



How the metaverse influences marketing and competitive advantage of retailers: predictions and key marketing research priorities

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Abstract

Retail is one of the sectors that Metaverse will strongly implicate. Given the hypothetical convergence of physical and the Metaverse shopping experiences, retailers in grocery segment must identify and forecast opportunities and emerging challenges to achieve a competitive advantage with appropriate marketing strategies. By anchoring in the brick-and-mortar context, the present paper discusses the sources of competitive advantage for grocery segment retailers in the Metaverse, highlighting differences and similarities with the traditional retail context. Moreover, following a marketing perspective, a research agenda is presented, looking at the retail sources of competitive advantage in the Metaverse.

Keywords Retail · Metaverse · Grocery · Competitive advantage · Virtual shopping · Immersion · Prospects

1 Introduction

The Metaverse, by its inherent nature, represents a burgeoning frontier, poised to amplify opportunities for experiencing virtual environments daily through multifaceted interactions such as gaming and engaging with a diverse array of service

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providers, inclusive of, but not limited to, business, education, and shopping. Projections anticipate metamorphic growth in the Metaverse market, with estimations suggesting a valuation of around \$800 billion by 2024 [10]. This trajectory signifies a potential disruption in the retail sector [60], recalibrating retailers' conceptualizations of marketing within these nascent virtual landscapes.

A proliferation of retailers, including, but not limited to, Uniqlo, Gucci, H&M, and Walmart, are positioned as potential trailblazers and early adopters in the realm of Metaverse retailing [42]. Current academic discourse delineates two principal streams of research within the Metaverse context. The initial stream centers around technologies integral to the Metaverse and the experiential facets thereof, such as virtual and augmented reality [36, 44, 61]. The subsequent stream explores a more expansive array of domains, addressing implications for consumers, retailers, in-store design, shopping experiences, advertising, and overarching marketing strategies within the Metaverse [5, 8, 25, 60].

However, a discernible gap persists in academic understanding, particularly regarding online (virtual) grocery shopping, rendering the knowledge fragmented and inconclusive. Despite extensive insights into the competitive advantages inherent to both physical and online grocery retailers [32, 59], the intersection of grocery shopping, competitive advantages, and the Metaverse remains a comparatively uncharted domain. The virtual operational dynamics within the Metaverse are likely subject to distinctive decision biases [57] and offer unique competitive advantages, enabling retailers to craft immersive and personalized shopping experiences that eclipse the constraints of physical retail. By harnessing the capabilities intrinsic to the Metaverse, retailers can formulate differentiated value propositions, fostering enhanced customer engagement and loyalty [31, 39]. This paradigm shift accentuates the potential for heightened brand visibility, customer retention, and elevated sales volumes, underscoring the pivotal role of the Metaverse in contemporary retail marketing strategies.

With a forward-looking lens, this paper endeavors to: (1) elucidate the multilayered interrelations between competitive advantages and Metaverse retailing; (2) offer a compendium of propositions; and (3) identify outstanding research avenues. To this end, an integrative literature review has been employed to distill, amalgamate, and synthesize prevailing findings [40], with a concentrated focus on the Metaverse, retailing, and marketing within this emergent digital ecosystem. Importantly, this paper highlights grocery shopping as a pivotal component within this discourse, seeking to illuminate the intricacies and potentialities inherent to this focal sector.

2 Why metaverse may be a fertile ground for retail evolution?

Applying a marketing approach and aligning retail strategies with customer needs can effectively illustrate a retailer's competitive advantage. Historically, Dunkin et al. [17] have maintained that most successful large retailers achieve their market goals by carefully selecting merchandise, employing competent managers who lead by example, and utilizing advanced technology to enhance efficiency and deliver innovative levels of customer service. Consequently, Day and Wensley [15], p. 2 concluded, "There is no common ground for competitive advantage

in practice or in the marketing strategy literature.” The literature has delved into several elements of competitive advantage, analyzing them in depth [28, 57, 58].

Even when supported by advanced technologies, customer contact remains one of the most relevant assets in building strategies for competitive advantage [26]. The Metaverse environment appears to be the next frontier for customer contact in advanced 3D virtual space. Research on the Metaverse is currently escalating (e.g., [16, 60]), particularly in the business domain [16, 19]. However, Dwivedi et al. [18] state that no agreement exists about the evolution and future features of the Metaverse. Scholars are actively encouraged to articulate visions and provide theoretical frameworks to address the implications of the Metaverse for various aspects of business (e.g., retail, hospitality, shopping, etc.). Although several definitions of the Metaverse exist, a recent one by Yoo et al. [60] describes it as “*an online collaborative shared space built of 3D environments that leverage high consumer immersion techniques to reduce the perception of technological mediation, alongside transferrable and unique digital assets, while allowing user-generated digital personas to interact with each other.*” Recent contributions related to the Metaverse in marketing, retail, and management have addressed its features, future perspectives, and research trends, especially in business management. Immersive technologies, visualization tools, and virtual marketplaces that improve competitiveness and personalized customer experience have attracted research attention [11]. Reportedly, technology seems to be a critical element that can either limit or enhance the diffusion of the Metaverse and the perceived value of such an environment [11, 43].

The Metaverse provides ample opportunities to experience virtual environments, including shopping with avatars and their virtual proxies. It opens several opportunities for retailers, as 3D virtual shops can offer augmented experiences to customers. Notably, within the domains of grocery shopping, retail, and the Metaverse, motivations have been identified as multidimensional [46]. The allure of the Metaverse often lies in its seamless blend of reality and digital convenience, allowing users to shop in immersive environments that can mimic or even enhance physical shopping experiences. Furthermore, the Metaverse can offer highly personalized experiences through the use of data analytics and AI [18, 43], tailoring product recommendations based on user behaviors, preferences, and past purchasing patterns. Such personalization not only enhances the shopping journey but can also increase brand loyalty [29]. Additionally, the Metaverse offers unparalleled engagement opportunities, such as exclusive virtual pop-up stores or interactive product launches that are only accessible within this digital realm [12]. These unique interactions can instill a sense of exclusivity and novelty, factors that can significantly sway consumer decisions and lead to value generation. Based on the digital twin argument, Metaverse stores (meta-stores) can draw inspiration from physical stores and vice versa, potentially integrating physical experiences into Metaverse stores. Hypothetically, traditional agreements between retailers and producers may need to be partially revised, potentially adopting alternative marketing logic and strategies. For instance, meta-stores can enhance their offerings in complementarity with physical shops and e-commerce.

3 Self-sovereign identity and non-transferable tokens for secure retail in the metaverse

Navigating user authentication and managing access in the fast-paced world of online grocery shopping and the Metaverse poses significant challenges [22], especially when it comes to combating duplicate or fake identities. Self-sovereign identity (SSI) presents a robust, decentralized solution to mitigate these risks [24]. With SSI, users can store authentication credentials in digital wallets, facilitating seamless interactions across various retail platforms and preventing the creation of multiple or fraudulent identities. SSI liberates users from platform-specific IDs by centralizing their various identities into a single, secure, and verifiable one [21], thereby enhancing user experience and bolstering security against fraudulent activities. For instance, a single SSI could unify a shopper's separate identities for a virtual supermarket and a high-end boutique, ensuring an efficient and secure shopping journey. Pairing SSI with non-transferable tokens (NTTs) could further elevate the retail experience [14, 43]. NTTs can validate actions or transactions, such as certifying the authenticity of a limited-edition item, thereby instilling greater trust. Additionally, NTTs can be integrated into loyalty programs, verifiable through a user's SSI, providing a secure way to benefit from promotions or rewards. In essence, the combined approach of SSI and NTTs offers a comprehensive strategy for enhancing trust, engagement, and incentives for grocery shopping within the Metaverse, addressing the dual challenges of security and user experience.

4 Methodological remarks

This work introduces a set of propositions that depict the sources of competitive advantage for retailers in Metaverse and grocery shopping context. These propositions follow a marketing perspective and build on the identified competitive advantages of brick-and-mortar stores. To achieve these goals, data from the literature have been utilized to compare the sources of competitive advantage of retailers with the potentialities of the Metaverse. Specifically, a qualitative approach employing the relating approach of MacInnis [40] was used, with a focus on the subtype 'differentiating'. This implies the ability 'to see types of things and how they are different, to discriminate, parse, or see pieces or dimensions that comprise a whole' [40]. This research process is based on a sequence of three interrelated stages.

Firstly, the domain-relevant body of knowledge was explored to identify and retrieve the sources of competitive advantage in the brick-and-mortar retail grocery context. The collected material was screened based on relevancy, timeliness, and research focus (summarization). Secondly, the integration phase was developed, involving an elaboration of sources of competitive advantage and a further comparison between brick-and-mortar and Metaverse contexts. The primary

goal of this phase is to present a comprehensive view of the observed phenomena. Therefore, the sources of competitive advantages were integrated and considered for possible evolution in the context of the Metaverse. The delineation phase focuses on understanding the relationship between sources of competitive advantage in a brick-and-mortar context and other concepts/dimensions, such as competitive advantage in the Metaverse. This final phase aims to understand how these dimensions will affect the effectiveness and efficiency of grocery shopping in Metaverse-like environments.

5 Conceptual framework and research propositions

5.1 Metaverse as an emerging channel?

The selection of distribution channels by grocery retailers continues to be a pivotal determinant of success, with technology playing an instrumental role in shaping these choices [38]. Over time, advancements in technology have necessitated a shift towards multi-channel or omnichannel configurations, particularly in grocery retailing [7, 54]. The proliferation of online platforms—including mobile channels, social media, and digital marketplaces—has catalyzed significant transformations in business models and the retail marketing mix, especially for grocery stores.

The Metaverse is emerging as a novel digital channel with the potential to substantially disrupt the established practices of grocery retailers [7, 54]. Dwivedi et al. [18] posit that it holds the potential to fuse different channels, blending virtual experiences with the tangible attributes of physical stores, thereby influencing grocery shopping experiences. The Metaverse can act both as an alternative and a complement to physical spaces such as hyper-specialized shops, supermarkets, and niche markets. As such, integrating the Metaverse into the omnichannel marketing strategy is essential, particularly for enhancing the consumer experience in grocery shopping. Consequently, we propose:

P1: *Metaverse is an alternative channel of distribution that integrates elements of both physical and digital channels.*

5.2 How the retail format will look in metaverse?

The current literature thoroughly addresses retail formats up to the present day (Lee et al., 2023). Gauri et al. [22] unequivocally emphasize the pivotal role of consumers in selecting appropriate store formats through an extensive literature review, advocating for a “customer-centric” framework for store format innovation, especially in grocery shopping. However, two notable yet underexplored research areas are the competitive advantages and the role of technology in influencing store format competition. Theoretically, stores in the Metaverse can replicate the characteristics of physical stores. The specific store format, which can include a variety of services and assortment breadth, is contingent upon available graphics, broadband capabilities, and the degree of social interaction between avatars. Given that avatars are not

constrained by physical limitations such as gravity and movements [35], users can explore diverse store formats within the Metaverse, enhancing their grocery shopping experiences.

However, certain limitations may exist in terms of avatars and store formats, potentially imposed by legal authorities, technical infrastructure, and payment gateways, which could impact the grocery shopping experience in the Metaverse [27].

P2: *Gamification will have a decisive role in format design (every format can be reproduced in the metaverse), and legal frameworks and technology infrastructure will impose limits.*

5.3 What is the interplay between stores' assortment and metaverse?

Assortment-related decisions are intricate, encompassing considerations regarding size, type of products, categories, pricing, and changes in assortment [30, 41]. These factors are pivotal in shaping consumers' perceptions, especially in grocery shopping [50]. In the Metaverse, the assortment can reflect that of physical stores. Although Metaverse stores can potentially accommodate unlimited assortment space, maintaining similarities with real stores in terms of dimensions allows avatars to experience shopping in a manner closely resembling reality, facilitating a smoother transition between virtual and eventual real experiences. Essentially, meta-stores can incorporate various elements such as music, sensory stimuli, and entertainment [48] to align closely with the physical store's ambiance. Hypothetically, the Metaverse store can emerge as a lucrative channel to implement pre-established agreements between retailers and suppliers, such as shelf positioning and in-store promotions. This immersive environment could allow for an augmented presentation of product attributes, alongside information on additional services [20, 51].

Retailers would determine the visual presentation of offerings based on the technological capabilities of both the stores and avatars. Therefore, it becomes imperative for retailers to identify which categories can best leverage the immersive potential of the Metaverse. In the realm of grocery assortments, categories like food products and those eliciting high consumer involvement during purchase (e.g., organic food, fresh produce, wines) appear to hold promising potential in the Metaverse. While current technology may not fully optimize the display of packaging characteristics, the Metaverse can offer information in a direct and immersive manner, proving crucial for traceability, safety, product characteristics, and sustainability.

P3: *The assortment in Metaverse will be a partial (or full) replication of brick-and-mortar assortment and will be fully supported by augmented communication.*

5.4 Is the price critical a success factor in metaverse?

Traditionally, price has been a pivotal competing factor among retailers, particularly in grocery shopping [33]. For a long time, retailers heavily relied on price as their competitive advantage to position their offerings, primarily due to standardization. It is only recently that retailers have shifted their focus more towards the value they deliver or co-create with customers [34]. Currently, pricing strategies are evolving,

centering more around the increasingly significant concepts of convenience and value.

Notably, pricing in the Metaverse should adhere to similar strategic goals and orientations as in traditional stores. However, given the virtual nature of the Metaverse, certain amendments may be necessary in pricing decisions, such as the type of currency used. Hypothetically, price should continue to be a significant factor in a retailer's strategy to position its offerings and facilitate customer segmentation. Nonetheless, uncertainties still persist regarding the payment gateways and currencies that will be utilized for transactions in this new digital realm [3, 45].

P4: *In the Metaverse, the price keeps its traditional role. International perspective and available payment gateways could impose additional roles.*

5.5 Can private labels secure a competitive advantage in the metaverse?

The literature affirmatively acknowledges the pivotal role of private labels in enabling retailers to build competitive advantages [55], foster customer relationships [23], establish loyalty [2, 37], present distinct value propositions [13], differentiate from competition [4, 6], and generate profits in vertical supply chains [53]. Specifically, in the context of grocery shopping, private labels can significantly influence consumers' purchasing decisions and perceptions of value. To date, the literature has yet to explore private labels within the context of virtual worlds like the Metaverse. It is posited that the technical characteristics of such environments will not impact the product itself, be it ingredients or quality, nor will they alter the positioning strategies of various private label brand lines. Given the conceptual similarities with physical stores, decisions surrounding private labels in the Metaverse should aim to achieve comparable strategic goals.

The Metaverse grants retailers the freedom to construct virtual shelves and feature multiple brands, allowing avatars to mimic in-store eye movements. Consequently, private label strategies and the positioning of assortments on the shelves can adhere to the same agreements that retailers establish with producers for brick-and-mortar stores. However, the Metaverse introduces unique factors, such as packaging visibility, specific advertising, augmented communication, information dissemination, and stock availability, all of which require careful consideration and adaptation by retailers venturing into this innovative digital realm.

P5: *Two categories of factors influence the competitive power of private labels in the Metaverse: (1) those similar to brick-and-mortar and (2) those completely different (e.g., digital products).*

5.6 The give-and-take relation between metaverse and logistics

Logistics and relationships play a crucial role in building a competitive advantage over other retailers, especially in the realm of grocery shopping, where cost management and efficient distribution of goods and services are pivotal [32]. Specifically, these elements are markedly influenced by two prevailing macro-environmental

trends currently reshaping the competitive landscape in retail: (1) the advent of new technologies [43, 56], and (2) a growing emphasis on sustainability [9, 52].

Relevant to the Metaverse, these trends significantly impact the final phase of value delivery—the retailer–consumer interaction. However, other stages of supply chain management and logistics relationships should not undergo radical modifications compared to those in brick-and-mortar and e-commerce business models, for example, purchasing products in meta-stores and arranging for home delivery. The implications of these trends within the Metaverse are mainly connected to the redefinition of in-store competitive dynamics. This includes increased price competition, shifts in customer preferences, the emergence of new market entrants, and the subsequent effects on the industry–distribution balance of power, which will inevitably reverberate throughout the entire supply chain.

P6: *Metaverse will impact the supply chain's last stage, redefining the dynamics of the order-delivery cycle.*

5.7 How real is the virtual role of human resources in securing a competitive advantage in metaverse?

Human resources stand as a significant factor fostering genuine differentiation in the value proposition among retailers, especially in the context of grocery shopping [47]. This is particularly true when considering the critical role of front-office human resources in shaping consumer perceptions and building enduring relationships with them. The importance of human resources also varies depending on the cultural context, thereby adding a layer of complexity when hypothesizing analogies or differences between brick-and-mortar and Metaverse settings. At its core, the comparison hinges on the extent to which the human dimension—encompassing aspects such as behavior, appeal, and communication—will be represented through Metaverse avatars and the level of service designated for the Metaverse experience. Given the current pace of VR adoption, it seems plausible that the Metaverse might not fully replicate and enhance the human touch, assistance, and relational aspects found in physical stores. Nonetheless, the Metaverse offers the prospect of always-open stores, potentially staffed with human-looking avatars to enrich the shopping experience, albeit possibly for limited hours daily.

With ongoing technological advancements, these human-resembling avatar staff could be complemented by automated chatbots or artificial intelligence-based avatars, further contributing to a nuanced and engaging customer interaction in the virtual realm of grocery shopping.

P7: *The role of human resources in metaverse stores will depend on the service level that retailers would like to integrate into their offerings and on the level of convergence between humanized personnel and chatbots based on artificial intelligence.*

5.8 Extension or metaverse-twin? Store image in the metaverse

Long-term strategies aimed at positioning retailers and enhancing their image play a pivotal role in building competitive advantage, especially in the field of

grocery shopping [1, 49]. The literature has intricately connected store image to various other elements, such as assortment, human resources, and private labels. At the core, it is imperative for marketers and managers to comprehend the reciprocal influence of reputation and image between physical and virtual environments. Given the distinct technical characteristics and configurations of the meta-stores, there will be an inevitable shift in the techniques and tools employed for image building. For instance, the role of avatars in managing customer satisfaction and loyalty will be a crucial aspect to consider. Navigating this nuanced landscape requires a thorough understanding of how these virtual elements translate to tangible impacts on a retailer’s image and, subsequently, their standing in the competitive grocery shopping market.

P8: *The image built over time by the retailer will impact the propensity to visit the store in Metaverse and the intention to rely on an entirely new purchasing process. Building the store image across the metaverse provides more significant challenges due to the expansion into “borderless” competition.*

Figure 1 provides a visual summary of how competitive advantage sources for retailers will be structured within the Metaverse, aligning with the propositions presented.

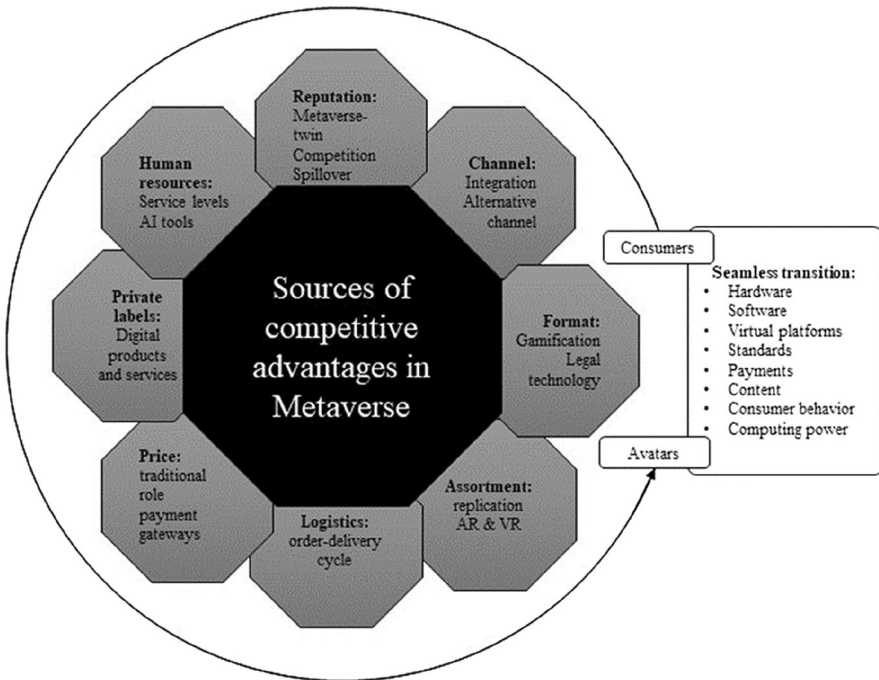


Fig. 1 Framework for competitive advantages of retailers in Metaverse. Source: Author’s elaboration

6 A research agenda from the marketing perspective

While the existing body of knowledge in this domain is still nascent, inconclusive, and fragmented, recent scientific attempts, particularly in the field of grocery shopping, have shed some light and provided useful insights. Works by Chakraborty et al. [12] and Yoo et al. [60] are particularly noteworthy, helping to outline a set of propositions and identify potential future research streams. The subsequent table (Table 1) delineates these emerging research frontiers and enumerates a series of open research questions that warrant further exploration in the evolving landscape of grocery retailing in the Metaverse.

7 Conclusions

Retailers are starting to view the Metaverse as a virtual space that demands strategic attention, an alternative yet not decisive communication tool in business strategies, or potentially a technology that may partially influence strategic business decisions. In this paper, we consider the latter approach and explore, from a marketing perspective, the role of the Metaverse in influencing retailers' sources of competitive advantage, with a special focus on grocery shopping. Firstly, research indicates that the Metaverse is a technology that can blend the real and virtual worlds for retailers. It not only enhances the customer experience within shops (e.g., with A.R.) but also brings the physical approach and traditional retail experience into 3D virtual shops. This dual capability opens up new investment opportunities for retailers in both physical and virtual realms and facilitates additional consumer insight and contact points.

Secondly, the Metaverse dictates that retailers adopt a customer-centric marketing approach in defining their strategic decisions. Customers will be diversified into new segments, including avatars, which will represent their needs. These avatars, living parallel lives managed by humans, will bring about alternative preferences and requirements. Such conditions are currently recognized mainly in games based on Metaverse platforms. Like consumers who care for their pets, customers will likely manage the lives of their avatars in the Metaverse, influencing user choices and retailer value offerings. Thirdly, analyzing the retail experience in the Metaverse allows us to assess the differences and similarities in the value proposition between virtual and real worlds. This comparison reveals substantial parallels in retailers' value propositions and sources of competitive advantage that affect customers' decisions and purchases.

Gamification emerges as a significant feature of the Metaverse, going beyond entertainment. It underpins the similarities between the virtual and physical realms. Thus, elements like graphics, movements, scenarios, and relationships in the Metaverse take on functional and technical significance, contributing to creating a competitive advantage for retailers investing in Metaverse projects. Furthermore, exploring competitive advantage sources lets us pinpoint the main risks of

Table 1 Retailers in the metaverse: research priorities from the marketing perspective

Research areas	Research questions
P1 Metaverse and channel management	<p>How will the Metaverse influence the choice and configuration of distribution channels? What are the effects of the Metaverse on the business models and retail marketing mix? How might the Metaverse alter the competitive dynamics between traditional and virtual retailers?</p>
Impact of emerging virtual channels on the marketing strategy of Retailers	<p>What are the opportunities and challenges of using the Metaverse as a communication and promotional channel for grocery products? How can grocery retailers effectively leverage the Metaverse to create consumer engagement and emotional connection?</p>
Metaverse and omnichannel marketing strategy	<p>What are the best practices for integrating the Metaverse into the omnichannel marketing strategy? What are the key factors to consider in ensuring a consistent and seamless experience for consumers interacting with grocery retailers through the Metaverse?</p>
P2 Consumer and retail formats in the Metaverse	<p>How do consumers influence the selection and design of retail formats in the Metaverse? What factors contribute to a "customer-centric" framework for store format innovation in the Metaverse? What are the preferences and expectations of consumers regarding different store formats in the Metaverse?</p>
Emerging in-store formats in the Metaverse	<p>What is the role of technology in shaping and competing with in-store formats in the Metaverse? How do graphics, broadband, and socialization between avatars affect the variety and functionality of retail formats in the Metaverse?</p>
Gamification and retail formats in the Metaverse	<p>How does gamification contribute to the design of different retail formats in the Metaverse? What are the benefits and challenges of incorporating gamification into retail formats in the Metaverse?</p>
Motives and barriers preventing shopping in Metaverse	<p>What are the main motivating factors to perform virtual shopping? What are the main barriers preventing avatars from shopping in Metaverse?</p>

Table 1 (continued)

Research areas	Research questions
P3 Assortment's decisions in the Metaverse	What factors influence assortment-related decisions in the Metaverse? How do assortment decisions in the Metaverse differ from those in physical stores?
Consumer perceptions of virtual assortment	How do consumers perceive the assortment of offerings in the Metaverse? What impact does the assortment in the Metaverse have on consumers' purchasing decisions?
Sensorics and Metaverse assortments	Do demographic factors induce shifts in consumer preferences and perceptions regarding assortment in the Metaverse? How can sensory elements (e.g., haptics) be integrated into Metaverse assortments? How do augmented communication techniques contribute to effectively conveying product and service attributes?
P4 Pricing in the Metaverse	What are the pricing strategies in the Metaverse? What factors should retailers consider when determining prices in the Metaverse? How can retailers position their offerings based on price in the virtual environment?
Customer perceptions of price in the Metaverse	How do customers perceive and evaluate price in the Metaverse? What role does price play in customers' purchasing decisions in the virtual realm? Do demographic factors induce differences in price sensitivity and willingness to pay in the Metaverse?
Payments, currencies, and the Metaverse	What challenges and opportunities are associated with payment gateways and currencies in the Metaverse? How do different international perspectives impact pricing and payment mechanisms in the virtual environment?

Table 1 (continued)

Research areas	Research questions
P5 The competitive advantage of private labels in the Metaverse	<p>How can private labels leverage the unique characteristics of the Metaverse to gain a competitive advantage?</p> <p>What factors contribute to the competitive power of private labels in the virtual realm compared to physical stores?</p> <p>How do private labels differentiate themselves from competitors in the Metaverse?</p>
Customer Perceptions and Relationships with Private Labels	<p>How do customers perceive private labels in the virtual environment?</p> <p>What role do private labels play in building customer loyalty in the Metaverse?</p> <p>Are there any differences in customer attitudes towards private labels in the Metaverse compared to traditional retail settings?</p>
P6 Logistics in the Metaverse	<p>How do new technologies reshape logistics processes and operations?</p> <p>What are the implications of virtual environments on order fulfillment, inventory management, and transportation?</p>
Sustainable Logistics in the virtual retail environment	<p>What does Metaverse retail entail in terms of sustainability?</p> <p>What is the relationship between logistics operations and sustainability?</p> <p>What strategies can retailers employ to integrate sustainable practices into their Metaverse operations?</p>
Competitive dynamics and power balance	<p>How does Metaverse impact retailers'; competitive dynamics?</p> <p>What distribution network and partnership changes occur due to Metaverse adoption?</p>

Table 1 (continued)

Research areas	Research questions
P7 Human resources, customer perceptions, and Metaverse retail	<p>How do human resources impact customer perceptions and their overall shopping experience?</p> <p>What are the human resources key differentiating factors between Metaverse and traditional stores?</p> <p>How can retailers leverage human resources to secure a competitive advantage?</p>
Human-like avatars and artificial intelligence in Metaverse stores	<p>What optimal balance is between human-like avatars and artificial intelligence in customer service?</p> <p>How can retailers integrate human-like avatars to enhance the shopping experience?</p> <p>What are the implications of relying on artificial intelligence for customer interactions in the Metaverse?</p>
Influence of Metaverse on the construction of the store image	<p>How does the Metaverse impact the construction of the store image?</p> <p>What role do avatars play in managing customer satisfaction, loyalty, and the store's image?</p> <p>How can retailers effectively build and manage the store image in the Metaverse, given the "borderless" competition?</p>

Source: Author's elaboration

grocery shopping in the Metaverse from a retailer's perspective. Grocery retailers in the Metaverse face challenges, including data privacy, security, maintaining customer trust, combating virtual fraud, ensuring product representation accuracy, enhancing user experience, managing virtual logistics, and standing out in a competitive virtual landscape. Reputation management will also play a crucial role in their success [43].

From the practitioner's side, it is essential to prioritize certain aspects. Understanding whether the customer is primarily interested in satisfying concrete grocery needs or seeking entertainment is fundamental. Retailers should find the appropriate level of gamification, balancing hedonistic and utilitarian values. Moreover, identifying the right level of similarity or difference between real and virtual stores is pivotal, focusing on why users choose to purchase grocery products in a Metaverse context.

In conclusion, this paper illuminates the practical implications of Metaverse retailing for both grocery retailers and the wider industry. The insights provided can guide retailers in navigating the challenges and leveraging the opportunities presented by the Metaverse. Understanding the risks, challenges, potential for differentiation, and customer engagement is pivotal. We advocate for investments in robust data security measures, the creation of immersive virtual shopping experiences, and prioritizing customer trust to flourish in this evolving landscape.

Declarations

Conflict of interest On behalf of all authors, the corresponding author states that there is no conflict of interest.

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