Thunderbird International Business Review

WILEY

RESEARCH ARTICLE

Not All That Glitters Is Gold! The Brokerage Role of Consulting Companies in Disseminating Information to Overcome the Barriers to Metaverse Adoption

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Received: 8 December 2024 | **Revised:** 12 October 2025 | **Accepted:** 15 October 2025

Keywords: adoption speed | AI-supported thematic analysis | augmented | consulting companies | metaverse | technology adoption

ABSTRACT

The last few years have seen a reemergence in the awareness of virtual worlds among practitioners and academics. Driven by tech giants' investments, the Metaverse is considered by some as an unprecedented revolutionary technology with the potential to unlock an entire gamut of new unexplored opportunities for both companies and individuals. Others instead talk of "Metaverse dream fallacy" for search traffic for the word Metaverse has collapsed by roughly 80% over the past year and some companies have discontinued their Metaverse projects. In such a puzzled situation, managers are left without solid advice on the Metaverse concrete adoption and adoption speed. This article explores the brokerage role of top consulting companies in disseminating information that makes managers aware of Metaverse concrete adoption and of its adoption speed. Based on an AI-supported thematic analysis of 199 documents on Metaverse published by world's top consulting companies in the 2 years 2021–2023, we identify four key barriers to Metaverse adoption and categorize them into an enriched four-legged TOE (i.e., technological, organizational, environmental, and human barriers) framework. In the process, we unveil a suite of managerially relevant aspects emerging from tapping into the Metaverse adoption process.

1 | Introduction

The Metaverse is one of the most popular buzzwords in business, and that is for a very good reason: virtual social worlds have shown to be promising tools for driving companies' actual and future growth (Kshetri and Dwivedi 2024; Ritala et al. 2024). They can be used to organize virtual team meetings and recruiting talks, to advertise or sell companies' digital artifacts, to provide educational courses, as well as to hold virtual entertainment events, such as the concert given by, for example, Marshmello in the virtual world Fortnite.

To be sure, the Metaverse is not entirely new stuff as it has been around for more than a decade as many virtual technologies have been used in the development of the virtual world of the online role-playing game Second Life (Gupta and Jauhar 2023; Kaplan and Haenlein 2009). Notwithstanding that, its recent climbing popularity is due to three key factors: (a) the significant advancements in its underlying technologies (Ritala et al. 2024); (b) the economic and social power of tech companies (Kraus et al. 2022); and (c) the market awareness of its applicability in many sectors, industries, and ecosystems (Dwivedi et al. 2022).

In the past, one of the problems with Second Life, a forerunner of the Metaverse, was its condition of technological incompatibility with mass-market adoption. In fact, internet navigation was quite slow and somewhat difficult at that time. Conversely, the set of technologies (e.g., blockchain, augmented reality, Web 3.0, and soon 5G) behind today's Metaverse has made considerable leaps forward in the last few years (Dwivedi et al. 2022; Gupta

and Jauhar 2023). While in Second Life users were glancing at their computer screens on traditional gaming consoles, such as Xbox, PlayStation, PCs, and smartphones, today users are entirely immersed in virtual social worlds by wearing headsets, gloves, or entire bodysuits. Fb-Metaverse and other start-ups, such as VRChat and RecRoom, are looking to generate strikingly immersive virtual worlds by moving beyond screenplays to incorporate VR capabilities.

Furthermore, in the past, virtual worlds were usually developed by gaming companies, while the "big tech" companies were not as large and influential as they are in our day and were breathing mostly outside the gaming business. Nowadays, big tech companies (e.g., Meta, Microsoft, Amazon, Google, Alibaba, and Tencent) are sensibly bigger, stronger, far more influential, and deeply caught up in the gaming business. Finally, individuals are much more aware and open to allowing advanced technologies and their benefits to penetrate their lives.

For the reasons above, the Metaverse market is likely to experience exponential growth in the incoming future, with projections indicating that its value will touch $5 trillion by 2030 (Elmasry et al. 2022). According to some optimistic forecasts, the number of Metaverse users is also expected to skyrocket from 250 million to 5 billion by the same year.[1] In a 7-year time frame, one-third of global businesses are poised to display products and services readily available in the Metaverse.[2] As widely known, Facebook's rebranding to Meta (October 28, 2021) and Mark Zuckerberg's launch of the Metaverse have vastly accelerated the adoption of Metaverse projects across various sectors and industries (Heo 2025; Kraus et al. 2022), such as manufacturing (e.g., BMW Group and Nvidia), retail (e.g., Gucci, Louis Vuitton, and Prada), healthcare (e.g., Scripps Clinic in California), and education (e.g., Neoma Business School and Milan-based Polytechnic). In addition, in July 2022, the Dubai Government announced the inauguration of its Metaverse strategy, underscoring that UAE economic success will be measured not only in terms of gross domestic product (GDP) but also in terms of gross Metaverse product (GMP) (Robertson 2022).

While many companies are pouring money in projects developing Metaverse platforms, VR headsets, and other related devices, others (such as Disney) are instead laying off employees and discontinuing their Metaverse projects since they have turned not to believe in a such fast-paced growth of the Metaverse (Kelly 2023). If you typed "Metaverse" in Google Trends, you would see that search traffic for the word has drastically collapsed by roughly 80% over the past year. This condition has led some to talk about the Metaverse dream as a "Metaverse dream fallacy" (Kelly 2023).

As such, despite the massive Metaverse potential for disruption and its gigantic expansion pledge, several unknowns, many uncertainties and a range of blind spots are actually being casted over its prospective development, thereby requiring accurate reflection and scrupulous research (Dwivedi et al. 2022; Kaplan and Haenlein 2020; Mancuso et al. 2024). In such regard, "its success will depend on the acceptance of the claims that the virtual and physical are sensorily similar and that the Metaverse thus represents a genuine reality in which users can socialize, work, and play" (Golf-Papez et al. 2022, 740). Beyond these claims, we do not know what are the "real" hinders to its acceptance since extant investigation has fallen short to recognize and categorize the barriers to Metaverse adoption.

Given the mixed evidence and the paucity of empirical insights related to the potential success and recent failures of Metaverse projects, one might ask whether all that glitters about the Metaverse is really gold or not. Perhaps there are some barriers impeding the Metaverse' adoption that managers should be aware of. Today's Metaverse is quite probably to be considered more as an "emerging interactive space" rather than "a mass-market application" (Kshetri and Dwivedi 2024; Ritala et al. 2024). More specifically, "Metaverses are online worlds that give three-dimensional form to individuals' digital lives. Metaverses allow users to create, outfit, and use digital avatars to represent versions of themselves in online social spaces" (Murray et al. 2023, 197). However, as it happens with every new technology, the Metaverse requires time and care to be adopted by the market mainstream. Our talks with a panel of innovation experts reveal that we are probably at the beginning of the Metaverse journey, where the technology adoption is slow since it is yet poorly understood (Aliman et al. 2024). However, its adoption rate can be accelerated by means of the intervention of some external facilitators or Metaverse brokers. Research on the role of innovation intermediaries dates back to the early 2000s (Van Lente et al. 2003; Howells 2006); however, still recent studies underline that the results on the subject are puzzling (Anzolin and O'Sullivan 2025; Kerstens and Langley 2025). This is due to various reasons, including the variety of perspectives, organizations, and industries considered—which have made it difficult to identify specific functions and types of intermediation (Caloffi et al. 2023), and furthermore the progressive spread of increasingly advanced digital technologies, including the Metaverse and artificial intelligence, which can impact innovation ecosystems through specific mechanisms (Colovic et al. 2024).

Differently from previous works which have limited their analysis to the Metaverse adoption in specific industries (Agrawal and Wankhede 2025; Butt et al. 2025; Contarino 2023), in this article, we contend that consulting companies might play a brokerage and pivotal role in favoring the Metaverse adoption as well as in accelerating its adoption speed virtually in every industry. This unique angle contributes to a deeper understanding of how information dissemination and managerial awareness can influence the Metaverse adoption process. In such regard, this study investigates the brokerage role of consulting firms in facilitating the adoption of Metaverse technologies by businesses. More specifically, we ask: how do consulting firms bridge the knowledge gap? and what barriers do businesses face in adopting these technologies?

To answer these questions, we investigate the main barriers to Metaverse adoption identified by business consultancy. The objective of the research is to identify the brokerage role of consulting firms in the Metaverse technology adoption process and to categorize the barriers to Metaverse adoption within a structured framework. In such light, we collected all available reports on the Metaverse published in the period 2021–2023 by 34 top consulting firms, encompassing 199 documents including white papers, articles, press releases, insights, and interview

transcripts. We adopted an AI-supported thematic analysis to understand and categorize the main barriers to Metaverse adoption.

The article aims to advance both the intellectual debate about Metaverse adoption and to support managers willing to embrace Metaverse-based businesses (Dia 2025). As concerns the intellectual contribution, we develop an enriched framework for understanding the key hurdles to Metaverse adoption based on the Technology–Organization–Environment (TOE) framework. More interestingly, the framework outlines four main barriers, one of which is, according to prior studies (Rehman et al. 2024), particularly relevant also in the Metaverse implementation. With regard to managerial contribution, we provide a roadmap helpful to managers willing to engage in Metaverse projects. In such a way, we support the increasing number of firms aspiring to be Metaverse-oriented by avoiding the pitfalls emerging from the barriers to Metaverse adoption we have identified.

2 | When and How Are New Technologies Adopted?

Going back to classic models of innovation (Schumpeter 1942) may turn helpful in answering the key research question about how consulting firms may act in facilitating the Metaverse adoption. Innovation researchers have long been concerned with exploring technology trajectories (i.e., the path a technology follows through time) and their adoption rate (Dosi 1982; Nelson and Winter 1977; Rogers 1983). Technological trajectories are often used to represent the technology rate of performance improvement and its rate of adoption in the marketplace (Schilling 2012).

Several consistent patterns have been observed in technology trajectories, thereby helping understand when and how technologies improve and spread (Dosi 1982; Rogers 1983). In this regard, new technologies usually exhibit an S-curve shape in their performance improvement over their lifespan. The S-curve, rooted in innovation diffusion theory (Rogers 1983), graphically describes the nonlinear process of technology adoption by recognizing early adoption, growth, and maturity phases (Sooampon 2025). Understanding the S-curve allows for managing the allocation of resources and the timing of changes related to the penetration of technologies in organizations and society (Chatterjee 2024). When technology is plotted against the amount of effort and money invested in the same technology, it typically shows a low adoption rate since it is usually poorly understood. However, as scientists and companies gain a deeper understanding of the technology, technology improvements start to accelerate its adoption rate.

Scholars have attempted to develop an encompassing theoretical framework fit to understand technology adoption and diffusion. These conceptual attempts include the Diffusion of Innovation (DOI) theory elaborated by Rogers (1983) and the TOE framework developed by other scholars (Tornatzky and Fleischer 1990). Shifting to virtual worlds, Buhalis et al. (2022) have claimed that "researchers should aim to incorporate theories to identify the potential research questions in the adoption of the Metaverse" (Buhalis et al. 2022). Our contribution is relevant in this regard, that is, in advancing our understanding of both the Metaverse adoption and of its adoption speed.

Actually, the Metaverse has been defined as "an interconnected network of virtual worlds that can be experienced synchronously by an unlimited number of users" (Kim 2023). To understand better the functionalities of the Metaverse, a recent study introduced the "Metaverse honeycomb," which is made up of seven pieces: identity, presence, and reputation in the virtual world, together with relationships, conversations, groups, and sharing that participants may activate in it (Keegan et al. 2024).

Recent studies have shown that, over the next decade, the development of the Metaverse might dramatically wrap into by increasing sales, reducing operation costs, and generating new business opportunities (Gökalp et al. 2022). Moreover, as earlier indicated, the Metaverse market is likely to experience exponential growth in the future, with projections signifying that its value might ascend to reach $5 trillion by 2030 (Elmasry et al. 2022). Notwithstanding that, a recent review shows that "Metaverse adoption is increasing gradually, indicating that there is still a need for more studies to carry on to better understand the factors influencing its adoption" (Alfaisal et al. 2024). As such, an unexplored issue that deserves particular consideration relates to the extent to which Metaverse adoption can speed up as much as technology brokers, such as consulting companies, would make steps in disseminating key information about it. Actually, firms usually embrace an innovation once that "disseminated information" makes them aware of it (Rogers 1983).

In specific circumstances, such as when the innovation affects a firm's customer interface or requires integration into their value chain operations, however, some "learning barriers" need to be tackled prior to proceeding in the adoption of the innovation in a wide fashion. This condition triggers a dilemma since the information required to adopt the innovation is inherent to the innovation adoption process (Weigelt and Sarkar 2009). As such, while it has hitherto received scant or no attention, we are aware that a critical area requiring consideration is the Metaverse adoption process and its adoption speed. In this article, we explore how the dissemination of information from consulting companies may facilitate the Metaverse adoption and enhance its adoption speed.

3 | How and Why Can Consulting Companies Facilitate a Technology Adoption?

Supply-side agents, such as consulting firms and technology solution providers, regularly play a significant role in guiding businesses through the increasingly complex innovation landscape. The role played by Boston Consulting Group (BCG) and its best practices department in speeding up the digital transformation of various industries, such as the automotive and animal health, is nothing else than the testimony that consulting companies may be able to solicit the improvement of firms' digital capabilities in several industries and ecosystems.[3]

Actually, consultants may take a crucial role in fostering innovation and in persuading business leaders and managers to embrace it by sharing their experience and offering their advice on

the most effective techniques to adopt and thereby legitimizing their earlier adoption. Starting from the 1990s, scholars have frequently argued on the role of consultants in developing information technology (Bloomfield and Danieli 1995), and how they act as facilitators of the IT innovation process within and across firms (Swanson 2010). Then we ask: how and why can consulting companies facilitate the adoption and spread of new technologies?

In fact, consultants may operate as "change agents" and "technology brokers" and thus assist business organizations in tackling technology adoption hurdles and in accelerating their innovation initiatives (Hu et al. 2019) by leveraging three key features. First, consulting companies may raise the firms' understanding of the specific technology and the potential demands it may ultimately satisfy. Consultants, in fact, act as knowledge distributors and information conveyors (Rogers 1983), thereby facilitating their clients' learning and skills transfer as concerns, for instance, projects employing the adoption of IT or cybersecurity technologies (Swanson 2010). In such regard, their goal is to contribute to the adoption of a technology and to accelerate its adoption speed. This occurs especially if the innovation has an impact on the company's customer interface or requires integration into its value chain. Actually, consultants can inform their customer firms and explain to them what kind of technology that is and how it can be integrated into their processes (Weigelt and Sarkar 2009). In the case of credit unions, for instance, extant studies indicate that consultants have delivered their experience and facilitated learning to overcome adoption hurdles in embracing electronic banking innovations (Weigelt and Sarkar 2009).

Second, consultants can help their clients recognize the value-creating potential associated with new technologies from all the other key players in the innovation network, such as university research groups, device manufacturers, technology operators, and technology providers (Pinto et al. 2017). Consulting companies are able to activate and manage knowledge and skill flows to favor their clients so that they can identify business opportunities arising from new technologies adoption, prioritize the configuration of the internal innovation protocols, and identify their contribution to the value creation process (Ferrigno et al. 2023; Ritala et al. 2024). What occurred, for instance, in the case of cloud computing technology was that the perception of relevant aspects related to organizational innovativeness and IT capabilities was preparatory to its adoption in SMEs (El-Haddadeh 2020).

Third, consulting companies may assist their clients in figuring out the competitive arena in which an innovation might be implemented, as well as in analyzing data regarding its technical maturity, industrial requirements, and market factors. In fact, the adoption of a technology may be contingent on a suitable understanding of the competitive advantage that the solution may offer over other products or services already existing on the market. The adoption of internet-based e-business innovations in an international business context was due, for example, to the fact that technological, organizational, and environmental factors could shape the trajectory of technology adoption and its adoption speed, as endogenous and exogenous drivers, such as technology readiness, firm size, competition intensity, and regulation, played a significant role in the process (Esposito et al. 2025; Lynch et al. 2025; Zhu et al. 2006).

As follows the scrutiny of these three factors, the role of consulting firms intended as brokers or intermediaries in technology adoption and in enhancing its adoption speed appears sufficiently clear, stretching beyond the sheer connection of their clients' firms with technical partners to take the role of innovation co-producers. As such, although it has received hitherto little or no attention, we are aware that the Metaverse adoption process and its adoption speed are critical areas requiring special attention. In fact, to understand the Metaverse acceptance process and its adoption propensity, it is important to grasp preliminarily the role that consulting companies may play in its diffusion (Dwivedi et al. 2022).

4 | Research Methodology

4.1 | Data Collection

To achieve this aim, we manually scraped 34 top consulting companies[4] websites and downloaded all reports available (including white papers, articles, press releases, insights, and interview transcripts) with Metaverse in the title. Moreover, we used a snowball approach from the references used in the reports collected to gather additional documents. Finally, we used Google Scholar to reach saturation levels. At the end of this process, we collected a total of 199 documents published between October 2021 and April 2023. An overview of the collected data is reported in Table 1.

Out of 199 reports, 160 (80.4%) were released by the seven major global consulting companies: Accenture (18); BCG (25); Deloitte (34); EY (21); KPMG (25); McKinsey & Co. (23), and PWC (14). The other 27 consulting companies in our sample produced overall 39 reports (19.6% of all reports analyzed). This condition confirms the extreme care and notable attention that major global consulting companies recognize for the Metaverse seen as both a technology and a business opportunity. This is documented by instructing a dedicated consulting practice team on digital transformation and/or VR/AR within the company.

4.2 | Data Analysis

To analyze these documents and ensure rigor and consistency in our analysis, we opted to conduct a thematic analysis (Abushaikha et al. 2025; Younis et al. 2024, 2025). However, given the large amount of data to analyze, we were aware that a traditional thematic analysis may cause problems in detecting patterns within the text of the collected documents. In addition, since this study is about the barriers to Metaverse adoption, which is a digital technology, an AI-supported thematic analysis would be a more suitable approach. For the above reasons, we decided to use the automatic transcription software SpeakAi. SpeakAi creates powerful research archives and analytics for both researchers and managers. It provides affordable automatic transcription, named entity recognition, sentiment analysis, and media management in one place. Moreover, we used the AI-assisted version of ATLAS.ti

TABLE 1 | An overview of the data collected.

Consulting company (in alphabetic order)	#Docs published on the "Metaverse"
Accenture	18
Alix Partners	1
Alvarez & Marsal	4
Analysis Group Inc.	1
Bain & Co.	1
Bates White	1
Boston Consulting Group	25
Deloitte	34
Ernst & Young (EY)	21
Guidehouse	3
JPMorgan	1
Kearney	5
KPMG	25
LEK Consulting	1
McKinsey & Company	23
Mercer	2
OC&C Strategy Consultants	1
Oliver Wyman	9
Putnam	1
PWC	14
Roland Berger	4
Strategy&	1
Wavestone	3
Total	199

Note: Top Consulting Companies in 2023 (www.managementconsulted.com/top-consulting-firms).

23.1.0 software to integrate the analysis, refine coding, and generate graphical representations of the data. Finally, we cross-checked the automated results and triangulated them with their substantive knowledge of the TOE framework and performed an additional manual thematic analysis on a subsample of documents randomly extracted from the database used in the study to double-check the results obtained with the AI-supported technologies.

Through this AI software set, we were able to automatically detect recurrent themes in the text of the 199 documents collected and interpret the message behind the words used by 23 of the 34 top consulting companies. More importantly, the thematic analysis performed through the AI software was key in this study as it enabled it (1) to unveil the Metaverse relevant adoption domains; and (2) to identify the main barriers hindering the Metaverse adoption. This research step has been performed using an enriched version of the TOE framework (Tornatzky and Fleischer 1990). The TOE framework is an approach developed to explain a firm's technology adoption process by describing how the process of adopting and implementing technological innovations is influenced by three relevant contexts: (a) the *technological* context; (b) the *organizational* context; and (c) the *environmental* context. As shown below, to expand our understanding of the barriers to Metaverse adoption to these three contextual features, we have added a fourth relevant one: (d) the *human* context.

4.3 | An Eagle-Eyed View of the Metaverse

The analysis of the 199 consulting reports reveals, generally speaking, the consulting companies' awareness of Metaverse technology. They describe their potential for a digitally augmented world that can generate innovative solutions altering the way individuals act and interact, and ultimately transforming human behavior. The most popular keywords in the reports suggest that consulting companies are committed to helping firms succeed in the new competitive environment, encouraging them to envision the future with these technologies, and to design business models that create economic value through the Metaverse (Figure 1).

FIGURE 1 | Word cloud of the top 160 keywords found in the consulting reports on the Metaverse (300 citations or more). [Color figure can be viewed at wileyonlinelibrary.com]

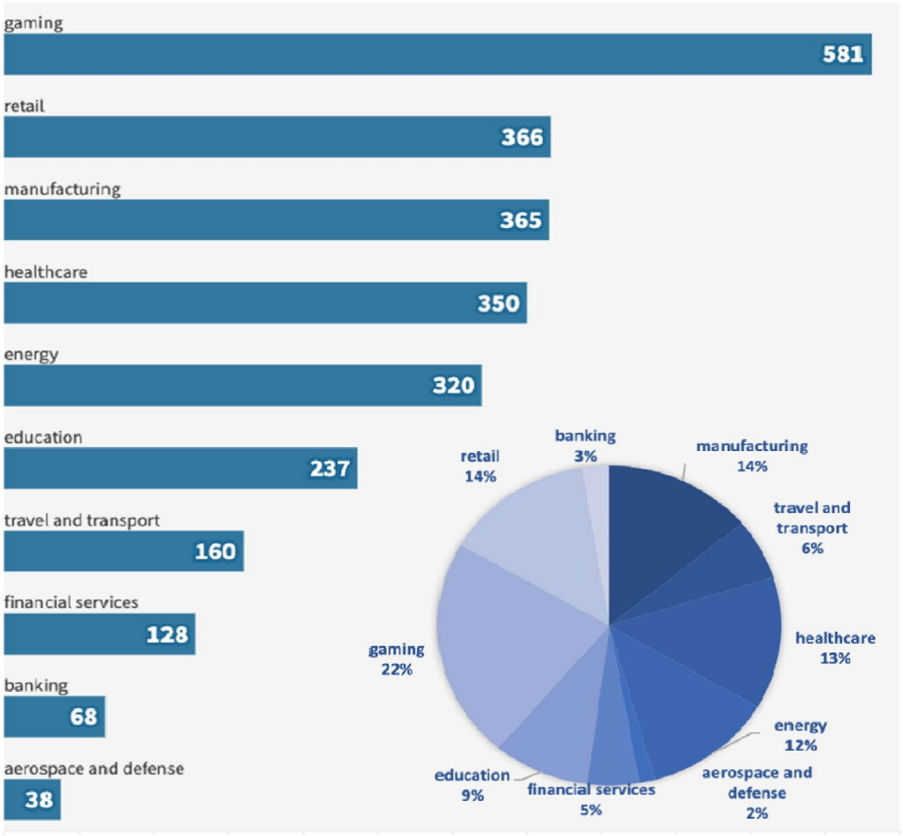

FIGURE 2 | Overview of the most cited industries in the consulting reports on the Metaverse. [Color figure can be viewed at wileyonlinelibrary.com]

As mentioned above, the emergence of the Metaverse is expected to have a major impact on many sectors and industries different from the gaming one. As such, the narrative of the gaming industry tells only a part of the story (only 22% of the reports). According to the reports collected in our dataset, the Metaverse may have an impact also on other relevant sectors and industries, such as retail (14%), manufacturing (14%), healthcare (13%), energy (12%), education (9%), travel and transport (6%), financial and payment services (5%), banking (3%), and aerospace (2%) (see Figure 2).

Several Metaverse-based services have been identified in the reports as promising by consulting analysts. These services show the potential of the technology to integrate with existing processes and activities to create value and deliver new solutions (Ferrigno et al. 2023; Ritala et al. 2024). One of such examples is Stivr, developed at the Stanford University Virtual Human Interaction Lab, which uses VR to train staff on workplace safety and customer service. The technology has reduced the workers' risks and improved customer satisfaction. Second, the reports highlight the collaboration between NVIDIA and BMW in the manufacturing industry as a prime example of the factory of the future. This partnership uses the notion of *digital twin* to simulate processes and activities to improve performance. Third, the Scripps Clinic in California is lauded as a leading healthcare institution for leveraging a novel mixed-reality headset to provide a 3D holographic view of the surgical plan, which is superimposed on the patients' anatomy.

As the Metaverse continues to evolve, these and other promising projects will need to evolve accordingly to meet evolving demands. In the remainder of this article, we highlight and discuss the main barriers to the Metaverse adoption.

5 | Emerging Themes in Metaverse Adoption Barriers

By using ATLAS.ti 23.1.0 software to repeatedly dig in and out through the data collected and analyze the content of the 199 consulting companies' reports containing Metaverse-related analyses and studies, we generated our first-order codes. The primary coding was created by mirroring the original content of the dataset as closely as possible. In the first step, 51 first-order codes were created. We then proceeded to the next phase by improving the codes to allow the generation of second-order themes, resulting in the generation of 14 themes.

In the final phase of our thematic analysis, drawing on significant contributions on technology adoption barriers and particularly on the TOE framework (Gökalp et al. 2022), we employed an abductive method to analyze the emerging themes and define the overarching dimensions. Four overarching dimensions to the Metaverse adoption became apparent. In particular, the themes explicate various barriers to the Metaverse adoption: (1) technological barriers; (2) organizational barriers; (3) environmental barriers; and (4) human barriers. This condition clearly

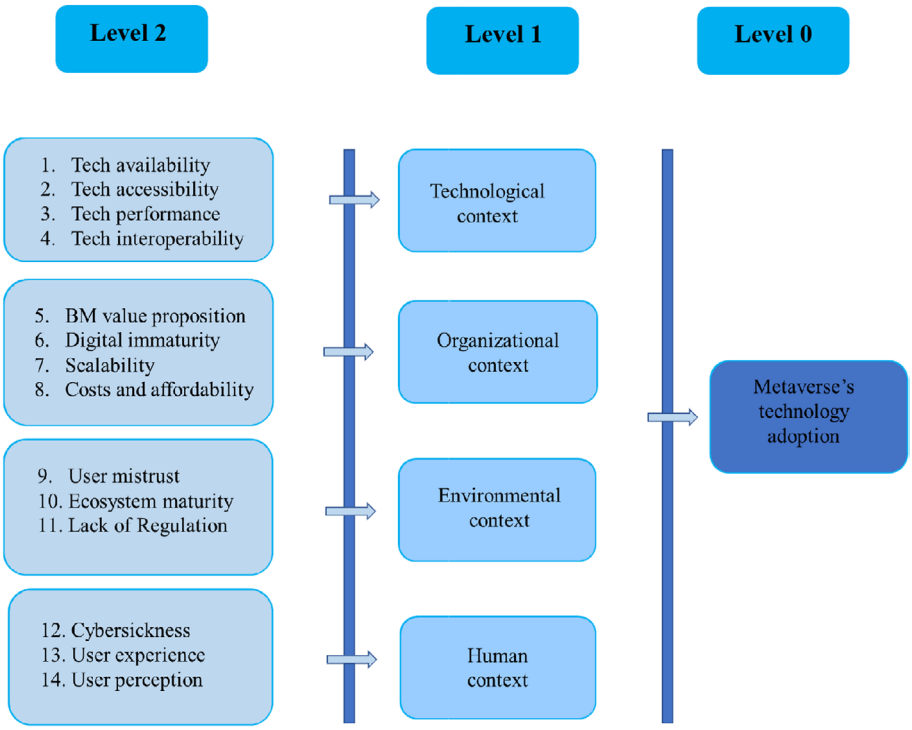

FIGURE 3 | Enriched TOE framework with sub-factors diagram linked to Metaverse adoption barriers (adapted for the application to the Metaverse from Gökalp et al. 2022). [Color figure can be viewed at wileyonlinelibrary.com]

shows a fourth pillar supplementing the original TOE framework that included only three factors (i.e., technological, organizational, and environmental) but fell short of considering the human factor. As a result, a key methodological insight of our analysis is the development of an enriched TOE framework illustrating the entire spectrum of the four key barriers tied to the Metaverse adoption (Figure 3).

5.1 | Technological Barriers

From a technological point of view, the analysis brings to light the following second-level themes: (1) technology availability; (2) technology accessibility; (3) technology performance; and (4) technology interoperability. First, the speed of technical advancement and the early degree of maturity according to which the Metaverse is to be considered in its infancy have both an impact on the adoption of the Metaverse. Therefore, based on the data collected, aspects shown to be pretty relevant at this stage include those related to the limited availability of advanced performing technologies and, more generally, to the technological development that is yet required to make the Metaverse available and usable in a mass-market setting. To be more specific, in certain circumstances, such as the possibility of having a smooth and simple transition between VR, AR, and the physical world, there is a need to further develop technologies that, at the present time, can cause the user to experience physical difficulties, such as latency times.

> Technologies that enable more convenient and effective high-quality AR and immersivity, such as lightweight glasses and headsets that provide easy transition between VR, AR, and the physical world without bulky equipment, will be transformative in terms of adoption (Excerpt n.57).

Second, the problem of the technology limited access becomes immediately relevant and apparent. The accessibility problem arises when the technology is available, but is not yet accessible sufficiently to businesses that need it to develop products and processes based in the Metaverse, or when it is not accessible directly to end-users that target to maximize their gratification from their Metaverse experience. For example, this condition refers to the accessibility of hi-speed internet services and its associated devices in specific geographical regions, which may hence be critically penalized vis-à-vis the vast choice of services accessible in other world's regions.

> Advances in information technologies in recent years have broken down physical, social, and geographical barriers. Now an increasingly large portion of the population has access to online connected tools and connection speeds (Excerpt n.4).

Third, the consulting reports analyzed usually emphasize the performance inadequacies of the technologies currently available. To be more specific, elements involving connection speed and specialized hardware capabilities to enable high-quality use of the services based in the Metaverse are considered to be keystones for the acceptance and the adoption of the technology. The consensus among consulting analysts that has emerged underscores that there is a significant space for improvement in this area.

> However, there are signs that accelerating advances in hardware, at both an infrastructure and man-machine interface level, will reduce some of the barriers to wider adoption in the years to come (Excerpt n.8).

Finally, a widespread adoption of the Metaverse is also hampered by the complex technological characteristics of certain technologies, such as technical interfaces. This condition occurs because of the problems generated by technological complexity and lack of user-friendliness that make it difficult to use them. Moreover, users' desire to swap their avatars over different Metaverse contexts is actually far from being fulfilled, due to the lack of interoperability among the various "Metaverses" (Park et al. 2023).

> The presence of unfamiliar and complicated user experiences represents a possible barrier to mass adoption of Web 3.0 (Excerpt n.5).

5.2 | Organizational Barriers

Four second-order themes have been extracted regarding organizational barriers: (1) business model value proposition; (2) digital immaturity; (3) scalability; and (4) cost and affordability of the Metaverse solutions. First, consulting analysts point to a lack of awareness of the technology among managers, who appear to be much less than fully aware of the potential the Metaverse could bring to their firms. This is a problem because managers are the ones who are ultimately responsible for taking business decisions. A few exceptions are those fields in which the Metaverse has already developed a sound presence since the beginning, such as education, gaming, and retail, especially concerning the fashion industry. However, it is not always the case, even in such fields, that managers have developed an advanced understanding of how the Metaverse might help them speed up the process of value creation within their firms.

> Mindset could actually be the biggest barrier for Web3 today because not enough people are thinking strategically about the impacts it will have on their business (Excerpt n.15).

Second, consulting reports highlight that it is difficult to involve individuals (e.g., employees and middle managers) in adopting widely the technology in their workplaces. Due to its complexity, an effective implementation of the Metaverse requires significant investment in training or retraining of the individuals operating in companies at various levels (e.g., employees and middle managers). Due to the lack of understanding or resistance to change or, in other words, to the presence of relative "digital immaturity," the effective participation in the adoption of this technology by firms' individuals is hence a remarkable challenge for several companies.

> Further, much of investor confidence hinges on factors like the prospects of improved interoperability across Metaverse platforms, broader workplace adoption and more affordable hardware options (Excerpt n.103).

Third, to accomplish the scaling up from the laboratory to the market, it is necessary to expand the development of teams and areas related to the Metaverse, as well as to advance technology-based projects that are currently in the pipeline. For this reason, it is also necessary to redirect attention toward the expansion of Metaverse-related teams and areas, as well as to scaling up projects from the laboratory to real-world applications.

> Key challenges for greater adoption are being able to scale up from laboratory to market readiness, along with overcoming technical challenges such as following or allowing the motion of the user with minimum resistance (Excerpt n.59).

Lastly, accessing the technology required to operate in the Metaverse poses significant economic challenges. In particular, the vast majority of the reports pinpoint the presence of significant factors curbing the deployment of the Metaverse for both firms and end-users. The latter is referred to in terms of the costs for the end-user, as concerns both the infrastructure required to benefit from the Metaverse, such as high-speed connections, and the equipment required for its use (e.g., Oculus in the case of Meta). These costs, as earlier indicated, can be broken down into two categories: (1) the cost of the infrastructure required to fully enjoying the Metaverse; and (2) the cost of the equipment required for its use.

> However, AR VR devices can be expensive, which acts as a barrier to mass adoption. This affordability barrier could create disparities in access for people to the Metaverse, and could exacerbate existing digital divides across genders and age groups. However, these devices may become more affordable over time as technologies mature (Excerpt n.20).

5.3 | Environmental Barriers

The environmental context of reference presents a number of obstacles that need to be overcome before the Metaverse is adopted. Mistrust and resistance on the part of the users, a surrounding environment that is yet on its way to reaching maturity, and the lack of a definite regulatory framework are the three environmental hurdles that have been identified. As such, unfavorable conditions may arise that make it more difficult for prospective users to fully accept and implement the Metaverse as well as the technological solutions that are based on it. The simple ignorance of the technology may ignite mistrust and reluctance in using it, as it may be the fear or anxiety of not being able to oversee and manage the tools in an appropriate and secure manner. Tools include such instruments as private keys associated with payment means that are used in the Metaverse.

> Some of the biggest challenges to the adoption and use of VR by businesses may be cultural. Apathy or distrust of new technologies are common reactions. There may also be confusion about how the technology will be used, how it works or what the experience will be like (Excerpt n.98).

Because of the complex nature of the technology that requires the availability of suitable network infrastructure, high-performance devices, and attractive usage options to acquire recognition, firms are expected to complement each other in adopting Metaverse content and solutions by interacting and coordinating with one another. As a result, interactions between and among firms operating at various levels of the Metaverse value chain are crucial and may ultimately provide valuable nutrients to the Metaverse environment that, while in progress, is concurrently distant from reaching maturity.

> As more companies in both B2B and B2C industries interact with users in Metaverse environments, new content and solutions from both incumbents and startups are powering a maturing ecosystem and accelerating broader adoption. New content and solutions from both incumbents and startups are powering a maturing ecosystem and accelerating broader adoption (Excerpt n.95).

Summing up, according to the content of the set of consulting reports examined one of the relevant factors that is preventing the widespread use of the Metaverse is the scarcity or absence of suitable regulation. As such, data privacy and security are poised at severe risk. Analysts agree that the regulator is unable to effectively circumscribe the regulatory application areas because of the lack of relevant user experience that in turn hampers the regulator from legislating in a consistent manner. The low degree of Metaverse adoption, in addition, hinders the capacity of regulatory authorities to step in by developing appropriate directives and specific policies.

> Limited adoption prevents intervention from regulators. The lack of a standard definition and evolving understanding of the concept has people confusing it for other technologies (Excerpt n.147).

5.4 | Human Barriers

Regarding the human barriers associated with the adoption of the Metaverse, three second-order themes have been identified: (1) cybersickness; (2) user experience; and (3) user perception. First, there are certain aspects of the Metaverse that humans cannot yet completely tolerate due to their physiological and psychological limitations. These limitations restrict the individual's capacity to use a technology for extended periods of time without developing the condition known as "cybersickness."

> A condition known as cybersickness (nausea or dizziness caused by the difference between what the eyes see and the motion sensed by the body) has limited adoption at scale, but this is expected to be mitigated through low latency tracking and rendering, as well as by gradual acclimation to the technology (Excerpt n.150).

Second, certain aspects of the technology are especially related to its early stage of development and, in such case, to the availability of high-quality experiences expressly tailored for Metaverse pioneers. While the offering of such experiences is improving rapidly, it is heretofore not fully developed, thereby uncovering a process that is driven by network effects. As more users enter the Metaverse, the technology will continue to advance and the availability of a set of high-quality user experiences will surely increase, thereby creating a positive feedback loop especially when the tipping point has been achieved.

> Indeed, surveys have found that the two biggest barriers to a wider adoption of XR are the user experience and limited content, both of which are improving quite fast (Excerpt n.25).

Finally, it is worthwhile mentioning that the factors influencing the end-users of the services tailored on the Metaverse are extremely important when it comes to identifying the adoption hurdles. Potential users do not typically have adequate knowledge of the technology and, as a result, are not in the position to understand its prospective usefulness and applications. Consequently, there is soaring risk that they would automatically consider the Metaverse as lacking economic value.

> A social barrier may emerge for the Metaverse similarly to what happened for the current social networks that characterize web 2.0. On those ones the ideological debate about the relationship between advantages and disadvantages is very broad (adapted from Excerpt n.5).

6 | Discussion Remarks on the Metaverse Adoption

Today, the Metaverse is supposedly undergoing different circumstances as concerns its technological, organizational, environmental, and human contexts. Nonetheless, we wonder: how far away are we really from the world that Neal Stephenson's depicted in his 2003 novel *Snowcrash*, when the term Metaverse made its initial inception (Golf-Papez et al. 2022; Plangger and Campbell 2022; Stephenson 2003)? In answering this research question, this article offers both theoretical and practical implications.

6.1 | Theoretical Implications

This research makes several contributions to the literature. First, we discussed the role of consulting companies intended as "enabling actors" that may facilitate the spread of Metaverse

adoption. In the process, we presented an enriched framework for understanding the key hurdles to Metaverse adoption based on the received TOE framework. The framework outlines four main barriers (i.e., technological, organizational, environmental, and human barriers) that executives are expected to be aware of when adopting a new technology such as the Metaverse. Our revised framework identifies four main types of barriers—technological, organizational, environmental, and human—that decision-makers should carefully consider when approaching a complex and immersive technology such as the Metaverse.

Notably, our framework extends the classic three-dimensional TOE model by explicitly introducing the human barrier as a fourth, distinct but related domain. This contribution directly addresses recent calls in the literature to enhance the TOE model by incorporating human drivers, which have often been overlooked in prior research. For example, Rehman et al. (2024, 13) explicitly acknowledge that their study "does not account for human factors in the TOE framework, despite existing evidence on their importance for the adoption and successful implementation of new technologies." In line with Marques et al. (2011), who argued that human factors should be integrated into innovation frameworks to better understand how they shape technology adoption, we highlight the critical role of factors such as awareness, motivation, and psychological readiness. By integrating the human dimension into the TOE framework, this work provides a more holistic four-legged understanding of the conditions under which organizations can effectively embrace Metaverse technologies.

Second, we suggested a consistent appreciation of consulting companies' impact on the adoption of Metaverse technology by firms. Specifically, we have explored the brokerage role of consulting companies in promoting the dissemination of knowledge and information about the Metaverse and in helping managers shun the pitfalls that come up from starting a Metaverse project. In doing so, as follows an automated thematic analysis of a set of publicly available reports on the Metaverse released by top consulting companies over 2021–2023, we categorized the contours of the four main barriers affecting the adoption of Metaverse technology and its speed.

Last but not least, we also provide a nuanced understanding of the nature of the challenges emerging from Metaverse adoption. Actually, according to our findings, the challenges associated with Metaverse adoption (and adoption speed) seem to converge toward two differing directions. Specifically, the former direction encompasses aspects related to the evolution of Metaverse technology and its physical and spatial accessibility as well as its economic convenience (Dia 2025; Lanteri et al. 2025). The latter, on the other hand, refers to the so-called "soft" aspects of the Metaverse, such as the human factor or the adopters' awareness, availability, and aspiration to use this kind of technology, as well as their ability to withstand the experiences it creates. Clearly, the two sides of the coin are interconnected. According to the enhanced thematic analysis of the consulting reports, there is widespread optimism about the first aspect. As such, consultants tend to raise managerial awareness as concerns the perception of favorable prospects related to Metaverse technological adoption and adoption speed. While they generally see it as a less sensitive aspect, the spread of information contained in the consulting reports is likely to have a high impact also on the other side of the coin, which is related to disseminating information about the Metaverse and providing ideas and suggestions to potential customers to encourage its use or the provision of services based on the Metaverse. As such, the active intervention of consulting companies may ultimately accelerate the Metaverse S-curve.

6.2 | Managerial Implications

Furthermore, we gathered a few indications that managers need to take into account in implementing Metaverse-related projects. In fact, the widespread inception of COVID has hastily accelerated the acceptance of digital services, the use of e-commerce, and the organization of virtual meetings. Advances in a suite of digital technologies, the growing influence of tech giants and related connection to platforms and apps, and the recognition of the Metaverse's applicability have fueled the preparation of the ground for its adoption. As such, we present a menu of managerial suggestions for companies willing to adopt Metaverse projects in Table 2.

Based on our findings, managers are given a series of helpful solutions to overcome each of the identified barriers to adopting the Metaverse. They may coordinate them in order to expedite the adoption process within their organizations. As such, managers need to keep not only active, but proactive, embrace change, and be mindful of the evolving landscape of the Metaverse that has surfed over almost two decades from Second Life's initial (unsuccessful) inception. The Metaverse adoption process bears, in fact, the potential to reshape an entire gamut of industries and ecosystems and generate a suite of unseen and unexpected new opportunities. However, the managers who can mindfully surf these waves are inevitably the ones that accept tackling the kinds of technological, organizational, environmental, and human challenges that clearly limit today the Metaverse adoption.

6.3 | Limitations and Future Research

While presenting some fresh insights, this article is also subject to a suite of limitations that future research may address. First, while we identify key barriers to Metaverse adoption within the TOEH framework, we do not explore whether or how companies have successfully overcome these obstacles. Although we propose potential lines of action for firms seeking to expand their use of Metaverse technologies, our analysis does not include concrete case studies of successful implementation—an area that future research could investigate in depth.

Second, while our thematic analysis yielded a gamut of valuable insights, the primary data source—press releases and public reports—is typically intended for non-specialist audiences. As such, they may lack the depth and specificity of academic or practitioner-focused research. Future studies could enrich our findings by conducting interviews or surveys with managers who have hands-on experience with Metaverse technologies.

Finally, although we manually collected and analyzed a substantial set of documents from the websites of leading consulting

TABLE 2 | Avenues for companies' adoption of Metaverse projects.

Managerial issue	Suggestions for managers	Related barrier
Promising Metaverse-based services	Explore promising Metaverse-based services identified in reports provided by consulting companies. These services can integrate with existing processes, create value, and deliver innovative solutions. Managers should be open to such innovative applications.	Digital immaturity, scalability (organizational)
Technological barriers	Far from being naïve adopters, managers need to be aware of the gamut of technological challenges posed by the Metaverse adoption, including technology availability, accessibility, performance, and interoperability. They should closely monitor the development of various Metaverse-related technologies to ensure it aligns with their business goals and needs.	Tech availability, tech accessibility, tech performance, tech interoperability (technological)
Organizational awareness	Increase their awareness of the Metaverse potential. They should understand to what extent the Metaverse can enhance their existing business models, instill the conception and design of new ones, and generate economic and social value. A proactive mindset toward digital technology development and adoption is then crucial.	BM value proposition (organizational)
Digital immaturity	Recognize that digital immaturity of employees and middle-level managers can be a significant hurdle to Metaverse adoption. Investing in training and retraining programs to familiarize employees and middle-level managers with this complex technology is essential for avoiding adoption failure and ensuring instead adoption success.	Digital immaturity (organizational)
Scalability challenges	As the Metaverse evolves over time, managers should focus on how and when scaling up their teams and projects. At a point in time, investing in projects development may become necessary to transition from the laboratory to real-world applications in an effective manner. It is important to be ready to spot in advance the right time to do so.	Scalability (organizational)
Economic considerations	The cost and affordability of Metaverse solutions are important factors to consider. Managers should be prepared to allocate and deploy resources and develop capabilities to meet the economic challenges associated with Metaverse adoption, for both their companies and end-users.	Cost and affordability (organizational)
Environmental hurdles	Be aware of environmental obstacles, such as user mistrust and resistance. These hurdles can stem from a lack of understanding or fear of the technology. As for any technology, building user trust is essential for successful Metaverse adoption.	User mistrust (environmental)
Regulatory uncertainty	Recognize that regulatory frameworks both in the United States, Europe, and China are inevitably evolving, which can impact data privacy and security. Managers should stay constantly informed on these evolutions in regulatory frameworks and be prepared to adapt to changing regulations in the Metaverse space.	Lack of regulation (environmental)
Broad impact beyond gaming	Recognize that the Metaverse is not limited to the gaming industry. It is expected to have a major impact on industries such as retail, manufacturing, education, healthcare, energy, and financial services. They need to be prepared for these changes across a variety of industries and ecosystems.	Ecosystem maturity (environmental)
User experience enhancement	Understand that the user experience and content quality are essential factors influencing Metaverse adoption. As user experiences improve and high-quality content becomes more widespread, adoption is likely to increase.	Cybersickness and user experience (human)
Consulting companies as "enabling actors"	Consulting companies play a crucial role in disseminating information and facilitating Metaverse adoption. Consulting firms can expedite the Metaverse adoption curve by generating optimism, providing guidance, and useful services for users.	User perception (human)

firms, our dataset covers the period spanning from 2021 to 2023. Despite its uniqueness, this temporal scope may limit the applicability of our findings to the current evolving technological landscape. Future research could extend this analysis to more recent materials, particularly in light of the widespread adoption of emerging technologies such as agentic AI and large language models, which are increasingly shaping the emergence of dominant designs in the digital market.

Data Availability Statement

The data that support the findings of this study are available from the corresponding author upon reasonable request.

Endnotes

[1] https://influencermarketinghub.com/metaverse-stats/.

[2] https://www.statista.com/statistics/1295784/metaverse-market-size/.

[3] www.bcg.com.

[4] The companies were listed on the following website: https://managementconsulted.com/top-consulting-firms/#:~:text=The%20top%20firms%20in%20this,EY%2C%20PwC%2C%20and%20Wavestone.

References

Abushaikha, I., O. M. Bwaliez, M. H. Yaseen, S. Hamadneh, and T. K. Darwish. 2025. "Leveraging Animal Feed Supply Chain Capabilities Through Big Data Analytics: A Qualitative Study." *International Journal of Quality & Reliability Management* 42, no. 9: 2605–2625.

Agrawal, R., and V. A. Wankhede. 2025. "Breaking the Virtual Wall: Analysing Barriers to Metaverse Adoption in Manufacturing Industries." *International Journal of Organizational Analysis*, ahead of print.

Alfaisal, R., H. Hashim, and U. H. Azizan. 2024. "Metaverse System Adoption in Education: A Systematic Literature Review." *Journal of Computers in Education* 11: 259–303.

Aliman, D. N., T. Hennig-Thurau, and A. Henke. 2024. "Navigating the Enterprise Metaverse: How Virtual Reality Affects Business Agility and Meeting Outcomes." *Business Horizons* 67, no. 6: 691–704.

Anzolin, G., and E. O'Sullivan. 2025. "Innovation Intermediaries in the Digital Transformation Process. A Comparative Case Study of Research and Technology Organisations in the US and the UK." *Technovation* 142: 103200.

Bloomfield, B. P., and A. Danieli. 1995. "The Role of Management Consultants in the Development of Information Technology: The Indissoluble Nature of Socio-Political and Technical Skills." *Journal of Management Studies* 32, no. 1: 23–46.

Buhalis, D., M. S. Lin, and D. Leung. 2022. "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, no. 2: 701–716.

Butt, A. S., M. Alghababsheh, and U. Awan. 2025. "Barriers to the Adoption of the Metaverse in Digital Supply Chains." *Journal of Enterprise Information Management*, ahead of print.

Caloffi, A., A. Colovic, V. Rizzoli, and F. Rossi. 2023. "Innovation Intermediaries' Types and Functions: A Computational Analysis of the Literature." *Technological Forecasting and Social Change* 189: 122351.

Chatterjee, M. 2024. "Technology Landscape Analysis: Metaverse." *IEEE Engineering Management Review* 52, no. 2: 125–146.

Colovic, A., A. Caloffi, F. Rossi, S. Paladini, and M. Bagherzadeh. 2024. "Innovation Intermediaries and Emerging Digital Technologies." *Technovation* 133: 103022.

Contarino, M. 2023. "What Are the Key Factors Influencing the Adoption of the Metaverse in the Consulting Industry?" Master's thesis, University of Twente.

Dia, H. 2025. "The Role of the Metaverse in Shaping the Future of Business Innovation." *Thunderbird International Business Review* 67, no. 2: 183–196.

Dosi, G. 1982. "Technological Paradigms and Technological Trajectories: A Suggested Interpretation of the Determinants and Directions of Technical Change." *Research Policy* 11, no. 3: 147–162.

Dwivedi, Y. K., L. Hughes, A. M. Baabdullah, et al. 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.

El-Haddadeh, R. 2020. "Digital Innovation Dynamics Influence on Organisational Adoption: The Case of Cloud Computing Services." *Information Systems Frontiers* 22, no. 4: 985–999.

Elmasry, T., E. Hazan, K. Hamza, et al. 2022. "Value Creation in the Metaverse: The Real Business of the Virtual World." McKinsey & Company.

Esposito, M., D. Halkias, J. Diaz, and T. Tse. 2025. "Environmental and Climate Impacts of the Metaverse." *Thunderbird International Business Review* 67, no. 4: 849–869.

Ferrigno, G., N. Di Paola, K. F. Oguntegbe, and S. Kraus. 2023. "Value Creation in the Metaverse Age: A Thematic Analysis of Press Releases." *International Journal of Entrepreneurial Behavior & Research* 29, no. 11: 337–363.

Gökalp, E., M. O. Gökalp, and S. Çoban. 2022. "Blockchain-Based Supply Chain Management: Understanding the Determinants of Adoption in the Context of Organizations." *Information Systems Management* 39, no. 2: 100–121.

Golf-Papez, M., J. Heller, T. Hilken, et al. 2022. "Embracing Falsity Through the Metaverse: The Case of Synthetic Customer Experiences." *Business Horizons* 65, no. 6: 739–749.

Gupta, M., and S. K. Jauhar. 2023. "Digital Innovation: An Essence for Industry 4.0." *Thunderbird International Business Review* 65, no. 3: 279–292.

Heo, J. 2025. "Marketing Luxury Fashion in the Metaverse: The Case of Gucci Town on Roblox." *Thunderbird International Business Review*, ahead of print.

Howells, J. 2006. "Intermediation and the Role of Intermediaries in Innovation." *Research Policy* 35, no. 5: 715–728.

Hu, Q., S. Williams, R. Mason, and P. Found. 2019. "Knowledge Management in Consultancy-Involved Process Improvement Projects: Cases From Chinese SMEs." *Production Planning & Control* 30, no. 10–12: 866–880.

Kaplan, A. M., and M. Haenlein. 2009. "The Fairyland of Second Life: Virtual Social Worlds and How to Use Them." *Business Horizons* 52, no. 6: 563–572.

Kaplan, A., and M. Haenlein. 2020. "Rulers of the World, Unite! The Challenges and Opportunities of Artificial Intelligence." *Business Horizons* 63, no. 1: 37–50.

Keegan, B. J., I. P. McCarthy, J. Kietzmann, and A. I. Canhoto. 2024. "On Your Marks, Headset, Go! Understanding the Building Blocks of Metaverse Realms." *Business Horizons* 67, no. 1: 107–119.

Kelly, J. 2023. "Whatever Happened to the Metaverse? Enthusiasm for a Virtual Future Is Draining Away and So Is Investment." *Financial Times*, February 16.

Kerstens, A., and D. J. Langley. 2025. "An Innovation Intermediary's Role in Enhancing Absorptive Capacity for Cross-Industry Digital Innovation: Introducing an Awareness Capability and New Intermediary Practices." *Journal of Business Research* 196: 115426.

Kim, Y. 2023. "Not Just for Play: Why the Metaverse Should Be Leveraged for Co-Creation." *Business Horizons* 66, no. 6: 795–802.

Kraus, S., D. K. Kanbach, P. M. Krysta, M. M. Steinhoff, and N. Tomini. 2022. "Facebook and the Creation of the Metaverse: Radical Business Model Innovation or Incremental Transformation?" *International Journal of Entrepreneurial Behavior & Research* 28, no. 9: 52–77.

Kshetri, N., and Y. K. Dwivedi. 2024. "How Can Virtual and Augmented Reality Facilitate International Business?" *Thunderbird International Business Review* 66, no. 2: 201–210.

Lanteri, A., M. Esposito, and M. Cappuccio. 2025. "Maximizing the Economic, Environmental, and Social Impact of the Metaverse." *Thunderbird International Business Review*, ahead of print.

Lynch, P. D., K. A. Lynch, and O. Shanti. 2025. "Building Metaverse-Ready Businesses: Insights From Global Literacy Trends." *Thunderbird International Business Review*, ahead of print.

Mancuso, I., A. M. Petruzzelli, A. Urbinati, and K. Matzler. 2024. "Leadership in the Metaverse: Building and Integrating Digital Capabilities." *Business Horizons* 67, no. 4: 331–343.

Marques, J. P. C., T. F. P. D. Silva, and J. B. Lima. 2011. "Towards a Framework for Organizational Knowledge Creation and Appropriation: The Human Factor as an Antecedent." *Journal of the Knowledge Economy* 3, no. 3: 406–420.

Murray, A., D. Kim, and J. Combs. 2023. "The Promise of a Decentralized Internet: What Is Web3 and How Can Firms Prepare?" *Business Horizons* 66, no. 2: 191–202.

Nelson, R., and S. Winter. 1977. "In Search of a Useful Theory of Innovation." *Research Policy* 6, no. 1: 36–76.

Park, A., M. Wilson, K. Robson, D. Demetis, and J. Kietzmann. 2023. "Interoperability: Our Exciting and Terrifying Web3 Future." *Business Horizons* 66, no. 4: 529–541.

Pinto, M. D. R., I. Saur-Amaral, and C. M. Brito. 2017. "Innovation in Service Industry: The Role of Consultants." *Journal of Innovation Management* 5, no. 4: 74–102.

Plangger, K., and C. L. Campbell. 2022. "Managing in an Era of Falsity: Falsity From the Metaverse to Fake News to Fake Endorsement to Synthetic Influence to False Agendas." *Business Horizons* 65, no. 6: 713–717.

Rehman, A., R. K. Behera, M. S. Islam, Y. A. Elahi, F. A. Abbasi, and A. Imtiaz. 2024. "Drivers of Metaverse Adoption for Enhancing Marketing Capabilities of Retail SMEs." *Technology in Society* 79: 102704.

Ritala, P., M. Ruokonen, and A. Kostis. 2024. "The Metaverse Flywheel: Creating Value Across Physical and Virtual Worlds." *California Management Review* 66, no. 4: 80–101. https://doi.org/10.1177/00081256241252700.

Robertson, D. 2022. "Introducing the 'Gross Metaverse Product'." *Politico*, May 10.

Rogers, E. M. 1983. *Diffusion of Innovations*. 4th ed. Free Press.

Schilling, M. A. 2012. *Strategic Management of Technological Innovation*. 4th ed. McGraw-Hill/Irwin.

Schumpeter, J. A. 1942. *Capitalism, Socialism, and Democracy*. 3rd ed. Harper & Row.

Sooampon, S. 2025. *Fundamentals of Managing Technology Ventures*. Springer Nature Singapore.

Stephenson, N. 2003. *Snowcrash: A Novel*. Spectra.

Swanson, E. B. 2010. "Consultancies and Capabilities in Innovating With IT." *Journal of Strategic Information Systems* 19, no. 1: 17–27.

Tornatzky, L. G., and M. Fleischer. 1990. *The Processes of Technological Innovation*. Lexington Books.

Van Lente, H., M. Hekkert, R. Smits, and B. A. S. Van Waveren. 2003. "Roles of Systemic Intermediaries in Transition Processes." *International Journal of Innovation Management* 7, no. 3: 247–279.

Weigelt, C., and M. B. Sarkar. 2009. "Learning From Supply-Side Agents: The Impact of Technology Solution Providers' Experiential Diversity on Clients' Innovation Adoption." *Academy of Management Journal* 52, no. 1: 37–60.

Younis, H., N. Shbikat, O. M. Bwaliez, I. Hazaimeh, and B. Sundarakani. 2025. "An Overarching Framework for the Successful Adoption of IoT in Supply Chains." *Benchmarking: An International Journal* 31, no. 7, ahead of print.

Younis, H., O. M. Bwaliez, M. Al-Okaily, and M. I. Tanveer. 2024. "Revolutionizing Supply Chain Management: A Critical Meta-Analysis of Empowerment and Constraint Factors in Blockchain Technology Adoption." *Business Process Management Journal* 30, no. 5: 1472–1500.

Zhu, K., K. L. Kraemer, and S. Xu. 2006. "The Process of Innovation Assimilation by Firms in Different Countries: A Technology Diffusion Perspective on e-Business." *Management Science* 52, no. 10: 1557–1576.