Do small- and medium-sized companies intend to use the Metaverse as part of their strategy? A behavioral intention analysis

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Abstract

Purpose – The purpose of the research is to analyze the factors that determine the intention of small- and medium-sized enterprises (SMEs) to adopt the Metaverse. For this purpose, the analysis of the effort expectancy and performance expectancy of the constructs in relation to business satisfaction is proposed.

Design/methodology/approach – The analysis was performed on a sample of 182 Spanish SMEs in the technology sector, using a PLS-SEM approach for development. For the confirmation of the model and its results, an analysis with PLSpredict was performed, obtaining a high predictive capacity of the model.

Findings – After the analysis of the model proposed in this research, it is recorded that the valuation of the effort to be made and the possible performance expected by the companies does not directly determine the intention to use immersive technology in their strategic behavior. Instead, the results obtained indicate that business satisfaction will involve obtaining information, reducing uncertainty and analyzing the competition necessary for approaching this new virtual environment.

Originality/value – The study represents one of the first approaches to the intention of business behavior in the development of performance strategies within Metaverse systems. So far, the literature has approached immersive systems from perspectives close to consumer behavior, but the study of strategic business behavior has been left aside due to the high degree of experimentalism of this field of study and its scientific approach. The present study aims to contribute to the knowledge of the factors involved in the intention to use the Metaverse by SMEs interested in this field.

Keywords Metaverse, Behavioral intention, PLS-SEM, Effort expectancy, Performance expectancy

Paper type Research paper

1. Introduction

Technological developments have changed the way society operates and how consumers and businesses interact with each other, first through connection to the system (primary Internet-email and e-commerce), then through simple interaction between users (Internet of platforms-Web 2.0), and now (the third era of the internet, the so-called Decentralized Internet) into a future of global connection and immersion in a virtual world (De Regt *et al.*, 2021). This last aspect represents a disruption with the forms of interaction in society, as virtual reality (VR) experiences allow people to spend a lot of time in immersive virtual environments and interact with content that is produced in an alternative reality: the Metaverse. Choi and Kim (2017) define Metaverse systems as a three-dimensional spatial representation based on

virtual and augmented reality. These experiences greatly transform the pace at which information is consumed and processed on a daily basis (Mishra *et al.*, 2020), pose major challenges in terms of usability and technological adaptation for companies (Suh and Prophet, 2018), as well as triggering profound controversies regarding the physical, social and psychological implications of immersive technology and the considerations that consumers and companies must take into account (Han *et al.*, 2022).

Based on the above, in the business environment, organizations must assess whether to adopt strategies in the Metaverse environment, taking into account the degree of ease associated with the implementation of a new virtual environment, which is known as effort expectation, and that refers to the cost of resources that would be involved in incorporating a new operating system in a given company (Carvajal *et al.*, 2021; Moriuchi, 2021). In the literature, several authors have related effort expectancy to the difficulty of implementing a new technology (Alam and Uddin, 2018; Nguyen and LE, 2020; Pei-Yee Chin *et al.*, 2020; Xena and Accounting, 2019). In the same way, previous studies have shown that the variable considered as effort expectancy has an impact on the determination of the intention to use a specific tool (Carvajal *et al.*, 2021; Pei-Yee Chin *et al.*, 2020). According to this logic, if a new technology requires less training and implementation effort, its intended use will be higher, so this construct is integrated into our research model.

Following this line of argument, authors such as Kosiba *et al.* (2022) and Pei-Yee Chin *et al.* (2020) have concluded in their research that both the expectation of effort and the expectation of results are the main drivers of business behavior toward the use of a technology. Therefore, the intention to use the Metaverse by a company will be affected by the economic effort and the acquisition of knowledge involved in the implementation of this tool in the organization as well as the ability to adapt to new forms of interaction and innovation that derive from its practical application, thus configuring the fundamental predictors incorporated in our research.

In line with the foregoing, previous studies such as those of Mazzarolo *et al.* (2021), Pozón-López *et al.* (2019), and Vărzaru *et al.* (2021) have identified the degree of satisfaction on the part of companies in the use of the internet, social networks and information systems as a significant construct that models their behavioral intention. Consequently, its relevance was taken into account in the design of the applied model.

The global Metaverse market is growing fast. According to Jeon (2021), it is expected to be worth 280bn U.S. dollars by 2025. This is why companies should value the inclusion of Metaverse systems within their value chain. The example par excellence is the step taken by the technology giant Facebook/Meta to be the pioneer in announcing its move to the virtual ecosystem by building a complete alternative world (Zuckerberg and Newton, 2021). A stage is beginning to dawn in which virtual reality assumes a very prominent role in technology-mediated production and consumption experiences worldwide. According to López Díez (2021) large companies have invested significant amounts (US$10bn) in the Metaverse project and are planning to invest even more in future years. In addition, governments around the world are taking into account the opportunities, risks, and policy implications of the Metaverse. The Korean government hopes to play a leading role in the Metaverse industry, where it plans to allocate 9.3tn won (about 51.6bn yuan) to accelerate digital transformation and cultivate new industries, as well as to help SMEs and venture capital firms to build blockchains (Ning *et al.*, 2021). Also the government of Dubai will host the Blockchain Summit, a mutually beneficial initiative for a transition from a regulated crypto-economy to the Metaverse (Warin, 2022). On the other hand, the European Commission has established that at least 20% of each Member State's recovery plan's budget must be spent on digitalization (European Commission, 2020). The government of Spain has implemented a digital kit by taking advantage of the European resources of the Next Generation program for the digitization of companies and SMEs and their inclusion in the Metaverse (Borrás, 2022). But all these investments are taking place without yet knowing whether their investment will be adopted by SMEs in various sectors to integrate the Metaverse as part of their business. Only a few SMEs,

such as Cerveza MUR, which has expressed its intention to enter the Metaverse to finance itself outside the traditional channels, and as a new form of entrepreneurship, and Qurable has also shown the same intention, but has had to partner with Maria Cher for its immersion in the Metaverse (Bravo, 2022). Then there are individual entrepreneurs with small SMEs such as the artist Beeple who made the NFT format work "Everyday's: The first 500 days" for use in the Metaverse (Yemenici, 2022). These are just some of the examples of the intended use of the Metaverse by SMEs. This perspective seems to indicate that SMEs will have to decide whether to enter the Metaverse in the coming years and offer their customers the possibility of interacting with their products through the incorporation of this technology.

However, the entry into the Metaverse implies the immersion of the business strategy in a new and practically unknown environment, where customers also represent new segments projected through their avatars (Collins, 2008; Papagiannidis *et al.*, 2017). In this sense, the entry into the Metaverse will not only constitute the adaptation of a business strategy through the adoption of a new technology but will be the beginning of a new form of business behavior based on the observation of an unexplored environment, consumers and competition. So far, the focus on technological adoption by SMEs has been on innovations in specific fields or strategies, such as LAN Technology (Anderson and Schwager, 2004), Social Media Marketing (Dahnil *et al.*, 2014), Open Source Software (D Macredie and Mijinyawa, 2011), Information and Communications Technology (Hashim, 2015; Molinillo and Japutra, 2017), E-commerce (Abdulhakeem *et al.*, 2017), Cloud Computing Services (Skafi *et al.*, 2020), and Blockchain Technology (Sun *et al.*, 2021). To a greater or lesser extent, they have involved modifications or partial adaptations in the strategies of the different companies for the technological integration of advances. However, the Metaverse is the construction of a new environment, an ecosystem to be built, which will be the meeting point of the future for companies and consumers (Toraman, 2022).

With regard to the analysis of SMEs, there have long been calls for research and understanding of the specific problems of SMEs in the face of the avalanche of new technological changes that have been offered (Dahnil *et al.*, 2014). But, above all, this demand has been accentuated by the magnitude and significance that these changes have brought to the reality of SMEs. Compared to large companies, most SMEs perceive the obstacles of implementing new technologies in their business operations as a costly, risky, and complex initiative (Ledesma-Chaves and Arenas-Gaitán, 2022).

However, according to the theory about SMEs, they can benefit from certain characteristics according to their structure when managing new environments and adopting emerging technologies. Examples are their ability to adapt and develop key competencies, become a learning organization, converting risks into opportunities, and their proximity to their environment that enables them to better raise capital for investments (Alberti *et al.*, 2018). More concretely, in an environment under construction such as the Metaverse, SMEs can benefit from elements such as a lesser burden and bureaucracy in developing new procedures, faster decision processes and shorter decision chains, flexibility to adapt quickly to changes, more effective internal communications, and a faster and more adaptive learning capacity (Seville *et al.*, 2015). Therefore, the general objective of this research is to know the intention of SMEs to adopt immersive technology models and develop strategies within the Metaverse, taking into account whether the company's own satisfaction is influenced by effort expectations and performance expectations.

2. Theoretical background
2.1 Strategic behavior of companies in the METAVERSE
In recent years, there have been three major waves of technological innovation, the introduction of personal computers, the internet, and mobile devices. Currently, the fourth wave of computer

innovation is developing around spatial and immersive technologies, such as virtual reality (VR) and augmented reality (AR) where it is giving way to a fifth wave where the Metaverse is the protagonist (Azar *et al.*, 2022). The Metaverse is a virtual reality (VR) space using the internet and augmented reality (AR) through avatars and software agents (Joshua, 2017). Meanwhile, the market for freelancers with a knowledge of VR and AR, as part of entrepreneurship in SMEs, will grow much faster than other skills (Choi and Kim, 2017; Loureiro *et al.*, 2020; Su *et al.*, 2020). Emerging issues, challenges, and opportunities related to the adoption of VR and AR technology for companies such as small businesses explain how the entrepreneurial process is affected by the polarization of the job market but also by creation opportunities for smaller companies, as long as they are able to exploit digital technologies for the creation of complementary value and establish their digital presence (Modgil *et al.*, 2022; Sahut *et al.*, 2021).

The fundamental characteristic of Metaverse systems is that they not only provide the consumer with a different or special product or service, but the consumer enjoys the opportunity to interact and participate in the overall experience (Papagiannidis *et al.*, 2013). For example, Italy's top soccer division screened AC Milan vs. Fiorentina within the Nemesis Metaverse, allowing fans to interact within the virtual room of Series A on May 1 (Dwivedi *et al.*, 2022). While it is true that this fact has been taken by companies as part of more advanced marketing strategies, in the Metaverse this becomes fundamental given the existing technological possibilities (Hazan *et al.*, 2022; Hollensen *et al.*, 2022; Hwang and Lee, 2022; Kang, 2022). In the same way, this type of virtual experiences could be used by SMEs in the future. Users can socialize, trade, and even earn income in virtual worlds. This has opened the way to a new way of interacting between companies and users and their representations in virtual worlds (Arakji and Lang, 2008; Schnack *et al.*, 2021; Zackery *et al.*, 2016). Recognizing the economic opportunities that are materializing within the Metaverse, different companies are launching e-commerce initiatives, trying to get a head start on what could become a revolutionary way of doing business online. Organizations such as Toyota, Circuit City, Dell, Sears, and Adidas have opened virtual stores on Metaverse systems in an effort to better understand and connect with consumers, reach new potential customers, and create and increase brand awareness (Arakji and Lang, 2008). The Metaverse has also the potential of improving the access and experience of several services in sectors such as education and healthcare (Dwivedi *et al.*, 2022). An example is the SME The bodymindself™ of Dublin, led by Dr. John Francis Leader, a psychotherapist specializing in experiential learning and mixed reality therapy, developed in collaboration with the Media, Art and Cyberpsychology group of the Psychological Society of Ireland (Leader, 2022). Although some companies have created transactional virtual stores, until now most of them have only allowed avatars to interact with the virtual products and services presented. Without offering them the possibility of buying any product. The initiatives of Balenciaga in collaboration with Epic Games to integrate high fashion into Fortite or Wendy's bet by creating an avatar in Twtich to promote its hamburger brand are examples where companies organize promotional and social activities related to the image itself rather than to specific products. They focus on brand awareness with the aim of generating indirect sales of their products, whether physical or digital, in the real world. Although it is true that today's technology enables virtually all types of transaction in the Metaverse, companies are incorporating the advances gradually, since in their initial implementation there have been difficulties associated with the implementation of the consumer technology (Durukal and Armagan, 2022; Oh, 2021; Papagiannidis *et al.*, 2013). An example of this occurred between 2007 and 2009, in relation to the virtual systems of Second Life, which resulted in an inability to survive in the absence of consumers in the virtual world (Clemons, 2009). Related to the Spanish environment, Gamium is a Spanish start-up company whose commitment is to create a decentralized social Metaverse with a unique digital identity that can be used in other Metaverses or rooms (Gamiun, 2022). In addition, Uttopion, an SME, is the company of the Metaverse through Lanzadera in January 2022, the startup accelerator of the owner of one of the largest Spanish food companies

(Lazadera, 2022). According to the company's website, it has sold more than one million euros of plots called "Terras" with prices ranging between 2,000 and 40,000 euros. The Uttopion Metaverse has two communities in Spain, of which 500 plots of each have been put up for sale. The first is Musichood Spain, which in the two years it has been running has held a total of 200 events such as the Oro Viejo festival by DJ Nano, with 4,700 people connected at the same time (Lazadera, 2022) Another example is Virtual Voyagers, one of the few SMEs specialized in virtual environments in Spain, focused on creating large Metaverse projects (Táboas, 2018).

The challenges presented by the Metaverse also include the inability of platforms to engage users in an immersive virtual world. Therefore, if we consider the studied SMEs as technology consumers, and considering that there is a technical gap in hardware and software performance compared to user expectations for the Metaverse (Park and Kim, 2022), to provide a sustainable service it is essential to have immersive content that works even with limited hardware and low-resolution software, such as Minecraft (Jaynes et al., 2003; Papagiannidis and Bourlakis, 2010). This study starts from the idea that SMEs should be considered consumers of immersive technology as they have to develop their business strategy for a new market with new consumers. The characteristics of the Metaverse turn its users into other potential consumers (Arakji and Lang, 2008; Papagiannidis et al., 2017) for SMEs that adopt it in their business model, enabling connections between users through visual, auditory, somatosensory, and gustatory senses, while movement and touch are possible in the virtual environment (Kraus et al., 2022). In the same sense, SMEs can use the data obtained to create strategies within the Metaverse world (Heller, 2020; Hollensen et al., 2022; Polas et al., 2022), and it will be possible to segment and offer more personalized and individualized advertising campaigns (Gálvez, 2022) for the development of their strategy and business model.

In addition to the above, according to Xi and Hamari (2021), SMEs are considering the shift to virtual environments, although there are many obstacles to be overcome, including consumer acceptance, the implementation model and information systems. So far, studies have been conducted that have even tried to determine the likelihood of actions taken by avatars in Metaverse systems with respect to virtual shopping and virtual stores, such as the Avatar Business Value (ABV) created by Arakji and Lang (2008), where they analyze a complete decision tree that leads to multiple business strategies. Immersive worlds are virtual spaces that extend our physical universe by adding new dimensions and domains for economic, social and leisure activities (Papagiannidis et al., 2013). The Metaverse system requires the design of a new content world intended to accommodate millions of users: The need arises to design buildings, scenarios, and environments in general (González, 2022) that involve challenges and opportunities for businesses to market their services to potential customers (Collins, 2008). In order to contribute with applied studies on the Metaverse and the decision that SMEs must face in order to be included or not in their value chain, we will present in the following sections an applied study model through the analysis of the effort expectation and performance expectation constructs in relation to business satisfaction.

2.2 Proposed model and justification of hypotheses

The approach taken in recent studies of Metaverse adoption in the consumer domain has been through the Technology Acceptance Model (TAM) (Akour et al., 2022; Almarzouqi et al., 2022; Mostafa, 2022). For the development of the model, the different constructs have been used according to the convenience of the analysis, applying those that were used for technological adoption by consumers and by companies. It should also be noted that, from the point of view of the theory of technological adoption by SMEs, the most convenient constructs were those extracted from the TAM and UTAUT models. These models have already been tested and are believed to be effective for investigating technology acceptance

by individuals, although the constructs from the TAM model are more suitable for investigating technology adoption by SMEs (Dahnil *et al.*, 2014). In fact, well-known researchers in the field of adoption have adapted the constructs applied to individuals to be used in SMEs (see Table 1).

Likewise, the theory on SMEs establishes a series of limitations to be taken into account with regard to the adoption of a new technology in the business environment. Based on the theory of the diffusion of innovation (DOI) and the conceptual framework of technology, organization and the environment (TOE) applied to the adoption of the Metaverse, we analyze the different factors to be considered by SMEs in the process. Within the TOE conceptual framework, there are the factors associated with the environment, organization and technology (Hatta *et al.*, 2015). The DOI theory provides three sets of factors associated with the characteristics of managers, characteristics of the internal structure and external characteristics of the organization (Hatta *et al.*, 2015).

2.2.1 Effort expectancy. The degree of ease associated with the use of a product or service is known as the effort expectancy (Venkatesh *et al.*, 2012). There is also the idea of the resource cost of incorporating a new system into their company (Carvajal *et al.*, 2021; Moriuchi, 2021). The literature relates effort expectancy to the difficulty of implementing a new technology (Chua *et al.*, 2018). For this reason, it has been argued that this construct is becoming less important as companies become more familiar with technology (Alam and Uddin, 2018; Nguyen and LE, 2020; Pei-Yee Chin *et al.*, 2020; Xena and Accounting, 2019).

Previous studies show that effort expectancy plays a role in determining the intention to use a tool and has been positioned as the second most important determinant of the intention to use a tool (Carvajal *et al.*, 2021; Pei-Yee Chin *et al.*, 2020). If a new technology requires less effort to understand, the intention to use it will be greater. As it becomes more intuitive and accessible, and as the degree of difficulty decreases, the intention to use it is likely to increase. For this reason, the expectation of effort must be taken into consideration if the intention to use it is to be fostered (Chua *et al.*, 2018; Nguyen and LE, 2020; Rahi *et al.*, 2019; Soliman *et al.*, 2019). Therefore, reducing difficulty can have a large impact on increasing the use of technologies. The literature shows that outcome expectancy and effort expectancy are the

End users	Need for training in the use of new technological tools
	Modification of workers' attitudes toward technological change
	Lack of technical knowledge, combined with a low appreciation of the benefits associated with the Metaverse
Organizational	Ease and rationality in the exchange of information in the new structure
	Influence and proper management of managers with respect to the availability of resources, money, time and talent to tackle Metaverse projects
Technological	Correct identification of the costs derived from the Metaverse as well as the return on investment
	Credibility of the new technology
	Compatibility with other businesses associated with the organization's environment
Management	Metaverse adoption process fully determined by top management, affecting day-to-day decision making
	Their involvement will determine the level of commitment and participation of the rest of the employees
	Training of senior management on the Metaverse, to encourage their support
	Need for a positive, innovative and tech-savvy attitude about the Metaverse
Business	Company perception of the Metaverse as a tool of competitive necessity
Environment	Adoption of an innovative or reactive attitude
	Need for market readiness to adopt Metaverse technology
	Culture, globalization and market trends

Source(s): Author's own creation

Table 1.
Factors to be considered by SMEs in the metaverse adoption process

main drivers of entrepreneurial behavior toward the use of a technology (Kosiba *et al.*, 2022; Pei-Yee Chin *et al.*, 2020).

The study presented here addresses the intention of SMEs to use the Metaverse, which will depend on the effort in economic resources and knowledge acquisition involved in the implementation of this tool in the company, as well as their business satisfaction, as related to the relationship between the variables: expectations of effort and satisfaction when implementing the Metaverse (Lee and Kim, 2022). In this sense, we formulate the following hypotheses:

H1. effort expectancy significantly influences SMEs' intention to use the Metaverse.

H2. effort expectancy significantly influences SMEs' satisfaction with the use of the Metaverse.

2.2.2 Performance expectancy. The authors Ho and Shafiq (2021), Moriuchi (2021), Lehmann *et al.* (2020), and Zheng *et al.* (2018) define performance expectancy as the degree to which the company believes that the use of a product or service will be useful in an organization. In other words, performance expectancy is the confidence that a behavior will lead to certain outcomes which will affect the likelihood that the company will direct its efforts toward that goal (Collado and Evans, 2019; Zheng *et al.*, 2018).

Depending on the company's expectations, it is explained what types of targets they choose (Howardson and Behrend, 2014). The company focuses on goals whose achievements are beneficial, feasible and achievable while improving its performance. Companies direct their behavior toward these goals when they consider that the expected result is sufficiently positive (Lehmann *et al.*, 2019).

Performance expectancy is known as a pillar in different behavioral theories (Grandón *et al.*, 2018; Venkatesh *et al.*, 2012). In all of them, a predictor is considered to explain the behavior. The formation of this estimate, idea or prediction is influenced by the previous positive or negative outcome. That is, after a positive outcome, expectations of success will increase and vice versa (Lehmann *et al.*, 2020; Zheng *et al.*, 2018). Previous studies affirm that performance expectancy is a factor of great importance in predicting the intention to use a system or technology. There is a positive relationship between performance expectancy and intention to use a new technology (Alam and Uddin, 2018; Carvajal *et al.*, 2021; Collado and Evans, 2019; Moriuchi, 2021; Nguyen and LE, 2020; Rahi *et al.*, 2019; Soliman *et al.*, 2019).

This research is based on the idea that investing efforts in the Metaverse leads to positive and beneficial ex-post results. We are not only referring to the economic benefit but also to expectations of improved customer experience, a greater capacity for innovation, an access to new markets and a higher performance of the company's image and popularity, as well as an increased recognition of value by employees (Song *et al.*, 2022). Logically, these expectations are rising as the Metaverse develops and grows and the potential for enterprise participation in immersive environments increases, as organizations already using the Metaverse report positive experiences and overall satisfaction with their experiences using the platform (Arpaci *et al.*, 2022; Lee and Kim, 2022).

H3. Performance expectancy significantly influences SMEs' intention to use the Metaverse.

H4. Performance expectancy significantly influences SMEs' satisfaction with the use of the Metaverse.

2.2.3 Business satisfaction. Following the decision to purchase or use a product or service, the organization may be satisfied or dissatisfied. Satisfaction refers to the degree of conformity with the results obtained after using a new technology (Mazzarolo *et al.*, 2021;

Tawafak *et al.*, 2021). The greater or lesser degree of satisfaction arises as a consequence of the subjective comparison between expectations and the final perception.

Numerous studies give a psychological approach to this concept and define it as the sensation of well-being and pleasure obtained from getting what one expects from a product or service (Lie *et al.*, 2019). Due to the aforementioned subjectivity and the incorporation of emotional and/or cognitive elements, it is a difficult concept to handle (Joo *et al.*, 2018; Tawafak *et al.*, 2018). This construct is of vital importance to many industries when it comes to business analysis. The monitoring of business satisfaction is a fundamental aspect for the success of the business against the competition, as it shows the fulfillment of needs, desires and objectives with respect to the original perception of the business (Ahrholdt *et al.*, 2019; Pozón-López *et al.*, 2019). It is also considered one of the key concepts in the development of marketing strategies, as it influences loyalty, fidelity and brand value, favoring the company's market share and profitability (Alzahrani and Seth, 2021; Lie *et al.*, 2019; Prayag *et al.*, 2018).

Satisfaction, therefore, is one of the central elements of behavioral analysis (De Oña, 2021; Wills *et al.*, 1974). Previous studies have pointed to satisfaction in the use of the internet, social networks and information systems as a predictor of behavioral intention, since among the most relevant variables that explain the intention to use a technology is the level of satisfaction with the technology (Mazzarolo *et al.*, 2021; Pozón-López *et al.*, 2019; Vărzaru *et al.*, 2021). On the other hand, satisfaction has been related in the literature to the intention of use when taking into account new technologies without the subjects of the study having interacted with the product, simply by having knowledge of its existence (Mustafa *et al.*, 2022; Tussyadiah, 2016), or having previous experience in a technology that predicts the object of study (Amin *et al.*, 2022; Lee *et al.*, 2022). In the case of this research, it was the experience that companies had with early Metaverse and immersion in virtual reality with different electronic devices (Atzeni *et al.*, 2022) without becoming a total immersion in Metaverse. The latter being the technology that precedes our object of study. Where virtual reality is concerned, the aspects of exploration and using skills to interact with the environment exist by including interactive features enabling the user to explore and control the environment (Sutcliffe, 2016). However, customer satisfaction as a measure for new technology adoption success is limited in scope and treatment and lacks comprehensiveness in capturing the full functionality of the virtual reality (Molla and Licker, 2001). It is considered that the measurement of new technology adoption success by companies should be based on the deployment of people, technology and strategy to accelerate improvement cycles and increase profit margins (Spyns *et al.*, 2002). The demand to develop a new research framework and model to measure Metaverse adoption from the business point of view is becoming more critical. Regarding these, there is a definition proposed by (Wu *et al.*, 2014) for business satisfaction as a measurement of the overall satisfaction that a business has with a new technology system adoption meeting its requirements and expectations. The authors considered that business satisfaction is not customer satisfaction because customers have different research goals and objectives. Business satisfaction focuses on answering how happy businesses are with the process of adopting a new immersive technology.

Therefore, we will analyze whether company satisfaction is significant in relation to intention to use the Metaverse:

H5. The satisfaction of SMEs significantly influences the intention to use the Metaverse.
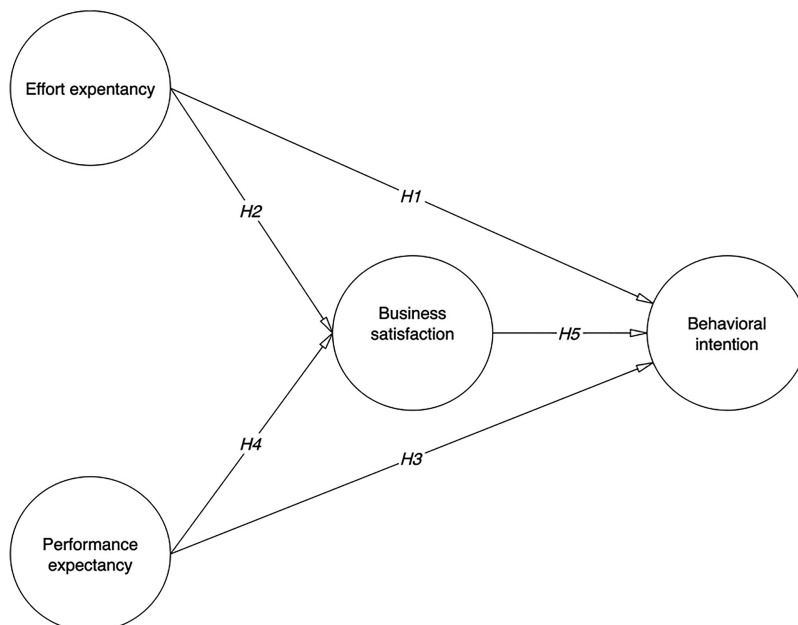
2.2.4 Behavioral intention. Behavioral intention is defined as a company's willingness, in terms of effort and action, to carry out a particular practice (Moriuchi, 2021; Nguyen and LE, 2020). Results from previous studies show that one of the keys to the success of a technology is the intention to use it (Faqih, 2022), as well as the success and growth of a new technology

lying to a great extent in the intention (Gunawan and Gunawan, 2019). The literature suggests that there is a strong correlation between behavioral intention and actual behavior (Alam and Uddin, 2018; Gansser and Reich, 2021; Moriuchi, 2021; Soliman *et al.*, 2019). Given the difficulty of measuring the actual behavior of a growing technology, a construct related to intention is often used as an indicator and predictor of behavior in virtual environments (Aburbeian *et al.*, 2022; Huang *et al.*, 2016).

Figure 1 below shows the model proposed for our research.

3. Methodology

The sample of this research is composed of 182 Spanish small and medium-sized enterprises (SMEs) in the technology sector (INE, 2019). Spain has been used as the country for the sample, on the basis of the scales of the tool Culture Compass™ (Hofstede Insights, 2022) being a tool used in the literature (Katz *et al.*, 2022; Masyhuri, 2022; Waters and Day, 2022). It is a tool that has been successfully used in previous analyses of international strategic behavior (Zgodavova *et al.*, 2017), business development (Ahmad and Singh, 2017), technology adoption processes related to satisfaction (Novak *et al.*, 2000), quality in management (Al Mubarak *et al.*, 2017) and virtual worlds and e-learning (Halder, 2019) The Hofstede Culture Compass has proven useful in identifying national trends in performance and behavior concerning management and adoption variables. With Hofstede's Culture Compass, a basic comparison can be made of the general cultural trends in each country, establishing principles and strategic ways of acting on certain dimensions (Zgodavova *et al.*, 2017). Here the Uncertainty Avoidance dimension defines Spain very clearly with a high score of 86 (Díaz-Soloaga and Díaz-Soloaga, 2023). This score has been verified in several studies with SMEs as the object of research (Mhedhbi and Essid, 2022; Somoza, 2023). In this sense,

Source(s): Author's own creation

Figure 1.
Proposed model

the sample has been made in a conservative environment as an extreme for the propensity to change, since if the main objective of the research is verified in this environment it will be more likely to be so in environments with a lower score. This was determined by Kraus *et al.* (2012) who showed that SMEs which are innovative in new digital projects perform better in uncertain and nonconservative environments. In this sense, the literature has examined the effects of the environment on SMEs with the implementation of innovative technology (Prajogo and McDermott, 2014).

For the distribution of the sample of companies, the research has tried to be as exhaustive as possible, in order to cover all the subsectors. According to the classification of the National Institute of Statistics (INE), the telecommunications and Information and Communication Technologies sector is divided into five subsectors (manufacturers, commercial industries, telecommunications, programming, and repair), each with its corresponding codes (INE, 2019). Table 2 shows the representativeness of the sample in each of them.

Table 3 shows some demographic data of the companies analyzed, referring to the time since their creation and the current number of employees.

A nonprobabilistic convenience sampling is carried out. This type of sampling implies that not all elements of the population have the same probability of being selected, and it is left to the researcher's judgment as to why. It is widely used in social and business sciences, since heterogeneity in terms of possible characteristics of the elements surveyed makes it necessary to establish research guidelines (Liao *et al.*, 2019). In our case, the convenience of the nonprobabilistic method is based on the need for knowledge on the part of the companies of the Metaverse concept, as well as their positive predisposition to its use. Our specific research requires prior knowledge of immersive reality on the part of the companies that make up the sample. Therefore, prior to the administration of the questionnaire, we contacted the digital

Sector	CNAE codes	Sample
Manufacturers	2611; 2612; 2620; 2630	19.23%
Commercial Industries	4651; 4652	15.93%
Telecommunications	6110; 6120; 6130; 6190	26.37%
Programming	6201; 6202; 6203; 6209	32.42%
Repair	9511; 9512	6.04%
Source(s): Author's own creation		

Table 2.
Distribution of the sample according to ICT sectors

Time since the creation of the company	
0–2 years	23.63%
More than 2 years up to 5 years	32.97%
More than 5 years–10 years	31.32%
More than 10 years	12.09%
Current number of employees	
Between 0 and 20 employees	26.92%
Between 21 and 50 employees	30.77%
Between 51 and 100 employees	18.68%
Between 101 and 150 employees	14.29%
More than 150 employees	9.34%
Source(s): Author's own creation	

Table 3.
Characteristics of the analyzed companies

strategy managers or CEOs of the company to determine their knowledge of the Metaverse, as well as to confirm their previous experience with virtual reality (VR) processes. This fact was also confirmed later in the fitter questions of the questionnaire, to confirm that the entire useful sample met the knowledge requirement. Subsequently, the questionnaires were distributed online through a platform created for self-administration. The research was conducted between January and April 2022. A total of 197 observations were obtained, of which 15 were discarded as incomplete or null, either because they are incomplete, or because they lack experience with virtual reality processes, since the literature advises eliminating the incomplete sample if the incomplete data are significant (Nelson *et al.*, 1996).

The scales have been adapted from other studies carried out previously and with verified results in their application in samples of companies. Thus, Effort Expectancy and Performance Expectancy have been adapted from Venkatesh *et al.* (2003), business satisfaction comes from the work of DeLone and McLean (2016), and Behavioral Intention is adapted from the research of Taylor and Todd (1995). We used Smart-PLS 3 software for data processing (Richter *et al.*, 2016). To this end, the reliability and validity of the measurement scales and the structural model were evaluated beforehand (Chin and Dibbern, 2010; Hair *et al.*, 2012). This technique is widely verified in the literature and is particularly interesting in the field of social research with small sample sizes (Wynne w. Chin, 1998). PLS-SEM has been used to test the model and hypotheses for two reasons: firstly, all measurements are treated as estimated Mode A composites (Hair *et al.*, 2019a, b; Henseler, 2017; Rigdon, 2016; Rigdon *et al.*, 2017); and, secondly, because it adopts an explanatory approach (Henseler, 2018). Composites are estimated in Mode A when the indicators that compose the latent variable are correlated. In addition, Mode A composites are the best choice in the case of the sample size being small or medium (Henseler *et al.*, 2009). On the other hand, it can be considered a technique that can handle various forms of construct operationalizations, including reflective measurements and composite models (Carrión *et al.*, 2016).

To measure the items of each variable, a seven-point Likert-type scale was used, where 1 is totally disagree and 7 is totally agree. The variables used in this research are shown in Table 4. This shows the items used and from where they were extracted.

4. Results

For the analysis of the PLS model, we proceed to analyze the reliability and validity of the measurement model, for which we have followed the recommendations in the literature (Fornell and Larcker, 1981; Henseler *et al.*, 2017). In the case of reflective variables, first of all, the individual reliability of the item is ensured. For this purpose, the factor loadings on their own latent variables are examined. These loadings must be higher than the 0.7 proposed in the literature. All the loadings of our reflective constructs are above this indication (Table 4). Secondly, the reliability of the constructs is analyzed using Cronbach's alpha and composite reliability indicators (Table 4). The latter is used due to the limitations of Cronbach's alpha, which takes into account the different values of the external loadings of the indicator variables (Hair *et al.*, 2017). In all cases, our indicators are higher than the required 0.8. In addition, convergent validity has been ensured by analyzing the average variance extracted (AVE). In our case, similarly, all indicators offer levels above the minimum level of 0.5, indicating high levels of convergent validity for the constructs.

And, finally, by means of Heterotrait-Monotrait (HTMT), which is an estimate of the real correlation between two constructs, if they were perfectly reliable (Hair *et al.*, 2017; Henseler *et al.*, 2015) In all cases they offered levels below the threshold of 0.9 (Table 5); even below the 0.85 level set by some authors as more recommendable and conservative (Henseler *et al.*, 2015). Regarding the assessment of the structural model, the model has been subjected to the standardized root mean square residual (SRMR) assessment. Values lower than 0.08 are

Variables	Items	Loadings	AVE	Composite reliability	Cronbach's alpha	Rho_A
Effort expectancy			0.715	0.882	0.811	0.890
	The use of the Metaverse is clear and understandable for my business	0.890				
	I don't think I will have any problems using the Metaverse in my business	0.764				
	I find the Metaverse useful for my business	0.878				
Performance expectancy			0.660	0.847	0.736	0.851
	Using the Metaverse allows me to make queries or transactions for my business faster	0.913				
	Using the Metaverse increases the quality of the products or services offered by my company	0.919				
	My company can access the Metaverse from any device	0.849				
Business satisfaction			0.888	0.959	0.936	0.944
	I believe that the use of the Metaverse has value in the business environment	0.895				
	I believe that the use of the Metaverse has many advantages for my company	0.970				
	I believe that it is worth using the Metaverse in my business activity	0.960				
Behavioral intention			0.913	0.969	0.952	0.953
	I intend to use the Metaverse for the development of my business activity	0.956				
	I intend to use some of the Metaverse services for the development of my business activity	0.968				
	My intention is to do more and more of my business activity through the Metaverse	0.943				

Source(s): Author's own creation

Table 4.
Scales and
measurement model

considered as a good fit. In our case, the SRMR is 0.074, so we consider it a good fit (Hair *et al.*, 2019a, b).

To evaluate the statistical significance level of the path coefficients we used a bootstrapping of 5,000 subsamples (Henseler, 2018). Table 6 shows the results and significance of the direct effects analyzed. Here it can be seen that, of the five hypothesized relationships, three of them are supported (H2, H4 and H5) and two are not (H1 and H3). Of the significant relationships, H2 presents a higher level of intensity (t-value 4.061). Likewise, we also incorporate the variance contribution of the preceding construct in each relationship.

When dealing with entrepreneurial behavior, it is important to analyze the variance contribution of the different constructs, in order to prioritize the development of strategies. Analyzing the R^2 of the preceding constructs, we observe the contribution of 0.38 of EXESF over SATIUS, as well as 0.228 of EXRES over SATIUS. In the case of the former, this makes it the most significant construct for the companies, both in terms of its importance and its explanatory contribution. It is also worth highlighting the explanatory contribution of satisfaction in the intention to use the Metaverse by the companies, with 0.41. The general model provides the following variance explanation data (Table 7), reaching almost 55% in the case of intention to use, which indicates the good development of the model.

The results of the mediation analysis provide empirical support for understanding the importance of the satisfaction construct for the companies in the adoption of strategies within the Metaverse (Table 8). The intervention of satisfaction on the part of the companies allows the relationships, which are not directly significant, to become so. We therefore speak of a total mediation by this construct in the model.

	EXESF	EXRES	IUS	SATIUS
EXESF				
EXRES	0.749			
IUS	0.692	0.707		
SATIUS	0.814	0.832	0.772	

Note(s): EXESF: Effort expectancy; EXRES: Performance expectancy; IUS: Behavioral intention; SATIUS: business satisfaction
Source(s): Author's own creation

Table 5. Heterotrait-monotrait ratio (HTMT)

Effects on variables	Path coefficient	5% CIlo	95% Cihi	Significance of effect (P-value)	R^2 of the dependent construct
EXESF → IUS (H1)	0.139	−0.163	0.462	0.386	0.090
EXESF → SATIUS (H2)	0.499	0.257	0.738	0.000	0.380
EXRES → IUS (H3)	0.096	−0.193	0.374	0.507	0.060
EXRES → SATIUS (H4)	0.312	0.039	0.576	0.023	0.228
SATIUS → IUS (H5)	0.558	0.312	0.746	0.000	0.410

Note(s): EXESF: Effort expectancy; EXRES: Performance expectancy; IUS: Behavioral intention; SATIUS: business satisfaction
Source(s): Author's own creation

Table 6. Effects of the construct on endogenous variables

	R^2	R^2 adjusted
IUS	0.559	0.542
SATIUS	0.608	0.598

Source(s): Author's own creation

Table 7. Explained variance of the model

	Direct effect	95% confidence interval	t value	Significance ($p < 0.05$)
Effort expectancy → Behavioral intention	0.139	(−0.163; 0.462)	0.868	No
Performance expectancy → Behavioral intention	0.096	(−0.193; 0.374)	0.664	No
	Indirect effect	95% confidence interval	t value	Significance ($p < 0.05$)
Effort expectancy → Behavioral intention	0.278	(0.107; 0.464)	3.063	Si
Performance expectancy → Behavioral intention	0.174	(0.019; 0.340)	2.169	Si

Source(s): Author's own creation

Table 8.
Significance analysis of direct and indirect effects

Empirical research on companies obtains conclusions and recommendations for their subsequent strategic development based on the models analyzed. Although these models are analyzed according to the established guidelines and their fit is checked, they may present problems in their application in reality. Therefore, our intention is that in a field as novel as the Metaverse, the implications for companies reach the highest level of verisimilitude and practical application. In this sense, we have tested the predictive capacity of the model (Shmueli *et al.*, 2019), i.e., its application for samples other than the one used, through $PLS_{predict}$.

The operation of $PLS_{predict}$ is based on the use of training samples, for which three parameters are determined: the number k, as subsets into which the sample is divided; the number r of repetitions, as the number of times the algorithm will iterate; and, finally, the prediction statistic, to validate the predictive power of the model (Kock and Hadaya, 2018). In our model, according to the 184 sample observations, we have determined a k = 5, so that the remaining samples are significant, as well as a number of repetitions r = 10. This offers a good balance between accuracy and computation time (Witten and Frank, 2002). The setting of the statistic depends on the asymmetric distribution of the prediction errors. If the absolute value of the skewness is less than 1, we will use the RMSE statistic (Shmueli *et al.*, 2019).

We apply $PLS_{predict}$ to calculate the benchmark $Q^2_{predict}$, which uses the mean value of the variables in a training sample as a prediction of the variables in the reserved sample. A positive $Q^2_{predict}$ value indicates that the prediction error of the PLS model is smaller than the prediction error given by the benchmark (Shmueli *et al.*, 2019). Subsequently, a linear regression model is created, which regresses the exogenous indicators, and the estimate is compared with the results of the PLS (sustained) model. The results of the latter should have better (lower) errors than the regression model (see Table 9).

For the dependent variables of interest, it is satisfied that all the $Q^2_{predict} > 0$, so we fulfill the first step. The analysis of the asymmetry of the errors reveals that their absolute values are all less than 1, so we will use the RMSE statistic. According to these data, we now compare according to the RMSE statistic the models generated by PLS and the Linear Regression model created. If all differences are less than 0, the model will have a high predictive value.

We therefore observe that all the differences are below 0, which allows us to affirm that the model has a high predictive value. As we have indicated, this fact is especially important for an emerging field such as the Metaverse and the strategic implications for companies that derive from it (see Table 10).

5. Discussion

This study has allowed us to answer the question posed in the title of the paper. According to this, SMEs do intend to use the Metaverse as part of their strategy as long as satisfaction acts as a mediator in the process prior to the development of strategies within it. The challenges and perceived opportunities in Spanish SMEs' behavioral intention affect the progress of the companies' digital entrepreneurship and their implications for policy and practice (Igartua and Ibarra, 2018). The current total investment for digitalizing Spanish SMEs is €4.656bn by 2021–2023 according to the 2025 governmental Digitalization Plan. In addition, the European Parliament Briefing's (Polona *et al.*, 2022) economic studies have predicted that the global Metaverse market will reach €597.3bn by 2030. This is why some stress the importance of the technical solutions and protocols to avoid the risk of some tech companies attempting to shape the emerging Metaverse standards. It seems that businesses that better engage with digital technologies will have a greater influence on business transformation and Metaverse adoption. The efforts of EU policymakers to foster the development of open Metaverse standards enable SMEs an interoperability to build the Metaverse ecosystem but warn that this may lock in developers and limit consumer choice and the creation of competing innovations. In this new framework, SMEs and in particular Spanish SMEs, have little flexibility given their limited capacity to manage the data required to adapt their strategies to market realities (Hirsch *et al.*, 2020). For SMEs digital technology must be initially viewed as an experiment for innovation, which is a differentiating capability needed for long-term success for businesses in the digital age (Cuevas-Vargas *et al.*, 2022; Hussain and Papastathopoulos, 2022; Sultana *et al.*, 2022).

The analysis of the results has allowed us to confirm the proposed hypotheses, as well as to reject others, and thus to obtain interesting conclusions on the behavior of the companies. The information obtained helps to understand what aspects companies prioritize when deciding whether to allocate resources to this virtual environment. Firstly, the relationship between effort expectancy and intention to use is not significant. This result is in line with those obtained by (Alam and Uddin, 2019) in their analysis of the adoption and

	$Q^2_{predict}$	Asymmetry	Statistician
IUS1	0.358	−0.121	RMSE
IUS2	0.334	−0.105	RMSE
IUS3	0.367	−0.162	RMSE
SATIUS3	0.522	0.365	RMSE
SATIUS2	0.521	−0.114	RMSE
SATIUS1	0.480	0.167	RMSE
Source(s): Author's own creation			

Table 9.
Choice of statistic for
$Q^2_{predict}$

	PLS model RMSE	Linear regression model RMSE	Differences
IUS1	1.382	1.436	−0.054
IUS2	1.418	1.477	−0.059
IUS3	1.315	1.394	−0.079
SATIUS3	1.120	1.211	−0.091
SATIUS2	1.156	1.157	−0.001
SATIUS1	1.116	1.126	−0.010
Source(s): Author's own creation			

Table 10.
Differences between
PLS model and linear
regression model (LM)

implementation by companies of the ERP (enterprise resource planning) system. However, it contrasts with the data obtained in the study of Subawa *et al.* (2020) on the uptake of e-commerce in SMEs, and that carried out by Nguyen and LE (2020) about the intention to apply management accounting in Vietnamese firms, in which they concluded that the effort expectancy construct is a good predictor of intention to use it. The fact that the development of strategies within the Metaverse requires a comprehensive and novel adaptation for the firm (Schumacher, 2022), rather than the adoption of a technological system or a management program, could explain to some extent the disparity in these results.

When Hypothesis 2 is fulfilled, it can be affirmed that, on the contrary, the expectation of the effort required does significantly influence the companies' satisfaction with the use of the Metaverse. This result is consistent with that obtained by Lim *et al.* (2018) in the study where they compile the factors that influence online repurchase. In addition, the research presented here also relates to the predictions of Chan *et al.* (2010). These authors confirm in their model that the expectation of effort influences satisfaction with the use of applications and other technologies imposed by the government.

In relation to outcome expectancy, it can be affirmed that it does not have a significant impact on intention to use, since Hypothesis 3, which establishes a relationship between both variables, is not fulfilled. This result differs from that obtained in studies on education conducted by Özlem (2022) and Sahin (2008), which state that the expectation of results does relate to the intention of use when it comes to integrating technological systems in the field of teaching, and those obtained by Keong *et al.* (2012) and Wongsabsin (2021) in their research on the implementation of resource planning in companies. This seems to indicate that companies in the development of strategies within the Metaverse do not pay attention in this first phase of the technology to the possible results to be obtained but that other variables determine their behavior.

However, with Hypothesis 4, it is corroborated that outcome expectancy has a significant impact on firm satisfaction. These results are consistent with previous studies on online tools. On the one hand (Alruwaie *et al.*, 2020), in their analysis of the use of e-government services, and, on the other hand (Song and Deng, 2019), confirm this relationship of variables in the field of virtual learning communities.

Finally, by fulfilling Hypothesis 5, this research confirms, as suggested by the literature, that the relationship between satisfaction and intention to use is significant. When deciding their approach to immersive systems, companies take into account the level of satisfaction that they will get from them. The same is true of several previous studies, such as the one carried out by Garg and Sharma (2020), in which satisfaction is revealed as the most significant predictor of the intention to use e-learning courses for employees in India. The same conclusions are drawn from the study by Xiao and Warkentin (2021) which also confirms this relationship with respect to the use of information technologies.

5.1 Academic, social, and business implications
This study has interesting implications for various stakeholders. We address the gap in studies related to SMEs' business adaptation to rethinking the opportunity which can be leveraged from the new cutting edge of technology and how to develop their strategic assets and capabilities toward the Metaverse virtual world. Understanding the circumstances and reasons for the behavioral intention of using the Metaverse system that facilitates digital entrepreneurship is of interest to academic research and guides business practice, as well as public policies aiming to support this phenomenon, given its positive impacts in terms of job creation and economic growth.

From an academic perspective, this work represents one of the first studies that places SMEs as a central object of analysis regarding the adoption of the Metaverse. The behavior of

companies in relation to the technological adoption of total immersive realities will imply important social changes, both from the development of their own business and from the point of view of their social responsibility. This research extends the existing theory on technological adoption in firms by introducing and adapting the satisfaction construct. The incorporation of the satisfaction construct is useful with respect to effort and performance expectations to address, from an academic point of view, the position of firms in the future and contribute to the need for empirical studies applied to the business environment in relation to Metaverse adoption. Once the implementation of the Metaverse is more widespread, the concept of satisfaction will be analyzed longitudinally, obtaining comparable results across companies and sectors, thus opening up an interesting field of future research. Therefore, this research serves as a starting point for academics and researchers to propose new models and avenues of research.

From a social perspective, the research is a relevant contribution. There is no doubt that the Metaverse, in addition to constituting a new technology for companies, will have unprecedented repercussions in the social sphere, given the plurality of areas in which there will be different uses and users (education, health, tourism) and the need for political regulations that focus on principles of responsible research and innovation, as well as incorporating the social benefit in relation to jurisprudence, labor relations, taxation, and social participation itself, among many other fields. The model reflects the fact that companies are currently observing reality, that of both consumers and competitors. SMEs show a predisposition toward Metaverse technology adoption through satisfaction in relation to expectations of achieving a balance between the company's needs and objectives. Therefore, the evolution of both sets in the Metaverse will be decisive in confirming the current behavior of companies or, failing that, in deriving future strategies that have not yet been considered. However, as we have already mentioned, it is essential for companies interested in developing strategies within the Metaverse to observe the behavior of the social environment.

From a political perspective, the considerable increase in public investment for the adoption and introduction of companies in digital technologies and, specifically, in the regulation of Metaverse systems, places this research as a starting point to develop policies related to the operability of SMEs in the adoption of immersive technology. It does do knowing what the reality of companies and their considerations regarding their resources and capabilities is. SMEs require practical approaches from researchers to seize the potential of the Metaverse. Recent studies describe how new technological advances have significantly optimized data analysis processes, making it profitable for companies of all sizes to invest (Liu *et al.*, 2020). In addition, SMEs can access multiple initiatives to ask for basic information, network, scale-up and updates in relevant technology or training funding opportunities (Sanchez-Hughet *et al.*, 2022). The model studied in this research indicates that SMEs propose a process of observation of reality, establishing a balance between the resources that they have and those necessary to operate in the Metaverse. The results indicate that SMEs are concerned about the effort to be made, translated into the cost of economic and non-economic resources that the adoption of the Metaverse may entail. Public policies should analyze the tangible and intangible resource needs of companies in order to economize and make the most of public resources. This research highlights the need for public policies tailored to the SME context for the development of specific strategies in the Metaverse. This will imply that the different strategies of public administrations should be aimed at reducing the adverse economic effects on SMEs and the costs associated with technological adoption.

The model analyzed presents important and novel implications for business. In the SMEs environment, the intention of companies to venture into the Metaverse is an original and necessary approach as companies must consider whether to adapt their business model to

this new reality and define the challenges and opportunities that the adoption of immersive technology would mean for the creation of business value. The proposed research model presents a dichotomous perspective in terms of the questions that companies should ask themselves in the process of adopting the Metaverse: What effort do I have to make to develop a strategy in the Metaverse? And what do I expect to obtain by developing a strategy in the Metaverse? The model proposes that both questions be asked simultaneously, as this will help to better determine the development strategy of companies in virtual environments. Companies organize their resources and capabilities, prioritizing which decisions to make and how to accommodate to the Metaverse adoption strategy from an integral vision, in relation to perceived satisfaction and their expectations in the technological adoption process, valuing the effort to be made and the performance to be developed.

Related to the above, entry into the Metaverse is a complex environment change for SMEs, as evidenced by the need to be satisfied with their decision. Therefore, prior to entry, the company must develop the corresponding digital and physical adaptation mechanisms to overcome the obstacles of access and operability in this new environment. This will increase its chances of success. Each SME will have to determine the degree of satisfaction of its strategy, as this will be the key that balances the efforts made, as well as the possible expected returns. At this early stage of Metaverse development, an SME must feel comfortable entering the Metaverse. This "comfort" will require, in business terms, data, analysis and information. This satisfaction can be associated at the company level with the reduction of uncertainty and knowledge of the new environment, so it will be necessary to implement systems for analyzing the environment in terms of the behavior of competitors in the Metaverse, the development of new strategies, consumer studies, and the impact on the environment, among other issues.

Furthermore, with regard to the organization and mobilization of the resources necessary for the adoption of the Metaverse, and given that the expectation of effort is the construct with the greatest impact on the model, its assessment must be carefully carried out by the SME before considering entry into the Metaverse. Therefore, the SME must carry out an adequate resource analysis and determine the necessary investment for the development of the strategy in the new environment. The necessary prioritization of tasks within all business processes must start with this in the case of the Metaverse.

All the necessary conditions for entrepreneurship are present in the Metaverse: a new technology with development options, the interest of the market and the presence of entrepreneurs who want to invest in it. As a result, the creation of companies in virtual worlds opens up new and unknown possibilities in the future, precisely because of the special global characteristics of the Metaverse. The issues derived from this research open up possibilities in the organization of resources for the entrepreneurship process of SMEs and start-ups. The possibilities of the Metaverse provide new companies with the ability to interact with a wider number of consumers, where an optimal level of feedback will provide companies with greater flexibility to adapt their products more quickly and efficiently than others already established in the market, also producing specific offers for the virtual world. The branding process will as well be accelerated by the transformation of the consumer's accessibility experience, starting from different premises and strategic designs, which must be defined and elaborated in the construction of the virtual business world.

In particular, for start-ups the market intelligence system will be more effective for targeting, and more advanced communication and marketing techniques will be used in general. It is also possible that these companies will face the challenge of new dynamic capabilities, network building systems or customer relationships as part of a new social reality. The consumer's flow in the face of a reality that is more adapted to his or her needs may have an impact on new business strategies. In general, the creation of value by new companies will involve a very different process from the one we know today.

These advantages will not be without new and complex challenges for start-ups. The Metaverse, apart from different entrepreneurial premises, will involve knowledge on the part of managers for which there is currently no complete experimental basis. Strategies will have to be implemented in a social, economic and legal environment under construction. While large companies are so far considering the Metaverse as an option to operate in the near future, developing plans to participate in immersive systems, the levels of investment currently required are far beyond the capacity of SMEs, which may not have the knowledge or technology necessary for its implementation. The level of access to the Metaverse may not be the same for all countries or economic organizations, thus limiting the number of consumers and companies. New sectors and companies will appear, which will manage aspects such as new products and services to organize a new environment, new IT platforms, forms of authentication, security, identity and digital presences, among other related aspects.

6. Conclusions
This research has been able to respond to the established objectives. The information obtained has resolved the questions raised about the attitude of companies toward the Metaverse. According to the results of this analysis, the expectation of effort and the expectation of results do not directly influence the intention to use the Metaverse, but they do so indirectly through satisfaction. At the present time, neither the expected return on investment nor the cost of resources involved in incorporating this new technology into the SME's business is a priority for the companies' objectives. The main priority is the satisfaction of the team and of the company as a whole: the pleasure and well-being of investing in a new technology and the fact that it meets expectations, as well as this being adjusted to the resources and capabilities present in SMEs. It can be deduced that, being in the initial phase, the companies mainly take into account being part of a new project and promoting aspects such as corporate image, innovation or even the interest in not being late for this new opportunity. SMEs want to be in the Metaverse, but do not clearly define what for.

The practical value of this study lies in offering SMEs a vision of how to approach access to the Metaverse, considering their own resources, capabilities and strategic development process. The model allows SMEs to order and prioritize their decision process in order to enter this new environment with a specific application. Based on this information, the level of satisfaction of the SMEs will be the main factor that will increase investment and, therefore, the Metaverse will grow to a greater or lesser extent. Its development and expansion would be a breakthrough for technology and society as a whole. The combination of the real world and the virtual world presents infinite possibilities with the ultimate goal of creating an interactive world in all areas: social relations, academia, videogames, property, art, entertainment, etc. It offers many interesting opportunities in different areas of society, including the business world. Technology is advancing and developing very fast, and SMEs are reacting in this sense: they are open to incorporating and backing the Metaverse to be at the forefront of this evolution.

7. Limitations and future research lines
Studies on the Metaverse linked to SMEs are scarce in the literature. Therefore, as the field develops, it will be possible to include in the discussion and in the theoretical structure of the research a larger amount of literature specifically associated with this area, so that the frameworks of the research can be better established, as well as the extension and comparison of the results.

The Metaverse is a nascent technology, in its early stages of adoption and development. As such, it is possible that new developments and strategies will enable SMEs to enter it in a

different way than how it is currently conceived. Therefore, although the model is useful to know a first strategic approach, future research should expand this according to new developments in the area.

Although the Spanish technology sector has world-renowned companies, it is true that its size is small, since the country's economic base is centered on other elements. For this reason, it would be advisable to replicate the study in countries with a greater tradition and power in their technology companies sector.

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