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The merchants of meta: A research agenda to understand the future of retailing in the metaverse

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Abstract

Due to rapid technological developments, the metaverse is quickly garnering attention from all areas of retailing. With a projected market of $800 billion by 2024, the metaverse is expected to radically reshape retailing in the digital world. However, very little is known about the metaverse from a customer, retailer, or brand perspective.

This article summarizes how the metaverse has been conceptualized thus far in the literature and the popular press. The authors offer a new conceptualization of the metaverse that contains four distinct dimensions: online collaboration, high consumer immersion, unique digital assets, and digital personas.

Considering that the technologies currently used to provide high consumer immersion (e.g., augmented reality, virtual reality) and unique digital assets (e.g., blockchain technology) are not fully developed or commercialized, the authors also propose the concept of a transitory metaverse to understand the current stage of metaverse development better.

The authors conclude by providing 27 directions for future research based on a full factorial of how the metaverse dimensions amplify three customer touchpoints in the digital experience (digital economic exchange, complex social relationships, direct environment interaction) for the three main stakeholders of any retailing exchange (consumers, retailers, brands) along the entire customer journey (pre-purchase, purchase, post-purchase).

Keywords: Metaverse; Transitory metaverse; Virtual reality; Augmented reality; Blockchain; Non-fungible token.

Introduction

“Rarely has the retail and consumer services sector been faced with a strategic challenge of such significant com- plexity and uncertainty, which has grown in terms of that significance so rapidly. Opportunities for leisurely reflec- tion and analysis by academics have been eclipsed by the

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need for practitioners to take business decisions not in reg- ular corporate time but in what has emerged as “Internet time.” Rightly discomfited by the rush to action, practi- tioners have turned to business schools, researchers, and finally to consultants and, until very recently, have found them wanting in both rigor and quality of insight.” (Reynolds 2000)

Two decades ago, the retailing sector faced a challenge of such unprecedented size and importance that it fundamen- tally shaped the face of the industry: eCommerce. It resulted in the emergence of Amazon, the disappearance of malls, and

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the expectation in many consumers’ minds that every prod- uct should be available within 24 hours at the doorstep. The quote above refers to this eCommerce revolution, but it ap- plies nearly identically to a challenge many companies face today – the emergence of the metaverse.

The metaverse is expected to fundamentally change how consumers interact with the digital world (Austin 2021) and reshape the retailing landscape. Retailing in collaborative vir- tual environments, or ‘metaverse retailing,’ allows consumers to navigate through an immersive virtual space, often using a digital representation of themselves, known as an avatar, and to interact with other avatars, including those of other con- sumers and retail personnel (Donath 1999). Like eCommerce, retailers who successfully establish a metaverse presence can expand their reach, with consumers from distant locations able to visit virtually. As a result, the metaverse market is expected to reach $800 billion by 2024, leading retailers to consider how they can adapt their strategies to compete in the ‘virtual’ future in the metaverse (Bloomberg Intelligence 2021).

Some pioneering retailers have begun collaborating with video game developers, early entrants into the world of re- tailing in the metaverse, to develop highly immersive and en- gaging retail experiences that appeal to early adopters. For example, clothing retailer Uniqlo worked with Mojang Stu- dios, the developer of the video game Minecraft, to produce a line of Minecraft-themed T-shirts that they then also made available in digital Minecraft and physical Uniqlo stores (Wa- ters 2020). Furthermore, as an illustration of how lucrative such partnerships can be, fashion brand Gucci offered a dig- ital version of its Dionysus Bag on the Roblox marketplace for $4,000, which is significantly more than the price of the physical version sold in retail stores (Barry 2021).

Aside from reaching the vast and rapidly expanding au- dience of video game players – the number of gamers is expected to pass three billion by 2023 – retailers also bene- fit from their ability to offer immersive experiences through such collaborations (Gilbert 2022). There is

evidence that consumers, on average, remain engaged significantly longer when shopping in immersive environments than on tradi- tional or mobile sites and are more likely to make purchases (Dogadkina 2022). Hennig-Thurau et al. (2022) also found that customers within the metaverse evaluate services more favorably than in a 2D environment. Given the relatively low constraints in choosing retail locations and designing virtual retail spaces, retailers in the metaverse can design customer experiences around a much wider set of criteria, incorporat- ing aspects of physical and eCommerce retail environments. Moreover, the metaverse offers retailers a platform to test dig- ital designs in virtual form for use by avatars before investing in designs for sale in physical stores, and also creates opportu- nities for co-creation (Anderson 2022 ; Gadalla, Keeling, and Abosag 2013).

While there are many opportunities for retailers in the metaverse, there are also significant challenges. For example, retailers not already targeting early adopters of the metaverse, who largely came to the metaverse through regular interac- tion with video games, must get to know a new and poten- tially unfamiliar audience. Furthermore, retailers must develop new capabilities to compete effectively in a rapidly changing virtual environment where many issues, such as which cur- rencies and modes of transacting will prevail and how tech- nology (e.g., blockchain technology) will continue to evolve, are as of now unclear (Rose et al. 2022). In addition to the need to develop new capabilities, retailers and consumers may find the cost associated with the technology needed to access the metaverse (e.g., virtual reality equipment and blockchain technology) to impede adoption. For example, a 2022 sur- vey found that half of US consumers say they will not enter the metaverse until less expensive virtual reality (VR) tech- nology is available (Ahmed 2022). Finally, issues such as the potential negative impact of technology on consumers' mental and physical health and the need to protect consumers' data and privacy must be considered as firms develop strategies to participate in the metaverse.

Despite the escalating interest in and importance of the metaverse for retailers, very little academic research is de- voted to the topic. Thus, this article aims to adopt a forward- looking perspective and delineate a research agenda to expand our understanding of retailing in the metaverse. In doing so, we have four overarching goals:

1. Review existing conceptualizations of the metaverse in both academic literature and managerial outlets and pro- vide a robust definition that applies to both marketing re- searchers and retailing managers;
2. Introduce the concept of transitory metaverses, which mimic aspects of traditional metaverses but exclude certain features that require significant computational power or fi- nancial resources to access them. Through transitory meta- verses, firms can design experiences that do not require blockchain technology or virtual reality (Sajid 2022). The lack of requirement for costly equipment to access these environments enables firms to expand their reach among audiences unable to access such technologies due to finan- cial or other constraints;
3. Summarize the current state of academic research on topics related to the metaverse and elaborate on where the field is heading as retailers adapt to the new virtual reality in the metaverse;
4. Propose a research agenda to identify questions requiring additional insights for retailing managers and researchers in the evolving world of the metaverse.

The metaverse is …

Although the metaverse has been the focus of much dis- cussion in recent years, there has yet to be a convergence on how to define this concept. Table 1 provides an overview of 20 definitions of the term

metaverse used in academic and non-academic sources. We offer a definition that combines the various aspects of the metaverse previously proposed. Based on our analysis of these prior conceptualizations, we define the metaverse as an online collaborative shared space built of 3D environments that leverage high consumer immersion

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Table 1
Citation Definition Collabor- ative High Consumer Immersion Transferrable and Unique Digital Assets User- Generated Digital Personas Definitions from Academic Articles Bourlakis, Papagiannidis, and Li (2009)
Kaplan and Haenlein (2009)
Gadalla, Keeling, and Abosag (2013)
Kim (2021)
Lee et al. (2021)
Park and Kim (2022)
Yang et al. (2022)
Hollensen, Kotler, and Opresnik (2022)
Dincellia and Yaylab (2022)
Hennig-Thurau et al. (2022)
Dwivedi et al.(2022)
Barrera and Shah (2023) "…virtual worlds extending our physical universe by adding new dimensions and domains for economic, social and leisure activities."
"…a three-dimensional, virtual environment… By entering it via a downloadable client program, users… can interact using virtual representations in the form of personalized avatars"
"…'computer-generated, multi-user, three-dimensional interfaces in which users can also experience other participants as being present in the environment.'" "…an interoperated persistent network of shared virtual environments where people can interact synchronously through their avatars with other agents and objects."
"…a virtual environment blending physical and digital, facilitated by the convergence between the Internet and Web technologies, and Extended Reality (XR)."
"… refers to a three-dimensional virtual world where avatars engage in political, economic, social, and cultural activities."
"…metaverse economic system is composed of four parts: digital creation, digital asset, digital market, and digital currency…"
"…a digital copy of how we are working in the physical world. In this 3D digital space, the users can come together via avatars that resemble them."
"…a decentralized and persistent virtual universe… the integration of [head-mounted displays] with other immersive and emerging technologies, such as blockchain, non-fungible tokens (NFTs), AI, and Web 3.0…"
"…a computer-mediated environment in which people act and communicate with each other via avatars in virtual "worlds" in a multisensory way in real-time." "... a virtual world with immersive capabilities providing an experience forecast to parallel the real world."
"…a technology-mediated network of scalable and potentially interoperable extended reality environments merging the physical and virtual realities to provide experiences characterized by their level of immersiveness, environmental fidelity, and sociability."?
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? Definitions from Non-Academic Sources The Economist (2021)
Alaghband (2022) “Think of it as virtual reality, or a massively multiplayer online game (MMOG), but limitless. People could play games, but they could also talk, shop, stroll, chat, watch movies, attend concerts, shop and do most things that they can do in the real world—and, crucially, the metaverse would interact with the real world in countless unpredictable ways.”
“It’s our digital lifestyles, which we’ve been living on phones or computers, slowly catching up to our physical lives in some way, so that full convergence. It is enabled by many different technologies, like AR and VR, which are the ones that most people tend to think about. But they’re not the only entry points.
There’s also blockchain, which is a big component…”??
? ?Summary of metaverse definitions.
(continued on next page)
Table 1 (continued)
Citation Definition Collabor- ative High
Consumer
Immersion Transferrable and Unique Digital Assets User- Generated
Digital
Personas Estrada (2022)
Chen (2022)
Laker (2022)
Griffin (2022)
Lovich (2022)
Pauwels (2022) “Think of the metaverse as ‘the evolution of the internet’ … Beyond the extended reality aspect of the metaverse, it is part of Web3 technologies, which is really enabled by decentralized blockchain technology, and ‘conceivably in the future provides a more immersive and trusted interactive internet’”
“The metaverse is the convergence of two ideas that have been around for many years: virtual reality and a digital second life.”
“…it’s a virtual world where people can interact with each other and businesses entirely realistically. This revolutionary technology is made possible by a combination of virtual reality, artificial intelligence, and blockchain.”
“a continuum of fast-changing technologies in which ‘businesses are racing toward a future that is very different from the one they were designed to operate in — as technologies such as extended reality, blockchain, digital twins, and edge computing are converging to reshape human experiences.’”

“a combination of the virtual reality and mixed reality worlds accessed through a browser or headset, which allows people to have real time interactions and experiences across distance.”
“massively scaled networks of real-time rendered 3D visual worlds with a sense of presence and memory continuity”?
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? Proposed Definition of the Metaverse Current Article The metaverse is 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. ? ? ? ? ? ?
indicates that the definition includes the proposed metaverse component.
indicates that the definition partially includes the proposed metaverse component.

techniques to reduce the perception of technological media- tion alongside transferrable and unique digital assets while allowing user-generated digital personas to interact with each other . This definition provides four distinct dimensions of the metaverse: online collaboration, high consumer immersion, transferrable and unique digital assets, and user-generated dig- ital personas. In the following sections, we provide details on each of these elements.
… an online collaborative shared space built of 3D environments …
The natural progression of technology has increased the ability of consumers to build expansive communities. From early online forums (e.g., Six Degrees, MySpace) to more modern social media applications (e.g., Instagram, TikTok), these platforms allow joint creation and participation in commerce across physical borders and different cultures (Accenture 2022 ; Boyd and Ellison 2007 ; D’Souza 2022 ; Goyal 2022). Metaverses are a further continuation of this progression that provide greater forms of collaboration due to the use of 3D software technology in one virtual space (Gartner 2021 ; Takahashi 2022).
As an example of such collaboration in the metaverse, Balenciaga, a fashion retailer, partnered with Epic Games, a video game developer, to offer players of the game Fortnite luxury fashion items that can be worn by their in-game characters (Tashjian 2021). Another example is NVIDIA’s Omniverse, a collaboration that enables consumers (e.g., artists, players, individual creators) to use different 3D software tools to work together in real-time and innovate within a 3D environment (Takahashi 2022). Specifically, artists can work with architects to create unique buildings, or individual creators can design new products for homes that can be used in the Omniverse, potentially other metaverses, and/or be brought into the physical world. Collaboration between firms is not simply restricted to artistic creativity. InterWork Alliance is a network of over 60 firms developing the Token Taxonomy Framework, which is competing with other alliances to set a “common language, behaviors, and properties” for cryptocurrencies so that consumers can use different cryptocurrencies when interacting with different firms (InterWork Alliance n.d.).

This intense level of collaboration in the metaverse pro- vides unique opportunities for retailers to generate greater customer engagement than current social media applications and social networking sites allow. As of 2022, consumers spend more time within 3D virtual shopping experiences than on 2D e-commerce websites, resulting in a 70% increase in conversion rates and a 450% increase in return on investments for retailers (Dogadkina 2022). Nevertheless, the long-term propensity to prefer 3D over 2D may be lower since these numbers are, in part, driven by the presence of early adopters in the 3D virtual shopping experiences, whose self-selection might indicate a greater level of excitement within this 3D en- vironment. Moreover, laggards who join the metaverse later might not necessarily behave similarly to the first movers.

One possible strategy for retailers to maintain this trend to- ward greater time spent in 3D virtual shopping environments is to leverage the collaborative aspect of the metaverse by working with other firms, artists, and consumers to create in- novative products and services which can further enhance the shopping experience. Additionally, retailers can form alliances and consortia with other retailers within the metaverse to set industry standards as the scale and number of metaverses ex- pand, enabling better coordination between retailers. Setting industry standards will also ensure that retailers' services will be highly compatible with technologies used in the metaverse, better secure the longevity of retailers within the metaverse, make the metaverse more accessible to consumers and moti- vate consumers to engage with the retailers for a longer period (Accenture 2022).

… that leverage high consumer immersion techniques to reduce the perception of technological mediation …

A second characteristic of the metaverse is that it uses high consumer immersion techniques convincingly enough that consumers are completely absorbed within the environ- ment. The metaverse uses a mix of augmented reality (AR), where digital objects (e.g., images, text, sounds) are super- imposed onto the physical world, and VR, which provides a 3D view of the digital world. This mixed reality offers consumers a greater range of interaction with digital envi- ronments than mobile technology by closely mimicking real life, leading consumers to spend more time in the metaverse (Dogadkina 2022).

To fully immerse in the metaverse, consumers often use VR headsets such as Oculus Quest 2 and Samsung Gear VR (Hickey 2022 ; Ravenscraft 2022) to move and interact with 3D environments as they would in a physical environ- ment. Virtual concerts are a popular way for firms to offer consumers immersive experiences using VR headsets. Meta- verses such as Decentraland and Cryptovoxels have hosted concerts for famous artists like Snoop Dogg and Marshmello (Hickey 2022). When attending such virtual concerts, con- sumers put on their VR headsets and interact with other at- tendees, dancing with or talking to them. For retailers in par- ticular the metaverse provides similar entertainment for con- sumers as physical malls do. Thus, the metaverse can poten- tially enhance the entertainment value offered by retail en- vironments and provide entertainment at a larger scale and scope (CB Insights 2021).

However, as sophisticated as current VR headsets are, they are not without limitations (Ravenscraft 2022). They are still quite expensive for the average consumer, inhibiting many from entering the metaverse. Also, they are considered by some to be bulky and awkward to use. Most must still be wired to a personal computer, smartphone, or gaming console or require expensive wireless adapters to capture a similar experience as the wired versions (Cable Matters 2020). Some consumers also experience motion sickness when using VR headsets. Lastly, a key concern for retailers is the lack of a standard VR headset for use in the metaverse.

Because VR headsets differ in software and hardware specifications, the level of consumer immersion achieved using them can differ greatly. Given the importance for retailers to provide an om- nichannel experience that offers a seamless journey that en- hances customer satisfaction and loyalty (Neslin 2022), firms will need to address such challenges regarding VR headsets and other technologies as they innovate to develop experi- ences that take advantage of 3D environments and immersive technology.

… alongside transferrable and unique digital assets …

The most noticeable difference between current metaverses and first-generation metaverses (such as Second Life) is the presence of unique digital assets that are transferrable between consumers and have an established market value – character- istics enabled by blockchain technologies, which are growing in use. Although blockchain was introduced to the general public through the bitcoin cryptocurrency, it gained popu- larity due to its unique ability to build a sharing economy, a business model where both firms and individuals provide short-term rentals of goods and services with high levels of security (Euromoney 2022 ; IBM n.d. ; Kumar, Lahiri, and Do- gan 2018 ; Rodeck and Curry 2022). Simply put, a blockchain is a decentralized digital ledger that allows for highly secure storage of transactions within a sharing economy. Each time a transaction is conducted, it is transmitted to each member in a peer-to-peer network and only accepted once most of this network has validated the transaction. Once the trans- action is validated, it is built into a block of transactions and chained together with other transactions to create a con- sensus history of all transactions. This process provides high levels of security since any malicious actors would have to control a majority of the nodes in the network to hack the ledger successfully. Building on this blockchain technology, most products and services offered in the metaverse are cre- ated and accessed as non-fungible tokens (NFTs) in which products and services have unique identification codes that differentiate them from copies of each other (Ante 2022 ; Na- dini et al. 2021 ; Sharma 2022). As such, NFTs allow con- sumers to have unique ownership of digital goods and estab- lish true ownership across the collection of such transactions.

While blockchain technology is not necessary for a meta- verse to exist, it is currently the only technology that allows for secure transactions and unique digital ownership. Current metaverses typically leverage blockchain technology to cre- ate, distribute, and transfer unique digital goods and services, allowing consumers and firms to create complex and evolving digital economies that were not previously possible. For ex- ample, Decentraland , a popular metaverse, uses the Ethereum blockchain to issue ‘LAND’ tokens (a specific type of NFT) that confer true ownership of digital real estate within the ecosystem. Additionally, Decentraland uses its own cryptocur- rency, ‘MANA,’ (which can be purchased through a cryp- tocurrency exchange, such as Coinbase), which must be used for all purchases within the ecosystem. Once acquired, each LAND token corresponds to a unique coordinate in the virtual world and allows only the owner to make digital changes to it. Users who own LAND in Decentraland are free to inno- vate by designing the animation and interactions experienced by other users on their virtual real estate (Kraken 2022). Es- sentially every consumer interaction within the metaverse in- volves interacting with one of these digital experiences built upon pieces of virtual real estate.

… while allowing user-generated digital personas to interact with each other

Unlike other technologies that allow physical consumers to interact with each other, such as social media platforms, the metaverse allows consumers to build and fully customize a digital persona to interact with other digital personas within a particular metaverse. A digital persona, commonly referred to as an avatar, is a "digital representation of a [consumer's] personal information created by the user or gathered as part of the terms of using a platform" (Robinson 2022). Digital per- sonas encourage consumers to extend their unique creativity into metaverses and build upon the idea that the metaverse is about individuality and digital ownership (Alaghband 2022). These digital personas are realistic or fantasized, highly cus- tomizable, often through purchased unique goods and ser- vices, and can interact directly through VR technology. These aspects of digital personas add to the immersive experience of metaverses and improve the diversity of communities while providing stronger protection of one's identity, which ad- dresses consumers' growing privacy concerns (Lucatch 2021 ; Robinson 2022).

Digital personas can be a realistic representation of an individual or can be fantasized with almost no limitations. For example, Soul Machines, a tech company, designs real- istic digital personas that replicate humans from their faces, body, hair, voice, and clothing, which are then used in meta- verses (Ong 2021 ; Soul Machines n.d.). Currently, Soul Ma- chines uses these realistic digital personas combined with AI in customer service, video games, education, and healthcare to connect and collaborate with consumers across cultures and boundaries. Soul Machines also plans to expand its technol- ogy across metaverses so that consumers can use the same digital personas in different metaverses. Still, the firm may face difficulty in achieving consumers' desire to use their dig- ital personas seamlessly across different metaverses, as meta- verses are not standardized in their ability to customize digital personas (Ong 2021). On the other hand, competitors of Soul Machines such as Wolf3D, Genies, and Crucible have moved away from realistic digital personas and offer consumers tools to create abstract digital personas with futuristic or fantasti- cal faces, bodies, hair, voice, and clothing (Takahashi 2021a ; Takahashi 2021b ; Wolf3D n.d.). For example, consumers can choose to have turquoise hair or a metallic mouse head.

An important trend within metaverses is how commerce changes as retailers face these novel virtual spaces and shared experiences. For retailers, digital personas offer new opportunities to optimize consumers' engagement with retailers and the brands they offer. For instance, retailers use realistic digi-

Table 2 ?
indicates that the digital platform includes the feature
? indicates that the digital platform partially includes the feature
X indicates that the digital platform does not include the feature

tal personas in metaverses to deliver a continuous journey for consumers between in-store and digital spaces. Likewise, re- tailers could create digital products such as clothing or voices that complement either realistic or fantasized digital personas and allow consumers to express their unique styles.

Not all that looks like a metaverse is actually a metaverse!

Two factors contribute to confusion surrounding the con- cept of a metaverse. First, the metaverse is not a single online space but a group of applications that share certain features. In this sense, the term "metaverse" is similar to the term social media, which is used to describe both a group of applica- tions and one specific implementation of the concept (e.g., Facebook). We use the plural form of metaverse, metaverses, to refer to a group of specific applications (e.g., Decentra-

land, Sandbox). Table 2 highlights how this conceptualization compares with other digital platforms.

Second, the current period of technological transition has created digital environments that mimic certain aspects of the metaverse but lack others. Two obstacles prohibiting the mass adoption of the metaverse are the lack of widespread adop- tion of VR technology and the computing requirements of blockchain technology. Since these are the only technologies available to produce high consumer immersion and trans- ferrable digital assets, firms face trade-offs when employ- ing them. While VR creates highly immersive access for consumers, its lack of adoption limits the growth of meta- verses that require the technology to access. Similarly, while blockchain allows for deep digital economies, its application comes at the cost of computational power, which can be al- lotted to other areas such as graphics or processing speed.

To address these issues, we conceptualize transitory meta- verses as online collaborative shared spaces built of 3D envi- ronments allowing user-generated digital personas to interact with each other. Unlike the metaverse, a transitory metaverse strategically excludes the use of high consumer immersion techniques to reduce the perception of technological medi- ation and/or transferrable and unique digital assets to opti- mize the use of existing computing resources given existing VR and blockchain technologies. Specifically, transitory meta- verses are being utilized to drive consumer adoption of the metaverse by getting consumers (and retailers) used to the unique types of interactions that can occur within the meta- verse compared to other digital platforms. At the same time, technological advances in VR and blockchain technologies are being made.

Most current metaverses are transitory metaverses and originate within the video game ecosystem. The most promi- nent examples are the video games Roblox and Fortnite. Roblox is an online platform that has captured over 50 per- cent of the US under-16 market (Lyles 2020). It is an on- line shared space where consumers interact with environments and games made by other developers. Similar to true meta- verses (i.e., includes all four metaverse components), users build digital personas to collaborate with other consumers and firms by forming an economy using a game-specific currency called Robux. However, Roblox purposefully does not use blockchain technology, which allows for a more user-friendly digital environment, nor does it require VR, which allows it to access a larger consumer base, specifically one with fewer monetary resources. Fortnite, which Epic Games originally produced as a video game, has transitioned over the years to include more non-gaming digital spaces, which have been leveraged for digital concerts and user-generated content creation (Park 2020). However, because Fortnite still primarily functions as a video game, it cannot incorporate blockchain technologies due to gameplay's computational requirements and is unwilling to require VR as it would greatly reduce its current consumer base.

Retailers must recognize the existence of these transitory metaverses and their differences from platforms within the metaverse. At present, transitory metaverses are the digital platforms that are most responsible for large-scale changes in consumer behavior since they have the broadest reach. For this reason, understanding transitory metaverses and the video game ecosystem is crucial for retailers and brands. Over time, however, as technology advances, the disadvantages of cur- rent technologies may disappear, leading to greater consumer adoption of platforms that are more similar to our definition of the metaverse.

Consumer impact of the metaverse

The four metaverse components (i.e., online collaboration, high consumer immersion, unique digital assets, and digi- tal personas) each directly impact how consumers view and use the metaverse. Understanding

these relationships and how they interact to make the metaverse unique among digital plat- forms is helpful in mapping out the role of retailers in this new virtual space.

Online Collaboration Resulting in Localized Communities and Non-Dyadic Relationships: Online collaboration enabled within the metaverse (both true and transitory ones) broadens consumers' social capabilities by creating homogenous, lo- calized communities alongside complex non-dyadic relation- ships. The experience-driven nature of the metaverse encour- ages groups of consumers with similar interests to cluster together and interact. Much like the online forums of the early 2000s and consistent with the ideological and techno- logical foundations that underpin the concept of social me- dia (Kaplan and Haenlein 2010), consumers naturally col- laborate with similar consumers within the metaverse. How- ever, unlike traditional social media applications, this collab- oration is characterized by much deeper shared experiences due to the immersive nature of these environments. For ex- ample, Auras Studios, a company specializing in VR and AR technology, created a 3D social media service called Xone, where consumers can design 3D environments and invite oth- ers to host events such as music performances or product launches (Auras Studios 2020). In addition, the technological variety within the metaverse enables users to build complex webs of relationships, much like in the real world. Tradi- tional social media applications focus mostly on dyadic so- cial relationships that are either transposed from the offline world into the online space (e.g., the initial idea behind Face- book) or are relatively shallow, as occurs with large networks of consumer connections formed through others that are not based on already-existing offline relationships. Interaction in the metaverse enables the development of much deeper and bi-directional relationships with firms and AI-generated characters.

High Consumer Immersion Resulting in Digital Mimicry and Responsive Feedback. High consumer immersion within a true metaverse allows for the digital mimicry of consumers' real-world actions while allowing for responsive feedback across all senses. Technology permitting, interactions within the metaverse should replicate interactions in the real world as closely as possible. In particular, Meta's AR/VR head- set, Quest Pro, tracks consumers' hand motions, facial ex- pressions, and eye movement, thereby providing real-time, accurate interaction with other consumers and the 3D envi- ronment (Meta 2022b). This digital mimicry creates a level of consumer interaction within the digital environment that does not exist elsewhere. High immersion, usually achieved through VR and AR technologies, allows consumers excep- tionally high levels of control over their interactions with and within the environment. Since these techniques incor- porate multiple senses (e.g., touch, sight, and sound), they enable consumers to mimic their digital and real-world in- teractions. This mimicry creates a sense of control for con- sumers, enabling environmental immersion to the highest de- gree. In addition, high immersion allows consumers to expe- rience feedback more directly and realistically than through traditional social media applications. This more responsive feedback makes consumers' interactions with the environ- ment, other consumers, and firms to be experienced more deeply, enhancing the impact of these interactions on their future behaviors.

Unique Digital Assets Resulting in True Ownership and Digital Real Estate. Unique digital assets represent a new form of virtual goods that are different from traditional dig- ital products. They allow consumers to exercise (and experi- ence) true ownership of digital goods and interact with dig- ital real estate. In marketing, considerable research has ex- amined the relationship between ownership and subsequent consumer behavior (Brasel and Gips 2014 ; Peck and Shu 2009 ; Strahilevitz and

Loewenstein 1998). For instance, when consumers legally own a physical good, their perception of the attractiveness and perceived valuation of that good in- creases over time (Strahilevitz and Loewenstein 1998). Simi- larly, when consumers own unique digital assets, they might experience deeper affective and cognitive connections with these goods than when they own traditional digital goods. Thus, consumers who have true ownership of digital goods might find them increasingly more attractive and valuable over time. Since digital goods are ultimately co-owned by the user's digital persona (i.e., avatar), they also allow for high levels of customization for those personas. Along with true ownership of digital goods, digital assets also allow con- sumers and firms to own digital real estate, which fosters high consumer immersion and is vital for how consumers interact within a true metaverse. In addition, firms' ability to purchase and design their own digital real estate provides them with economic incentives that directly impact how consumers interact within the metaverse (Mileva 2022).

Digital Personas Resulting in Self-Expression and Psychological Distance. Finally, the use of digital personas and the difference in the psychological distance experienced in a true or transitory metaverse compared to other digital plat- forms impact consumer self-expression. Research has shown that digital personas impact how consumers experience self- presence and transportability while engaging with a digital experience (Christy and Fox 2016). Studies have also shown that digital personas can reshape consumers' behaviors and beliefs outside of the digital experience (Szolin et al., 2022). Within the metaverse, consumers' ability to build and cus- tomize digital personas, combined with high consumer immer- sion and customization enabled through unique digital assets, allows for much greater digital self-expression than is pos- sible on other digital platforms. Moreover, using digital per- sonas reduces the psychological distance between consumers and their environment when interacting with aspects of the metaverse. Psychological distance is composed of temporal, spatial, and social dimensions (Liberman, Trope, and Stephan 2007). Given the central role of digital personas in the meta- verse, consumers are likely to experience reduced spatial and social barriers when interacting with the digital environment.

Amplified consumer touchpoints along the customer journey

Through its impact on consumers, the metaverse shifts the availability and intensity of consumer-retailer touchpoints. We rely on the customer journey framework (i.e., pre-purchase, purchase, and post-purchase stage; Lemon and Verhoef 2016) to capture the temporal elements of the retailing and con- sumption experience within this space. Specifically, we pro- pose that the metaverse components amplify three customer touchpoints in the digital experience: digital economic ex- change, complex social relationships, and direct environment interaction. Through its impact on the digital experience, the metaverse impacts how retailers interact with consumers and marketers. Fig. 1 illustrates this framework. In the following section, we describe these touchpoints and discuss in more detail the opportunities posed by each across the customer journey.

Digital Economic Exchange. One of the most significant differences between the metaverse and other digital platforms is the realism and increased opportunities for economic ex- change. Although e-commerce opportunities exist on other digital platforms, the depth of economic systems created in the metaverse is unique. With the combination of online col- laboration leading to non-dyadic social networks, unique dig- ital assets resulting in true ownership and digital real estate, and digital personas allowing digital goods to be used for self- expression, the formation and evolution of digital economic exchange is a fertile

area of opportunity for retailers. Using the customer journey framework, we propose that value ex- ploration, value exchange, and value evaluation are the three areas of opportunity created by the amplified touchpoints sur- rounding digital economic exchange.

Complex Social Relationships. One constant theme that emerges from each metaverse component is the depth of con- sumer relationships within the metaverse compared to other digital platforms. Whether it is online collaboration encourag- ing the development of localized communities, high consumer immersion leading to more realistic social feedback, or digi- tal personas making social relationships feel much closer than those possible in other digital environments such as social me- dia, the complexity of social relationships in the metaverse (in terms of depth and breadth) is one of the most promising op- portunities for retailers and marketers. With the framework above, we propose that relationship development, relationship validation, and relationship maintenance are the three areas of opportunity created by the amplified touchpoints surrounding complex social relationships.

Direct Environment Interaction. Perhaps the most notice- able amplified touchpoint is between consumers and the dig- ital environment since the metaverse enables a much greater variety of ways consumers can directly interact with the dig- ital environment. Specifically, with unique digital assets en- couraging firms to leverage their digital real estate for deep experiences, high consumer immersion allowing consumers to receive instantaneous feedback from the environment, and digital personas allowing psychologically closer experiences, the opportunities that exist for retailers in this realm are essen- tially endless. Within the framework, we propose that product creation, product delivery, and product spillover are the three areas of opportunity generated by the amplified touchpoints surrounding direct environmental interaction.

Opportunities in the metaverse

We now elaborate on the potential opportunities in the metaverse mentioned above and suggest areas of interest for further investigation. To structure our discussion, we consider the three main stakeholders of any retailing exchange (con- sumers, retailers, and brands) and the opportunities the meta- verse presents to them along the pre-purchase, purchase, and post-purchase stages of the customer journey within each of the three amplified touchpoints defined above (digital eco- nomic exchange, complex social relationships, direct environ- ment interaction). This results in 27 opportunities with an as- sociated set of research questions, all of which are illustrated in Fig. 2 .

Customer level

Fig. 1. Consumer impact of metaverse components and amplification of customer journey touchpoints. Pre-Purchase Stage – Value Exploration – Digital vs. Phys- ical Product Characteristics . Customers can interact with and experience products in a 3D world within the meta- verse. These interactions provide greater detail about the products and a more personalized experience than simply scrolling through a webpage full of product images (McDan- nald 2022). In addition, the metaverse offers the ability to develop unique digital products through blockchain technology (e.g., Burberry’s NFT collection and Fortnite’s Balenciaga skins). The resulting digital assets, which customers own, differ from traditional digital products, such as music downloads (George-Parkin 2022). While digital products within the metaverse are unlikely to replace physical products fully (Boutenko, Florida, and Jacobson 2022), understanding how customers assess digital as opposed to physical prod- ucts and how firms can leverage such products to attract cus- tomers in the metaverse is an issue of central importance (Hajro et al. 2021).

Value Exploration RQ1: How do customers evaluate unique digital products compared to traditional digital products? Is there any spillover of value exploration from equivalent physical products?

Pre-Purchase Stage – Relationship Development – Cus- tomer Community Formation. The high levels of consumer immersion in the metaverse allow consumers to build deeper digital relationships with others compared to traditional digi- tal platforms. Moreover, consumers' ability to express them- selves in ways that are not possible in the real world allows for different types of relationships, and thus communities, to form that would not exist otherwise. For instance, consumers can create and wear 3D digital clothing such as sneakers or dresses which are not bound by the physical environment us- ing any material that can fit a variety of body types and even move on its own (e.g., small white balls of spikes orbiting around an avatar's dress) (Meta 2022a). As the technologies used in the metaverse continue to advance, the breadth and depth of these communities are likely to co-evolve with them. That is, as transitory metaverses continue to grow in popu- larity in the short term, understanding how elements of the immersive experience and self-expression included in these new metaverses impact community formation compared to early forms of the metaverse, such as Second Life is a topic of central importance.

Relationship Development RQ1: How does the metaverse impact how relationships are formed? How do cus- tomers form communities in the metaverse? How do these communities impact customer interactions with other customers, retailers, and brands?

Pre-Purchase Stage – Product Creation – Evolution of Customer Expectations. The rapid evolution of the metaverse causes customer needs and desires to change as customers' expectations of their experience in the metaverse are also still evolving. The highly immersive interactions customers expe- rience combined with the rapid evolution of the metaverse experience can make it difficult for retailers and brands to accurately assess the current state of customers' needs and desires at a given time due to such rapid changes in cus- tomer expectations. This issue is exacerbated by marketers' relative lack of experience with customer data collection and relationship building in the metaverse, making it critical for brands to invest in understanding how customers form needs in the metaverse and how they communicate these needs to brands and retailers. Furthermore, due to their positive im- mersive experiences in the metaverse, customers may reduce their brand or firm interactions on other digital platforms from which firms previously gained insight into their behaviors. As customers spend more time in the metaverse, they will likely reduce interactions on other digital platforms, which increases the urgency for new methods and conceptualizations to understand the customer experience in this realm.

Fig. 2. Opportunities in the metaverse along amplified customer touchpoints. Product Creation RQ1: How can brands and retailers accurately evaluate customer needs as they evolve with the metaverse? What barriers does the metaverse place regarding understanding customer needs and desires?

Purchase Stage – Value Exchange – Choice of Currency . Customers use cryptocurrencies when making purchases in the metaverse, the value of which is highly volatile. In ad- dition, cryptocurrencies vary widely in terms of their pur- pose and utility, which demands a deeper understanding of the impact of certain types of cryptocurrencies on customers (Jeffries 2022 ; Rossolillo 2022). For example, most cryptocur- rencies (e.g., The Sandbox's SAND, Decentraland's MANA, Highstreet's HIGH, and Virtua's TVK) can be used to create, trade, and

purchase NFTs (e.g., digital land, buildings, ac- cessories). Still, other cryptocurrencies, like ApeCoin's APE, provide customers access to games and other services and products. As a result, retailers face uncertainty regarding which currencies consumers are likely to adopt. This deci- sion may impact how consumers perceive and determine the value of products purchased in the metaverse. In addition, pur- chases of such currencies leave a trail based on the purchase. They can be linked to consumers' data, increasing the risks to consumers of attempts to invade their privacy through access to their email or stored information related to other online accounts.

Value Exchange RQ1: How do customers determine which types of currency to use in the metaverse? Do these decisions impact product value evaluation? Does unique digital ownership interact with the types of currencies used in valuing products and impacting the customer journey?

Purchase Stage – Relationship Validation – Effects of So- cial Shopping. The ability for consumers to co-experience the retailing process is a key dimension that separates the meta- verse from other digital platforms. For example, Adidas has opened across multiple metaverse platforms digital storefronts that allow consumers to inhabit the same digital space to- gether, similar to retailing locations in the non-digital world (Murad and Smale 2022). The question remains, however, as to how these digital relationships influence consumers' atti- tudes and behaviors. Moreover, retailers have a unique oppor- tunity in the metaverse to build highly interactive consumer touchpoints that can expand existing consumer-to-retailer re- lationships. As such, understanding how to leverage these op- portunities for relationship building, experience construction, and anticipate important consumer outcomes is an important next step for retailers in the metaverse.

Relationship Validation RQ1: How does the shared experi- ence of shopping in real-time with other customers im- pact retailing interactions in the metaverse? Are these interactions more similar to real-life shopping or tra- ditional digital shopping? How does the nature of so- cial interaction in the metaverse change how customers build relationships with retailers and brands?

Purchase Stage – Product Delivery – Purchase of Digital Products . The metaverse allows for the purchase of digital and physical products, which has important implications for how retailers design both their digital presence and their product delivery and fulfillment processes. For example, consumers in the metaverse can visit digital retail stores and sample physical products (Needleman 2021), such as gaging whether a couch would fit into their living room. Consider the example of Gucci, which sold hundreds of thousands of limited-edition digital fashion items for consumers' avatars when building its metaverse, Gucci Garden (Wong 2022). Other firms, such as Nike, have used strategies such as a "drop," a term referring to a launch of a limited edition of a product to encourage con- sumers to purchase NFTs quickly (Mims 2022). Retailers and marketers choosing to operate in the metaverse must under- stand and implement digital environment and digital product delivery strategies with careful consideration of consumers' perspectives.

Product Delivery RQ1: How can retailers leverage the metaverse to encourage the purchase of digital prod- ucts and engage more with them? Which product de- livery strategies should retailers use for consumers to acquire digital products?

Post-Purchase Stage – Value Evaluation – Differences in Consumption Patterns . Customers participating in different metaverses will be exposed to novel economies characterized by greater social integration and collaboration between all en- tities (e.g., customers and firms, firms and other firms). The complexity of these economies will

potentially produce a di- verse range of innovative digital products (e.g., digital houses, digital artwork, and clothes for digital personas) that often have a similar purpose as they do in the physical world (e.g., digital furniture is placed in a digital home similar to how physical furniture is placed in a physical home). Nevertheless, whether and how the processes customers follow in purchas- ing and consuming these digital products differ from those in the physical world is uncertain. For example, unique digital ownership in the metaverse can offer protection against illegal reproductions and pirated products, better capturing and re- flecting the value of these digital products (Cartagena 2022). Thus, it will be valuable to understand how the different meta- verse characteristics impact customers' consumption patterns.

Value Evaluation RQ1: How do the processes customers follow in purchasing and consuming digital products in the metaverse differ from those in the physical world? How does unique digital ownership impact consumer behavior in general?

Post-Purchase Stage – Relationship Maintenance – Re- duced Need for Goods and Services. Because the need for goods and services is lower in digital environments, a key challenge for retailers and brands is finding ways to increase customer demand for goods and services in the metaverse. One way this has been executed in transitory metaverses is by using temporal scarcity (limited time availability) to drive customer purchases (McDowell 2020). Still, little is known about how such tactics work with more established forms of unique digital assets in the metaverse.

Relationship Maintenance RQ1: How does unique digital ownership impact the demand for goods and services from the customer's perspective? How can tools such as temporal scarcity and NFT technology be leveraged to help increase customer demand? What types of goods and services can be created to maintain relationships with customers who make few purchases in the metaverse?

Post-Purchase Stage – Product Spillover – Challenges of Dual Digital Ownership . Unique digital assets have two dis- tinct components: the digital asset (e.g., digital artwork, fur- niture, or clothing) and the NFT, which makes the digital asset unique from other identical digital assets. The challenge of this dual ownership is that the NFT is often bound to a particular metaverse and bought with a cryptocurrency used only in that metaverse (Marinotti 2022). Thus, unique digi- tal asset ownership in the metaverse differs from ownership in the physical world because customers cannot easily trans- fer their digital assets across metaverses. Moreover, the vi- sual and functional aspects of digital assets are held within and controlled by the metaverse where the asset is purchased. This poses challenges for customers when utilizing, trading, or selling their purchased digital assets, and it might also af- fect customers' future purchase behavior in the metaverse.

Product Spillover RQ1: What challenges do customers face when owning unique digital assets, and how do they address them? How do unique digital assets affect cus- tomers' utilization, trading, or selling behaviors? How does unique digital asset ownership affect customers' future purchase behavior?

Retailer level

Pre-Purchase Stage – Value Exploration – Expected Role of the Retailer . Current customers, who are first-movers, tend to engage within the metaverse longer than other channels (Dogadkina 2022). While this may change for later adopters, this overall trend is unlikely to reverse entirely. Retailers can, therefore, leverage the rich 3D environment to provide con- sumers with an authentic and valuable experience (McDan- nald 2022), collaborating with other businesses. Such expe- riences

require meaningful content that will encourage cus- tomers to spend more time in the metaverse and potentially purchase more products through the retailer (Townsend and Perdomo 2022). Developing such enriched content will create opportunities for retailers within the metaverse that would not be possible in the physical world or traditional e-commerce channels. Therefore, retailers should understand and establish their role in the metaverse, especially since there is the risk that retailers might compete directly with brands when en- gaging with customers.

Value Exploration RQ2: What is the expected role of the retailer in the metaverse? How is it similar/different from the retailer's role in the real world or traditional eCommerce? What strategies can retailers use to match these expectations? Can retailers and brands co-exist, and if so, in what manner?

Pre-Purchase Stage – Relationship Development – Impact and Use of Digital Real Estate. Unique digital ownership within the metaverse allows retailers to own their digital space. In many metaverses, such as Decentraland or Sandbox, users (and companies) can purchase specific pixels within the digital rendering of the metaverse that can be used to build digital experiences for other users to enjoy (Mileva 2022). This unique ownership of digital real estate is artificially scarce, directly affecting retailers' strategies when interact- ing with customers through the metaverse. As such, retailers must identify which metaverses to enter, where and when to purchase digital real estate, and how to leverage the real estate to create value for customers.

Relationship Development RQ2: How does the owner- ship of digital real estate impact how retailers in- teract with customers? Are there first-mover advan- tages/disadvantages? How does this digital real estate impact retailer strategies for entering the metaverse?

Pre-Purchase Stage – Product Creation – Limitations on Products/Services. Although the metaverse offers many ad- vantages for marketers, it has limitations regarding the types of products and services retailers can provide. Retailers may find it difficult to directly transfer their offline product and service offerings to the metaverse, which could diminish the value they can add to the metaverse. Specifically, current AR/VR technology limits products and service interactions to only sight and sound. Thus, retailers need to consider how to replicate the purchase experience of products and services in the real world within the metaverse. Also, the nature of the metaverse is highly experiential due to high consumer im- mersion. As such, retailers might benefit from offering more experiential products and services, which may retain or even increase their desirability.

Product Creation RQ2: What types of products and ser- vices can retailers provide to customers in the meta- verse, and what types will be restricted and not feasible for sale?

Purchase Stage – Value Exchange – Cost of Omnichannel Strategy . A major cost for retailers associated with the meta- verse relates to extending their omnichannel strategy. Retail omnichannel strategies may become more complex as retailers expand into the metaverse, making it more difficult to stream- line the entire omnichannel strategy concerning sales, market- ing, and customer service. Retailers must consider how much of their physical store strategy (e.g., many points-of-presence, inventory-carrying tasks, one-stop shopping) will be required in the metaverse. Furthermore, as retailers broaden their reach into the metaverse, they will have access to sensitive customer information not found on other digital platforms, such as hand and eye tracking (Vittorio 2022). Retailers must understand how to store, manage, and analyze this customer information. Along with a large volume of customer data, there are privacy concerns retailers will need to address to ensure

that sensitive customer data are not breached. The complexity of operating in the metaverse poses many risks such as mixed customer experiences between channels and customer data breaches. Retailers must be aware of these risks and attempt to mitigate them.
Value Exchange RQ2: What are the costs to retailers op- erating in the metaverse compared to other digital plat- forms? What strategies can retailers employ to circum- vent these costs? Are there unexpected cost savings within the metaverse that do not exist on other digi- tal platforms?

Purchase Stage – Relationship Validation – Human Front- line Employees vs. AI. Relative to other digital platforms, the metaverse enables highly immersive interactions between customers and frontline employees. High consumer immer- sion and digital personas create an environment where deep social interactions occur, including relationships with retail employees. One challenge retailers face is the choice of us- ing AI-based avatars to interact with customer-based avatars (Darbinyan 2022) versus human frontline employees. In ad- dition, there is limited evidence regarding the role of par- ticular avatar characteristics (e.g., more versus less realistic features, gender, and other aspects of appearance) for rela- tionship building and other important outcomes.
Relationship Validation RQ2: Do frontline employees have a unique role in the metaverse compared to other digi- tal platforms? How do retailers leverage AI and digital avatars to replace frontline employees? Does the in- creased consumer immersion cause customers to expect human frontline employees?

Purchase Stage – Product Delivery – Store Design . Re- tailers can create novel digital experiences in the metaverse, representing a critical shift in how consumers shop, even us- ing online channels. Retailers can take advantage of this shift through store design or virtual presence within the metaverse. With the rapid technological development of 3D software and VR/AR, retailers can build 3D spaces that are not limited by real-world boundaries (Dogadkina 2022). Retailers can col- laborate with consumers to design digital stores so that they are more personal, and consumers find increased value in their digital retail experience. In addition, retailers can design digi- tal stores to be more entertaining and interactive than physical store experiences by engaging consumers' senses (e.g., sight, touch, hearing) and allowing consumers to interact with prod- ucts in fun and novel ways. In doing so, retailers will need to provide a seamless consumer experience between the re- tailers' physical and digital stores to ensure an uninterrupted consumer journey (Næss 2022).
Product Delivery RQ2: How can retailer-consumer col- laboration in metaverse store design so that the store enhances the consumer journey? Which aspects of digital stores should retailers focus on in the metaverse to encourage greater engagement with digital products?

Post-Purchase Stage – Value Evaluation – Reselling and Upgrade Decisions . Reselling or upgrading products are two common ways retailers increase sales, but it is unclear how retailers should design these strategies in the metaverse. Popular resellers (e.g., The RealReal, ThredUp) take advantage of societal trends such as a focus on sustainability and affordable luxury fashion, but such trends may not necessarily be top of mind for many consumers in the metaverse (Doniger 2021 ; Verdon 2019). Even though there are many industries (e.g., fi- nancial services, fashion, sports) trying to establish their pres- ence in the metaverse and innovating strategies to increase their sales, retailers could gain inspiration from the gaming industry when designing their strategies for reselling and up- grading, especially as many industry experts expect that the gaming industry is and will continue to

be at the forefront of the metaverse (Porter et al. 2022). BlackBots, an NFT collec- tion of 3D avatars within the Cryptovoxels metaverse, allows users to customize their NFTs by changing their name or upgrading the NFT by combining it with other NFTs (e.g., users can purchase weapons and other accessories for their BlackBot avatar) (BlackBots 2022).
Value Evaluation RQ2: How can retailers convince con- sumers to repurchase or upgrade items? What role does unique digital ownership play in the process of upgrad- ing? How do repurchase or upgrading processes differ in the metaverse compared to other digital platforms?

Post-Purchase Stage – Relationship Maintenance – Loyalty Programs and Store Redesign. Maintaining customer relation- ships in the metaverse requires an omnichannel approach for established retailers with a physical or traditional digital pres- ence. Brands can leverage their already established loyalty programs to help drive customers' engagement through dif- ferent customer touchpoints between digital platforms. Under- standing what drives a customer to interact with these touch- points is the first step in integrating the metaverse into re- tailers' strategies. Also, due to the experiential and highly immersive nature of the metaverse, retailers must be mindful of continually redesigning store layouts to be exciting and en- joyable for customers, keeping up with needs that are likely to evolve as they experience the metaverse. The digital nature of the metaverse allows for many more unique interactions than with other channels, giving retailers an increased abil- ity for creative storefronts that continually drive customers to reengage with them.
Relationship Maintenance RQ2: How do retailers attract customers in the metaverse compared to traditional e- commerce platforms? How frequently will retailers need to redesign their digital storefronts? Does the experien- tial nature of the metaverse change the way current retailer loyalty programs work?

Post-Purchase Stage – Product Spillover – Bundling Strate- gies . Another method retailers can use to increase sales in the metaverse is to bundle products and/or services and sell them at a single price. Retailers can develop bundling strategies that leverage customer trends within the metaverse and physical worlds. For instance, fashion retailers such as Forever21 and Pacsun observed that many customers like to own digital versions of physical products (McDowell 2022). As a result, Pacsun sold unique digital artwork of anthropomorphized rats bundled with different perks such as physical clothing, free shipping of physical items bought at Pacsun, and an invitation to special events 1 . Retailers need to recognize attractive bundling opportunities that leverage unique digital ownership and the 3D environments characteristic of the metaverse.
Product Spillover RQ2: What opportunities do retailers have to bundle unique digital and physical offerings? How does the mix of offerings in a bundle change the valuation of the goods/services? Do negative externali- ties impact physical offerings when bundled with digital offerings?
Brand level

Pre-Purchase Stage – Value Exploration – Marketing Rules for Value Communication . The metaverse allows brands to connect with customers in new ways and can potentially en- able brands to be more innovative in how they communicate value to customers. Through their immersive experiences pos- sible in the metaverse, consumers are exposed to an expanded set of relevant contextual or usage-related themes that could be leveraged for messaging or brand engagement opportuni- ties. For instance, Wendy's, a global fast-food chain, devel- oped its game mode, "Food Fight," within Fortnite, a free-to- play multi-platform game, where players destroy freezers full of burgers to convey Wendy's mission against serving frozen

beef (Wright 2022). Destroying freezers is consistent with groups of players acting out the brand's mission in a much more immersive fashion than is possible with traditional ad- vertising. Additionally, brands such as Coca-Cola use NFTs to reward and incentivize customers to engage with the brands.

Value Exploration RQ3: How can brands communicate value differently in the metaverse compared to other digital platforms? What traditional forms of digital communication are unlikely to be effective within the metaverse, and why?

Pre-Purchase Stage – Relationship Development – Of- fline/Online Brand Equity Transfer. An immediate question that brands need to address is how to translate their offline brand equity (and online equity built on other digital plat- forms) to the metaverse. The depth of customer experiences on the metaverse changes how consumers build relationships and communities, not only with each other but also with re- tailers and brands. Brands face many challenges when en- tering the metaverse, such as digital real estate selection, customer expectations of immersive experiences, and specific metaverse selection, among many other challenges. As such, brands should collaborate with customers and retailers to un- derstand how customers view brand interactions differently in the metaverse compared to brand interactions in other digital and non-digital environments.

Relationship Development RQ3: What aspects of offline brand equity translate (or do not translate) into the metaverse? Do brands need to change their metaverse branding compared to their online branding on other digital platforms?

Pre-Purchase Stage – Product Creation – Co-Creation Op- portunities. The metaverse allows brands to co-create offer- ings with consumers. As brands design experiences for cus- tomers in the metaverse, they can leverage high immersion techniques, allowing deep interactions between the brand and the customer. Furthermore, the increase in consumer immer- sion increases the number of meaningful touchpoints a cus- tomer can have with a brand and where the touchpoints occur, as customer experiences in the metaverse are expected to re- place many future interactions on current digital platforms (Adebayo 2022). Customers who interact with brands in the metaverse may be less likely to do so on other platforms and firm-owned channels such as social media or company web- sites. The opportunities to incorporate customer feedback and the ability to co-create experiences and products with cus- tomers increase as brands begin to understand these touch- points.

Product Creation RQ3: How can brands leverage the high levels of digital collaboration possible in the meta- verse to co-create products and services with cus- tomers? Does high consumer immersion change con- sumer touchpoints and opportunities for co-creation? How does unique digital ownership change the role of customer co-creation in the metaverse compared to other digital platforms?

Purchase Stage – Value Exchange – Communicating In- trinsic Brand Value . With its unique features, i.e., collabora- tive, high levels of immersion, transferrable and unique digital assets, and user-generated digital personas, the metaverse of- fers brands a great deal of flexibility and new and relatively untested options for communicating an offering's distinctive value. For instance, brands can choose to showcase a prod- uct's or service's value by developing NFTs (e.g., Adidas' "Into the Metaverse," "Gucci Garden Archetypes") or even creating a separate metaverse for the brand itself (e.g., Nike's "Nikeland") (Wright 2022). Many brands are quite aggressive in innovating within the metaverse (e.g., Samsung's metaverse smartphone, Walmart's collection of digital art) as well as utilizing all the resources available in the metaverse

(e.g., PricewaterhouseCoopers purchasing digital land on the Sand- box metaverse to better connect with customers) to commu- nicate the brand's intrinsic value to customers (Dickens 2021 ; Marks 2022). With such a variety of possibilities, many never before possible in retail environments, brands must understand how to convey their distinctive value to consumers in this new environment. For instance, whereas consumers' expectations regarding pricing and messaging to support a luxury positioning for a brand such as Gucci are relatively well understood, there is much less evidence regarding such expectations in the metaverse. Gucci and Louis Vuitton, for example, have begun venturing into the metaverse and attempting to convey brand value through NFTs, which they expect can serve as a form of authentication for their tangible products (Thomas 2022).

Value Exchange RQ3: How can brands communicate the value of their products and services in the context of the metaverse? Does the nature of the metaverse cause cus- tomers to overlook or hyperfocus on certain dimensions of brand communication?

Purchase Stage – Relationship Validation – Relationship Impact of Digital Ownership. The ability for customers to own unique digital products likely impacts how brands build customer relationships. Research shows that customers build fewer brand connections with digital products than with physi- cal ones (Atasoy and Morewedge 2018). However, unique dig- ital ownership in the metaverse can allow meaningful brand interactions. Specifically, compared to other digital platforms, these digital products increase opportunities for social expo- sure through increased collaborations, provide more brand- consumer touchpoints, and have higher levels of perceived ownership from the customers' perspective. These differences not only allow brands to leverage these products to deepen their long-term relationships with customers but also allows customers to interact more meaningfully with brands in a dig- ital space as compared to a physical store.

Relationship Validation RQ3: How does unique digital product ownership impact how brands build relation- ships with customers? Compared to other digital plat- forms, does it reduce or increase the psychological dis- tance of brands within customers' minds?

Purchase Stage – Product Delivery – Metaverse Selection . For brands looking to enter and grow their presence in the metaverse, a central question is which metaverse(s) to choose or whether to develop their own metaverse. There are cur- rently more than 50 metaverses to choose from, each with different features and emphases (Murad and Smale 2022). For example, The Sandbox, a gaming metaverse, is one of the largest metaverses, with many communities emphasiz- ing complete freedom for consumers to build and own NFTs (Goyal 2022). Star Atlas is more niche and provides a sci- ence fiction experience to consumers using the latest graph- ics. Meta's metaverse, Horizon Worlds, aims to both grow its consumer base as fast as possible and increase engage- ment among its consumers (Liber 2022); it forgoes visual appeal for simplicity so that consumers feel more motivated to join this metaverse and can easily interact and collaborate. Other metaverses, such as Metahero, created by Wolf Digital World, use advanced 3D technology to allow marketers and consumers to create highly detailed, realistic NFTs. Marketers need to understand the features of each metaverse and the de- mographics of consumers participating in each, so they choose one that best matches their target audience (Qualtrics 2022). If there are no metaverses that meet marketers' objectives, marketers have the option, albeit expensive, to develop their own metaverse, as Nike and Gucci have done (Golden 2021; McDowell 2022).

Product Delivery RQ3: Which metaverse features (e.g., population, required technology, theme, 3D environment complexity) should marketers consider when deciding which metaverse(s) to choose? When and how should marketers decide to develop their own metaverse?

Post-Purchase Stage – Value Evaluation – Social Expres- sion of Brands . Many brands in the metaverse take advan- tage of unique digital ownership and deep social interactions between user-generated digital personas as a way for cus- tomers to connect with and deepen relationships with the brand. For example, Stella Artois, a beer brand and a spon- sor of many renowned horse racing tracks collaborated with Virtually Human Studio to develop a metaverse event where players can collect, breed, trade, and race their unique dig- ital horses (Glenday 2021). Stella Artois offered this event to players so that the firm could reach a new audience and share "the art and elegance of Stella Artois." Another brand, Dolce & Gabbana, showcased their wearables for digital per- sonas at the Metaverse Fashion Week in Decentraland, where customers can "celebrate the creativity and innovation of the [metaverse]" (Dolce&Gabbana 2022). Brands could also work with social or virtual influencers like Charli d'Amelio or Lu do Magalu to connect with consumers (Molenaar 2022). Given the novelty of such practices and brand experiences in the metaverse, research exploring the effectiveness of such tactics as part of brands' marketing strategies is lacking.

Value Evaluation RQ3: How do post-purchase behavior differences impact customers' brand evaluations? How does the social experience of consumption impact these evaluations? How can brands leverage shared consump- tion experiences to increase branding opportunities?

Post-Purchase Stage – Relationship Maintenance – Geospatial Targeting. Much like the non-digital world, dig- ital location in the metaverse should be a relevant customer characteristic that can be used to target and segment cus- tomers due to unique digital real estate. Specifically, retail- ers will choose locations for their virtual storefronts based on the metaverses and spaces within them where their tar- get customers can be reached. Digital geospatial location is already a topic of interest to brands looking to expand into the metaverse (OS Developer 2021). It provides the metaverse a significant advantage for customer re-engagement compar- ative to other digital platforms. As such, there is a need to understand how brands (and retailers) can use this segmenta- tion tool to maintain relationships with customers.

Relationship Maintenance RQ3: How can brands leverage the geospatial targeting available due to digital real es- tate? How can brands leverage unique digital real es- tate to maintain customer relationships and foster cus- tomer loyalty?

Post-Purchase Stage – Product Spillover – Marketing Spillover . The highly collaborative shared space in the metaverse offers brands greater access to their current and potential customers. Yet, it is likely that for brands, there are both positive and negative consequences to this level of access, with downstream consequences for partner or competitor brands. Brands must fully capture these consequences to form more effective strategies to generate greater market share in the metaverse. One such brand partnership is between Meta, the parent company of Facebook, and NBCUniversal to build metaverse experiences to attract fans of the hit TV show, "The Office," into Meta's metaverse, Horizon Worlds (McAuliffe 2022). The purpose of this partnership for both Meta and NBCUniversal is to garner a new audience. How- ever, it is unclear how both brands should manage their rela- tionship. Research is needed to shed light on such marketing spillovers.

Product Spillover RQ3: Why do brands choose different approaches to manage a marketing spillover? When should a brand choose to showcase its

partnership with other brands? How should brands deal with their re- lationships with other brands? In what situations will a brand be better or worse off because of a marketing spillover? How will the marketing of weaker brands im- pact its stronger competitors?

Conclusion

The nascent nature of transitory metaverses is collabora- tive. It allows user-generated digital personas but lacks other aspects of our definition of the metaverse, which are high consumer immersion and transferrable and unique digital as- sets. As both VR technology and the computing requirements of blockchain technology becomes more accessible and af- fordable over time, transitory metaverses will transition to "true" metaverses. VR technology reduces the perception of technological mediation, enhancing consumer immersion in the metaverse. In addition, blockchain technology enables highly secure storage of transactions within a sharing econ- omy, meaning that consumers can have unique ownership of digital goods which are transferrable.

Even though the metaverse is still in its infancy, the pos- sibilities for retailers and brands to grow in this digital plat- form are seemingly endless. It provides retailers and brands with unique opportunities along the customer journey's pre- purchase, purchase, and post-purchase stages within each of the three amplified touchpoints (i.e., digital economic ex- change, complex social relationships, direct environment in- teraction). However, with these benefits come risks. Examples include difficulty transferring offline product and service of- ferings directly to the metaverse (pre-purchase stage), provid- ing mixed customer experiences (purchase stage), and offering unattractive reselling and upgrading decisions to customers (post-purchase stage). Since the metaverse is being shaped continuously by technology companies, gaming companies, metaverse platforms, VR and AR developers, retailers, and brands are iteratively experiencing how best to engage with consumers in this new world. With time, retailers might find more creative, collective solutions by working with consumers and brands to manage the risks and opportunities in the metaverse.

This is an exciting time for consumer, retailing, and marketing scholars as they can help guide practitioners and transform marketing practice and education for the metaverse. While many challenges are likely to lie ahead as this domain is rapidly evolving, we hope this article provides insights re- garding how researchers can contribute in meaningful and rel- evant ways to scientific progress in retailing in the metaverse domain.

Declaration of Competing Interest

None.

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