchain Technologies in Marketing. This cluster carries a more technical focus. The cluster includes the most-cited sources: as the absolute leader in citations, Saberi et al. (2019) explore the technical aspects of blockchain technology and highlight the barriers and challenges we may face during its implementation and adaptation to new environments. Casino et al. 2019; Risius & Spohrer, 2017; Tapscott & Tapscott, 2018; Yli-Huumo et al. 2016 approach blockchain from a less practical and more research-focused perspective, presenting systematic and bibliographic reviews. The remaining researchers begin integrating marketing into the blockchain context. They also speculate on how blockchain could reshape marketing strategies and advertising campaigns (Boukis, 2019; Ertemel, 2018; Gleim & Stevens, 2021; Parssinen et al., 2018; Rejeb et al., 2020).

The blue cluster focuses on trust-building mechanisms in blockchain-based marketing environments, with an emphasis on customer trust and decentralized exchanges. This cluster serves as a kind of bridge between the other two, as researchers explore the complexity of implementing Web3 technologies, its impact on building B2C relationships, the ethical foundations of changes in marketing communications, and the consequences of transparency in technologies such as blockchain, NFTs, and the metaverse. Tan & Saraniemi (2023a) highlight how blockchain technology enables trust in digital exchanges through its transparency, tamper-proof nature, and decentralized control. Blockchain can definitely facilitate ethical marketing practices by creating transparent systems for tracking goods and verifying authenticity (Tan & Salo, 2023). In the co-citation cluster

analysis, the trend toward transparency and reliability clearly shapes a unique form of marketing communication with customers. This highlights a key stream within the cluster: blockchain in customer relationship management. One potential tool for this is the creation of a new loyalty program, which Treiblmaier & Petrozhitskaya (2023) explore in their studies. Although this cluster contains fewer publications than others do, the researchers' contributions significantly advance our work and has a lot of potential for further research.

The green cluster focuses on the metaverse and NFTs. This stream of research focuses on: (1) Marketing in the Metaverse; (2) NFTs and Brand Engagement; and (3) Virtual Influencers and Synthetic Customer Experiences. The first studies on the metaverse as a new business entity appeared in 2015 with a peak in 2022. Such a rapid increase in academic interest directly explains why this stream is one of the largest in the cluster. The green cluster's research on Web3 marketing reveals significant scholarly attention to metaverse applications, particularly following a surge of interest in 2022. Multiple researchers investigate the transformation of consumer experiences in virtual environments, examining both immersive interactions and synthetic customer experiences across various sectors, including hospitality and tourism (Barrera & Shah, 2023; Buhalis et al., 2023; Golf-Papez et al., 2022; Tan et al. 2024). While exploring the metaverse's potential for marketing innovation, scholars demonstrate its capacity for personalized marketing, gamification, and value co-creation through virtual shopping and events (Chohan & Paschen, 2023; Dwivedi et al., 2023). However, researchers also highlight significant challenges in transitioning from physical to virtual experiences, particularly addressing technological barriers and user acceptance issues (Buhalis et al. 2023; Gursoy et al. 2023). Table 4 summarizes the three clusters identified.

Table 4

*Summary of thematic clusters identified through co-citation.*

| Cluster | Focus | Key Streams | Highlights |
|---|---|---|---|
| 1. Blockchain's Role in Marketing (Red) | Presents blockchain technologies in marketing and their impact on brand-consumer interaction. | Blockchain and Consumer Relationships<br><br>Blockchain and Supply Chains<br><br>Systematic Reviews of Blockchain Technologies | Focused on technical aspects of blockchain.<br><br>Explores challenges in implementation.<br><br>Discusses marketing strategies enabled by blockchain. |
| 2. Ethical and Trust Issues in Blockchain Marketing (Blue) | Trust-building mechanisms in blockchain-based environments, focusing on ethics and transparency. | Ethical marketing<br><br>Blockchain in Customer Relationship Management (CRM)<br><br>Decentralized Exchanges | Highlights blockchain's potential for ethical marketing through transparency.<br><br>Examines loyalty programs and trust in digital exchanges |
| 3. Metaverse in Consumer Engagement and Branding (Green) | Research on the metaverse and NFTs as tools for marketing and consumer engagement. | Marketing in the Metaverse<br><br>NFTs and Brand Engagement<br><br>Virtual Influencers and Synthetic Customer Experiences | Explores immersive virtual experiences and their impact on branding.<br><br>Discusses challenges in adoption, including technology and user acceptance barriers.<br><br>Focuses on NFTs as tools for digital ownership and brand value creation. |

To understand the underlying themes, we conducted a thorough examination of their objectives using a thematic analysis to develop a contextual understanding and advance our knowledge of these concepts. The authors used VOS viewer for clustering as it is one of the most widely adopted software for thematic analysis (Lim, Kumar, & Donthu 2024). Cluster and thematic analyses were conducted using a co- occurrence network with the author's keywords. The study conducted a keyword co-occurrence analysis to uncover the field's thematic structure. Keywords in academic papers are terms chosen and crafted by the authors, typically serving as key components that encapsulate the essence of the paper's content (Kwon, 2018). The selected keywords enable the emergence of specific concepts, related issues, and trends using the applied methodology and bibliometric analysis tools (Strozzi et al., 2017).

The keyword co-occurrence analysis reveals three distinct clusters that represent important themes at the intersection of blockchain technology, marketing, and emerging digital environments such as the metaverse (see Fig. 3).

Blockchain plays a key role in modern marketing strategies by providing secure and transparent systems (Gleim & Stevens, 2021; Peres et al., 2023; Rejeb et al. 2020). The first cluster (red), related to blockchain and social media, focuses on how blockchain is being used to secure data within social media platforms and

marketing. The study shows that one-third of the analyzed articles focus on the interaction between marketing and blockchain. The keyword co-occurrence analysis confirms the strong connection between blockchain and marketing. It also examines the influence of social media on consumer purchase decisions, particularly in the context of blockchain technology. Additionally, this cluster highlights how blockchain is being integrated into marketing strategies to build brand trust through transparency and secure transactions.

The second cluster (blue) revolves around cryptocurrency generally and digital marketing. It explores the impact of cryptocurrencies and blockchain on digital advertising strategies and how blockchain is applied to improve transparency and efficiency in supply chains, especially in e-commerce (Baek & Yi, 2024; Dulisse et al., 2024; Sakas, Giannakopoulos, Kanellos, & Tryfonopoulos, 2022). Moreover, it discusses the role of blockchain adoption in big data strategies and its contribution to digital advertising.

The third cluster (green) centers on the metaverse and NFTs, focusing on how the metaverse is used to create unique customer experiences and drive engagement through virtual-reality marketing (Choi et al., 2023). NFTs are examined as tools for enhancing user engagement and building digital brand assets. Additionally, this cluster examines the role of augmented and virtual reality as new channels for customer interaction within branded experiences in the Web3 landscape (Belda, 2023; Xie et al., 2023).

Bibliographic coupling measures similarities in references between publications; that is, the more references shared between two publications, the higher the bibliographic coupling between the documents (Klarin, 2024). In this study, we identified two dominant clusters (red and green), which account for 62.5% of all the documents under consideration, and united two smaller clusters (yellow and blue). We divided each cluster into streams that highlight current trends and topics referenced by modern studies. The clusters and many of the streams show a similar pattern to those found in the co-citation network (see Fig. 4).

The red cluster belongs to the cluster “Blockchain and Marketing” and is divided into three distinct streams. The **first** one focuses on how blockchain technologies can be leveraged to improve digital marketing and advertising strategies. Joo et al. (2023) propose that blockchain could help improve brand safety, consumer privacy, and transparency in digital advertising. Kim (2023) suggests that blockchain technology, with its strengths and reliability, can be integrated into the existing centralized, multi-party-controlled advertising ecosystem. Peres et al. (2023) examine the key advantages of blockchain technology for marketing and highlight the need for focused scientific research on this topic.

The second stream explores issues related to data security, privacy protection, and user rights in blockchain-based marketing platforms. Research on blockchain in marketing encompasses three interconnected streams. The first explores blockchain's role in building trust through enhanced security and transparency in marketing strategies, where Kumar et al. (2021) identify blockchain as a key emerging technology enabling marketing mix personalization, while Marthews & Tucker (2023) examine its limitations specifically in online advertising applications. The second stream investigates data security and user privacy aspects of blockchain-based marketing platforms. Studies by Kumar et al. (2021) and Marthews & Tucker (2023) highlight both opportunities and uncertainties in implementing blockchain solutions for marketing purposes.

The third stream focuses on blockchain's practical applications in marketing strategy and consumer behavior analysis. Research by Malik et al. (2023) explores word-of-mouth marketing in NFT project promotion, while

Sakas et al., (2022) investigate digital marketing strategies for cryptocurrency trading platforms, emphasizing the importance of optimizing customer satisfaction. The third stream focuses on blockchain's practical applications in marketing strategy and consumer behavior analysis. Research by Malik et al. (2023) explores word-of-mouth marketing in NFT project promotion, while Sakas et al., (2022) investigate digital marketing strategies for cryptocurrency trading platforms, emphasizing the importance of optimizing customer satisfaction.

The green cluster primarily focuses on analyzing consumer behavior in the online environment while addressing ethical considerations in the application of blockchain technology. This approach not only emphasizes the study of consumer behavior but also proposes practical strategies to build stronger relationships with consumers through the use of blockchain tools. This cluster is divided into two main streams. The first stream we can highlight is the use of blockchain technologies in digital advertising, which has drawn controversy but, unlike the red cluster, relies on real examples rather than assumptions.

The second stream primarily explores ethical issues related to the use of Web3 technologies in advertising. Tan & Salo (2023) synthesize and propose a shift in the ethical logic of marketing in the blockchain-based sharing economy. The conceptual framework developed by Tan & Salo (2023) proves instrumental to our investigation, elucidating ethical considerations in blockchain marketing while providing a theoretical bridge to stakeholder theory, which serves as a cornerstone for our research conclusions. Tan & Saraniemi (2023) formulate principles defining the concept of "trust" in relation to blockchain, based on interviews with specialists.

The third cluster reflects emerging trends that are just gaining momentum in the field of new internet technologies. This cluster includes research on marketing, the impact of the metaverse, digital technologies, and marketing personalization. Within this cluster, we identify three main streams. The metaverse and the future of marketing explores how the metaverse is shaping marketing and consumer research, examining the influence of virtual worlds and digital interactions on brands and consumer relationships. The stream reveals how changes driven by the metaverse have new implications for marketing practice (Barrera & Shah, 2023; Cheah & Shimul, 2023; Dwivedi et al., 2023; Gursoy et al., 2023). This cluster is split into two main streams. The first stream explores trends in personalized marketing and the integration of gamification into business: Chandra et al. (2022) present the concept of personalization, and Y. Liu (2022) examines the impact of digital marketing capabilities and blockchain technology on a company's ability to build and maintain strong customer relationships. The second stream within the cluster explores the role of influencers as key players in marketing strategies in the new internet (Haikel-Elsabeh, 2023; Meyer et al., 2023; Taylor, 2022). This is especially evident in the gaming industry. Sharma et al. (2024) view gamification as a potential marketing tool in the Web3 world, whereas Treiblmaier & Petrozhitskaya (2023) see potential in building B2C loyalty programs.

Table 5

*Summary of thematic clusters identified through Bibliographic coupling.*

| Cluster | Main Focus | Key Streams | Highlights |
|---|---|---|---|
| 1. Blockchain and Marketing (Red) | The role of blockchain in marketing strategies and its technical applications. | Blockchain in digital marketing and advertising<br><br>Data security and privacy<br><br>Practical applications in consumer behavior | Blockchain supports brand safety, consumer privacy, and transparency in marketing.<br><br>Emphasizes technical strengths and challenges, with practical examples like NFT marketing. |
| 2. Ethical and Consumer Behavior (Green) | Consumer behavior and ethical issues in blockchain-based marketing. | Blockchain in digital advertising<br><br>Ethical issues in Web3 technologies<br><br>Trust and transparency in blockchain | Relies on real-world examples rather than assumptions.<br><br>Examines ethical marketing and consumer trust in blockchain.<br><br>Proposes strategies for stronger B2C relationships. |
| 3. Metaverse and Digital Technologies | New trends in marketing, including the metaverse, digital personalization, and gamification. | Metaverse and its impact on marketing<br><br>Personalized marketing and gamification<br><br>Influencers in the Web3 world | Highlights the transformative role of the metaverse in marketing.<br><br>Explores gamification and influencers as key tools in the Web3 era.<br><br>Emphasizes personalization in customer relationships. |

Through co-citation analysis, we traced the seminal works and theoretical foundations that shaped the field, while bibliographic coupling reveals emerging research clusters and future trends. Examining the thematic streams identified through both methods provides a comprehensive view of the field's development and trajectory. In this case, we use CitNetExplorer to build citation networks that map the connections between articles. Based on this and the fact that the average year of papers in the co-citation analysis is 2018.4, while in the bibliographic coupling it is 2022.1, we can assess the evolution of the fields, the directions of the knowledge streams, and their potential future paths.

The first research category in the blockchain cluster identified in the bibliometric and content analyses concerns the influence of blockchain on advertising systems, which, over time, have evolved into sl digital marketing instruments. Yli-Huumo et al. (2016) constitute one of the seminal contributions that launched the research cycle on blockchain and its marketing impact. For instance, Risius & Spohre (2017) build upon Yli-Huumo's research, acknowledging it as both an essential source of technical fundamentals and a baseline framework, and then extend it by incorporating more comprehensive dimensions of blockchain research. The researchers observed that blockchain studies primarily focused on technological advancements; however, they identified significant research gaps in application-oriented studies, particularly in management and value creation domains (Parssinen et al., 2018). Recent studies have explored more specialized research directions,

such as advertising systems and blockchain integration (Kim et al., 2023), media promotion systems (Ding et al., 2021), and the influence of new technologies on advertising markets (Joo et al., 2023). Within this cluster, we identify a distinct research stream focused on literature reviews and research agendas.

A new stream emerges as an offshoot of the original "introductory" stream. Among the most impactful studies contributing to our research, Rejeb et al. (2020) stand out for proposing six foundational hypotheses that guide future blockchain marketing research. These hypotheses encompass critical domains: disintermediation, data transparency optimization, trust amplification, fraud mitigation, data security enhancement, and loyalty program transformation. The study extends the theoretical framework developed by Treiblmaier (2018) and Yli-Huumo (2016), which demonstrate how the research funnel has narrowed over the years, offering diverse research trajectories beyond technical fundamentals. The analysis identifies a distinct cluster examining blockchain's influence on both marketing operations and strategy. Through our investigation and comparison of co-citation and bibliographic coupling patterns, we confirm the significance of this cluster, as this research direction has evolved to explore consumer behavior in the context of long-term blockchain implementation.

The next direction within the cluster represents a technical stream, focusing on the characteristics of blockchain transparency. This stream initiates the formulation of key features that are fundamental to arguing for the advantages of Web3 technologies in marketing. These essential characteristics comprise data privacy and security (Saberi et al. 2019; Treiblmaier, 2018). Referring to Rejeb (2020), Tan & Salo (2023) assert that, while exploratory blockchain discussions exist, they may not provide meaningful insights into the systematic conceptualization of blockchain-based marketing research, citing their failure to incorporate fundamental marketing principles, particularly value creation. An empirical investigation involving 18 blockchain specialists provides substantial evidence supporting this theory. The study's principal finding emphasizes blockchain's transformative capacity to redefine trust mechanisms within digital ecosystems, subsequently influencing marketing strategies and economic exchanges in decentralized networks (Tan & Saraniemi, 2023a).

These insights laid the groundwork for a new research direction examining blockchain's role in CRM systems. Treiblmaier & Petrozhitskaya (2023) suggest that blockchain can revolutionize customer loyalty programs by offering consumers control over their loyalty points and enhancing transparency in rewards systems. This new approach to loyalty programs empowers customers by eliminating intermediaries and enabling more direct and flexible exchanges between consumers and businesses (Treiblmaier, 2018). Through experimental research, Wang et al. (2021) supported this theory and empirically demonstrated that enhanced transparency increases consumer trust. The researchers in this cluster focus on testing existing implementation mechanisms across operational platforms, providing empirical validation of theoretical frameworks. The study by Sakas et al., (2022), for example, investigates how digital behavior metrics influence the optimization of digital marketing strategies for cryptocurrency trading websites. These studies make significant contributions by empirically testing theoretical propositions established by preceding researchers.

The concluding cluster analyzes emerging manifestations of Web3 technologies, specifically metaverse and NFT applications, and their marketing implications. The cluster's mean publication year of 2022.7 reflects the nascent stage of marketing research in this domain. For our investigation, this cluster serves as a crucial indicator of forthcoming research trends. The CitNetExplorer synchronous citation analysis reveals particularly intensive cross-referencing patterns among authors within this cluster (see Fig. 5)

To conclude, we divided the three major clusters into categories and research streams (Table 6). We also indicated the type of study and the theories used. We coupled content analysis of the most influential articles with papers identified through bibliographic techniques and other relevant references to make the study more comprehensive. Four research categories emerged from combining the bibliometric and content analyses.

Table 6

*Analysis of the most influential articles.*

| Category | Stream | Articles | Type of analysis | Theories |
|---|---|---|---|---|
| Blockchain and Marketing Strategies | Blockchain and Consumer Relationships | Saberi et al. (2019) | Conceptual/Descriptive | N/A |
| Blockchain and Marketing Strategies | Blockchain and Consumer Relationships | Casino et al. (2019) | Conceptual/Descriptive | N/A |
| Blockchain and Marketing Strategies | Blockchain and Consumer Relationships | Risius & Spohrer, (2017) | Conceptual/Descriptive | N/A |
| Blockchain and Marketing Strategies | Data Security and Privacy in Blockchain-Based Marketing | | | |
| Blockchain and Marketing Strategies | Data Security and Privacy in Blockchain-Based Marketing | Ertemel (2018) | Conceptual/Descriptive | eWOM, Theory of Planned Behavior |
| Blockchain and Marketing Strategies | Data Security and Privacy in Blockchain-Based Marketing | Gleim & Stevens (2021) | Conceptual/Descriptive | eWOM, Theory of Planned Behavior |
| Blockchain and Marketing Strategies | Data Security and Privacy in Blockchain-Based Marketing | Parssinen et al. (2018) | Conceptual/Descriptive | Matrech |
| Blockchain and Marketing Strategies | Data Security and Privacy in Blockchain-Based Marketing | Rejeb et al. (2020) | Conceptual/Descriptive | Social Exchange Theory, New Marketing Mix |
| Blockchain and Marketing Strategies | Data Security and Privacy in Blockchain-Based Marketing | V. Kumar et al. (2021) | Conceptual/Descriptive | Theory of Planned Behavior |
| Blockchain and Marketing Strategies | Data Security and Privacy in Blockchain-Based Marketing | Marthews & Tucker (2023) | Conceptual/Descriptive | Social Exchange Theory |
| Blockchain and Marketing Strategies | Systematic Review of Blockchain Technologies in Marketing | Yli-Huumo et al. (2016) | Conceptual/Descriptive | N/A |
| Blockchain and Marketing Strategies | Systematic Review of Blockchain Technologies in Marketing | Boukis (2019) | Conceptual/Descriptive | N/A |

| Category | Stream | Articles | Type of analysis | Theories |
|---|---|---|---|---|
| Blockchain and Marketing Strategies | Blockchain in Digital Advertising | Joo et al. (2023) | Quantitative | MarTech, New marketing Mix |
| Blockchain and Marketing Strategies | Blockchain in Digital Advertising | Kim (2023) | Conceptual/Descriptive | Theory of Planned Behavior |
| Blockchain and Marketing Strategies | Blockchain in Digital Advertising | Peres et al. (2023) | Conceptual/Descriptive | |
| Blockchain and Marketing Strategies | Blockchain in Digital Advertising | Malik et al. (2023) | Conceptual/Descriptive | N/A |
| Blockchain and Marketing Strategies | Blockchain in Digital Advertising | Sakas et al. (2022) | Quantitative | Matrech |
| Trust and Decentralization in Marketing | Customer Trust and Decentralized Exchanges | Tan & Saraniemi (2023a) | Qualitative | Social Exchange Theory |
| Trust and Decentralization in Marketing | Customer Trust and Decentralized Exchanges | Treiblmaier & Petrozhitskaya (2023) | Conceptual/Descriptive | Stakeholder Theory |
| Trust and Decentralization in Marketing | Ethical Marketing | Tan & Salo (2023), | Conceptual/Descriptive | Matrech |
| Trust and Decentralization in Marketing | Blockchain in Digital Advertising | Ding et al. (2021), | Quantitative | |
| Trust and Decentralization in Marketing | Blockchain in Digital Advertising | Lemos et al. (2022) | Quantitative | Stakeholder, New marketing Mix |
| Emerging Trends in Web3 Marketing | Marketing in the Metaverse | Barrera & Shah (2023), | Conceptual/Descriptive | N/A |
| Emerging Trends in Web3 Marketing | Marketing in the Metaverse | Buhalis et al. (2023), | Conceptual/Descriptive | N/A |
| Emerging Trends in Web3 Marketing | Marketing in the Metaverse | Golf-Papez et al. (2022), | Quali-Quanti | Theory of Planned Behavior |
| Emerging Trends in Web3 Marketing | Marketing in the Metaverse | Cheah & Shimul (2023), | Conceptual/Descriptive | Stakeholder, Theory of Planned Behavior |
| Emerging Trends in Web3 | Marketing in the Metaverse | Dwivedi et al. (2023), | Conceptual/Descriptive | MatrTech, New marketing Mix, |

| Category | Stream | Articles | Type of analysis | Theories |
|---|---|---|---|---|
| Marketing | | | | Social Exchange Theory |
| Emerging Trends in Web3 Marketing | Marketing in the Metaverse | Gursoy et al. (2023) | Conceptual/Descriptive | Stakehlder, eWOM |
| Emerging Trends in Web3 Marketing | NFTs and Brand Engagement | Belk et al. (2022), | Conceptual/Descriptive | Theory of Planned Behavior, Social Exchange Theory, eWOM |
| Emerging Trends in Web3 Marketing | NFTs and Brand Engagement | Chohan & Paschen (2023), | Conceptual/Descriptive | Theory of Planned Behavior, Social Exchange Theory, New Marketing Mix |
| Emerging Trends in Web3 Marketing | NFTs and Brand Engagement | Hofstetter et al. (2022), | Conceptual/Descriptive | Theory of Planned Behavior, eWOM |
| Emerging Trends in Web3 Marketing | NFTs and Brand Engagement | Nadini et al. (2021) | Quantitative | Social Exchange Theory, Stakeholder |
| Emerging Trends in Web3 Marketing | Virtual Influencers and Synthetic Customer Experiences | Miao et al. (2022), | Conceptual/Descriptive | N/A |
| Emerging Trends in Web3 Marketing | Virtual Influencers and Synthetic Customer Experiences | Hollensen et al. (2023), | Conceptual/Descriptive | MarTech |
| Emerging Trends in Web3 Marketing | Personalized Marketing and Gamification | Chandra et al. (2022), | Conceptual/Descriptive | Theory of Planned Behavior |
| Emerging Trends in Web3 Marketing | Influencers and Digital Ownership in Web3 Marketing | Haikel-Elsabeh (2023), | Qualitative | Social Exchange Theory |
| Emerging Trends in Web3 Marketing | Influencers and Digital Ownership in Web3 Marketing | Meyer et al. (2023), | Quantitative | Stakeholder |
| Emerging Trends in Web3 Marketing | Influencers and Digital Ownership in Web3 Marketing | Taylor (2022), | Conceptual/Descriptive | MarTech, Theory of Planned Behavior |
| Emerging Trends in Web3 | Influencers and Digital Ownership | Sharma et al. (2024), | Conceptual/Descriptive | eWOM. Social Exchange Theory |

| Category | Stream | Articles | Type of analysis | Theories |
|---|---|---|---|---|
| Marketing | in Web3 Marketing | | | |

As Table 6 indicates, research on marketing in Web3 employs various theoretical lenses. The core theories adopted in the most cited articles are the theory of planned behavior (Dionysis et al., 2022; Xie et al., 2023), social exchange theory (Kumar & Shankar, 2024; Liu et al., 2023; Tan & Saraniemi, 2023b; Wang et al., 2023; Xie & Muralidharan, 2024), stakeholder theory (Garrigos-Simon et al., 2012; Liu et al., 2021; Tan et al., 2024; Wagner, 2023; Yayla et al., 2024), and value co-creation theory (Bilgihan et al., 2024; Hofstetter et al., 2022; Sung et al., 2023; Wang et al., 2023). Some theories are utilized in specific research streams. For instance, eWOM is used in six articles on the influence of marketing and social networks in the new 3.0 era (Dionysis et al., 2022; Ertemel 2018; Gursoy et al., 2023; Koay et al., 2023; Kumar & Shankar 2024; Xie et al., 2023). Additionally, four studies directly mention the new marketing mix concept, specifically in brand marketing management. (Bilgihan et al., 2024; Dwivedi et al., 2022; Kumar & Shankar, 2024; Yadav et al., 2024). Other theoretical lenses applied are the S-O-R theory, the theory of reasoned action (TRA), expectancy theory, the status quo, media richness theory (MRT), and the theory of gamer motivation. However, some articles, particularly those in the blockchain cluster, are technical and do not mention or use the concepts of any particular theory.

## Conclusions

The metaverse based on Web3 technology provides an opportunity for businesses and society, it also poses unique challenges. It may improve inclusivity and bring consumers together, but it may also polarize them by fostering communities and exacerbating social disparities. It can make socializing easy by overcoming geographical boundaries and simultaneously enable consumers to isolate themselves from the real world. Understanding it better will help others understand its complexities.

The Web3 ecosystem introduces new ethical challenges, particularly in balancing transparency and privacy. Blockchain's transparency fosters trust but raises concerns about data privacy, requiring frameworks that protect sensitive information while maintaining credibility. Researchers such as Tan and Salo (2023) emphasize the importance of developing ethical marketing approaches that integrate transparency with privacy safeguards. Exploring how these principles can be applied across industries and cultural contexts is vital for creating responsible marketing practices. Emerging technologies like NFTs and the metaverse further complicate the ethical landscape. These tools enable immersive consumer experiences but pose risks of psychological manipulation and over-commercialization. Golf-Papez et al. (2022) highlight the need for ethical guidelines to prevent exploitation in synthetic environments.

We maintain that research would benefit from future investigations into the four categories we identified in our analysis: forecasting customers' behavior, the social exchange between customers, the challenges of developing MarTech, and the role of stakeholders in the Web3 ecosystem. The literature review reveals several critical directions for future research in consumer behavior within Web3 environments. Taylor (2022) identifies a significant research gap concerning the psychological implications of immersive digital marketing, particularly in metaverse environments. This gap becomes especially relevant for gaming-based metaverse marketing, where consumer-advertiser interactions occur in virtual contexts. Building on Marikyan et al. (2022) findings about response efficacy and cybersecurity threats, future research should investigate how users'

confidence in blockchain services evolves over time and across different applications. Additionally, while Alkhudary et al. (2023) emphasize trust's role in mitigating perceived risks, more research is needed to understand how this trust-risk relationship varies across different Web3 platforms and user demographics. Kumar et al. (2021) and Taylor (2022) highlight the critical need for investigating cross-platform behavioral patterns in Web3 environments.

Web3 is about who owns the internet, while the Metaverse is about how we experience the internet. Web3 (or Web 3.0) is a vision for the "backend" or infrastructure of the internet. The Metaverse is a vision for the "frontend" or user interface of the internet. It refers to a network of immersive, interconnected, 3D virtual worlds where people can socialize, work, play, and learn using digital avatars. For a Metaverse to be truly open and persistent, users need to be able to own their digital goods (like avatar clothing, virtual real estate, or tools) and move them seamlessly between different virtual worlds. Web3 provides the economic and ownership layer that makes this possible. This research advances the field of Web 3.0 marketing through a systematic bibliometric and content analysis of 121 articles. By identifying three main research clusters: Blockchain's Role in Marketing, Marketing in the Metaverse and Digital Technologies, and Ethical and Trust Issues in Marketing—this study provides a comprehensive framework for understanding the evolution of marketing within decentralized digital ecosystems. A key contribution is the integration of previously fragmented perspectives in existing literature. The study synthesizes insights across various theoretical frameworks, including the Theory of Planned Behavior, Social Exchange Theory, Stakeholder Theory, and Martech theory, offering a cohesive understanding of the field. Through advanced bibliometric techniques such as co-citation and bibliographic coupling, this research reveals the evolution of marketing strategies and emerging trends like NFT-driven consumer engagement and blockchain-based loyalty programs.

Furthermore, this study contributes to academic discourse by proposing a structured research agenda. It identifies critical gaps in the literature, including the psychological impact of immersive technologies, the long-term effects of blockchain-enabled trust mechanisms, and the cultural aspects of Web 3.0 consumer behavior. These insights provide valuable direction for both academic research and practical marketing implementation in the Web 3.0 environment.

The emergence of Web 3.0 and the metaverse presents a paradigm shift that offers unprecedented opportunities for businesses while simultaneously posing unique societal and ethical challenges. This study advances the field of Web 3.0 marketing by conducting a systematic bibliometric and content analysis of 121 articles, successfully synthesizing a historically fragmented body of literature. By identifying three primary research clusters—Blockchain’s Role in Marketing, Marketing in the Metaverse and Digital Technologies, and Ethical and Trust Issues in Marketing—this research provides a comprehensive structural framework for understanding the evolution of decentralized digital ecosystems. Furthermore, the study grounds these developments in established theoretical frameworks, including the Theory of Planned Behavior, Social Exchange Theory, Stakeholder Theory, and MarTech Theory, offering a cohesive lens through which to analyze consumer-brand interactions in this new era.

Despite the rapid projected growth of the Web 3.0 market, significant research gaps remain that necessitate targeted academic inquiry. This review identifies four critical categories for future investigation: forecasting consumer behavior, exploring the dynamics of social exchange, addressing the complexities of MarTech development, and examining the roles of stakeholders within the Web 3.0 ecosystem. Future studies must

investigate the psychological implications of immersive digital marketing, evaluate the cross-platform transferability of behavioral intentions, and assess the long-term sustainability of emotional connections fostered by virtual influencers and gamified loyalty programs. Additionally, there is a pressing need to understand how cultural differences shape consumer perceptions of digital ownership and value co-creation.

Future studies should explore how behavioral intentions transfer across different Web3 platforms and examine the evolution of user attitudes as they interact with multiple Web3 technologies simultaneously. Research should also expand on Dionysiset al. (2022) framework by investigating the impact of subjective norms in various Web3 contexts and the role of perceived behavioral control in adopting emerging Web3 technologies. Furthermore, there's a pressing need to develop new theoretical frameworks tailored to Web3 environments, given their unique characteristics and challenges. This could include investigating how traditional behavioral theories adapt to decentralized, immersive, and blockchain-based contexts, and how integrating TPB components (attitudes, subjective norms, and perceived behavioral control) manifests in cross-platform user experiences.

A significant portion of the literature we reviewed examines value creation, in which customers gain exclusive rights to digital assets, fostering a sense of exclusivity and integrating these virtual items into their self-identity (Bilgihan et al., 2024). Despite the growing body of research on NFTs, the specific impact of decentralized branding and distribution strategies remains underexplored, as Hofstetter et al. (2022) suggest. Further investigation is needed into how gamification elements influence long-term brand loyalty, as indicated by Wang et al. (2023). Additionally, a notable research gap exists in understanding the role of cultural differences in shaping value co-creation processes. Cultural factors significantly influence how users perceive digital ownership, uniqueness, and social value, as well as their engagement with gamified systems.

Future studies should explore how cultural dimensions shape consumer expectations and interactions in Web3 environments, thereby providing a more nuanced understanding of global consumer behavior. By combining elements of digital ownership, consumer psychology, and gamification, the body of research advances our understanding of how Web3 technologies reshape consumer-brand interactions.

Loyalty programs are a critical mechanism for social exchange in Web3, evolving into systems of reciprocal value exchange between brands and consumers. Blockchain-powered programs offer benefits such as transparent product information and exclusive privileges, surpassing traditional models through enhanced incentive structures and gamification. However, significant research gaps remain.One major gap lies in understanding the long-term sustainability of emotional connections created through gamified and virtual engagement mechanisms, such as avatars and virtual influencers (Meyer et al., 2023; Wang et al., 2023). Further studies should assess the impact of these connections on customer retention and brand loyalty over time.

Another key area is the effectiveness of blockchain-enabled reward structures compared to traditional loyalty programs (Peres et al., 2023; Treiblmaier & Petrozhitskaya, 2023). Research is needed to explore how these programs influence consumer behavior and whether they provide superior value in fostering loyalty. The evolution of transactional rewards and emotional engagement as Web3 technologies mature also warrants further investigation (Peng, 2021; Xie et al., 2023). This includes examining how the balance between these elements shifts in response to technological advancements and changing consumer expectations.

Demographic factors present an additional gap, with little understanding of how different cultural and market contexts affect consumer responses to virtual relationship-building tools, such as avatars and influencers (Ghali et al., 2024). Future research should explore how these tools can be optimized for diverse consumer segments. Lastly, while blockchain's role in content validation and electronic word-of-mouth (eWOM) has been explored, its long-term effectiveness in cross-platform dynamics remains unclear. Studies should address the integration of eWOM across Web3 environments and the credibility challenges of blockchain-verified systems.

Marketing technology (Martech) in Web3 represents a transformative force reshaping traditional marketing approaches. While blockchain technology offers potential to eliminate traditional marketing roles through direct producer-consumer connections, marketing continues to adapt by integrating these technologies into existing processes (Haynes & Hietanen, 2023). The evolution of Martech manifests across several interconnected technological dimensions. At its foundation, Web3 Martech relies on blockchain infrastructure, enabling peer-to-peer transactions while navigating practical limitations in scalability, energy consumption, and token volatility. Parssinen et al. (2018) note that while blockchain promises to revolutionize online advertising, widespread adoption awaits solutions to technical challenges. However, Dwivedi et al. (2022) emphasize its current value in enhancing transparency and enabling secure consumer data sharing, particularly in loyalty programs and the traceability of marketing efforts. The advancement of immersive technologies marks another crucial evolution in Martech.

The complexity of modern MarTech reveals several critical research directions. Future studies should investigate how marketing professionals can effectively integrate emerging software and hardware skill sets into metaverse implementations, and examine new targeting approaches as consumer touchpoints expand across digital economic exchanges, social relationships, and environmental interactions. Key research trajectories include: the transformation of advertising execution and evaluation methods, the development of comprehensive marketing parameters, the integration challenges of personalized recommendation systems, and the advancement of engagement metric analysis in Web3 environments. This agenda emphasizes the need to understand both individual technological components and their collective impact on marketing approaches, providing crucial insights for strategy development in the evolving Web3 landscape.

Current research reveals a complex hierarchical ecosystem in Web3 marketing. Alkhudary et al. (2023) and Sung et al. (2023) map key stakeholders, including creators, intermediaries, investors, speculators, and consumers, in value creation processes. Lee et al. (2023) and Peng (2021) highlight how major technology companies dominate decision-making power, with Google and Facebook controlling 60–70% of the American advertising market. Liu et al. (2021) demonstrate how these companies exploit technical advantages to control user data, creating unequal value chain positions. Dwivedi et al. (2023) and Ghali et al. (2024) emphasize the importance of governance frameworks, and Antsipava et al. (2024) discuss coordination between regulators and opinion leaders; significant research gaps remain.

Future research in Web3 marketing ecosystems should focus on multiple critical dimensions. Academic investigation is needed to understand the long-term implications of power disparities on smaller stakeholders and to develop effective international governance structures. Scholars should examine how diverse stakeholder interests can be integrated while maintaining a balance between technological innovation and participant protection. Furthermore, research should address the development of sustainable value distribution

mechanisms and explore effective approaches to cross-border regulatory coordination in Web3 marketing environments.

Understanding the evolution of trust dynamics among stakeholder groups is another crucial area for investigation, as it underpins the sustainable and equitable development of the Web3 marketing ecosystem. Future research must focus on establishing practices that prioritize consumer well-being while leveraging the potential of decentralized technologies, ensuring that trust and ethics remain at the forefront of Web3 marketing's evolution.

Finally, the ethical and structural realities of Web3 marketing demand rigorous scrutiny. While decentralized technologies promise equitable value distribution, current ecosystems are still heavily influenced by the dominance of major tech companies, highlighting a critical need for research into international governance structures, cross-border regulatory coordination, and sustainable value distribution. Marketers must also navigate the delicate balance between blockchain's inherent transparency and the necessity of consumer data privacy, establishing ethical guidelines that protect users from psychological manipulation in synthetic environments. Ultimately, by outlining these fundamental trends and proposing a structured research agenda, this study equips both scholars and practitioners with the foundational insights required to navigate and shape the future of marketing in the decentralized digital economy.

## Declarations

# Conflicts of interest

We declare that there are no conflicts of interest associated with this manuscript.

# Author Contribution

All authors reviewed the manuscript

## References


1. Aiolfi, S. & Luceri, B (2024). “See you on the Metaverse: A bibliometric expedition through the Metaverse landscape”, *Technological Forecasting and Social Change*, 207:1–19.
2. Alkhudary, R., Belvaux, B., & Guibert, N. (2023). “Understanding non-fungible tokens (NFTs): Insights on consumption practices and a research agenda”. *Marketing Letters*, *34*(2):321–336.
3. Almeida, F.D., Santos, J., & Monteiro, J. (2013). “E-Commerce Business Models in the Context of Web 3.0 Paradigm”. *International Journal of Advanced Information Technology*, *3*(6):1–12.
4. Alon, I., Anderson, J., Munim, Z.H., & Ho, A. (2018). “A review of the internationalization of Chinese enterprises”. *Asia Pacific Journal of Management*, *35*(3):573–605.
5. Antsipava, D., Strycharz, J., van Reijmersdal, E.A., & van Noort, G. (2024). “What drives blockchain technology adoption in the online advertising ecosystem? An interview study into stakeholders’ perspectives”. *Journal of Business Research*, *171*, 114381.

6. Aria, M., & Cuccurullo, C. (2017). “B*ibliometrix*: An R-tool for comprehensive science mapping analysis”. *Journal of Informetrics*, *11*(4):959–975.
7. Baek, T.H., & Yi, K. (2024). “A computational approach to cryptocurrency marketing on social media”. *International Journal of advertisement*.
8. Barrera, K.G., & Shah, D. (2023). “Marketing in the Metaverse: Conceptual understanding, framework, and research agenda”. *Journal of Business Research, 155*, 113420.
9. Belda, I. (2023). Metaverse and NFTs: New technological challenges in direct and international introduction. *IDP-Internal, Law, and Politics*, *37*, 403678.
10. Belk, R., Humayun, M., & Brouard, M. (2022). “Money, possessions, and ownership in the Metaverse: NFTs, cryptocurrencies, Web3 and Wild Markets”. *Journal of Business Research*, *153*:198–205.
11. Bilgihan, A., Leong, A.M.W., Okumus, F., & Bai, J. (2024). “Proposing a metaverse engagement model for brand development”. *Journal of Retailing and Consumer Service, 78*:103781.
12. Boukis, A. (2019). “Exploring the implications of blockchain technology for brand–consumer relationships: A future research agenda”. *Journal of Product & Brand Management*, *29*(3):307–320.
13. Bretas, V.P.G., & Alon, I. (2021). “Franchising research on emerging markets: Bibliometric and content analyses”. *Journal of Business Research*, *133*:51–65.
14. Buhalis, D., Lin, M. S., & Leung, D. (2023). “Metaverse as a driver for customer experience and value co-creation: Implications for hospitality and tourism management and marketing”. *International Journal of Contemporary Hospitality Management*, *35*(2):701–716.
15. Casino, F., Dasaklis, T.., & Patsakis, C. (2019). “A systematic literature review of blockchain-based applications: Current status, classification and open issues”. *Telematics and Informatics*, *36*:55–81.
16. Castañeda, K., Sánchez, O., Herrera, R.F., & Mejía, G. (2022). “Highway Planning Trends: A Bibliometric Analysis”. *Sustainability*, *14*(9), Article 9.
17. Chandra, S., Verma, S., Lim, W.M., Kumar, S., & Donthu, N. (2022). “Personalization in personalized marketing: Trends and ways forward”. *Psychology & Marketing*, *39*(8):1529–1562.
18. Cheah, I., & Shimul, A.S. (2023). “Marketing in the metaverse: Moving forward - What’s next?” *Journal of Global Scholars of Marketing Science*, *33*(1):1–10.
19. Choi, D., Lee, H.K. and Kim, D.Y. (2023). "Mood management through metaverse enhancing life satisfaction". *International Journal of Consumer Studies*, 47(4):1135–1149.
20. Chohan, R., & Paschen, J. (2023). “NFT marketing: How marketers can use nonfungible tokens in their campaigns”. *Business Horizons*, *66*(1):43–50.
21. Cui, T.H., Ghose, A., Halaburda, H., Iyengar, R., Pauwels, K., Sriram, S., Tucker, C., & Venkataraman, S. (2021). “Informational Challenges in Omnichannel Marketing: Remedies and Future Research”. *Journal of Marketing*, *85*(1):103–120.
22. Ding, Y., Luo, D., Xiang, H., Liu, W., & Wang, Y. (2021). “Design and implementation of blockchain-based digital advertising media promotion system”. *Peer-To-Peer Networking and Applications*, *14*(2):482–496.
23. Dionysis, S., Chesney, T., & McAuley, D. (2022). “Examining the influential factors of consumer purchase intentions for blockchain traceable coffee using the theory of planned behavior. *British Food Journal*, *124*(12):4304–4322.

24. Dulisse, B.C., Connealy, N., & Logan, M.W. (2024). “The influence and role of cryptoculture on target congruence in cryptocurrency investment behavior: A theoretical model”. *Crime Law and Social Change 81*(4):421–441.
25. Dwivedi, Y.K., Balakrishnan, J., Mishra, A., De Bock, K.W. and Al- Busaidi, A.S. (2024). “The role of embodiment, experience, and self- image expression in creating continuance intention in the metaverse.” Technological Forecasting and Social Change, 203:123402.
26. Dwivedi, Y.K., Hughes, L., Baabdullah, A.M., Ribeiro-Navarrete, S., Giannakis, M., Al-Debei, M.M., Dennehy, D., Metri, B., Buhalis, D., Cheung, C.M.K., Conboy, K., Doyle, R., Dubey, R., Dutot, V., Felix, R., Goyal, D.P., Gustafsson, A., Hinsch, C., Jebabli, I., … Wamba, S.F. (2022). “Metaverse beyond the hype: Multidisciplinary perspectives on emerging challenges, opportunities, and agenda for research, practice and policy”. *International Journal of Information Management*, *66*:102542.
27. Dwivedi, Y.K., Hughes, L., Wang, Y., Alalwan, A.A., Ahn, S.J., Balakrishnan, J., Barta, S., Belk, R., Buhalis, D., Dutot, V., Felix, R., Filieri, R., Flavian, C., Gustafsson, A., Hinsch, C., Hollensen, S., Jain, V., Kim, J., Krishen, A.., … Wirtz, J. (2023). “Metaverse marketing: How the metaverse will shape the future of consumer research and practice”. *Psychology & Marketing*, *40*(4):750–776.
28. Ertemel, A.V. (2018). “Implications of blockchain technology on marketing”. *Journal of International Trade, Logistics and Law*, *4*(2):35–44.
29. Garrigos-Simon, F.J., Lapiedra Alcami, R., & Barbera Ribera, T. (2012). “Social networks and Web 3.0: Their impact on the management and marketing of organizations”. *Management Decision*, *50*(10):1880–1890.
30. Gaur, A., & Kumar, M. (2018). “A systematic approach to conducting review studies: An assessment of content analysis in 25 years of IB research”. *Journal of World Business*, *53*(2):280–289.
31. Ghali, Z., Rather, R.A., & Khan, I. (2024). “Investigating metaverse marketing-enabled consumers’ social presence, attachment, engagement and (re)visit intentions”. *Journal of Retailing and Consumer Services*, *77*:103671.
32. Gleim, M. R., & Stevens, J. L. (2021). “Blockchain: A game changer for marketers?”. *Marketing Letters*, *32*(1):123–128.
33. Golf-Papez, M., Heller, J., Hilken, T., Chylinski, M., De Ruyter, K., Keeling, D.I., & Mahr, D. (2022). “Embracing falsity through the metaverse: The case of synthetic customer experiences”. *Business Horizons*, *65*(6):739–749.
34. Gursoy, D., Lu, L., Nunkoo, R., & Deng, D. (2023). “Metaverse in services marketing: An overview and future research directions”. *The Service Industries Journal*.
35. Haikel-Elsabeh, M. (2023). “Virtual Influencers versus Real Influencers Advertising in the Metaverse, understanding the perceptions, and interactions with users”. *Journal of Current Issues and Research Advertising*, *44*(3):252–273.
36. Haynes, P., & Hietanen, J. (2023). “Marketing without trust? Blockchain technologies in the sharing economy as assemblage and pharmakon”. *Journal of Business Research*, *163*, 113940.
37. Hofstetter, R., de Bellis, E., Brandes, L., Clegg, M., Lamberton, C., Reibstein, D., Rohlfsen, F., Schmitt, B., & Zhang, J. Z. (2022). “Crypto-marketing: How non-fungible tokens (NFTs) challenge traditional marketing”. *Marketing Letters*, *33*(4):705–711.

38. Hollensen, S., Kotler, P., & Opresnik, M. O. (2023). “Metaverse – the new marketing universe. *Journal of Business Strategy”*, *44*(3) :119–125.
39. Jing, Y., Wang, C., Chen, Y., Wang, H., Yu, T., & Shadiev, R. (2024). “Bibliometric mapping techniques in educational technology research: A systematic literature review”. *Education and Information Technologies*, *29*(8):9283–9311.
40. Joo, M., Kim, S.H., Ghose, A., & Wilbur, K.C. (2023). “Designing distributed ledger technologies, like Blockchain, for advertising markets”. *International Journal of Research In Marketing, 40*(1):12–21.
41. Kim, J., Lee, K. H., & Kim, J. (2023). “Linking blockchain technology and digital advertising: How blockchain technology can enhance digital advertising to be more effective, efficient, and trustworthy”. *Journal of Business Research*, *160*:113819.
42. Kim, J.H. (2021). “P2P Systems based on Cloud Computing for Scalability of MMOG”. *The Journal of The Institute of Internet, Broadcasting and Communication*, *21*(4):1–8.
43. Klarin, A. (2024). “How to conduct a bibliometric content analysis: Guidelines and contributions of content co-occurrence or co-word literature reviews”. *International Journal of Consumer Studies*, *48*(2):e13031.
44. Koay, K.Y., Tjiptono, F., Teoh, C.W., Memon, M.A., & Connolly, R. (2023). “Social Media Influencer Marketing: Commentary on the Special Issue”. *Journal of Internet Commerce*, *22*:S1–S3.
45. Kukreja, D., Gupta, S., Patel, D., & Rai, J.N. (2023). “Scientometric review of Web 3.0”. *Journal of Information Science*.
46. Kumar, A., & Shankar, A. (2024). “Investigating the role of metaverse influencers’ attributes for the next generation of services”. *Journal of Services Marketing*,
47. Kumar, V., Ramachandran, D., & Kumar, B. (2021). “Influence of new-age technologies on marketing: A research agenda”. *Journal of Business Research*, *125*:864–877.
48. Kwon, S. (2018). “Characteristics of interdisciplinary research in author keywords appearing in Korean journals”. *Malaysian Journal of Library & Information Science*, *23*:77–93.
49. Lacy, S., Watson, B.R., Riffe, D., & Lovejoy, J. (2015). “Issues and best practices in content analysis. *Journalism & Mass Communication Quarterly*, *92*(4):791–811.
50. Latino, E.M., De Lorenzi, M.C., Corallo, A., & Petruzzelli, M. (2024). “The impact of metaverse for business model innovation: A review, novel insights and research directions”, *Technological Forecasting & Social Change*, 206:1–20.
51. Lee, C.T., Ho, T.Y., & Xie, H.H. (2023). “Building brand engagement in metaverse commerce: The role of branded non-fungible tokens (BNFTs)”. *Electronic Commerce Research and Applications*, *58*:101248.
52. Lemos, C., Ramos, R.F., Moro, S., & Oliveira, P.M. (2022). “Stick or twist-the rise of blockchain applications in marketing management”. *Sustainability*, *14*(7):4172.
53. Lim, W.M., Kumar, S., & Donthu, N. (2024). “How to combine and clean bibliometric data and use bibliometric tools synergistically: Guidelines using metaverse research”. *Journal of Business Research*, 182:114760.
54. Lim, W.M., Das, M., Sharma, W., Verma, A., and Kumra, R. (2025). “Gamification for sustainable consumption: A state- of- the- art overview and future agenda”. Business Strategy and the Environment, 34:1510–1549

55. Liu, L., Zhang, W., & Han, C. (2021). “A survey for the application of blockchain technology in the media”. *Peer-to-Peer Networking and Applications*, *14*(5):3143–3165.
56. Liu, Y. (2022). “Effect of Digital Marketing Capabilities and Blockchain Technology on Organizational Performance and Psychology”. *Frontiers in Psychology*, *12*:805393.
57. Liu, Y., Lin, L., Jiang, L., Zhang, W., Wang, X., Gheisari, M., Gong, T., Gao, C., & Najafabadi, H.E. (2023). “A blockchain-based privacy-preserving advertising attribution architecture: Requirements, design, and a prototype implementation”. *Software-Practice & Experience*, *53*(8):1700–1721.
58. Malik, N., Wei, Y., Appel, G., & Luo, L. (2023). “Blockchain technology for creative industries: Current state and research opportunities”. *International Journal of Research in Marketing*, *40*(1):38–48.
59. Marikyan, D., Papagiannidis, S., Rana, O.F., & Ranjan, R. (2022). “Blockchain adoption: A study of cognitive factors underpinning decision making”. *Computers in Human Behavior*, *131*:107207.
60. Marthews, A., & Tucker, C. (2023). “What blockchain can and can’t do: Applications to marketing and privacy”. *International Journal of Research in Marketing*, *40*(1):49–53.
61. Mathmann, F., Chrysochou, P., Tiganis, A., & Martin, B.A.S. (2024). “What motivates crypto likes? How assessment regulatory mode increases social media engagement with crypto assets”. *Psychology & Marketing*.
62. Meyer, E.A., Sandner, P., Cloutier, B., & Welpe, I.M. (2023). High on Bitcoin: Evidence of emotional contagion in the YouTube crypto influencer space. *Journal of Business Research*, *164*, 113850.
63. Miao, F., Kozlenkova, I.V., Wang, H., Xie, T., & Palmatier, R.W. (2022). “An Emerging Theory of Avatar Marketing”. *Journal of Marketing*, *86*(1):67–90.
64. Nadini, M., Alessandretti, L., Di Giacinto, F., Martino, M., Aiello, L. M., & Baronchelli, A. (2021). “Mapping the NFT revolution: Market trends, trade networks, and visual features”. *Scientific Reports*, *11*(1):20902.
65. Park, E. (2024). “Examining metaverse game platform adoption: Insights from innovation, behavior, and coolness”. *Technology in Society*, 77:102594.
66. Park, H., and Lim. R.E. (2023). “Fashion and the metaverse: Clarifying the domain and establishing a research agenda”. Journal of Retailing and Consumer Services 74:103413.
67. Parssinen, M., Kotila, M., Rumin, R. C., Phansalkar, A., & Manner, J. (2018). “Is Blockchain Ready to Revolutionize Online Advertising?”. *IEEE Access*, *6*:54884–54899.
68. Paul, J., Lim, W.M., O'Cass, A., Hao, A.W., & Bresciani, S. (2021). “Scientific procedures and rationales for systematic literature reviews (SPAR- 4- SLR)*”. International Journal of Consumer Studies*, 45:O1–O16.
69. Peng, W. (2021). “Decentralized storage design of SNS open e-commerce marketing model”. *Proceedings of the 2021 Fifth International Conference on I-SMAC (IOT in Social Mobile Analytics and Cloud) (I-SMAC 2021)*, 909–912.
70. Peres, R., Schreier, M., Schweidel, D. A., & Sorescu, A. (2023). “Blockchain meets marketing: Opportunities, threats, and avenues for future research”. *International Journal of Research in Marketing, 40*(1):1–11.
71. Popescu, V.D., Barbu, M.C., Girboveanu, R.S., Juganaru, M., & Dinu, A. (2025). *Management & Marketing*, 23(2):234–244.
72. PricewaterhouseCoopers. (n.d.). *PwC*. PwC. Retrieved November 19, 2024, from

73. Rejeb, A., Keogh, J.G., & Treiblmaier, H. (2020). “How Blockchain technology can benefit marketing: Six pending research areas”. *Frontiers in Blockchain*, *3*,3.
74. Risius, M., & Spohrer, K. (2017). “A Blockchain research framework: What we (don’t) know, where we go from here, and how we will get there”. *Business & Information Systems Engineering*, *59*(6):385–409.
75. Saberi, S., Kouhizadeh, M., Sarkis, J., & Shen, L. (2019). “Blockchain technology and its relationships to sustainable supply chain management”. *International Journal of Production Research*, *57*(7):2117–2135.
76. Sakas, D.P., Giannakopoulos, N.T., Kanellos, N., & Migkos, S.P. (2022). “Innovative cryptocurrency trade websites’ marketing strategy rfinement via digital behavior”. *IEEE Access*, *10*:63163–63176.
77. Sakas, D.P., Giannakopoulos, N.., Kanellos, N., & Tryfonopoulos, C. (2022). “Digital marketing enhancement of cyptocurrency websites through customer innovative data Process”. *Proccesses*, *10*(5):960.
78. Sanmiguel, P., Sadaba, T., & Sayeed, N. (2024). “Fashion brands in the metaverse: Achievements from a marketing perspective”. *Journal of Global Market Fashioning*, *15*(3):320–340.
79. Sharma, W., Lim, W.M., Kumar, S., Verma, A., & Kumra, R. (2024). “Game on! A state-of-the-art overview of doing business with gamification”. *Technological Forecasting and Social Change*, *198*:122988.
80. Stallone, V., Wetzels, M., & Klaas, M. (2021). “Applications of blockchain technology in marketing-A systematic review of marketing technology companies”. *Blockchain Research and Applications*, *2*(3):100023.
81. Stallone, V., Wetzels, M., Mahr, D., & Klaas, M. (2024). “Enhancing digital advertising with blockchain technology”. *Journal of Interactive Marketing*, *59*(1):76–98.
82. Steuer, J. (1995). “Defining virtual reality: Dimensions determining telepresence.” In Communication in the Age of Virtual Reality, edited by F. Biocca and M. R. Levy. Routledge.
83. Strozzi, F., Colicchia, C., Creazza, A., & Noè, C. (2017). “Literature review on the ‘Smart Factory’ concept using bibliometric tools”. *International Journal of Production Research*.
84. Sung, E., Kwon, O., & Sohn, K. (2023). “NFT luxury brand marketing in the metaverse: Leveraging blockchain-certified NFTs to drive consumer behavior”. *Psychology & Marketing*, *40*(11):2306–2325.
85. Tan, T.M., & Salo, J. (2023). “Ethical marketing in the blockchain-based sharing economy: Theoretical integration and guiding insights”. *Journal of Business Ethics*, *183*(4):1113–1140.
86. Tan, T.M., Salo, J., Alejandro, T.G.B., Tan, G. W.H., Ooi, K.B., & Dwivedi, Y.K. (2024). “Guest editorial: A blockchain-based approach to marketing in the sharing economy”. *Journal of Business Research*, *177*:114639.
87. Tan, T.M., & Saraniemi, S. (2023). Trust in blockchain-enabled exchanges: Future directions in blockchain marketing”. *Journal of the Academy of Marketing Science*, *51*(4):914–939.
88. Tapscott, D. & Tapscott, A. (2018). “*How Blockchain Will Change Organizations”* (pp. 43–56).
89. Taylor, C.R. (2022). “Research on advertising in the metaverse: A call to action”. *International Journal of Advertising*.
90. Treiblmaier, H. (2018). “The impact of the blockchain on the supply chain: A theory-based research framework and a call for action”. *Supply Chain Management: An International Journal*, *23*(6):545–559.
91. Treiblmaier, H. & Petrozhitskaya, E. (2023). “Is it time for marketing to reappraise B2C relationship management? The emergence of a new loyalty paradigm through blockchain technology”. *Journal of*

*Business Research*, *159*:113725.

92. Wagner, D. (2023). “A review and research agenda for brand communities in sports”. *International Journal of Sport Communication, 16*(3):335–343.
93. Wang, H., Zhang, M., Ying, H., & Zhao, X. (2021). “The impact of blockchain technology on consumer behavior: A multimethod study”. *Journal of Management Analytics*, *8*(3):371–390.
94. Wang, J., Jiang, H., Sun, J., & Deng, L. (2023). “Motivation to adopt gamification in NFT”. In A. Marcus, E. Rosenzweig, & M.M. Soares (Eds.), *Design, User Experience, and Usability, Duxu, Pt. I* (Vol. 14030, pp. 610–623). Springer International Publishing.
95. Wasiq, M., Bashar, A., Akmal, S., Rabbani, M.R., Saifi, M.., Nawaz, N., & Nasef, Y.T. (2023). “Adoption and applications of blockchain technology in marketing: A retrospective overview and Bibliometric Analysis”. *Sustainability*, *15*(4):3279.
96. *Web 3.0 Market To Reach $33.53Bn By 2030 | CAGR 49.3%*. (n.d.). Retrieved November 19, 2024, from https://www.grandviewresearch.com/press-release/global-web-3-0-market
97. Wider, W., Jiang, L., Lin, J., Muhammad, A.Fauzi, Jingjing, L., & Choon, K.C. (2024). “Metaverse chronicles: A bibliometric analysis of is evolving landscape”, *International Journal of Human-Computer Interaction*, 40(17):4873–4886.
98. Xie, Q., & Muralidharan, S. (2024). “It’s a comparison game! The roles of social comparison, perceived exclusivity and perceived financial benefits in non-fungible token marketing”. *Journal of Research in Interactive Marketing*, *18*(2):294–314.
99. Xie, Q., Muralidharan, S., & Edwards, S.M. (2023). “Who will buy the idea of non-fungible token (NFT) marketing? Understanding consumers’ psychological tendencies and value perceptions of branded NFTs”. *International Journal of Advertising*.
100. Yadav, S., Pandey, S.K., & Sharma, D. (2024). “Marketing beyond reality: A systematic literature review on metaverse”. *Management Research Review*, *47*(7):1029–1051.
101. Yang, H., Cho, Y., & Han, S.-Y. (2024). “Understanding user perceptions toward marketing in the metaverse”. *Kybernetes*, *ahead-of-print*(ahead-of-print). https://doi.org/10.1108/K-08-2023-1524
102. Yayla, A., Dincelli, E., & Parameswaran, S. (2024). “A mining town in a digital land: Browser-based cryptocurrency mining as an alternative to online advertising”. *Information Systems Frontiers*, *26*(2):609–631.
103. Yli-Huumo, J., Ko, D., Choi, S., Park, S., & Smolander, K. (2016). “Where is current research on blockchain technology? A systematic review”. *Plolos One*, *11*(10):e0163477.
104. Zhang, D., Chadwick, S., & Liu, L. (2022). “*The metaverse: Opportunities and Challenges for Marketing in Web3”*, SSRN Scholarly Paper No. 4278498, Social Science Research Network.
105. Zhang, J., Quoquab, F., & Mohammad, J. (2024). “Metaverse tourism and Gen- Z and Gen- Y's motivation: ‘Will You, or Won't You Travel Virtually?’”. *Tourism Review*, 79:304–320.

# Figures

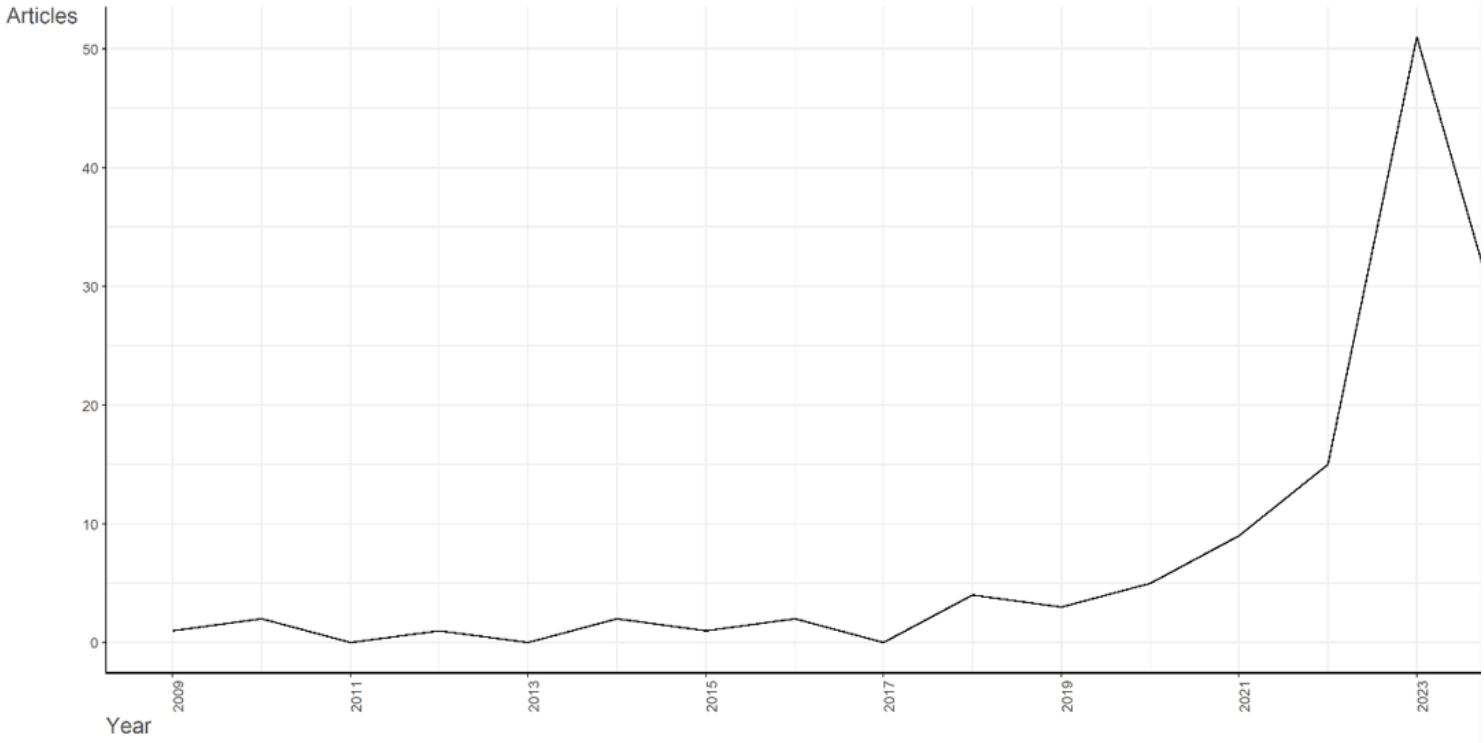



**Figure 1**

*Annual scientific production (number of articles per year).*

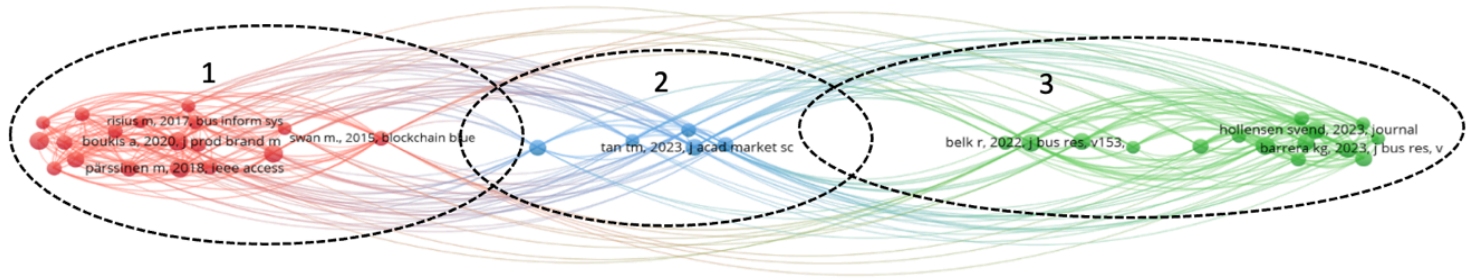



**Figure 2**

*Co-citation showing linkages across articles. 1 = Blockchain's Role in Marketing cluster, 2 = Ethical and Trust Issues in Blockchain Marketing cluster, 3 = Metaverse in Consumer Engagement and Branding.*

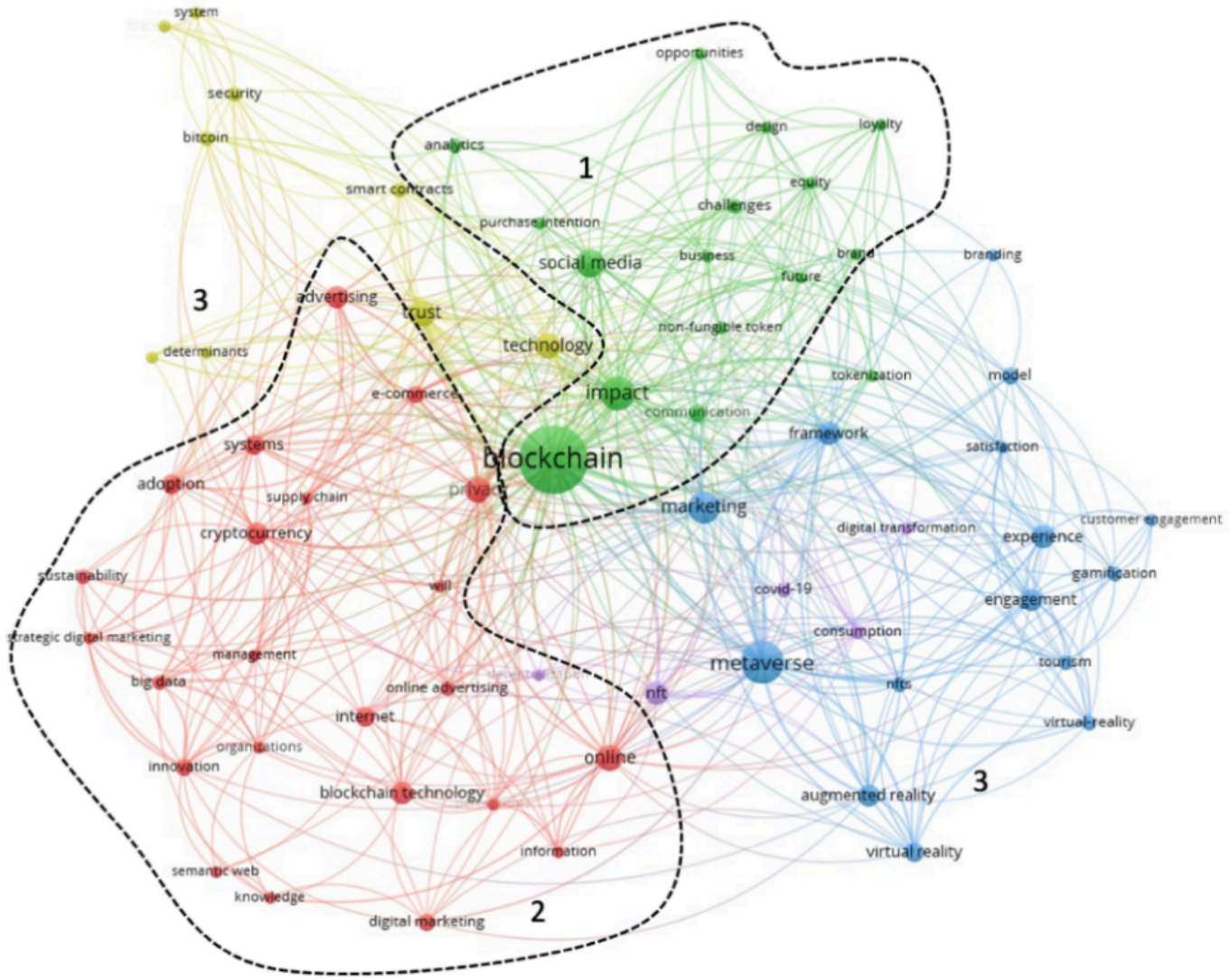



**Figure 3**

Keyword co-occurrence analysis. 1 = Blockchain and Social Media Cluster, 2 = Cryptocurrency and Digital Marketing cluster, 3= Metaverse and NFTs.

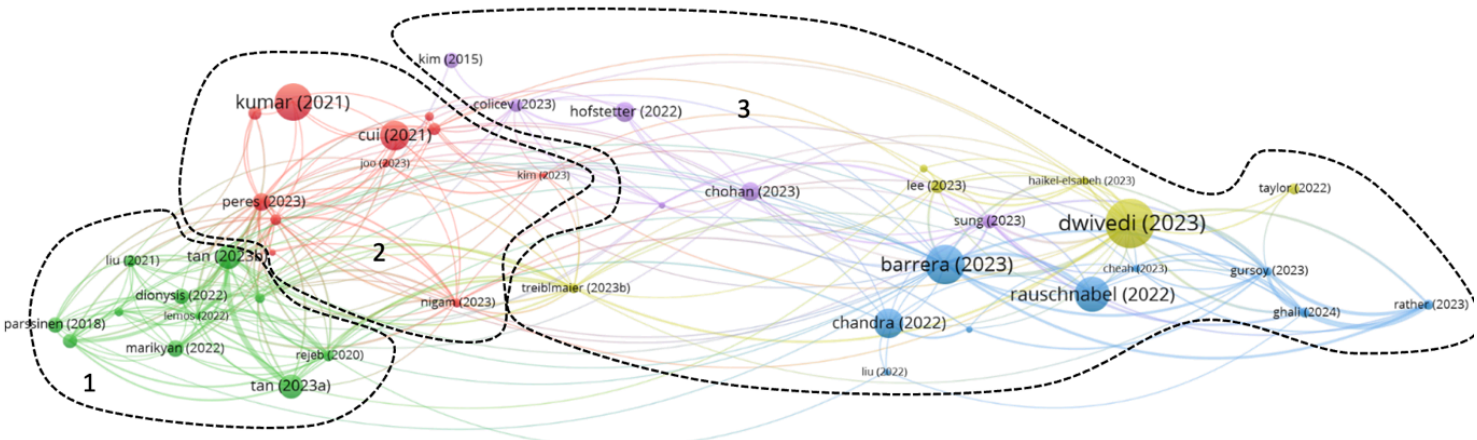


**Figure 4**

*Bibliographic coupling showing linkages across articles. 1 = Blockchain's Role in Marketing cluster, 2 = Ethical and Trust Issues in Blockchain Marketing cluster, 3 = Marketing in the Metaverse and Digital Technologies.*

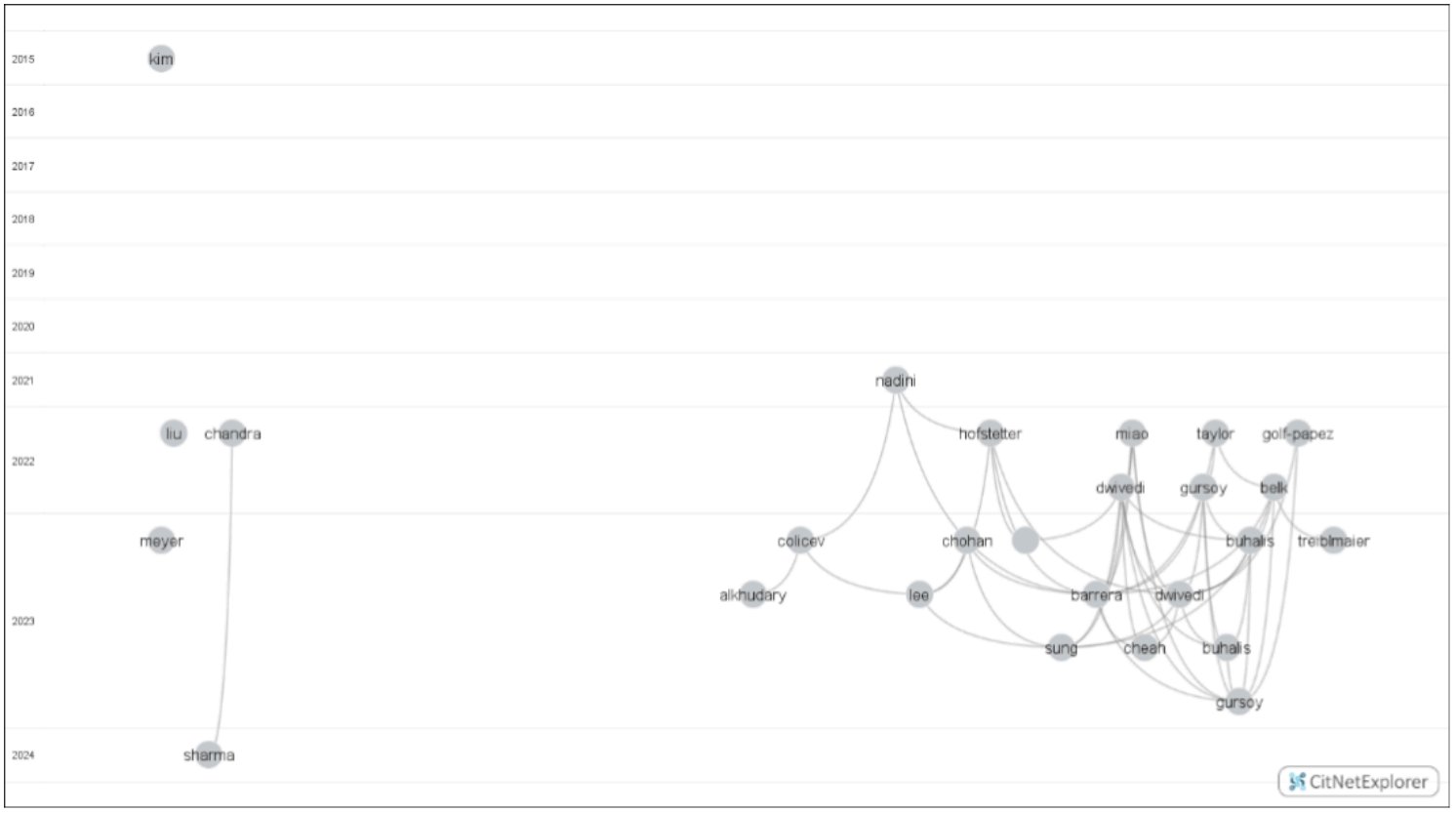



**Figure 5**

*Citation networks of the "Marketing in the Metaverse and Digital technologies" cluster.*

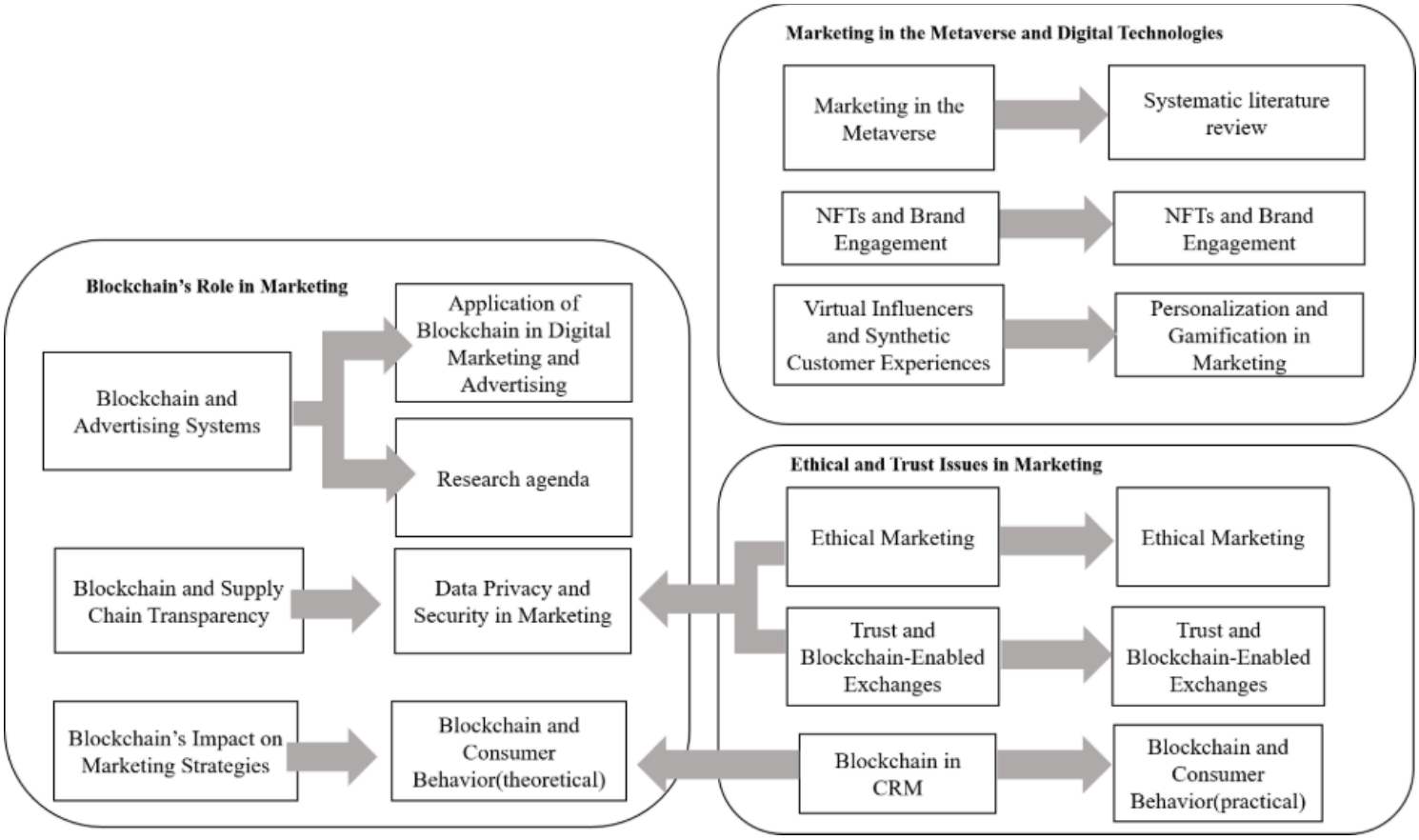



**Figure 6**

Research framework – Marketing in Web 3.0.