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## WHERE ARE WE GOING? FROM E-COMMERCE TO THE METAVERSE: CONSUMER BEHAVIOUR AND THE ROLE OF EMERGING TECHNOLOGIES

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**Abstract.** The emergence of the metaverse is poised to reshape e-commerce by integrating immersive technologies and new forms of consumer engagement. However, the extent of its impact on consumer behaviour and the directions in which it will develop remain unknown. To shed light, this study presents a systematic literature review of 62 peer-reviewed articles published between 2015 and 2022 in WoS and Scopus, examining how e-commerce is evolving toward the metaverse. The analysis identifies five main research categories: e-commerce strategy and marketing, online consumer behaviour, metaverse drivers, new business models, and the role of influencers. Online consumer behaviour is the primary focus of researchers and accounts for the largest proportion of publications, largely concentrated in China, the United States, and South Korea. The findings show that influencers, both human and virtual, play a decisive role in consumer trust and purchase intent. At the same time, emerging technologies such as AR, VR, AI, and blockchain facilitate interactive experiences and more effective personalisation in marketing. Furthermore, the metaverse fosters innovative and sustainable business models, particularly in the fashion industry. Despite these advances, consumer trust and risk perception remain significant challenges. The analysis highlights several research gaps, including the need to examine cross-country differences, gender dynamics, socioeconomic barriers to entry, and the integration of sustainability and circular-economy values into metaverse-based business models.

**Keywords:** metaverse; e-commerce; live streaming; fashion; technology

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**JEL Classifications:** M30, M31, L81, O33

### 1. Introduction

Continuous technological advances, both in electronic media and on the internet, favour the creation of new forms of e-commerce and new strategies to reach consumers (Saad & Yaacob, 2021; Chen et al., 2022; Chen et al., 2024). The current consolidation of e-commerce and the new scenarios that may arise represent a challenge and an opportunity for companies (Kennedy et al., 2022; Mustafa et al., 2022; Sonntag, et al., 2023) in this key global channel for companies and consumers (Gu et al., 2021; Mustafa et al., 2022). Companies hire influencers (actors, athletes, etc.) to increase their market share by boosting product sales (Chetoui et al., 2020; Hudders et al., 2021; Ma, 2021; Molina-Prados et al., 2021; Wang et al., 2021). This is intended to attract consumers' attention to their advertising messages and to establish connections between brands and celebrities (Ma, 2021; Wang et al., 2021; Zhou & Tong, 2022). The significant growth of social media has led to the rise of social media influencers (SMIs), who mention brands and generate positive and favourable feelings towards them

(Khan et al., 2022; Molina-Prados, et al. 2021). The number of companies that employ their services has grown exponentially in recent years (Arora, et al., 2019; Le & Aydin, 2022).

The evolution of the metaverse, driven by advances in technologies that enhance interaction between the physical and virtual worlds, has received significant attention from both businesses and researchers (Buhalis, Lin & Leung, 2023; Sonntag et al., 2023). This metaverse represents a "post-reality" digital environment that is characterised by its continuous nature and ability to integrate physical and virtual reality (VR) into a shared multiuser experience (Davis et al., 2009; Fernandez, 2022; Mystakidis, 2022; Hollensen et al., 2023; Wang et al., 2022). The metaverse is a self-contained, immersive virtual space that combines physical, human, and digital worlds (Gursoy et al., 2022; Lee et al., 2022; Wang et al., 2022). Its development has been driven by new technologies such as artificial intelligence (AI), VR, the Internet of Things (IoT) and blockchain (Bhat et al., 2023), enabling users to interact within this environment for work, socialising, or entertainment (Grupac et al., 2022; Lee et al., 2022; Wang et al., 2022; Zabel et al., 2023). Recent studies highlight that the design of immersive experiences in the metaverse transforms user perception and creates disruptive opportunities for digital marketing and customer loyalty, especially through the integration of AI and augmented reality in human-machine interaction.

For these reasons, companies' interest in emerging digital technologies and the metaverse has grown (Grupac et al., 2022), as has their influence on e-commerce and consumer behaviour (Deng et al., 2021; Hung, Tse & Chan, 2022). Evidently, shifts in consumer demands and habits are prompting companies to rethink the online shopping experience, with a focus on brand personalisation that integrates both physical and virtual worlds (Dwivedi et al., 2022; Silva & Bonetti, 2021). In this way, the success of a brand will depend on a coherent and adaptable approach towards an innovative, physical, and interactive environment, increasingly tied to an immersive experience within the virtual world (Harrisson-Boudreau & Bellemare, 2021), where influencers serve as models of consumer engagement (Molina-Prados et al., 2021).

The evolution of the metaverse significantly affects e-commerce business models, particularly customer interactions and core company strategies (Balakrishnan et al., 2024; Chakraborty & Biswal, 2024). Consequently, new business frameworks are likely to emerge, and current models are expected to integrate the metaverse as an additional channel.

There is no clear forecast of when this transformation will emerge owing to the factors that condition it. However, a full shift towards digital products and a transition from traditional e-commerce to metaverse-based commerce are expected (Büchel & Spinler, 2024). Thus, this study explores the current state of knowledge on the transition from e-commerce to the metaverse in the fashion industry, emphasising consumer behaviour and the impact of opinion leaders on social media. Additionally, we aim to identify the current research taxonomy for these topics, providing a categorisation and structure for the available studies. Thus, this study aims to explore the following research questions:

**General RQ:** What do we know about the transition from commerce to the metaverse in the fashion industry, taking into account consumer behaviour and social influencers?

The following research sublines were formulated:

**RQ1:** What are the categories of articles that have been published to date?

**RQ2:** Can a taxonomy of current research on these topics be identified?

**RQ3:** What gaps exist in the literature on e-commerce, the metaverse, consumer behaviour and social influencers, and what future research directions should be pursued?

## 2. Theoretical background

To answer our research questions, we have developed relevant concepts to establish relationships among them and to provide context for our search for related studies and research.

### *Metaverse*

Recently, technologies linked to the metaverse have received significant global attention (Bousba & Arya, 2022; Buhalis, Lin & Leung, 2023; Zhang & Ye, 2023). The term "metaverse" combines "meta" (a Greek prefix meaning "beyond") and "verse" (short for "universe") (Lee et al., 2022). According to Mystakidis (2022), "the metaverse is a post-reality environment: a continuous, multiuser space that merges physical reality with digital virtuality". This immersive, virtual hyperspace combines physical, human, and virtual dimensions into a self-sufficient and time-independent realm (Wang et al., 2022). The incorporation of advanced technologies, such as VR, augmented reality (AR), AI or blockchain, has played a strategic role in the growth of the metaverse, allowing users to participate in work, social interactions, and recreational activities within a shared digital environment (Bousba & Arya, 2022; Kim & Kim, 2024; Lee et al., 2023; Zabel et al., 2023). These technologies foster a shared digital environment in which individuals can collaborate and create together (Lee et al., 2023; Mystakidis, 2022). According to scholars such as Mystakidis (2022) and Zhang and Ye (2023), the metaverse relies on a convergence of technologies that facilitate multisensory interaction beyond virtual environments, digital objects, and avatars, thereby distinguishing it from traditional VR or AR. Thus, the metaverse is viewed as a next-generation internet in which users can live as digital natives, experiencing an alternative existence in a three-dimensional virtual space with avatars or holograms (Wang et al., 2022; Kaur et al., 2024). According to the above authors, the same rules for verbal and nonverbal communication that exist in the real world, such as gestures, mimicry, or tone of voice, have been adopted in the metaverse through these technologies. Consequently, consumers' preferences, behaviours and brand commitments (consumer brand engagement) are changing.

Although interest in the metaverse has increased significantly, its development is still in an early stage (Lowry et al., 2024). According to the Metaverse eCommerce report (Statista, 2024), the metaverse e-commerce market in Spain is projected to reach USD 418.5 million in 2025, with a compound annual growth rate (CAGR) of 41.00%. By 2030, the market volume is forecasted to grow to USD 2.3 billion, with an estimated user base of 11 million. The user penetration rate is anticipated to rise from 9.1% in 2025 to 23.3% by 2030. The evolution of information and communication technologies has facilitated the development of internet- and social network-related technologies, leading to changes in conceptualisation and consumption habits (Chen et al., 2022; Saad & Yaacob, 2021; Su et al., 2023). This novel e-commerce scenario is continuously improving the consumer experience (Bae et al., 2022; Costa et al., 2022; Helm et al., 2020), driving sales growth through this channel.

The term social commerce was created in 2005 amid the growth of social networks (Curty & Zhang, 2011). The goal of social commerce was to extend e-commerce to social networks, exploiting their development and favouring the sustainability of these networks (Liang & Turban, 2011; Yan et al., 2016; Asma & Afreen, 2022; Herzallah et al., 2022), and it was characterised as a phenomenon consisting of the interaction of social media and e-commerce (Asma & Afreen, 2022; Zhang & Benyoucef, 2016).

Although social commerce has attracted interest from both academics and industry professionals, no consensus on its definition has been reached, though there is agreement on its elements (Braojos et al., 2019). Meilatinova (2021, p.2) defines social commerce as "an extension of e-commerce sites, integrated with social media and Web 2.0 technology to encourage online purchases and interactions with customers before, during, and after the purchase". Thus, social commerce has opened new channels that have improved communication between companies and customers, driving new dynamics in business practices (Molina-Prados, et al., 2021; Xu & Liu, 2019); providing a series of advantages, such as being able to buy at any time without having to travel; enabling "traditional" online purchases, in which the information that consumers receive basically comprises images, text or prerecorded videos (Liu & Zhang, 2024); and improving trust (Almajali et al., 2021; Asma & Afreen, 2022). According to Demaj and Manjani (2020), this information asymmetry between consumers and online sellers has contributed to consumer mistrust in online purchases. In this context, it is unsurprising that innovations associated with e-commerce, such as live streaming e-commerce (LSC) (Lyu et al., 2022), as well as novel

technologies (AR, VR, immersive technologies, and gamification, among others) that emphasise the consumer experience, have emerged (Bae et al., 2022; Silva & Bonetti, 2021). Notably, LSC differs from traditional e-commerce in terms of the purchase process (Chen et al., 2022; Lin et al., 2022; Lyu et al., 2022). In LSC, merchants and suppliers can provide product or service information in real time (Chen et al., 2022; Wang et al., 2022), which is another element of entertainment that encourages consumer participation and another factor that influences decision-making.

#### *Social media influencers*

As the popularity and use of social media platforms have grown, consumers have been enabled to share their opinions and experiences with their peers (Asma & Afreen, 2022; Chetioui et al., 2021; Huang & Benyouce, 2013). The use of social networks has increased by 8.8%, reaching 58% of the world's population (Wearesocial, 2022). In this context, the figure of the influencer has emerged; this refers to a person with a high level of popularity (Cheng et al., 2022; Lyu et al., 2022), many online followers and a wide reach with a great ability to influence their followers' decisions (Geng et al., 2022; Hudders et al., 2021; Le & Aydin, 2022; Lyu & Kim, 2020; Meng et al., 2021; Tobon & García-Madariaga, 2021). Notably, social media influencers (SMIs) represent a new type of independent third-party endorser who shape audience attitudes through blogs, tweets, and other social media (Freberg et al., 2011, p. 90). SMIs can significantly influence a company, its product or service and its target audience (Lim et al., 2017; Molina-Prados, et al., 2021).

### **3. Methodology**

In this study, we conducted a systematic literature review (SLR) to explore the interplay among e-commerce in the fashion industry, virtual environments such as the metaverse and emerging technologies, consumer behaviour, and digital marketing strategies. By using this methodology, we were able to determine the current state of the metaverse literature, structure the topics of interest, and summarise the findings. We followed the established guidelines to ensure that the study is transparent and replicable. In this way, key aspects of the metaverse and consumer behaviour are explored in depth, the literature is grouped homogeneously, and future research avenues are identified. SRL has already been applied in other studies of the fashion industry by Abdelmeguid et al. (2022), Thorisdottir and Johannsdottir (2019) and Yang et al. (2017)

#### *Planning*

In the first planning stage, we sought to develop an adequate research process that would, as a result, address the deficiencies in the literature regarding electronic commerce, the metaverse, consumer behaviour, and the role of influencers. Next, we established the objectives and research questions we sought to address in this review. These questions are key to the development of the entire process (Kitchenham & Charters, 2007; Xiao & Watson, 2019).

#### *Databases and search string*

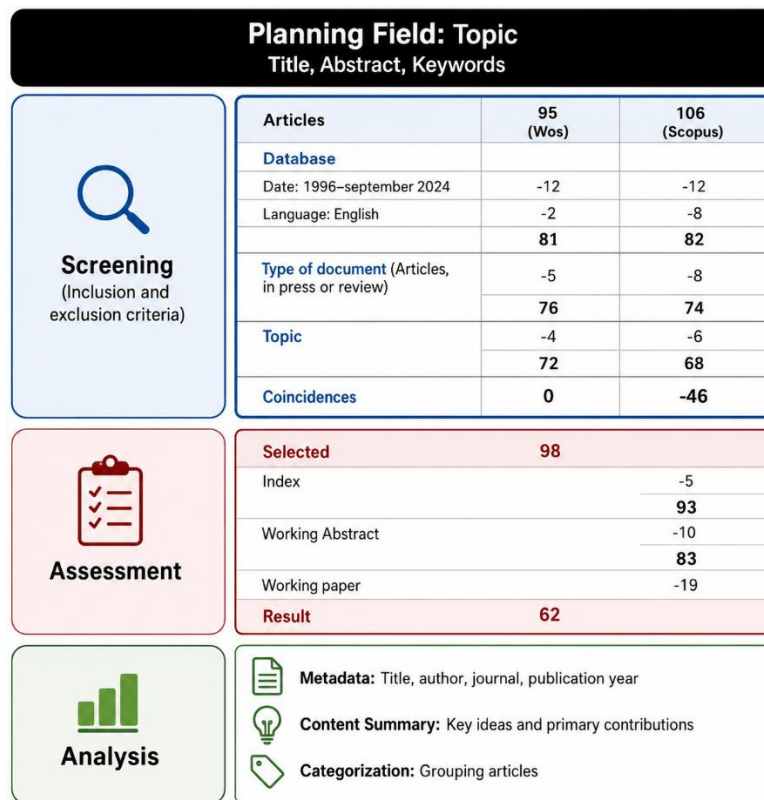
The databases used were WoS (Web of Science), which is commonly used in reviews and is renowned in the field of research for its quality and rigorous controls. We also searched the Scopus database, which provides a wide collection of rigorous, peer-reviewed academic papers. After various tests to refine the search string, the following was formed: [("ECOMMERCE" OR "E-COMMERCE" OR "METAVERSE"), AND ("FASHION") AND ("INFLUENCER") AND ("CONSUMER" OR "CONSUMER BEHAVIOUR")]

#### *Screening and assessment of articles*

We systematically selected and evaluated articles from the databases, including those relevant to our objects of study. A series of generally accepted criteria, which were developed in several steps, had previously been defined. First, we conducted an initial review of the title and abstract, followed by reading the texts of those considered likely to be included in our analysis. For this process, we used appropriate tools to ensure the consistency of the methodology with our objectives and research questions. The articles for which no agreement was reached were resolved through collaborative authorship, reducing bias.

As a result of the selection phase, 201 articles were obtained from WOS and Scopus that met the initial criteria established, with the search terms appearing in the keywords, title, or abstract. The exclusion criteria established

in Figure 1, including publication quality, language, and suitability for the research topic, were subsequently applied. Articles that appeared in both databases were also excluded. After applying these criteria, we obtained 62 articles. Figure 1 shows the flow of this analysis, based on the PRISMA methodology.



**Figure 1.** SLR Process

Source: Authors' own

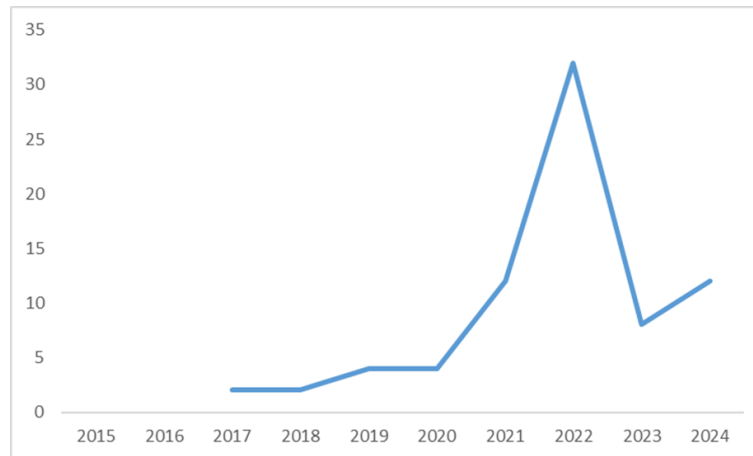
### Analysis

In this phase, the authors analysed and synthesised the articles obtained in the previous phase. To organise the process and make it transparent, we developed a database that compiles all relevant information and in which researchers work collaboratively, code the information, and follow established practices (Zahay, 2021), to reduce individual biases and improve the reliability and validity of the findings. The database was developed in a spreadsheet, including the essential aspects of the research. Finally, the information was synthesised, and the results and contributions identified were written.

## 4. Results

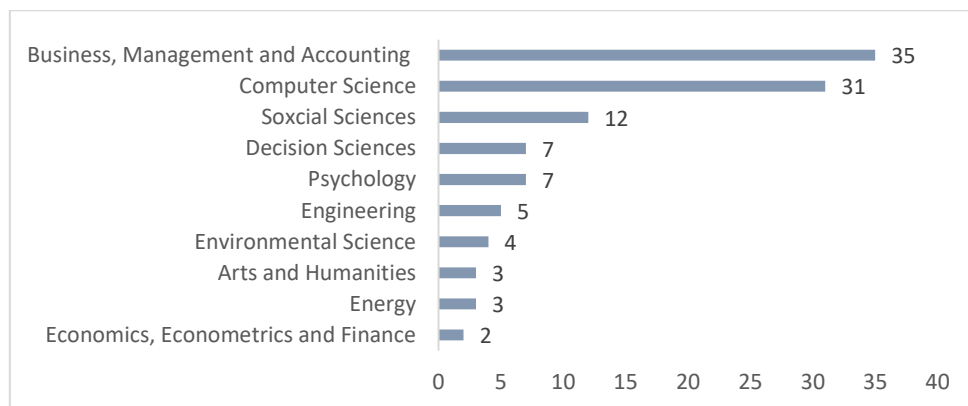
First, we conducted a descriptive analysis to provide an overview of the characteristics of the scientific production of the selected articles. Specifically, we presented the characteristics in relation to its evolution, thematic areas, main journal, methodology and theoretical background. Second, we conducted a content analysis. This analysis focused on identifying the main lines of research followed by the authors of the selected articles, as shown in Section 4.2.

The first article was published in 2015. Figure 2 shows the evolution of the documents in this line of research. Interest in this topic has also been growing in the scientific community since 2022. Our analysis of the publications revealed 10 main themes. Business, Management and Accounting, and Computer Science, with 35 and 31 publications, respectively, are followed by Social Sciences and Decision Science, with 12 and 7 publications, respectively. Figure 3 shows the distribution of the focal publications by thematic area.



**Figure 2.** Evolution of publications

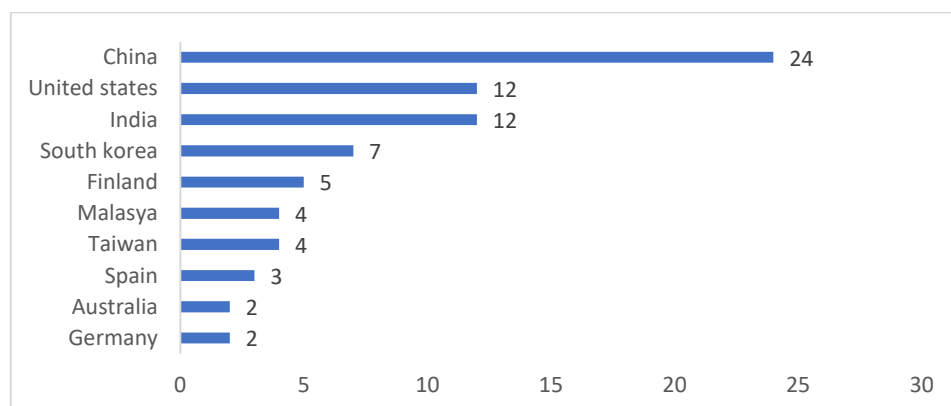
Source: Authors' own



**Figure 3.** Distribution by thematic area

Source: Authors' own

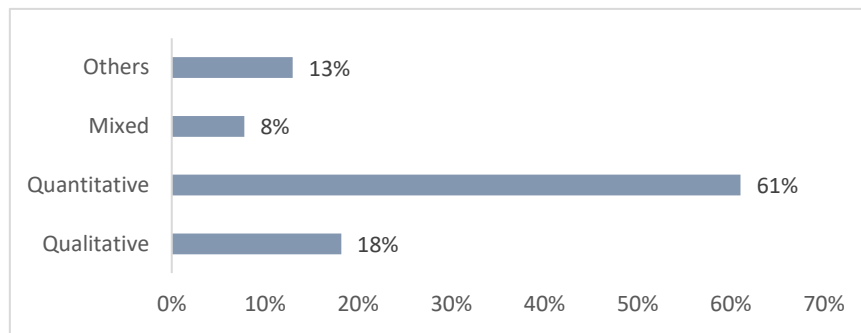
We analysed the countries that have published works in this research area. Figure 4 shows that only ten countries have published more than two works. As the graph shows, China is the most prolific country, with twenty-four publications, followed by the United States and South Korea, with twelve publications each.



**Figure 4.** Countries by number of articles

Source: Authors' own

Additionally, we analysed the methodologies used in the research. We observed that 61% of the studies were quantitative, 18% were qualitative, and 8% used mixed methods (quantitative and qualitative). In quantitative studies, SEM is the most widely used technique. Quantitative research has been applied in most studies related to social commerce, live streaming, and consumer behaviour (see Figure 5).



**Figure 5.** Research methods

Source: Authors' own

The theories used in the focal articles varied greatly, as shown in Table 1. Only 35% of the articles incorporated a theoretical framework for support. The most commonly used theories include stimulus–organism–response (SOR) theory and the technology acceptance model (TAM). Moreover, Mustafa et al. (2022) use the unified theory of acceptance and adoption and a TAM-based technology model (see Table 1).

**Table 1.** Theoretical framework

| Theoretical framework               | Author                                       |
|-------------------------------------|----------------------------------------------|
| Auction Theory                      | Xu et al. (2024)                             |
| Consumer value theory               | Tan et al. (2022); Ng et al. (2022)          |
| Diffusion of Innovation Theory      | Chakraborty & Biswal (2024)                  |
| Dynamic Capabilities                | Zabel et al. (2023)                          |
| Disruptive Technology Theory        | Bhat et al. (2023)                           |
| Dual-process theory                 | Yuan et al. (2021)                           |
| Elaboration likelihood model (ELM)  | Ng et al. (2022); Chung et al. (2018)        |
| Embodied Cognition Theory           | Huang & Chung (2024)                         |
| Emotional contagion theory          | Meng et al. (2021)                           |
| Feelings-as-Information Theory      | Chen et al. (2024)                           |
| Gamification Theory                 | Sharma et al. (2024)                         |
| Generational theory                 | Chung et al. (2018)                          |
| Information asymmetry theory        | Xu, Cui & Lyu (2022)                         |
| Network Effects Theory              | Zhang & Ye (2023)                            |
| Neuro-marketing psychology theories | Srivastava et al. (2022)                     |
| Parasocial relationship theory      | Yuan et al. (2021); Xu, Cui & Lyu (2022)     |
| Positivist philosophy               | Silva & Bonetti (2021)                       |
| Psychological reactance theory      | Asma & Afreen (2022)                         |
| Psychological sense of community    | Lyu & Kim-Vick (2022); Lyu & Kim (2020)      |
| Signaling theory                    | Srivastava et al. (2022); Tóth et al. (2022) |
| Social Exchange Theory              | Tóth et al. (2022)                           |
| Social comparative theory           | Tran (2022)                                  |
| Social identity theory              | Lyu and Kim (2020)                           |
| Social influence theory             | Srivastava et al. (2022)                     |
| Source Credibility Theory           | Garg & Bakshi (2024)                         |

|                                         |                                                                                                                                                                           |
|-----------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Stimulus–organism–response theory (SOR) | Herzallah et al. (2022); Hwei & Youngsook (2022); Asma & Afreen (2022); Aafar et al. (2023); Lee et al. (2023); Payal et al. (2024); Lee et al. (2024); Lin et al. (2022) |
| Technology Acceptance Model (TAM)       | Bae et al. (2022); Chung et al. (2018); Al Khaldy et al. (2022); Xi et al. (2024); Zhou & Tong (2022)                                                                     |
| Transference theory                     | Asma & Afreen (2022)                                                                                                                                                      |
| UTAUT theory                            | Mustafa et al. (2022)                                                                                                                                                     |

Source: Authors' own

The information we obtained from this SLR indicates that authors have been mostly concerned with online buyers on different platforms, such as Alibaba in Tóth et al. (2022), secondhand platforms, such as Bae et al. (2022) and Tan et al. (2022), and regular livestream viewers, such as Meng et al. (2021). With respect to the respondents' occupations, students, professionals, and practitioners have been considered, for example, by Cheng et al. (2022). Regarding age, some studies have focused on millennials and Generation Z, such as Bae et al. (2022). Finally, with respect to gender, some studies focusing on women stand out, such as that of Stofkova et al. (2022).

In qualitative studies, specifically those employing content analysis, Facebook comments have been evaluated, as in the work by Yang and Shin (2021); reviews on online shopping platforms have been investigated, as in the study by Tóth et al. (2022); fashion brands have been described, as done by Yu and Kim (2019); and Instagram posts have been scrutinised, as in the work by Saad and Yaacob (2021). Based on this analysis, we established five categories of research lines.

#### *E-commerce marketing and strategy*

Strong marketing strategies have supported the rise of e-commerce in recent years. In this context, live streaming has played an important role by influencing purchasing behaviour (Geng et al., 2022; Chen et al., 2022). It has also proven useful as a sales promotion tool, supported by influencers (Garg & Bakshi, 2024). These live streaming campaigns positively affect consumers' intention to purchase (Zhou & Tong, 2022), especially because of the trust and emotional value they perceive. Companies must thus strive to offer quality services in the metaverse to improve user satisfaction and loyalty (Kim & Yoo, 2024). Additionally, multichannel and omnichannel marketing strategies are needed for the metaverse, with fluid consumer experiences distributed across several different platforms to achieve greater effectiveness (Ramadan, 2023).

Content marketing is another influential element—a strategic communication approach aimed at attracting and retaining consumers to increase sales. Yang and Shin (2021) examined the effect of marketing actions communicated more informally, using hashtags and/or emoticons, on customer engagement, on the one hand, and the influence of the complexity of customer interactions, on the other hand. Moreover, social media influences consumers' brand awareness (Al-Dwairi et al. 2020). This brand value will provide companies with short- and long-term benefits, enabling them to retain consumers who will continue to buy their products. Consumers always remember a strong brand (Maskuro et al. 2022).

One of the main strengths of the metaverse is that immersive experience and perceived value have a significant positive effect on continued purchase intention (Hwei & Youngsook, 2022; Lee et al, 2023, 2024). To do this, the metaverse must rely on available technologies, such as machine learning and AI. Thus, Srivastava et al. (2022) use these technologies to predict consumer purchase intentions and to explore gamification as a digital marketing tool for companies and the benefits it can bring to consumer experience, engagement, and sales (Milanesi et al., 2022). Branded nonfungible tokens (BNFTs) can also enhance brand engagement in the metaverse by boosting consumer engagement and fostering loyalty through interactive, immersive experiences (Lee et al., 2023, 2024). This interactivity, through active control, two-way communication and synchronicity, significantly increases consumer trust, awareness and brand attachment (Jafar et al. 2023).

As a consequence, purchase intentions in the real world will increase. Thus, we position the metaverse as another key marketing element to transform interactions into purchases (Payal et al. 2024). These marketing actions can

be integrated at the physical and digital levels through the enhanced second-scoring auction-based physical–virtual synchronisation mechanism to simultaneously allocate and match physical and virtual entities in the synchronisation service market of human-focused vehicular metaverses (Xu et al., 2024). Additionally, real-to-virtual platforms that rebuild their business models in the metaverse by leveraging network effects and bundling strategies are noteworthy (Zhang & Ye, 2023). These authors note that the bundling of real and virtual products, influenced by social and network effects, helps platforms differentiate themselves and capture market value.

#### *Online consumer behaviour*

Consumer purchase intention and behaviour must be explored further in relation to the sustainable growth of e-commerce (Mustafá et al., 2022). In fact, in this review, 33.7% of the articles fall within this line of research, highlighting researchers' interest in the subject and facilitating the construction of a map of positive and negative factors that influence purchase intention.

In this context, consumer trust is a key factor in the development of e-commerce, social commerce, and live streaming (Asma & Afreen, 2022; Kennedy et al., 2022; Jeon et al., 2021). The recommendation systems used by e-commerce platforms help build trust among consumers (Kennedy et al., 2022). Consumer trust in traditional commerce is transferred to online commerce, positively influencing consumers' repeat purchase intentions (Jeon et al., 2021). Buyer/seller trust and third-party recognition have contributed to the evolution of C2C e-commerce (Yoon & Occena, 2015).

The customer experience during the browsing and purchasing process is also a key factor in the development of online e-commerce. Companies can use technology to create more satisfying customer browsing experiences (Bae et al., 2022; Costa et al., 2022). There is a growing interaction between customers and platforms, which influences their purchasing behaviour. Undoubtedly, increased interactivity is a determining factor for the evolution of e-commerce and social commerce (Hewei & Youngsook, 2022; Lin et al., 2022; Lyu & Kim, 2020; Yuan et al., 2021). Some technologies, such as AI (Costa et al., 2022), AR and VR (Al Khaldy et al., 2023), stand out as elements that facilitate immersive experiences (Hewei & Youngsook, 2022; Huang et al., 2022), the use of avatars (Chakraborty & Biswal, 2024) or gamification (Milanesi et al., 2022; Sharma et al., 2024).

We have also identified a series of factors that positively influence consumer online purchasing behaviour, such as perceived usefulness, ease of use and security (Herzallah et al., 2022), eWOM (Tobon & García-Madariaga, 2021; Tóth et al., 2022), perceived enjoyment (Lin et al., 2022; Xi et al., 2024) and positive online reviews received (Chung et al., 2018). In terms of negative factors, risk perception has one of the greatest effects on purchase intentions through Instagram (Herzallah et al., 2022) and on group purchases (Ou et al., 2022), and is a main cause of shopping cart abandonment (Rejikumar & Asokan-Ajitha, 2020).

#### *Metaverse boosters*

Through this review, we also identified a category we called metaverse enhancers. It includes 10.8% of the articles. Certain digital drivers are crucial for the evolution from pure e-commerce to commerce in the metaverse, especially related to the improvement of interactivity (Gursoy et al., 2022; Hewei & Youngsook, 2022), livestreaming (Chen et al., 2022; Lin et al., 2022), and gamification (Sharma et al., 2024). An example of this improvement is the development of avatars that foster a connection between celebrities and their followers (Bousba & Arya, 2022; Brito et al., 2022). Avatars are effective patterns that can generate engagement through a variety of strategies, from humanisation to robotisation (Brito et al., 2022). On the other hand, advances in AI, VR, AR and mixed reality facilitate the introduction of digital humans (Al Khaldy et al., 2023; Chen et al., 2024; Xi et al., 2024) with a more active role in the fashion industry, which requires a deeper understanding of how consumers interact with digital humans (Silva & Bonetti, 2021). Although the evolution of the metaverse faces challenges, such as user acceptance of and integration with technology (Al Khaldy et al., 2023), nascent technologies offer compelling benefits that drive its development. Examples include improved product visualisation for users, the ability to try on an item virtually with their avatar, product customisation, and social shopping supported by influencers.

VR and AR also play key roles in transforming the customer experience, making it more immersive, thereby improving customer satisfaction (Huang & Chung, 2024), the shopping experience (Chen et al., 2024), and the

user experience (Xi et al., 2024). Another key technological development is avatars and direct commerce with avatars (D2A) in the metaverse, which enable brands to interact with customers more directly (Chakraborty & Biswal, 2024). We also highlight innovations derived from the application of big data and algorithms (Arora et al., 2019) for various utilities, such as personalised recommendations, dynamic detection capabilities (Zabel et al., 2023), the generation of image-based listings for mobile optimisation and geolocation-based feeds (Bae et al., 2022; Grupac et al., 2022), product classifiers based on machine learning (Arora et al., 2019) and customisable purchase filters (Bae et al., 2022), as drivers of the metaverse.

All this development has, in parallel, driven the growth of online resale platforms for secondhand products, a clear example of sustainable business models (Bae et al., 2022). Another group of driving technologies includes machine learning and AI, which use different algorithms, such as natural language, decision trees or convolutional neural networks, to estimate demand in the context of e-commerce and support marketing decisions related to product design and development (Arora et al., 2019; Srivastava et al., 2022). These technologies provide more accurate information about consumers' tastes and preferences (Srivastava et al., 2022).

#### *Generation of new sustainable business models*

A total of 12.2% of the papers address new business models in the fashion world based on electronics. The metaverse will generate new basic strategies and business models, but the question of when it will achieve widespread adoption remains. Thus, companies must already prepare for possible transformations in digital product sales and customer engagement (Büchel & Spinler, 2024). The increase in purchases of fashion products through e-commerce has driven the adoption of innovative practices that are leading us towards the development of new, more sustainable business models (Silva & Bonetti, 2021). Among these business models, we highlight secondhand platforms (Bae et al., 2022), collaborative economy platforms (Tan et al., 2022), online group purchases on community e-commerce platforms (Ou et al., 2022), subscription boxes (Andonova, Anaza, & Bennett, 2021), and the development of C2C social commerce (Saarijärvi et al., 2018; Yoon & Occena, 2015; Yrjölä et al., 2017).

Since these are new business models, researchers have addressed various aspects of them. In the case of online used-product sales platforms, Bae et al. (2022) explore technology-based strategies as a starting point for advancing research into technological innovations that contribute to their development. Other authors focus more on factors related to the consumer as a driver of these new business models (i.e., Andonova, Anaza, & Bennett, 2021; Ou et al., 2022; Tan et al., 2022). For their part, Bhat et al. (2023) indicate that new financial business models (Fintech) can exploit emerging technologies, including the metaverse, to improve their services.

#### *The role of influencers*

In the fashion industry, influencers play a crucial role in boosting sales and improving the effectiveness of promotions, thus driving the development and evolution of online commerce (Molina-Prados et al., 2021; Garg & Bakshi, 2024). Influencers are social agents with a wide reach and great capacity to influence the purchasing decisions of their followers, both in social commerce (Lyu & Kim, 2020; Meng et al., 2020; Tobon & García-Madariaga, 2021; Geng et al., 2022; Le & Aydin, 2022) and in traditional commerce (Ma, 2021; Wang et al., 2021; Zhou & Tong, 2022). Thus, unsurprisingly, there is great interest in analysing in depth the characteristics of influencers and their effects on purchase intentions. For example, personality and attractiveness are highlighted as characteristics that influence experience and perceived value and subsequently purchase intentions (Xu & Kim, 2022) or as moderators in the case of live streaming (Lyu et al., 2022). Furthermore, popularity (Cheng et al., 2022; Lyu et al., 2022), fairness (Stubb & Colliande, 2019), reputation, and perceived authenticity are also influential characteristics of influencers that affect purchase intentions (Le & Aydin, 2022). Influencers' credibility also positively influences consumers' experience and perceived value (Xu & Kim, 2022; Chaudhry, 2022; Garg & Bakshi, 2024), provided they do not engage in unethical practices (Chaudhry, 2022). Given the influence influencers have on purchasing intentions, it is interesting to develop mechanisms to measure their real impact on online commerce platforms, especially on social networks (Arora et al., 2019).

The evolution of technology has enabled the emergence of digital avatars, which are becoming effective digital influencers due to the engagement they generate (Brito et al., 2022). These avatars help build relationships between companies and customers, boosting brand awareness, promoting their products, and fostering trust that translates into increased sales (Moreira et al., 2022).

In relation to the sectors in which new metaverse business models may emerge, Kou et al. (2023) suggest that tourism is the most promising sector for sustainable investments in the metaverse, with a focus on organisational effectiveness and on reducing environmental impact through clean energy. However, Singh et al. (2024) identify five key issues (physiological, psychological, legal, security and social) that can negatively impact customers in the tourism and hospitality sectors.

## 5. Implications of the obtained results

The transition of e-commerce towards a metaverse-based model is in an incipient state, with many unknowns yet to be clarified and progress in the research area. The results of the content analysis of articles published from 2015 to 2022 provide a general overview of research on the subject. We highlight the following as the main objects of study: on the one hand, the behaviour of the fashion consumer before e-commerce and the metaverse, and on the other hand, the role that influencers play in the purchasing process. Interest in the subject stems from diverse thematic areas, mainly business, management, accounting, and IT, as evidenced by the number of publications. Regarding the journals, we did not identify any with greater specialisation; rather, most published a small number of articles. The most productive countries are China, the United States and South Korea. Methodologically, quantitative studies stand out. These data indicate that this research area has attracted the scientific community's interest but remains underdeveloped.

Based on this analysis, we identified five categories of published articles on e-commerce and the metaverse. Table 2 shows the number of articles by category. We observe that the line of research that has attracted the most interest in the academic community is "Online Consumer Behaviour", accounting for 33.7% of the articles published.

**Table 2.** Percentage of articles by category

| Categories                        | % Articles |
|-----------------------------------|------------|
| E-commerce Strategy and Marketing | 22.1%      |
| Online Consumer Behaviour         | 33.7%      |
| Metaverse drivers                 | 10.4%      |
| New business models               | 11.7%      |
| Role of influencers               | 22.1%      |

Source: Authors' own

The first category is "E-commerce Strategy and Marketing", which describes how the metaverse leverages cutting-edge technologies to create new marketing strategies, for example, using live streaming (Chen et al., 2022; Geng et al., 2022) or influencers who expand their reach and build consumer trust (Garg and Bakshi, 2024). The articles analysed indicate that interactive and immersive experiences, facilitated by nonfungible tokens (NFTs) and reinforced by omnichannel marketing, can influence consumer purchase intentions (Kim & Yoo, 2024; Lee et al., 2023). Additionally, content personalisation and the use of gamification and AI tools, such as machine learning, improve the prediction of consumer tastes and behaviour (Srivastava et al., 2022; Milanese et al., 2022). The development of strategies focused on creativity and user engagement favours e-commerce in the metaverse and builds customer loyalty.

The second category identified in our analysis is "Online consumer Behaviour". Consumer trust is a critical factor in the successful implementation of e-commerce in the metaverse (Kennedy et al., 2022; Asma & Afreen, 2022). Trust can be reinforced by the use of new technologies such as AR and VR (Costa et al., 2022; Hewei & Youngsook, 2022). On the other hand, risk perception is one of the most important factors leading to negative online shopping behaviours, such as cart abandonment (Rejikumar & Asokan-Ajitha, 2020; Herzallah et al., 2022). However, the metaverse, with its interactive capabilities and consumer engagement, can mitigate these risks and convey a sense of security in a personalised way (Lin et al., 2022).

The third category is "Metaverse drivers". Technological advances, such as AI, VR, and AR facilitate the transition of current e-commerce to the metaverse. These elements improve interactivity and consumer engagement. Additionally, the use of avatars facilitates stronger connections between brands and their customers, creating unique interaction experiences that cannot be replicated in traditional e-commerce (Bousba & Arya, 2022; Brito et al., 2022).

The drivers of the metaverse facilitate better product visualisation and virtual testing, thereby improving consumer satisfaction and engagement (Chen et al., 2024; Huang & Chung, 2024). The challenges of user acceptance of technology and its technical integration must be addressed to realise the potential of the metaverse. (Al Khaldy et al., 2023). As these technologies evolve, deeper integration between the physical and virtual worlds of the metaverse will be promoted. The fourth category includes new business models. The metaverse will revolutionise traditional business models, particularly in the fashion industry. More sustainable business models will emerge that focus on secondhand platforms and collaborative economies (Bae et al., 2022; Tan et al., 2022). These platforms exploit the synergies of the metaverse by grouping real and virtual products, thereby contributing to brand differentiation and increasing customer loyalty (Zhang & Ye, 2023).

The rise of C2C social commerce and online group-buying models demonstrates the metaverse's ability to transform customer relationships and drive more sustainable business practices (Yoon & Occena, 2015; Saarijärvi et al., 2018). Companies must be prepared for this change, developing strategies that facilitate fluid transitions between the sale of physical and digital products and customer interactions (Büchel & Spinler, 2024).

Finally, we grouped the studies that analyse the "Role of influencers" in this environment into a fifth category. Influencers undoubtedly play a key role in encouraging consumer participation in sectors such as fashion or social commerce. Personality, attractiveness and transmitted confidence clearly affect consumers' purchase intentions (Xu & Kim, 2022; Le & Aydin, 2022). They are thus shown to be social agents with a wide reach and a strong capacity to influence consumer behaviour (Meng et al., 2020; Tobon & García-Madariaga, 2021). Furthermore, the emergence of digital avatars as influencers enables brands to interact with consumers in innovative ways, reinforcing brand loyalty (Brito et al., 2022) and building trust (Moreira et al., 2022).

## 6. Conclusion

Based on a systematic literature review of 62 articles published from 2015 to 2022, this study explored the shift from traditional e-commerce to metaverse commerce, focusing on new technologies and social influencers in the fashion sector. The analysis was organised around three research questions: firstly, *what are the categories of articles published to date?* Secondly, *can a taxonomy of current research on these topics be identified?* And, thirdly, *what gaps exist in the literature on e-commerce, the metaverse, consumer behaviour and social influencers, and what future research directions should be pursued?*

Regarding the first question, we have identified five generic research categories: e-commerce strategy and marketing, online consumer behaviour, metaverse drivers, new business models, and the role of influencers. Online consumer behaviour was the most researched among these categories, reflecting notable academic interest in trust, engagement, interactivity, and purchase intention, especially in virtual environments.

For the second question, this study establishes a taxonomy that organises existing knowledge of the interrelation between e-commerce and the metaverse. The outcome reveals that the metaverse is set to revolutionise e-commerce by combining futuristic technology with unique methods to deliver more effective, immersive consumer experiences. New technologies like AR, VR, and AI make personalised content possible and improve predictions of consumer trends, resulting in better marketing activities, greater involvement, and greater consumer buy-in. Similarly, the metaverse also encourages new sustainable business models, especially in sectors such as fashion, which is growing faster through secondhand platforms and collaborative economies. In response to the impact of influencers, the results find that influencers, human or digital avatar, are essential to improve consumer participation, influence purchase intention, develop brand loyalty, and build trust in these new virtual environments. Consumer trust plays a pivotal role in successful interaction in metaverse commerce,

and personalisation and interactivity have been shown to contribute to a better user experience and a greater sense of security.

Regarding the third question (RQ3), the study identifies several significant research gaps. Consumer risk perception is an ongoing issue and is associated with negative online shopping behaviour, such as shopping cart abandonment. Future research thus needs to continue investigating mechanisms to reduce perceived risk through immersive and personalised experiences. Also, more research is needed on cross-country differences, gender-related behaviours, socioeconomic barriers to adopting the metaverse, and strategies to integrate sustainability and circular economy elements into metaverse-based business models.

Thus, this study adds to the academic literature by advancing an integrated approach to metaverse commerce, transitioning from its current form of e-commerce within the fashion industry. This analysis is novel, as it enables a systematic taxonomy in which consumer behaviour, influencer marketing, new-age technology, and viable business models can be closely associated. The findings additionally emphasise the strategic significance of immersive technologies and digital influencers in future online consumption experiences.

## 7. Limitations of the research and future lines

This study has several limitations. First, our SLR included only peer-reviewed scholarly articles published in English, from the first publications to 2022; we did not include conference proceedings or articles published in media, which, owing to the novelty of the focal phenomenon, could also offer some interesting contributions. Second, the review included articles published in WoS and Scopus, which, according to authors such as Harzing and Alakangas (2016) and Zhang and Eichmann-Kalwara (2019), are the main repositories of scientific publications and the most appropriate databases for our study. Thus, we excluded other publication types.

With respect to future lines of research, in line with Mumu et al. (2022), deepening understanding of trust across different contexts (platforms, influencers, and streamers) would be of interest. Furthermore, following the recommendations of Kennedy et al. (2022), certain factors that influence consumer behaviour on online platforms, such as order management, product variety, company image and reputation, and trust in their recommendation system, including online payments, should be explored (Stofkova et al., 2022).

From a gender perspective, as this is a relevant aspect increasingly integrated into marketing, it can facilitate segmentation and provide significant value. In addition to the gender variable, it would be interesting to explore the social and economic barriers to accessing the metaverse, consuming it, and interacting with and establishing relationships in this space. The differences across various countries could be analysed to evaluate the adoption variables in this new panorama. These aspects will be relevant for brands, companies and metaverse developers themselves when establishing the usability and functionality of the spaces in this area. Finally, it is critical to study and assess how the values of sustainability and the circular economy can be applied to the creation, development, and sale of NFTs (fashion products) in the metaverse, following Castillo-Alcántara (2022) regarding their innovative production in Spain.

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