Shops and the Metaverse:

What does the future hold?

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ABSTRACT

In today's consumerist culture, e-commerce and digital shopping experiences have become central for numerous societies across the globe. Factoring in the concept of the metaverse—which has gained considerable traction over the last year and is said to be the next evolutionary step of the internet—shopping as we know might potentially experience drastic changes in the future. This research paper aims to forecast these changes, trying to decipher the metaverse's shopping trajectory through the following main research question: *What shopping experiences could the metaverse offer by 2032?* For that purpose, we approached various theoretical concepts, helping us understand the metaverse's potential trajectory from a tecno-economic and customer experience perspective; through that, a conceptual model was built that considers how the metaverse might evolve as an innovation, what new affordances this innovation will allow for shopping, and how retailers will utilize these affordances to overhaul their corresponding customer experience. By approaching such theory, and deriving a thematically relevant set of questions from it, we then approached a select list of ten experts—interviewing them, and transcribing said interviews, for the purpose of extracting useful knowledge from their expertise. With that newfound knowledge, we were then able to uncover important themes surrounding shopping in the metaverse—identifying key stakeholders, trends, and uncertainties—and used that knowledge to create four distinct scenarios. In terms of trends, those that were deemed as central were the gamification of shopping, safety concerns regarding the metaverse, hybrid metaverse shopping, multi-metaverse shopping, and increased brand presence. Additionally, the key stakeholders that were identified were metaverse providers, brands, retailers, meta-creators, and consumers. Finally, these scenarios are based on two critical uncertainties—the maturity of metaverse technology and the degree of metaverse public acceptance—incorporating them with the aforementioned trends and stakeholders to achieve detailed and in-dept forecasts. While no single scenario offers a definite depiction of what shopping experiences might exist in the metaverse, by 2032, collectively they offer realistic approximations, allowing for a holistic appreciation of how this thought-provoking innovation might develop in the future when concerning shopping—ranging from the extremely positive, to the extremely negative, and everything in between.

KEYWORDS: *metaverse, e-commerce, shopping, customer experience, scenarios*

Table of Contents

1. Introduction

In 2021, Facebook—a company that, up to that point, had been synonymous with its most well-known social-media platform—changed its name to Meta and revealed to the world its plans to create the Metaverse. Mark Zuckerberg himself said he believes the metaverse to be the continuation of the internet (Meta, 2021)—evolving it into something that is more focused on experience and immersion. Yet, Meta and its founder were not the first to coin the term *metaverse*; that honor goes to renowned science fiction-author Neil Stephenson (1992), who, in the book *Snow Crash*, described such a digital world—at a time where such a venture would have seemed technologically unimaginable. In his book, Stephenson (1992) describes a boulevard of truly gargantuan proportions—being "considerably bigger than Earth"—that is filled with reality bending buildings, phantasmagorical "light shows", zones designated for video-game like combat, and is constantly swarmed by millions of enthralled users (p. 32). Within this near-infinite boulevard, "major corporations" vie to acquire precious digital real-estate, filling it with their own unique creations in order to encapsulate the minds and attention of the metaverse's many users (Stephenson, 1992, p. 32). While Stephenson's vision back in 1992 was based on a techno-economic dystopian appreciation of humanity's future, where corporations reign as the supreme leaders of the part of society that has not fallen into anarchy—the modern revival of the term metaverse does share some similarities with that of Stepheson's own. Primarily, versions of the metaverse describe interactive, three-dimensional worlds—inhabited simultaneously by numerous users and having their own unique commercial and economic infrastructure. This falls in line with the modern—and widely accepted—definition of the term metaverse, that being "persistent virtual worlds", that heavily utilize technologies such as virtual (VR) and augmented (AR) reality, and have an engrained digital economy (Ravenscraft, 2021, para. 6). With the addition of potentially lucrative digital concepts, such cryptocurrency and NFTs, only adding to the metaverse's commercial prospect (Ravenscraft, 2021), and with Meta (2021) showcasing a wide array of e-commerce specific features—focusing on developing a *creator economy*, along with a *developer ecosystem*, as part of a wider commerce-based initiative—interest begins to form on how a metaverse shopping experience would look like. With most modern societies being intrinsically consumerist—and with digital products, such as NFTs, having gained considerable traction over the past few years—the prospect of an immersive digital world, with strong e-commerce ties, has the potential to reshape our understanding of online shopping. Thus, it is important to understand how the metaverse might function—and

perhaps dare to imagine how commerce and shopping will function within it in the future.

1.1 Scientific Relevance

The novelty of the metaverse as a whole means that scientific literature and insight on the matter is sparse to non-existent—this is more pronounced when one tries to find scientific literature that deals with the commerce specific aspects of the concept. Additionally, the definition of the metaverse has experienced considerable change over the years—with technological maturity playing a key role in its substantiation—meaning that studies of a certain age might prove, in part, irrelevant, even when addressing the topic directly. In one such rare instance, Bourlakis et al. (2009) discussed the economic potential of businesses engaging in retail activity within select "metaverses"—yet, in this case, the term "metaverses" referred to popular online worlds of the time. This means that such scientific efforts focused mainly on MMOs (massively multiplayer online games) which—while undoubtedly central/relevant for the time—are no longer accurate in substantiating what a metaverse-like world can be. While MMOs do share the central metaversal element of persistent worlds and functioning economies within them (Bourlakis et al., 2009), they are still bound by their scope—meaning that they are one of many digital words, instead of being an overarching true metaverse world (Ravenscraft, 2021). The metaverse that we hear about today aims to be the next evolutionary step of the internet (Meta, 2021), meaning that the scale, technologies, and socio-economic processes needed to create it are much larger than any known MMO. The same goes for the retail aspects of a modern day—as far as definitions go—metaverse, with a metaverse shopping experience having much more in terms of moving components.

Thus, taking into account the lack of relevant scientific knowledge and the extreme novelty of the subject as a whole, this research can only adopt an exploratory stance—aiming to approach those with the most relevant connection to a commerce-viable metaverse, and generating usable knowledge anew. With that in mind—and considering that the modern metaverse still lies in the future, calling for some flexibility in terms of timeframes—the following research question will be the focus of this paper:

RQ: *What shopping experiences could the metaverse offer by 2032?*

Additionally, the following sub-questions can provide an expanded appreciation of how these shopping experienced might develop into different experiential cores—based on the factors that are most influential when shaping customer experience overall:

SQ 1: *What emotional shopping experiences could the metaverse offer by 2032?*

SQ 2: *What functional shopping experiences could the metaverse offer by 2032?*

SQ 3: *What sensory shopping experiences could the metaverse offer by 2032?*

1.2 Societal Relevance

With "retail e-commerce sales" amounting "to approximately 4.9 trillion U.S. dollars worldwide" in 2021 (Statista, 2022a, "Global Retail," para. 1), it is reasonable to say that digital shopping has become a permanent fixture of global societal norms. Considering as well the unforeseen amount of internet connectivity/activity that drives daily existence for many—with smart phones having become a commonality—then the future role of the metaverse become of major societal importance. Humanity is currently within the peak of *Web 2.0*—meaning the current state of the internet—which has reached mass mainstream appeal due to the aforementioned approachability and portability of smartphones, acting as constant nodes for digital connectivity (Atkins, 2022). This mainstream appeal has also led to the rise of a digital, technological oligopoly—with key corporations having cemented their presence as industry titans of this ongoing digital age (Atkins, 2022). This corporate oligopoly also reaches into the world of digital shopping; that important sub-aspect of the internet is also heavily influenced by major, influential corporations. Amazon is one such shining example of this effect, with the e-commerce company reaching an estimated "global brand value" of "705.65 billion U.S. dollars" in 2021 (Statista, 2022b, section Amazon: Brand Value 2006-2022, para. 1). Moving on from Amazon, Meta is another corporation with a major shopping presence—with its Facebook marketplace function offering a unique social shopping experience.

As the metaverse is said to be the evolution of the internet (Meta, 2021)—or at least play a major part in the future development of its conceptual continuation in the form of *Web 3.0* (Atkins, 2022)—and taking into account the current importance of digital shopping/e-commerce within broader society, then it becomes clear why the concept of shopping within that new environment is of societal importance. While the metaverse can potential enhance existing digital shopping structures by introducing them into three-dimensional, immersive worlds—it can also revolutionize certain aspects of digital retail by bringing underutilized concepts into the broader economic spotlight. From propagating a digital economic paradigm based on exclusivity/ownership, to creating a "a robust and flexible financial ecosystem that will allow users to seamlessly connect between the physical

8

and virtual worlds" (Moy & Gadgil, 2022, p. 15)—generating multifaceted and immersive shopping experiences in the process—the metaverse can potentially alter the human perception on what it means to shop. This potential bridging of physical and digital shopping spaces—along with the aforementioned enhancement of existing digital shopping environments—can greatly affect broader societal dynamics and norms, generating societal interest for further study on that notion alone.

2. Theory

2.1 Metaverse as an Innovation

As stated by Mark Zuckerberg during his company's, Meta, unveiling of the metaverse, this radical platform is set to be the evolution of the internet as we know it (Meta, 2021)—branding it as a unique innovation that aims to redefine the context of existing within a digital space. The reasoning behind the metaverse's classification an innovation lies in its potential to influence the broader economic spectrum—as innovations in this context have the to propagate "techno-economic and social interactions" that encompass major parties such as "suppliers", "distributors", and "consumers" (Perez, 2009, p. 188). In that sense, the metaverse's innovational properties can also push into the classification of a "technological discontinuity"—as it is novel knowledge, which emphasizes on innovative technology, that has the potential to heavily alter already established "production processes" or outright replace them with something completely different (Dwyer, 2019, p. 5). With that in mind, evolutionary economics can be utilized as the theoretical basis for the metaverse's potential route as an innovation—providing broader context on how this technology might influence and be utilized within the broader economy. Thus, any changes induced by the metaverse can manifest in the form of "creative destruction", as novel technologies—the metaverse as an innovation being one such case—have the significance to cause "cataclysmic changes" within the established economic status-quo and bring about a broader "restructuring" within the economy as a whole (Cunningham et al., 2015, p. 104). Such overarching changes will shape metaverse role within the economy as a whole—and through association its viability as a shopping modality in the years to come.

2.1.1 Evolutionary Economics and Innovation

When dealing with the metaverse's position within the economy—taking into consideration it's techno-economic significance as an innovation—the concept of "long-wave cycles" (Cunningham et al., 2015, p. 104) comes into the forefront, potentially affecting the future of metaverse commerce due to its economic significance. As proposed by some, within the context of evolutionary economics, we are currently amidst the 6th major economic cycle since the Industrial Revolution, consisting "of biotech, pharmaceuticals, recycling and alternative energy, software, mobile communications and digital technology" (Cunningham et al., 2015, p. 104). If we are to consider the metaverse to be one of the peak technological points of this 6th cycle—as it combines major aspects of "software, mobile communications and digital technology" (Cunningham et al., 2015, p. 104), due to its

innovational properties—then we might consider that this current cycle is reaching its technological threshold, as indicated by the complete integration and exploitation of all relevant technologies (Cunningham et al., 2015). Though it could also be the case that the metaverse is not the peak of this 6th cycle, but instead another step towards its eventual culmination—as it hard to assess if all "existing technologies have been exploited fully" (Cunningham et al., 2015, p. 104) for a project that has yet to enter the wider economy in any tangible capacity. The position of the metaverse along the current economic cycle has the potential to greatly affect its shopping experience; a metaverse towards the higher end of the cycle can signal the obsolescence of previous technological paradigms—due to their thorough exploitation (Cunningham et al., 2015)—and subsequently force retailers to build shopping experiences around a new technological paradigm.

Considering that a key concept of evolutionary economics is that "businesses are continually looking for ways (new knowledge) to make money" (Dwyer, 2019, p. 20), then it becomes evident that the metaverse's role as an innovation will attract businesses to adapt within its parameters. The rate of adaptation will also depend on the quality of information businesses receive regarding the technology surrounding the metaverse—as they naturally find themselves unable to find "the perfect solution" to their problem, due to their inability to process new information in the most optimal way possible, leading to a partially defective mental roadmap down the line (Dwyer, 2019, p. 20). From a practical standpoint— especially when concerning e-commerce and shopping within the platform—that could potentially translate to an adaptation teething phase, with an error-riddles initial application being made public before the "the perfect solution" (Dwyer, 2019, p. 20) is synthesized.

Despite of the high probability for mistakes, business might still be urged to pursue the metaverse for their shopping representation—evolutionary economics suggest that industries are constantly "disrupted" by emerging technologies/innovations and either face decline or "coevolve" with this new parameter (Dwyer, 2019, p. 21). In this case, coevolution refers to an organizational need to develop to accommodate a technology, rather than expecting for technology to achieve the opposite rather—an effect that might cause considerable alterations across an organization's overall customer experience structure. If we are to look at the metaverse's predecessors—the internet and the mobile interment accordingly—then we can see that businesses and industries alike were "disrupted by and forced to coevolve" with such paradigm shifts in a similar fashion (Dwyer, 2019, p. 21). In regards to the smartphone, if are to observe the rate of co-evolution regarding digital commerce, the Apple App Store launched with a modest 500 available apps upon it debut in

2008 (Strain, 2015)—something which was soon enough followed by the launch of its Android counterpart—and more recently in 2020 mobile devices accounted for 45% of all e-commerce transactions in the U.S. (Danziger, 2021). Starting out as a rather novel concept, the mobile internet—with mobile apps in particular—forced numerous companies and industries to rethink their approach to selling online, with the evidence of this coevolution being the meteoric rise of company/business specific commerce focused mobile apps.

2.1.2 Shakeout Effect & The Metaverse

It is also worth considering the effects and trends that may arise if we approach the metaverse as its own separate industry—something which can be seen as justifiable based on the concepts' tremendous scope. Most importantly, this means that the metaverse as a whole will probably have a *shakeout* phase—implying that many interested parties will attempt to develop their own version of the product at the beginning, but only a few established options will remain as the industry matures as a whole (Buenstorf, 2007). By its nature, this process will force "smaller competitors" out of the race to establish the dominant design early, leaving companies with greater economic power to create "barriers of entry" by either strong-arming their less powerful competition out of business or outright buying them out (Dwyer, 2019, p. 26). This shakeout pattern carries within both risks and considerable opportunities—mainly early investors will have to deal with the initial uncertainty as their related product matures into something more tangible, but can also potentially define its design and parameters down the line (Buenstorf, 2007). Consequently, this shakeout environment might potentially lead to a few large, influential companies wrestling control of the market and creating a corresponding oligopoly (Dwyer, 2019)—with each included corporation providing its own iteration of a metaverse platform to the public.

Despite the aforementioned corporate dominance, smaller scale competitors can still be competitive; this can occur through the existence of "niche" versions of a product that co-exist alongside mainstream options, as "dominant designs" are much less common within the media industries (Dwyer, 2019, p. 26). As the metaverse can be potentially placed within the broader media industries, this opens the door for "hits" from smaller metaverse contributors, creating fertile ground for parallel/alternative metaverse offerings that will target smaller, "niche" market segments (Dwyer, 2019, p. 26). Thus, we are left with a potential future market environment that contains multiple metaverses—both mainstream offerings from a few major companies, and smaller-scale "niche" operations from various smaller businesses (Dwyer, 2019, p. 26). Consequently, every metaverse version—large or

small—has the potential to offer a different shopping experience; with different companies having dissimilar motives and approaches when it comes to cementing the retail parameters of their platform. Additionally, one must consider the future inter-connectivity of a multi-metaverse environment—as a unified retail environment might offer a different shopping experience when compared to one that is segmented/walled-off based on the provider.

2.1.3 Technological Revolutions

Though the approach of the metaverse being a major innovation and nothing more does have merit to it—limiting its role to that of a standard "technological discontinuity" (Dwyer, 2019, p. 21)—one cannot help but consider more large-scale definitions when the immense scope of this technology comes under investigation. In fact, the metaverse can be seen as a technological conglomerate, including innovative technologies from the realms of VR, AR, video-games, NFTs, and more—some of which have yet to reach full maturity (Ravenscraft, 2021). If we are to consider the definition of a *technological revolution*—meaning "a set of interrelated radical breakthroughs, forming a major constellation of interdependent technologies", or "a cluster of clusters" (Perez, 2009, p. 189)—then the potential of the metaverse being a technological revolution becomes apparent, as it contains socio-economically significant clusters of its own. Such technological revolutions have the potential to create fertile ground for more innovations, introduce/standardize new technologies, and promote structural change that can greatly "increase the efficiency and effectiveness of all industries and activities" (Perez, 2009, p. 190)—leading to the profound transformation "of the economy (and eventually society)" as a result (Perez, 2009, p. 189).

If the metaverse does end up being a technological revolution, then its socio-economic importance is elevated immensely, as it has the potential to jumpstart noteworthy developmental surges through its diffusion (Perez, 2009)—while also causing the frenzied de-rooting of existing infrastructure and industries, that are tied to the previous revolution, while it is being installed (Perez, 2011). From a shopping/e-commerce perspective, this would force retailers to forego such outdated technologies, coaxing them to adopt to the technological solution that is most preferential to the customer/consumer (Meyer & Schwager, 2007). In addition to the enlarged consumer interest, a metaverse as a technological would also offer considerably different opportunities to retailers—mainly due to the socio-economic improvements and accelerated innovative processes that would come about as a result (Perez, 2009). Lastly, the concept of technological revolutions also brings the factor of time into the picture, as they tend to have a corresponding "installation period"

after a major "big bang" moment in their development (Perez, 2011, p. 19). This adds further depth to the case of the metaverse as a technological revolution, as its unique benefits to shopping might not be fully available by the year 2032—which is the focus of the RQ.

2.1.4 Innovation Model

Up to this point, we have approached the metaverse through its effect/influence on the broader economy—be it as an innovation or a technological revolution—and seeing how it's shopping parameters could potentially evolve in the process. Yet, the multifaceted nature of the metaverse means that it cannot unaltered by other innovational components in the broader economy—especially when considering that the metaverse is dependent on the cooperation of various sub-innovations/technologies for its own existence and future function. Within the context of evolutionary economics, "innovations emerge from (inter)actions of micro entities" (Schlaile et al., 2017, p. 13)—showcasing an expansive web-like property to innovative thinking, as it spreads and expands via the interaction of various key-stakeholders. If an innovation is to match the parameters of its definition—that being the introduction of inventions into the broader economy/society (Storsul & Krumsvik, 2013)—then greater credence has to be given to the way it is carried and implemented throughout the economy. Within the innovation model for evolutionary media economics, the creative industries are portrayed as a nexus of innovation—spreading and cultivating innovative thinking, while also overhauling though-process throughout the rest of the economy (Cunningham et al., 2015). This would suggest that the metaverse can benefit from an existing database of innovation—taking inspiration from the creative industries through the implementation of industry best practices within its own creative parameters. Even if specific innovations are not to be adopted directly, there are still procedural benefits to be gained based on this model—as interacting with the creative industries can lead to the acceptance of thought models for other industries that "enhance their ability to innovate" (Cunningham et al., 2015, p. 108). This apparent osmosis-like trait of innovation opens a lot of opportunities for the metaverse and its commercial aspects; businesses can potentially adopt industry best practices from parts of the creative industries that carry targeted benefits it terms creating an emotional attachment to virtual worlds—these benefits being "interactivity and media richness" along with an overarching sense of "telepresence" (Kohler et al., 2011, p. 774). If anything, the strategic selection and repurposing of such knowledge—in this case for creating an emotional, experiential core to the metaverse's shopping affordances—can be seen as a credible economic "investment", as innovation is a

key ingredient to "productivity growth and competitiveness" (Cunningham et al., 2015, p. 109).

Regrading what existing innovations there are to assimilate—as far as shopping and metaverse-bound shops are cornered—many possibilities start to emerge, and existing online worlds are of special interest in that capacity. As the metaverse is characterized as the "convergence of virtually enhanced physical reality and physically persistent virtual space" (Hackl, 2020), then this process of innovation "borrowing" can understandably extend to both world building that focuses on AR, VR, or is simply based within digital space. *Pokémon Go*, for example, has been hailed as the progenitor of the *mirrorworld* (Kelly, 2019)—with the mirrorworld being used by some as a different term to describe the metaverse (Hackl, 2020), although there are core differences between the two concepts—and its widespread use of AR can act as a significant innovative boon to the metaverse. The aforementioned game has showcased the mass appeal that comes with weaving the physical world with the digital—creating a digital scaffolding over our own reality that will only deepen in complexity and immersion capabilities as time goes on (Kelly, 2019). Considering the metaverse heavily relies on the near-seamless interconnectivity between the physical world and that of its own (Meta, 2021), we can already see how AR—and products that heavily rely on the technology, such as *Pokémon Go*—have already inserted their own innovational seeds into the concept. One could argue that the differences between the mirrorworld and metaverse—with the first describing an interactive digital scaffolding that extends over our own reality (Kelly, 2019), and the second evolving the concept into something that includes both a purely digital world and a digitized overlay of our own (Meta, 2021)—showcases the innovation model in action. The mirror world aimed to advance existing innovations from AR products into a cohesive AR world (Kelly, 2019), and the metaverse took that concept and joined it with a parallel purely digital world— showcasing a continuous process of creative thought and exchange/improvement of existing innovations among industries.

Video-games—specifically MMORPGs (Massively Multiplayer Online Role Playing Game)—can also act as another major source of innovation/knowledge for both the metaverse as a whole and its commercial aspects specifically. The reason for this is that MMORPGs revolve around the creation of online worlds with a basic financial/economic connection to the physical world, while also having a multifaceted social component that encourages users to remain engaged online (Ondrejka, 2004); both of these attributes are critical to the concept of the metaverse in its totality (Ondrejka, 2004) and have the potential

to create an emotional connection between the user and the platform. Since these two major components have already been infused into the conceptual core of the metaverse—at least in the way in which it was recently unveiled by Meta (2021)—one has to consider what other, more nuanced aspects of online games can be repurposed for metaverse usage. One aspect with a strong customer experience enhancing potential is that of user created content— *Second Life* is one important benchmark in the utilization of such tools, as since the beginning of its life cycle, it offered options for the collaborative creation of in-world content in real-time (Ondrejka, 2004). Such features can prove especially important individual users in the metaverse, as they can use creative tools that are hard-baked into the platform to create innovations of their own—formulating unique product offerings with real world viability (Kohler et al., 2011) and creating a new shopping category comprised of user generated content/services. Despite the clear commercial benefits, the focus on user created content as an innovation can help create further emotional value in the world of the metaverse, while also generating a creative social nexus amongst various users (Kohler et al., 2011)—this socio-emotional network can evolve into a shopping affordances accordingly, as users will be incentivized to sell and buy content amongst themselves.

Generally speaking there are a lot more commercial innovations that can be retrieved from video-games—and beyond, if one is to factor in monetizable digital items such as NFTs and crypto-currency—but many of them come with considerable drawbacks in terms of customer experience. Such occurrences can still fall within the category of a *process innovation*—as they create structural changes in the creation and delivery of a product/service (Storsul & Krumsvik, 2013)—but have drawbacks that can negatively affect the overall shopping experience through unsatisfactory/warped customer interactions. If we are to consider that innovation is not good by default, but often comes with relocated drawbacks within its broader conceptual map (Schlaile et al., 2017), then the problematic scenario arises that many—if not all—potential innovations that can be fed into the metaverse might come with their own set of hidden shortcomings. Of note is also the fact that some innovations might start off as overwhelmingly positive, appearing beneficial, but might change to include malignant aspects the longer they exist within an industry (Schlaile et al., 2017). Thus, it is worth exploring how many existing innovations will make their way into the metaverse in regards to shopping—along with their potential drawbacks—as they are sure to shape the emotional side of the corresponding customer experience and the related shopping affordances.

2.2 Shopping Affordances in the Metaverse

The introduction of such a new innovation/technology—the development of the metaverse in this case—into the broader economy will most likely lead to the creation of new affordances (Autio et al., 2018), generating new affordances for the realms of e-commerce/retail accordingly. Affordances refer to the potential uses an object might present—in terms of "functional utility"—based on the capabilities of the user (Grabarczyk & Pokropski, 2016). In that sense, as far as the metaverse is concerned, affordances settle into a more multifaceted role—as different users/organizations might utilize the platform differently if we are to factor in an individual's capabilities/limitations. Additionally, affordances deal with "the limitations built into the technologies, and the social context that triggers users' experimentation and the testing of those limits" (Hopkins, 2016, p. 8), making technology and its limitations central in understanding how the related affordances might develop. With that in mind, the metaverse can be seen as an "an emergent digital platform", albeit a highly advanced one, with its own set of potential "basic" and "emergent" affordances: the first refer to the baseline capabilities of the platform, while the latter point to potential uses that are dependent "on user interaction" (Hopkins, 2016, p. 9). Thus, while technological limitations are critical for the shaping of affordances (Hopkins, 2016)—as is the case with the innovational aspects of the metaverse—it still important to consider that users will still dictate much of what is achievable within the platform affordance-wise. This also extends to shopping within the metaverse, with both users and technological innovation acting as determining factors for potential shopping affordances.

By approaching affordances without "an exclusive focus on features" we can set up direct comparisons "across specific technologies" (Hopkins, 2016, p. 7)—being able to set up comparisons across mediums, despite the related technological potential, and see which affordances have a wider sense of cross-platform transferability. This means that existing affordances, from other technological mediums, might potentially find a home in the metaverse—being branded as new due to the different types of interactions they might allow for in that new environment. While affordances—such as the ones that will potentially be created by the "techno-economic paradigm" that is the metaverse—allow for organizations to "perform new actions", they can also aid towards performing "existing functions more efficiently" (Autio et al., 2018, p. 75). Potentially, within the context of retail and shopping, this means that the metaverse might offer a unique mixture of new/overhauled affordances: some will allow for completely new shopping actions/experiences, while others will massively improve on existing shopping actions/experience and bring them into this new

technological medium. All things considered, these new affordances have the potential to overhaul the metaverse shopping experience—giving retailers the tools to engage with their customer-base in an experientially innovative manner.

2.3 Customer Experience in the Metaverse

In the context of a digitally driven world—with AR-centric creations being a prime example—affordances "engage customers in a contextually and experientially rich manner" and become guiding rods in the customer decision-making process (Chylinski et al., 2020, p. 374), dictating the corresponding touchpoints along the way and forming the conceptual framework of the digital customer experience. Since the metaverse will be a digital world in its own right—and promises to focus heavily on immersion (Meta, 2021)—the same symbiotic relationship will probably apply between customer experience and affordances, generating the aforementioned fertile ground for the creation of an overall customer experience that caters to the metaverse's unique experiential shopping parameters. Through this affordance materialization by retailers, existing customer experiences can be enhanced or created anew—making it important to understand their base experimental components, as they will most likely lay the foundation for a potential metaverse shopping experience structure.

If are to look at Mascarenhas et al. (2006) definitions of "total customer experience", a balanced split between "physical and emotional elements" must be achieved—as it is only through a combination of "functional and emotional benefits" that companies can achieve the best possible customer experience (p. 399). The same segmentation is true for digitally oriented affordances, with a line being drawn between their phycological and technological components (Grabarczyk & Pokropski, 2016)—creating parallels between emotional experience and technological functionality. Additionally—despite the apparent importance of the emotional and functional dimensions of the overall customer experience structure— sensory experience aspects also play an important role when it comes to creating value within the traditional retail customer experience (Hultén, 2013). With all the above in mind, it is important to breakdown these value-adding components of a potential metaverse customer experience structure, highlighting important sub-factors within them and placing them within the wider experimental frame of a potential metaverse shopping experience.

2.3.1 Emotional Experience

The first value creating axis, towards a successful customer experience, is that of

emotions (Parise et al., 2016)—showcasing how a focus on the consumer's emotional core can positively affect the attached customer experience. With the metaverse being set to be an innovation that will to cater to the needs of the user, and not the other way around (Meta, 2021), the role of emotions become even more critical—as the consumer's emotional experience will potentially dictate a large part of the metaverse's success as a shopping modality. Such is the importance of understanding the customer's individual/personal experiences—with emotions being a central component of such experiences—that their apparent absence can halt an organization from achieving any short of meaningful customer gratification (Meyer & Schwager, 2007). This emotional emphasis subsequently holds great importance from the perspective of future metaverse retailers, as they will need to provide "immediate, personalized, and emotional content" in order to find success in this advanced digital sales paradigm (Parise et al., 2016, p. 412). With that goal in mind, retailers will be urged to rethink their emotional approach to shopping, and enrich their offered customer experience in innovative and engaging ways; the use of technology will be critical in this effort, as it can "provide a mentally stimulating, enjoyable, and interesting experience to the user" (Parise et al., 2016, p. 414).

For the purpose of this research, five core emotional factors have been considered for the potential shaping of a metaverse shopping experience—the first being aesthetics. Aesthetics are critical for achieving an "emotional fit" between retailer and customer, leveraging specific technological innovations to "to provide an aesthetically pleasing experience for specific shopping behaviors" (Parise et al., 2016, p. 414). AR and other video-rich technologies are seen as core examples of digital tools that can be used to achieve an aesthetic customer equilibrium (Parise et al., 2016); as the metaverse is looking to include all such modalities, and potentially expand upon them, retailers will encounter unique opportunities to add unforeseen aesthetic value to their digital customer experience layout. From utilizing AR, to position products within the customer's grasp and person, to crafting aesthetically unique shopping environments—the potential of this experiential sub-pillar seems truly expansive. The second emotional sub-core to be considered, when approaching the potential customer experience of a metaverse shopping environment, is memorability. Primarily, memorability can give a distinct competitive advantage to retailers by allowing them to "differentiate themselves from competitors" through the design and creation of both "memorable customer experiences" and "retail environments" (Petermans et al., 2013, p. 1). It is interesting to note that designers and retailers alike perceive memorability in different ways: the designer is inclined to perceive the notion as a space that is welcoming and

intrinsically familiar/home-like to the consumer, and the retail is inclined to point towards practical rewards during a shopping experience—such as "loyalty cards" (Petermans et al., 2013, p. 5). Considering the metaverse's vast creative potential, both interpretations of memorability can be co-utilized, opening the door for shopping experiences that are practical, elicit long-term customer loyalty, and are uniquely suited to the consumer—fostering further incentivisation for shopping within the platform. Moving on, we have the emotional aspect of personalization—as modern consumer culture pushes individuals to seek customized experiences that suit their specific needs (Shukla & Nigam, 2018). Within a virtual world setting, the need for customization can take the form of digital customization—with users being to inclined to customize their virtual selves/avatars, products, or their environments (Park et al., 2008). Additionally, this need for personalized experiences can allow for greater communication between consumers and brands; following a virtual world pattern where developers assume an advisory role towards the user (Park et al., 2008), potentially leading to an increased brand presence within a customer experience context. As the metaverse is set to emphasize greatly on personalization/customization, the potential for tailored-made shopping experiences is worth further analysis and consideration.

The penultimate emotional ingredient is that of education—as it is perceived to be of importance when trying to achieve a pleasurable shopping experience (Bäckström & Johansson, 2006). This focus on education encourages retailers to inform consumers, in a thorough and easy-to-follow fashion, regarding the product/services on sale and their potential uses (Bäckström & Johansson, 2006). Considering that current promotions for the metaverse promise a clear focus on social interactions (Meta, 2021), this educational emotional core can potentially allow retailers to establish a closer and more interactive relationship with their customer-base—adopting an almost advisory role through their shopping journey and amassing a stronger brand presence in the process. Lastly, we have the emotional element of safety—which is a key part of a traditional, and successful, customer experience (Shaw & Ivens, 2002). With digital safety being a key focus of many internet brands throughout its evolution—with AOL having such a focus in the past (Shaw & Ivens, 2002)—it is worth considering how safety will be dealt with in the metaverse, and how retailers will implement it within the corresponding shopping parameters.

2.3.2 Functional Customer Experience

The second customer experience metric to consider when assessing a consumer's journey is that of functional value—with functionality, in the utilitarian sense, being "one of

the main drivers of customers' evaluation and perception of a new product" and thus being a key factor in a holistic customer experience package (Gentile et al., 2007, p. 405). In that sense, while providing immersive experiences within a metaverse shopping experience will still be key—those not wishing to have any gaps in their retail offerings should also consider the utility of their products/services, making sure to keep that unassuming aspect central and updated accordingly. As indicated by Berry et al. (2002), at its core, a baseline customer experience is made up of two components: emotions—which we discussed in detail during the previous section—and the practical performance of a product/service. This entails that the provided product should resonate with a sense of embedded craftmanship—shying away from materials and processes that would make it appear as cheap—and should function seamlessly, making the customer experience smooth and uninterrupted through its streamlined utility (Berry et al., 2002). Thus, for the retail experience to be complete, metaverse sellers—along with retailers across both digital and physical environments— should aim to instill an essence of high and reliable quality in their offerings. In addition to function and quality, one most also consider price as part of that particular customer experience grouping—as, together, they make the bulk of the rational part of the overall customer experience (Grønholdt et al., 2015). While function and quality are important, their benefits can be easily overshadowed if the price of what is on offer is disproportionately high—dampening the overall customer experience. Lastly, the final element of functional customer experience value is that of convenience—with Wong (2013) placing it as a central component on the functional axis of the customer experience. To put it simply, convenience refers to the "value proposition articulated by the service encounter", paying emphasis to the time/effort put in by the customer during a retail transaction (Wong, 2013, p. 94). Without the presence of convenience, customers might choose not to invest their time in a specific retail modality—making it an important factor to keep in mind for a future metaverse retail endeavor.

2.3.3 Sensory Customer Experience

The final experiential factor to consider is that of sensory value within the broader customer experience paradigm; this holds especially true for "synthetic" worlds such as the metaverse, as one can only experience them through the digitally enabled application of "sensory stimuli" (Grabarczyk & Pokropski, 2016, p. 32). This makes the correct application of senses within the overall metaverse customer experience vitally important, as they provide an anchor between the user and the world he/she is trying to interact with. The

correct application of sensory components is key to achieving "sensory immersion"—a mode of immersion that is "technology-mediated" and aims to "stimulate the user with artificial sensory stimuli" in order to create a connection between user and virtual landscape (Grabarczyk & Pokropski, 2016, p. 32). It is worth noting that such a type of immersion tends to focus on hyper-realistic environments and worlds (Grabarczyk & Pokropski, 2016)—something which Meta (2021), at least, does not seem to abide by, showing as much through the conceptual use of cartoon-like avatars and an overall video-game-like aesthetic. Within a retail context, sensory manipulation can be utilized to elicit specific emotional responses from consumers—with lighting, smell, and music being key sensory nodes to that effect (de Farias et al., 2014). Thusly, it is interesting to consider how the metaverse retail ecosystem might take advantage of such senses—and how immersive the platform will end up being after its completion.

2.4 Conceptual Model

Figure 1, as seen below, illustrates the relationship and conceptual connections between all the aforementioned theoretical concepts, forming a concise conceptual model:

```
┌─────────────────────────────────┐
│ The metaverse is an innovation: │
│                                 │
│ •   We don't know what players  │
│     will be the winners         │
│ •   We don't know if it will be │
│     revolutionary               │
│ •   We don't know what existing │
│     innovations will influence it│
└─────────────────────────────────┘
              │
              ▼
┌─────────────────────────────────┐
│ This innovation will generate   │
│ potential (new) affordances for e-│
│ commerce                        │
└─────────────────────────────────┘
              │
              ▼
┌─────────────────────────────────┐
│ Retailers can innovate the related│
│ customer experience using these │
│ affordances                     │
└─────────────────────────────────┘
```

Emotional Customer Experience:	Functional Customer Experience:	Sensory Customer Experience:

• Aesthetics
• Memorability
• Personalization/ customization
• Education
• Safety
	• Functionality & quality
	• Price
	• Convenience
		• Immersion
		  ○ Light
		  ○ Smell
		  ○ Sound

Figure 1 - Conceptual Model

3. Methodology

3.1 Why Scenario Planning?

Now that we've gained a better and more holistic appreciation of the theoretical factors that might play a role in the shaping of shopping affordances in the metaverse by the year 2032, it is time to dive into the methodological basis that will be used to create a grounded depiction of this not so distant future. Specifically, scenario planning will be the main methodological tool that will be used for this purpose, as this method allows us "to see a wider range of possible futures" and the opportunities that may develop within them (Schoemaker, 1995, p. 25); this forecasting potential is critical when approaching our RQ, as it requires us to delve into the potential future development of shopping experiences in the metaverse. Scenario-oriented methodologies have been used successfully to calculate the future trajectory of numerous complex subjects—from international relations to scientific conceptualization—showcasing their effectiveness as a predictive tool (Ramirez et al., 2015). Effective scenarios can combine various critical elements into a single, concise story—guiding decision making away from the pitfalls of over/under prediction (Schoemaker, 1995). The elements that need to be identified and analyzed to lead to an effective scenario include scope, in terms of market reach, technologies, geographical reach, and time; stakeholders, as in the parties that will be influenced and can influence within the parameters of the specific scenario; trends, as in political, societal, or economic inclinations that might influence future developments; and uncertainties, as in events of major importance, that lack the potential of a clear outcome (Schoemaker, 1995). These are the core building blocks that are needed to construct an adequate set of scenarios—though, depending on the subject matter at hand, some factors might take precedence over others in terms of importance.

3.2 Scenario & Research Design

"Explorative scenarios" seem best suited for the intricacies of the research question at hand—as such scenarios aim to forecast all possible futures, achieving that through a diverse portfolio of perspectives (Börjeson et al., 2006, p. 727). This suitability comes down to the structure of the research question, as it revolves around a "what can happen" formation—in this case the what referring the possible future affordances for shops and shopping that will be allowed for in the metaverse—affirming the exploratory nature of the research and the need for a corresponding scenario structure (Börjeson et al., 2006, p. 727). Furthermore, a key component of such scenarios types is the focus "situations when the

structure to build scenarios around is unknown" (Börjeson et al., 2006, p. 727)—this holds especially true for anything related to the broader metaverse, as the concept itself is characterized by its novelty and constantly developing nature. Reaching deeper into the conceptual essence of explorative scenarios, the subcategory of "external scenarios" (Börjeson et al., 2006, p. 727) also seems to follow the parameters of the research question. Specifically, this scenario sub-category applies a focus on a "broad target group", relying on broader, overarching clusters of influence for the production of scenarios (Börjeson et al., 2006, p. 728). Since the metaverse is indeed broad—including multiple companies, technologies, and interested parties—this scenario type appears most appropriate; that also being true for the metaverse's shopping aspects. Shops and shopping can span multiple industries, product/service types, and varying types of potential consumer interactions; as this research effort aims to provide scenarios that encompass them all under the classification of shops and shopping, then the preference and classification of external scenarios seems functionally suitable for that goal. Finally, it is worth considering that the aforementioned scenario categorization—that being of explorative and external accordingly—are also highly preferential towards a qualitative methodological approach (Börjeson et al., 2006), adding further credence to the qualitative pathway that will utilized through this research effort.

Regarding the specific layout, structure, and number of the final scenarios, a "2 × 2 scenario matrix" is seen as the preferential scenario layout for this research—being the standard route of approach for most academic endeavors using scenario planning (Strelkovskii et al., 2020, p. 5). Through this layout, we end with dour final scenarios; two of them sit at the ends of the spectrum—usually representing "good" and "bad" forecasts of the future—while the ones in between tend to present more "optimal" scenario alternatives (Strelkovskii et al., 2020, p. 5). This type of scenario matrix offers the distinct advantage of being more comprehensible to those that are not directly involved or have studied the method (Ramirez et al., 2015), making the end scenarios more palatable towards a broader audience. Many prominent organizations—including Shell and the World Economic Forum—use between 2-4 scenarios, affirming the widespread appeal and approachability of this particular matrix layout planning (Strelkovskii et al., 2020). Yet, the limited scenario quantity of the 2 x 2 matrix means that there is danger of extreme polarization occurring (Strelkovskii et al., 2020)—as the limited number of available scenarios means that those at opposite ends might end up gravitating towards forecasts that verge on the extreme. While some scholars support the introduction of more final scenarios to avoid the aforementioned

pitfalls—including the introduction of denser matrix models such as "3 x 3" (Strelkovskii et al., 2020, p. 5)—this paper will nonetheless focus on the more widely recognized scenario matrix of 2 x 2, as it has the most amount of academic credibility behind it. One important factor to note behind this matrix choice is that "scenarios should connect directly with the mental maps and concerns of the users" (Schoemaker, 1995)—approachability is not an element of the final scenarios that should be treated lightly, as there is a point of diminishing returns between the number of available scenarios, and needless complexity aimed towards those that are in the best position to utilize them. Thus, four final scenarios with an evident explorative/external core will the main forecasting result of this research—offering a detailed depiction of all critical futures for the metaverse and its shopping components, while keeping the mode of delivery open for more widespread organizational/strategic use.

3.2 Data Collection

When it comes to the creation of scenarios that deal with the short-term future, the "stakeholder led approach", as outlined in Hamilton et al. (2020, p. 2), becomes a prominent and beneficial lens of methodological approach—especially when it comes to generating critical knowledge/data for scenario creation. This methodological roadmap begins with "defining the scope of the question", then the identification of "stakeholders" for the purpose of gathering information, then the recognition of critical "trends and uncertainties", then the creation of adequate scenarios, and finally a last round fine-tuning to assure the final results are both complete and clear (Hamilton et al., 2020, p. 2). When considering which stakeholders would be best suitable for the completion of this research, diversity of knowledge and skills are pinpointed as one of the most important considerations for the selection process (Hamilton et al., 2020). While stakeholders are shown to be a potent source of knowledge, the metaverse's novel status makes it hard to pinpoint them accurately—as they have yet to be properly identified/emerge—creating the need to focus on different information sources for the research at hand.

The same importance in a wide diversification of opinion, as outlined above, is also supported by the Delphi technique of scenario development—with the main difference being the requirement of an expert panel as the main source of knowledge for the creation of viable scenarios (Börjeson et al., 2006), instead of selected stakeholders. Additionally, within this mode of scenario creation, "human judgment" is placed as a driving component of future forecasting, also emphasizing the fact that "that the judgement of a number of informed people is likely to be better than the judgement of a single individual" (Börjeson et

al., 2006, p. 731). Furthermore, we must also consider that the Delphi technique was created to deal with studies that worked with a considerable "lack of data" (Börjeson et al., 2006, p. 732)—something that also applies to this study, as the metaverse is still a very novel concept for many and therefore has not generated the same level of academic research as other subjects. Thus, the importance of experts as the preferred source of relevant information/knowledge becomes clear—even though the Delphi method was not be utilized in its entirety for the research—as they can help us fill in the informational gaps that surround the metaverse as a concept.

Additionally, individuals from orbiting/sympathetic professional fields can be seen as "remarkable people" (van der Heijden et al., 2002, p. 287); this means that—while they might not hold expertise that is directly linked to the metaverse, something which is understandable as it does not yet exist—their diverse portfolio of experiences, knowledge, and insights can help challenge the researcher and help steer the overall process towards previously unconsidered results/parameters (van der Heijden et al., 2002), justifying their selection as circumstantial experts. If we are to consider that shopping in the metaverse will be a multi-layered affair, then there are several current professional fields that can provide potential experts for this purpose. This collection of individuals with diverse but relevant skill-sets/expertise can lead to thinking that is "out of the box" and create a cognitive scaffolding for scenarios that is free of biases and offers a truly multi-disciplinary approach (van der Heijden et al., 2002, p. 287). Thus, several individuals can justify some level of expertise regarding shopping in the metaverse; making the line between a "remarkable person" (van der Heijden et al., 2002, p. 201) and a traditional expert even more thin—while leaving room for a relevant informational polyphony that will provide a greater array of information. An expert in the field of retail marketing and e-shops might not possess the same skill-set as a technical lead with a focus on digital shopping experiences—both offer insight from different sides of the spectrum, creating a more holistic and practical forecasting basis in the end.

Circling back to the "stakeholder led approach" as depicted by Hamilton et al. (2020, p. 2), that generalized layout will preferred, but with the key alteration of focusing on experts instead—an alteration that allows us to forego the questionnaire heavy emphasis of the Delphi approach and all its closely related variants (Börjeson et al., 2006). Such a layout allows for the bypassing of stakeholders as the main source of knowledge—replacing them with experts—and also combats one of the main pitfalls that accompanies the Delphi approach; that drawback is that focusing on a written questionnaire, for the purpose of

knowledge gathering from experts, can cause the researcher to forego otherwise important circumstantial questions (Börjeson et al., 2006). Instead, the modified pathway by Hamilton et al. (2020) is set up to contain five key phases—as outlined in the sequential table below—leading to the finalized expert led approach that will be the guiding rod for the data collection process.

1. Identifying the scope of the question—this is achieved by the theoretical framework and the relevant points of informational interest that emerge from within it.
2. Interviewing of expert pool—the experts will be selected based on the understanding of the question and its scope, and will be interviewed for the generation of knowledge.
3. Identification of stakeholders, trends, and uncertainties—these will be unearthed by interviewing the aforementioned group of experts, as they can "identify pertinent issues, driving factors and critical uncertainties" (Ramirez et al., 2015, p. 73).
4. Creation of scenarios—the newly acquired expert knowledge is used to create four distinct scenarios.
5. Evaluation of scenario clarity and quality—the final scenarios will be evaluated for their overall clarity and ability to answer the research question in an analytically acceptable manner.

3.2.1 Why Expert Interviews?

Having identified experts as the central axis of relevant knowledge when it comes to the scenario building process—interviews will act as the main mode of qualitative interaction with said selected individuals. The main reason behind this particular approach is that expert interviews—a process with widespread appeal and significant use within the broader qualitative world of academia—are particularly well suited to deal with exploratory-focused research (Bogner et al., 2018). Having already established the exploratory nature of both the research question and its scenario derivatives, this sympathetic affinity of interviews, when it comes to being used as a knowledge collection tool, is particularly desirable. Additionally, the use of expert interviews can be used to speed-up the data generation process (Bogner et al., 2018), something which is particularly useful in a data dry environment—as is that of the metaverse and its commercial aspects.

When it comes to shaping the interviews themselves, in terms of their general structure/layout, semi-structured interviews appear as the most adequate choice. Such a format entails that only a rough topic guide will be followed, as this allows for the gathering

of "unexpected information and interpretations" (Bogner et al., 2018, p. 13); this is not achievable when relying on the use of a more strict topic guide. Additionally, such an interview encourages the researcher to implement multiple micro-revisions across the research process—and even during the interviews themselves—allowing space for precious adaptive maneuvering when faced with the "advancing state of information" that concerns the research (Bogner et al., 2018, p. 13). Practically speaking, this translates to changes in the topic guide (Bogner et al., 2018); this can manifest as targeted question changes during an interview to fit the nuances of the interview, or it can mean minor tweaks to the overall guide between interviews on a per need basis. In this particular research, the topic guide remained the same throughout all the interviews, with the majority of the questions having an open-ended format that allowed for on-the-go adaptations—without the need for overarching changes or adjustments. Additionally, this flexible—but uniform across all interviews—topic guide ensured a degree of repeatability for the overall research structure, while still adhering to the core semi-structured interview principles. Considering that qualitative methodological processes are supposed to "produce rich and meaningful descriptions of phenomena", in a repeatable fashion when under similar conditions (Collingridge & Gantt, 2008, p. 390), these non-intrusive—in regard to the semi-structured interview layout—structural elements becomes increasingly important, while not halting any of the benefits of the overall looser interview format.

The topic guide was formed via the work done in the theoretical framework part of this paper—containing several open-ended questions that correspond thematically with specific segments of utilized theory. This guarantees that the subsequent questions created are thematically aligned with research's conceptual framework, ensuring that the researcher has a clear and concise pathway to follow when conducting the interviews (Kallio et al., 2016). Specifically, the questions contained a mixture of a few, key "general questions", along with a larger amount of "topical or specialist questions", with such a ratio being seen as optimal when comes to expert interviews (Bogner et al., 2018, p. 13). In order to avoid generalizations, the use of specialized question was used a means of probing—eliciting more relevant and clear meaning from more generalized discourse (Hermanowicz, 2002). Lastly, around the topic of questions, a small introductory segment was dedicated to establish rapport—by reminding the interviewee of the goal of the main topic of the research, and inquiring about his/her background and overall acquaintance with the concept of the metaverse—followed by an open-ended statement at the very end, asking the interview to provide any final thoughts that may extend beyond the provided questions. These additions

to both the beginning and the end of the interview serve as a way "to get the respondent talking" and as a "cool down" technique accordingly, both being recommended for a smooth interview process (Hermanowicz, 2002, p. 488)—all of these elements can be observed within the topic/interview guide (Appendix A).

In terms of the mode through which the interviews were conducted, the general and most preferred suggestion is that of face-to-face sessions—with many long distance alternatives being seemed as inferior. As was the case for this research, all of the selected experts were not available in person; this was mainly due to the roster being spread across varying countries, factoring in also the unwillingness towards face-to-face interactions that Covid-19 has cultivated. Thusly, the second-best alternative when physical interaction is not possible is that of video-interviews (via Zoom, Skype, etc)—as the "virtual visual presence" of the interviewee, via video, can help rectify most of the shortcoming of long-distance interview efforts (Bogner et al., 2018, p. 15).

3.2.2 Conducting Expert Interviews

For the interviews with the selected pool of experts, a topic/interview guide (Appendix A) was utilized in a semi-structured fashion; the questions numbered 1 to 3 always came first, while the rest of the more specified questions and sub-questions were inserted based on the flow and topical direction of the interview. In some cases, certain secondary questions were used for the purpose of probing—instead of being presented as a stand-alone conversational point—as the practice is of great importance when it comes to conducting a successful interview (Hermanowicz, 2002). Beyond the elements prescribed in the topic/interview guide, a set standard introduction was planned for all interviews— including verbal consent to a consent form that provided to the participants before the interview, a short summary of the research topic, a brief inquiry of the participant's professional experience, and an inquiry of the participant's first contact with the concept of the metaverse. Additionally, an open-ended question urging the participant to share any final thoughts that the questions might not have covered was added at the end—aiming to provide the interview with an adequate "cool down" period (Hermanowicz, 2002, p. 488).

It is also worth noting that all the interviews were conducted via Zoom, with the cameras of both the parties being turned on to support a proper sense of virtual presence (Bogner et al., 2018), and aimed to last between 45 to 60 minutes—this timeframe cannot be always achieved, as some individuals are partial to giving very condensed responses. Lastly, all the interviews were recorded—as is that is standard interview practice within the realm of

academic research (Hermanowicz, 2002)—and were transcribed in text form. For the purpose of transcribing, the use of the software Otter.ai was utilized—making corrections on the processed document to ensure true-to-form verbatim transcriptions.

3.2.3 Expert Selection Criteria

A key criterion for selecting our experts—with the concept of "remarkable people" (van der Heijden et al., 2002, p. 287) being central as mentioned previously—is that such individuals act as key decision-makers within their perspective fields and that their insights/ideas act as catalysts for change within their broader professional environments (Bogner et al., 2018). Additionally, experts—and their derivatives—can be identified by the area of knowledge which they inhabit and can consequently propagate. Such knowledge can be split into three main categories: "technical knowledge", referring to information that is factual in nature and revolves around organization procedures and operationalization; "process knowledge", referring to knowledge that focuses on the "sequences of actions" and broader interactions within a given field, while also being based heavily on "practical experience"; and "interpretive knowledge", referring to a broader ideation and/or interpretation of a topic and/or field that the interviewee might have limited access to (Bogner et al., 2018, pp. 8-9). Lastly—while keeping in mind the role of the expert and the types of knowledge that individual can provide—we must also continue to consider that shopping in the metaverse is a multifaceted affair, calling for many professional fields that might appear relevant to its future development.

Thusly, the following key criteria are the guiding rod through which the research expert panel was assembled:

- An individual holding a senior role and/or 5+ years of professional experience within any of the following fields:
    - Innovation management
    - Retail marketing
    - E-shop creation/management
    - E-commerce
    - Customer experience
    - Digital strategic planning
    - Consulting (from credible companies, that have potential insights into the metaverse, and with a portfolio of commerce-heavy projects)
- And/or an individual that has participated/worked-on a major project with metaverse-

like attributes—from either a creative or technical standpoint.

As individuals that fit the above criteria are not necessarily easy to come by, a multi-channel approach was used to come in contact with them. Such channels included personal networks, research on professional platforms such as LinkedIn, and suggestions from confirmed interviewees towards others with similar/appropriate skill sets. It is also worth noting that the ongoing Covid-19 pandemic made numerous individuals inaccessible for interviewing—even when video-interviews were presented as an option—due to the varying degree of regulation intensity from country to country. Additionally, at the time of writing this paper, the concept still holds novel status—making it inaccessible to many due to the lack of clear information. This led to an additional level of challenge when it came to the procurement of relevant experts. In the end, 10 interviewees were secured—squarely meeting the 7-10 suggested range when it comes to expert interviews.

3.2.4 Expert List

For the complete list of all ten selected experts, please refer to Appendix B.

3.3 Data Analysis

Having collected and processed the data accordingly, the last step remaining is that of analysis. Thematic analysis will serve as the main tool in untangling and ordering the data collected from the interviews—identifying any emergent themes that may come from within them. Additionally, besides formulating an overarching sense of meaning across a diverse data-set, thematic analysis allow us to formulate an answer for our main research question—and can help make apparent more sub-questions, along with their corresponding answers, through the process of analysis itself (Braun & Clarke, 2006). In order for the aforementioned patterns to be identified in the data, coding must first take place: the three steps involved are open, axial, and selective coding. Open coding will stem from an initial appreciation and engagement with the data and derive fragments of meaning from that—these fragments will then be assorted into codes that will "capture both the diversity, and the patterns, within the data" (Braun & Clarke, 2006). Axial coding will then try to find dominant themes and sub-themes amongst all the existing codes, and selective coding will distill those finding into central concepts/categories based on thematic repetitions and relations (Boeije, 2010). Lastly, for the coding process, Atlas.ti was used to better structure the data into relevant thematic categories—resulting in a comprehensive coding tree containing open, axial, and selective codes (Appendix C).

<p style="text-align:center">4. Results</p>

Having analyzed and processed the relevant data extracted from the interviews, seven core themes have been created as a result—each with their corresponding sub-categories. These themes will be the basis for the main scenario narrative—as they'll provide the trends and uncertainties needed to create them.

4.1 Shopping Gamification

The most prominent theme that was prevalent across the entire interview process was that of gamification, with 8 out of 10 interviews mentioning Roblox—amongst other notable video game tittles—and all interviews touching upon the notion of videos and gamification at one point or another. When discussing the role of video-games within the broader metaverse, Expert 2 stated that "the current state of gaming is an early state of the Metaverse"—encapsulating the essence of why gamification in critical to the metaverse, extending to its shopping aspects via association.

4.1.1 Reward Systems

One critical sub-aspect of gamification that was made apparent during the interview process was that of reward systems, with Expert 6 formulating an example of how brands/retailers might "gamify" their metaverse shopping experience through the implementation of a thought-out reward system:

> So let's say you are a big customer of Starbucks, and you get coffee every time, and you used to get this little paper, right, with stamps. And if you have 10 stamps, you get free coffee … you get 10 stamps or you get, you buy 10 coffees, and you get one Starbucks coin … a stamp card is gamification, right? Collect them, get the 11th, one for free. It's, like, very basic incentivizing. But what if you can gamify, that experience of earning Starbucks coins, right? By buying a Starbucks mug, collecting all the Starbucks franchise, or visiting as many Starbucks in the world or in your city…

In this case, brands such as Starbucks acts as vessels for an extended incentivization structure—potentially coaxing consumers to engage with their perspective brand beyond a simple purchase. From buying a cup of coffee to collecting brand merchandise, Expert 10 shows that brands can create customer interaction structures that unify all of their potential product/service offerings—with that being achievable through reward systems. With that in mind, reward systems such as the one above might appear more liberally within the

metaverse shopping environment—utilizing the overarching gamification trend to incentivize consumers in an entertaining manner throughout their journey.

4.1.2 In-depth Customization/Personalization

The most prevalent aspect within the theme of gamification was that of customization—with the concept of customizable avatars being a central conversational topic for every single interview. When addressing the metaverse and its commercial aspects, Expert 10 stated that "I believe that the customization is one of the key drivers that unlocks value from this thing"—highlighting the concept as integral to fully unlocking the metaverse's future potential. Expert 2 pointed that this concept, that is promoted as an integral part of the metaverse (Meta, 2021), is intrinsically tied to gaming, stating "I mean, that's the essence of gaming, the essence of differentiating one player from another"— adding further credence to a gamified metaverse ecosystem that will be inhabited by highly customizable avatars. Additionally, Expert 4 was quick to point out that our current understanding of customization is merely the beginning, stating:

> I think what we have right now in terms of Metaverse, we are hitting, not even the tip of the—maybe like 0.5% of the iceberg … all of that customization will start to compound and eventually you will likely be able to almost customize anything and everything in the world that you'll be inhabiting.

This drives home the future potential of this aspect of the metaverse—creating fertile ground for highly customizable appearances, products, shopping environments, and much more. Chiming in to the concept of customized shopping journeys/environments, Expert 3 also stated:

> In a digital world, the information that you're going to gather is going to be, a, much more precise and, b, much faster. So basically, you can have an interaction with the Gap on the metaverse now and literally in a matter of seconds, you might have a different type of interaction.

This showcases that the data trail provided by the consumer can be used to provide an extremely unique shopping experience—something that can prove beneficial for retailers across the board. To conclude, this element of all-encompassing customization holds immense potential from a customer experience perspective—satisfying the consumerist urge to seek out highly personalized experiences (Shukla & Nigam, 2018).

4.1.3 Creator Economy

The concept of customization also bled into the sub-theme of a creator economy—with user-generated content being an important conversational topic across all interviews. Expert 2 outlined the important of commercialized user creations, stating that their significance stems from their ability in "democratizing creativity and, and even intrapreneurship to some extent". Going back to the video-game roots for user creations, Expert 4 highlighted their commercial potential by pointing to the origins of League of Legends—with the massively popular video-game being "a prime example of a user generated content that is done right", as the concept originated from a Warcraft player that created a new video-game format by using the platform-provided creation tools. Expert 1 also argued that social influence—something that is quintessential to modern day gaming through platforms such as Twitch—will also be critical to the creation of such sellable content, stating that "the influencers of the future … are going to create their own products", creating a unique user-cast of "meta-creators". Lastly, Expert 6 was quick to point out that such user-creators would have a unique advantage to aid them—especially when competing with larger and more well-funded organizations—affirming the low-cost production metrics of such efforts by stating "so it is not that hard to make a million virtual t-shirts—but it is hard to make a million physical t-shirts". Once again, following from the example of their video-game predecessors, user creators will be able to mass produce at no-cost—needing only a personal combination or relevant skills and creativity to produce a retail-ready digital product.

4.1.4 Platform Based Currency

The last sub-theme orbiting the core concept of gamification is that of streamlined currencies—with Expert 9 arguing that such a concept has been already been achieved in popular online games, stating "in World of Warcraft, you had gold, and you could buy gold and stuff like that". Expert 6 also saw the concept of a streamlined currency being achievable, stating "so you know, credits you see in sci fi right, they just stay with credits doesn't have any other meaning. I think that would be very promising". Lastly, Expert 3 argued that such a concept would best supported by a "crypto supported" digital wallet—creating the "opportunity through … Ethereum type of platforms to have a coin, which is, you know, globally accepted". Such a streamlined currency initiative would add further fuel to the fire that is the trend of gamification within the metaverse—following the footsteps of gaming modalities that often relied on a few platform-specific currencies. Additionally, the

concept of a singular—or at least close to that—currency also falls in line with the concept of convenience as proposed by Wong (2013), adding to the overall customer experience by streamlining it.

4.2 Safety Concerns

Safety in the metaverse emerged as one of the main themes through the interview knowledge-gathering process—with experts showing a homogeneous approval of the technical safety aspects of the platform, while acknowledging gaps beyond that around the issues of psychological safety and disingenuous human behavior. This falls in line with the role of safety within the world of retail and shopping—being a critical part of an emotionally complete and successful traditional customer experience (Shaw & Ivens, 2002).

4.2.1 Technical Safety

From a purely technical standpoint, expert 4 argued that the relevant e-commerce technology has reached an acceptable point of maturity to ensure relevant safety, arguing "I think security and safety, that's one of the things that blockchain technology, and also the current maturity of a lot of our shopping platforms, already, you know, offers I think". This technical aspect of safety was supported by others as well, with expert 7 showing the same confidence towards the underlying commercial blockchain technologies, by stating "you can say that there's quite some security built into it because of its decentralized kind of, of nature". Expert 10 also showed a similar assured stance towards the overall practical security of this future endeavor by stating "I think that security protocols and, you know, backup mechanisms would be significantly reinforced"—indicating that related technical security factors have reached beyond satisfactory maturity, making them trustworthy is terms of metaverse retail usage.

4.2.2 Psychological Safety Concerns

Despite the overall trustworthiness of the metaverse's potential for technical safety, experts also pointed towards concerns of a mental nature beyond that. Expert 3 stated that "if I were to choose an area of increasing weariness, it would have to be with the mental and psychological, you know, safety of actually using that"—referring to the underlying mental toll metaverse usage overall, including for shopping, might bring upon the user. Expert 8 focused the lens of psychological drawbacks towards the platform's potential to foster seclusion and antisocial behavior, stating that "if you create an environment, which is a

much closer replica to alternative realities, then I would see a risk for higher level of isolation and potentially people over investing in this environment"—showcasing the addictive qualities that the word-building qualities of the metaverse might lead to. In an age where phycological well-being occupies a central role in most societies, the lack of complete psychological safeguarding points to an underlying problem of the platform's overall potential as a viable shopping modality.

4.2.3 Disingenuous Behavior

Moving on, disingenuous human behavior came into the forefront as a potential sub-thematic safety concern within a metaverse shopping environment—with experts pointing towards monetary scams and unauthorized data manipulation as two important factors towards that effect. When referring to the digital scamming culture in today's world, expert 5 mentioned that "I think it's still going to be something that is going to exist. I don't think they're gonna solve that"—showcasing how that very same culture will move to the metaverse's shopping environment in the future, with no clear solutions to such unsavory being in sight. Regarding to potential solutions towards consumer-aimed scams in a future metaverse shopping experience, expert 6 stated "I think that's solvable. But just as solvable as getting scammed in the real world with real money, right, that happens too and it still happens"—arguing that although that online scam culture has shown to be surprisingly persistent, despite apparent deterrents, and thus will more than likely move onto the metaverse commerce landscape. The same sentiment was shared by Expert 9, who argued that such societal "safety hazards" will most like "replicate" into "tomorrow's metaverse-powered version" of e-commerce—making them see near-unavoidable due to their relation with human behavioral tendencies.

4.3 Hybrid Metaverse Shopping

Through the interviews, it became apparent that one of the core themes regarding the metaverse and shopping is that of a hybrid shopping experience. All experts indicated that physical shopping and products will persist in the metaverse in some capacity—though the ratios in such a relationship differ from expert to expert—moving in to support the metaverse since it can provide a complete retail experience in an autonomous fashion.

4.3.1 Physical Shopping Symbiosis

When it comes to establishing the value of brick & mortal retailers, Expert 2 was

quick to solidify their inherent value in the customer journey by stating "experiential value is interconnected through virtual and physical"—indicating that true customer experience comes from combining digital and physical retail modalities. In the same vein, Expert 8 forecasted "a hybrid customer journey, that starts on the metaverse, and then at some point along the customer path it moves to the physical world—and vice versa". Expert 10 reverberated that very same sentiment, arguing that "we could see a world where the people who are actually active on the metaverse for shopping would also opt that for their natural … goods and shopping. Therefore, we would see those, you know, synergies coming out"—showcasing that the inherent need for physical shopping will force the development of such synergies, if anything. Expert 1 adds to this need for physical shopping, expanding by stating that "physical stores are also important, especially for people in the Mediterranean countries", adding that for such groups it is "in their culture to visit the stores, to touch the product". This adds an additional cultural layer to the need for physical retail locations, perpetuating their existence in a metaverse-focused world. Lastly, Expert 6 showcases how physical shops can thrive with a digital overlay—akin to mirror-world layout—unfolding a scenario where there's a "little … character, and it knows its way around the shop, and it can highlight products for you in the actual physical shop". This shows that physical stores cannot just remain within the metaverse ecosystem, but thrive through the use of its AR extensions in a semi-autonomous fashion. From a sensory customer experience standpoint, the co-existence of physical shopping helps fill in the gaps left by an incomplete sensory offering—supplementing any experiential deficiencies by inserting the tried-and-tested component of brick-and-mortar shops into the mix.

4.3.2 Physical Goods Within Metaverse

Moving forward, the existence of physical good within the metaverse itself also proved to be an important sub-component of this proposed hybrid model. Expert 1 suggested that 3D printing can play a major role in extracting physical goods from the metaverse's digital world, stating "let's think about a digital painting, and somehow you want to download it because it does not exist in the physical world—but you have the 3d printers". In this case, the incorporeal is made into a tangible, physical product—redefining the perceived dimensionality of metaverse digital goods. Concluding this section, Expert 5 approached a much more recognized approach to physical good incorporation, stating "I go to Amazon, I have the fast checkout. With one click, I have the item on my home. The next day, it is going to be the same for the metaverse"—showcasing how existing mechanisms for

incorporating physical goods in a digital retail space will transfer over to the metaverse. Additionally, the easy of access of physical goods through the metaverse adds the theoretical concept of convenience that was deemed to be important for a functionally sound customer experience (Wong, 2013).

4.3.3 Partial Metaverse Immersion

The last factor towards a hybrid metaverse model to consider is that of immersion—as the interviews as a whole have showed that the metaverse will have limited potential in terms of providing retail shopping immersion. Expert 3 expresses that exact sentiment by stating that "in order to be able to fully immerse yourself in the experience, you would have to have … multi-sense type of interaction … I don't know to what extent that is going to be physically feasible". Expert 8 reinforced that sentiment of limited immersion, arguing "that it's going to be difficult to replicate the physical experience"; this indicates that replicating a physical shopping setting won't be feasible for the foreseeable future, making the implementation of a hybrid shopping model near necessary for maintaining a customer experience equilibrium. Lastly, expert 6 argues that, while most senses can be replicated for the sake of immersion, there is a point of diminishing returns—with smell as an example, he states "it's not that hard to make you smell something—but to make you stop smelling that thing is really hard". The lack of particular senses, while not detrimental to the overall concept of metaverse shopping, still poses a problem—as a complete sense profile enables the creation of a successful and fulfilling customer experience framework (de Farias et al., 2014), further enforcing the need for a hybrid model to fill in any sensory gaps.

4.4 Multi-Metaverse Shopping

Another important thematic pylon that was unearthed during the interview was that of multiple metaverses—with the notion of multiple, co-existing metaverses offering unique opportunities for shops and shopping. While the timeframe of such developments was contested, a cross-interview consensus was reached regarding this multi-platform approach: multiple metaverses are likely to exist in the future, varying in scale and audience-focus, and offering a mostly seamless cross-platform shopping experience.

4.4.1 Multi-Platform Development

The most critical aspect to this theme is that of multiple metaverses, with Expert 8 stating the following:

Over time, you're gonna end up with some big players—in the same way that you have when you're talking about mobile operating systems. You mentioned Android, you mentioned IOS … until we got to those two as dominant systems, you had six or seven that didn't make it. You had Nokia, you had Blackberry, you had Sony Ericsson … each one of them had a different operating system in their mind.

This perfectly encapsulates the notion of parallel platform development from different major organizations—mirroring the aforementioned notion of a metaverse shakeout effect that forces out "small competitors", in favor of bigger/market-dominant organizations (Dwyer, 2019). Expert 10 expands this notion of a metaverse oligopoly further, bringing forth the notion that different metaverses might be developed based on country specific needs; thus, Expert 10 states "we might see … a different version of it in Africa or in India, right, to cater for the local scale, access to infrastructure, etc". This takes the aforementioned notion of platform oligopoly further, categorizing it anew based on geographical/national limitations. Regardless of the means of separation, Expert 4 affirms the notions of a multi-metaverse future—stating that if the "metaverse becomes … a huge success, what I imagine is, ultimately, different universes may congregate". With all of the above in mind, the metaverse diverges from being a single-platform concept—opening the possibility for multiple digital worlds in the years to come. This multi-metaverse approach truly extends the boundaries of this concept as a whole—pushing it from world building to a potential universe building endeavor of sorts.

4.4.2 Metaverse Commercial Potential

Another sub-theme that might intensify the need for multiple metaverses is that of the concept's inherent commercial potential—forcing more companies to develop versions of it, in order to achieve a competitive edge over their corporate peers. Expert 1 confirms this expansive potential, stating that the metaverse "after the industrial revolution, it's going to be the new thing. That's for sure"—this notion follows closely behind Perez's (2009) definition of a "technological revolution", supporting the notion of increased development and economic influence accordingly. Additionally, if we are to consider that a function of technological revolutions is to promote further innovations (Perez, 2009), it is not beyond the realm of possibility to consider multiple metaverses as innovation-continuities—spawning from the original platform and differentiating themselves to a degree. Thus, the metaverse has the potential to act as a growth stimulus within the broader economy—amplifying its platform derivatives and the market components that orbit it accordingly.

4.4.3 Niche Platforms

The next sub-theme also focuses on the existence of various metaverses, but turns the spotlight to smaller, targeted platforms with a niche purpose/audience. Expert 4 argues that's such a specific construct could revolve around commerce specifically, stating that "a native metaverse first shopping platform … will emerge in the future". Expert 8 develops the idea of use-specific platforms by arguing that he "cannot imagine … the same platform for recreational purposes, like video gaming, and the same platform for professional services"—insinuating that different digital worlds would have to exist to accommodate for different audiences and use-cases. Lastly, Expert 5 argues that such nice platformization could also extent to brand assets and worlds, stating "imagine each brand owning a different aspect of the aesthetic. So, for example, one brand is going to own … super realistic avatars and the other ones are going to be … more abstract". This niche platform basis fits with the shakeout effect notion that specialized alternatives of a product are provided by smaller organizations (Dwyer, 2019); though, the scale of these organizations was not entirely specified through the interview process.

4.4.4 Eventual Cross-Platform Communication

The last sub-theme to consider is that of cross-platform communications—with all experts agreeing that such a connection would be achievable at one point or another. Expert 10 made the point that "if we have more than two players … I would expect for the majority of them to have interoperability"—indicating that a multi-platform environment would be interoperable by default. Expert 8 justified this sense of connectivity by stating that "companies that create a lot of barriers will not survive … if you buy something, your expectation will be to be able to make use of it across platforms"—insinuating that organizations will be forced to cross-communicate in order to avoid attracting the ire of their customer base. One might see a connection between the concept of convenience as proposed by Wong (2013) and this particular sub-theme—as cross-compatible online worlds only serve to add functional customer experience value to the metaverse by simplifying one's shopping journey.

4.5 Increased Brand Presence

Moving on, another important theme that was emerged from the newly acquired knowledge –that was derived from the interview process—was that of an increased brand

presence within a metaverse retail environment. Through the combination of a more hands-on role within the customer experience process, and by utilizing the metaverse's social media heritage/properties, brands can establish just that—solidifying their influence within the metaverse mediascape.

4.5.1 Brands as Digital Advisors

Regarding how brands can connect better with their customer-base, Expert 10 stated that successful brands "will be like the personality advisors … to the people living in the metaverse"—showcasing the potential of brands playing an active, and almost mentor-like, role within the digital existence of their customers. This concept resonates with the idea of an "emotional fit" (Parise et al., 2016) that was discussed in the theoretical portion of this paper—as brands can leverage this more intimate position to coax the customer's emotional core and create a fruitful relationship. Via such retail-focused relationships, Expert 2 argues that "it provides … infinite potential to balance what a brand stands for, in terms of core values … and its relationship to actual benefits"—again showcasing the potential for brands to redefine their role within the customer journey.

4.5.2 Metaverse Communications Focus

Another sub-thematic factor to consider is the metaverse's social media heritage—as the communicative focus of the platform has the potential to greatly influence brand saturation down the line. Expert 2 argues that there will be a herding of "audiences from Facebook, to Instagram, to WhatsApp, and then the metaverse"—pointing out that the relational nature of all of these platforms, in terms of communicational focus, will cause users to acclimatize easily at each rung of the social media ladder. This is stance is aligned with Meta's (2021) vision of platform that puts people and communication at the forefront—solidifying the relational properties of social media in regard to the metaverse. Additionally, a platform wide focus on communication can help educate customers to a greater degree amidst their perspective shopping experience—proving useful information that is key of for an emotionally apt customer journey (Bäckström & Johansson, 2006).

4.6 Uncertain Maturity of Metaverse Technology

The penultimate theme that emerged from the expert interview process was the rate of development of the metaverse as a platform—with experts offering contradicting opinions regarding the future of metaverse technology as a whole. This shows a considerable amount

of uncertainty around the metaverse's future as a technologically driven platform—with the factors of technological characteristics/aspects, both positive and negative, and the uncertain timeframe around the metaverse's launch and conceptual maturity coming into play.

4.6.1 Negative Technological Aspects

The first sub-theme to consider here is any potential negative aspects surrounding the technology that will make up the metaverse. Speaking about the general state of technology in the metaverse, Expert 3 stated "I think that once technology catches up … we're gonna have the first … big Metaverse wave", expanding more by saying that the "technology is not there yet". This shows a more generalized inadequacy regarding the technology that surrounds the metaverse, placing a considerable developmental hurdle for it to be market ready in the future. With specific technological issues in mind, expert 6 argued that "the major thing that … might still need to be solved … is how to get all these people in the same server"—extenuating the shortcomings of modern servers to cater for large swathes of simultaneous users, raising a question mark regarding the metaverse's ability to properly handle its future user-base. Lastly, Expert 9 mused on the incremental nature of modern technological development, stating:

> Looking at my own Apple Watch … it has definitely improved. It's much better today than it was in 2015. But seven years in, it still has taken many leaps from its original version, right? But … it still runs out of battery, right? Like it runs out of battery every evening. So we haven't figured out that one yet.

This shows that technology, while undoubtedly improving continuously, does so at a much slower pace than what is needed to support the metaverse's technological needs. Overall, such negative technological aspects go against the principle of functionality, in the customer experience sense, as outlined by Berry et al. (2002)—creating a potentially crude platform that might damage all future metaverse shopping experiences.

4.6.2 Positive Technological Aspects

Having discussed the negative aspects of the technology that supports the metaverse, it is only natural that the next sub-theme is that of the positive aspects of the same subject. Expert 7 argues that "The first personal computers were very, very expensive, just for the few", expanding that "with the development and advancements of technologies, they become … cheaper and cheaper", along with "more accessible" and "much faster". This contradicts the aforementioned sentiment of Expert 9, presenting a much more conservative

rate of technological improvement, and further highlights the uneven spread of opinions regarding the rate of technological progress. Moving on, expert 5 stated that "I like computers and seeing how fast the graphics cards are evolving … the level of quality you can have year by year, in 10 years, multiply this by 10 years, what can we can have, right?"—this shows that graphical technology is experiencing an upward trajectory, creating a positive basis for the metaverse's future graphical fidelity. Lastly, Expert 3 stated that "the two elements that need to be in place … bandwidth … 5g edge computing … all these things are already in place"—showing that the necessary connectivity-based infrastructure required to maintain the metaverse is already a reality, giving it an advantage for future implementation. In contrast to the previous sub-section, such aspects attempt to balance the potential lack in functional customer experience within metaverse shopping—yet the presence of both adds to the uncertainty surrounding technology in the metaverse overall.

4.6.3 Uncertain Metaverse Timeframe

The final sub-theme for this section is the timeframe needed for the metaverse's release and subsequent maturation—something which is especially important for the RQ, as we deal with the specific year of 2032. Regarding this subject, opinions amongst experts were divided, creating 2 generalized categories where the metaverse exists at functional state before the year 2032 or after it. Expert 1 argued that any potential delays can be attributed to disruptive external factors, stating "we have some external factors—like the COVID situation, and all of these—that somehow became a bottleneck of this meta acceleration", moving the required date for metaverse maturity at "around 15 years". As logic would have it, a repetition of such external factors has the potential to halt the progress of large parts of the economy—consequently slowing down metaverse development efforts in the process. Others had a much shorter prediction when it came to the metaverses development timeframe, with Expert 10 stating that "we do believe that within seven to 10 years, this will be one of the key channels for any type of social interaction—and hence, it will be also core to the shopping experience of the consumers". With Expert 3 cropping the aforementioned timeframe even further, talking about metaverse experiences being available at "three to five years", it becomes evident that the timeframe needed for the metaverse to be released and functional is uncertain.

4.7 Uncertain Degree of Mass-Adoption

The last theme to consider is that of the metaverse's potential degree of mass

adoption—with the combined expert pool expressing some uncertainty regarding how far that rate of adoption will progress. Taking into consideration the sub-themes of consumer acceptance and accessibility, it becomes clear that the metaverse's large-scale incorporation into the economy is anything but certain.

4.7.1 Lack of Consumer Acceptance

Concerning the sub-theme of consumer acceptance, the expert-bound knowledge that was acquired pointed towards numerous pain-points around the metaverse that might cause consumers to reject it. One such point of contention is the larger-than-usual amount of hardware required to access the metaverse, with Expert 2 stating "individuals are dependent upon technology, but at the same time there—with great differences in discrepancies—they're overwhelmed". This shows that consumers can be resistant to platforms that are too complex, perhaps abstaining from utilizing them if the reward is disproportionate to the effort needed to access them—something which Expert 4 confirms, as consumers can be "deterred by the complexity of it all" and choose more familiar shopping venues instead. Expert 1 perpetuates that notion, arguing that consumers need to gradually adapt to the metaverse by stating "you cannot take a consumer from 1 to 10, it needs to be step by step"—failing to do so might overwhelm them and cause disenfranchisement. Moving on, Expert 8 pointed out that the concept of digital ownership—which shows to be central in the concept of the metaverse (Meta, 2021)—can also be problematic to comprehend, stating:

> I don't fully grasp the concept of non-replicability … if you think about real estate, in the real world, it's given you can only make whatever exists, you cannot make any more of it. Now, if you go on the metaverse, okay, you can set up the rules, and say that there are limits.

Again, this non-comprehension of the concept of digital ownership may spill over to the potential consumer-base of the metaverse, causing many to shy away from utilizing it. Lastly, Expert 5 argues that consumers might be simply plagued by compounding indecisiveness, arguing that "consumers don't know what they want—from the metaverse. They want to try a lot of things. They're curious. But there's not a clear like, hey, this is what we need". Thus, a lack of consumer acceptance might be to a degree unavoidable, as consumers are unaware themselves of what they truly wish to interact with—leaving metaverse developers guessing as to how best appease them.

4.7.2 Metaverse Accessibility Issues

The concluding sub-theme is that of the accessibility aspect of the metaverse, with experts arguing that the platform might prove inaccessible in certain instances. For starters, Expert 10 argues that—from a generational standpoint—the metaverse caters more to younger generations, stating "actually research shows that generation Z, and the millennials, are much more prone to use that". Supplementing that thought-process, Expert 3 argues that his over-catering to younger generations alienates the older ones, cutting off "that part of the market". With the same generational gap in mind, Expert 7 argued:

> Kids already feel that Facebook is for grandma and grandpa … most of their time they're spending it on Roblox and … they can be spending it in … Minecraft, or sandbox, or things like that … there are already virtual worlds out there … they're gaining all this popularity and they have millions of monthly active users, they are expanding quicker and quicker … into e-commerce.

This shows that younger individuals are preconditioned to be attracted to the metaverse, giving further credence to the question if older generations will follow suit. Lastly, Expert 5 pointed out that the metaverse might be inaccessible from a socio-economic standpoint, arguing that those with lesser means might not be able to access it at all for a time; specifically, he said that such demographics are "going to be joining the metaverse so late" but will "be still consuming things and advertising products through websites, social media and such". With that in mind, accessibility becomes more of an issue, as people have other options besides the metaverse that are more approachable by design—offering greater functional customer experience depth as a result of that edge.

4.8 Scenarios

Having identified the main scenario themes through the expert interview process, we must now differentiate them between trends and critical uncertainties—so as to move to the creation of our final scenarios (Dean, 2019). As their names suggest, the themes *Uncertain Maturity of Metaverse Technology* and *Uncertain Degree of Mass-adoption* were deemed to have the highest degree of uncertainty out of all the themes—deeming them critical uncertainties (Dean, 2019). With that in mind, the uncertainties will be split into their high (+) and low (-) derivatives, creating four distinct scenarios. These scenarios, along with their specific details, can be observed in Figure 2 below:
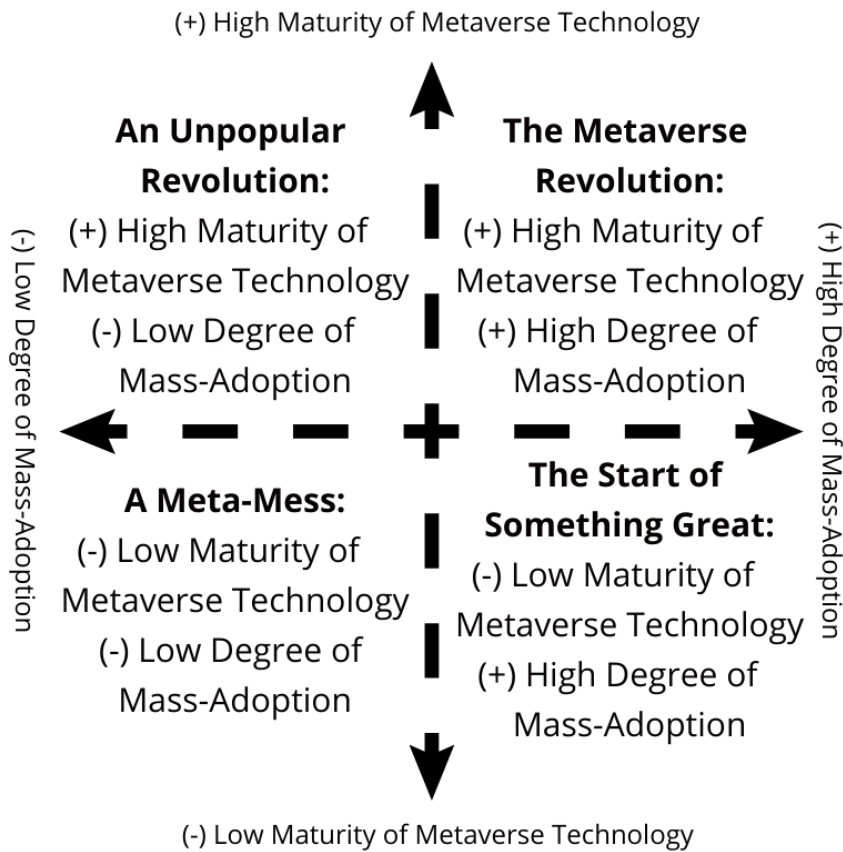
Figure 2 - Scenario Matrix

Lastly, the remaining themes are designated as trends—due to their relatively low degree of uncertainty—and will be inserted into all final scenarios accordingly. Additionally, the main five stakeholders recognized through the themes can be observed within Tale 1 as follows:

1. Metaverse Providers	This stakeholder group really came to shine during the discussion of a multi-platform metaverse environment—with providers both big and small being seen as responsible for providing their own version of a metaverse product to the public. Major tech corporations seem to form the bulkhead of this stakeholder category; yet, there is still room for smaller organizations through the aforementioned niche offerings, potentially diversifying the overall metaverse shopping structure.
2. Brands	Brands, within the concept of metaverse shopping, are projected to adopt a more hands-on approach within their

	overall customer experience layout. With that in mind, as seen through the interview data, brands are predicted to adapt an almost advisory role within their customer-base's perception—being much more experientially intimate and targeted with their customer relations.
3. Retailers	This stakeholder section is seen as providing the basis for all future metaverse shopping experiences—maintaining a hybrid/cross-interactive retail network that extends beyond the boundaries of the exclusively digital and into the physical world.
4. Meta-creators	With a potential metaverse creator economy being so prominent, it is only logical that the meta-creators themselves will play a central role—enriching the product offerings within the metaverse through their own unique creations.
5. Consumers	The final stakeholder group of interest is that of the consumers, as they will the ones to experience all potential metaverse shopping experiences in the first place.

Table 1 - Stakeholders

4.8.1 The Metaverse Revolution

You are in the year 2032. The term metaverse is something you know well, as the first platform launched three years prior. As a metaverse user, you know there is no single such platform—but, instead, multiple major organizations have developed their own versions, creating an environment of several co-existing metaverse worlds. Besides the main metaverse offerings from pre-existing organizations—such as Meta, Microsoft, Google, Roblox, and others—new companies have also emerged within this new digital landscape. One of these new players has grown rapidly in size over the past two years, now competing directly with mainstream metaverse providers within a digital oligopoly. Other new arrivals have moved to the edges of the metaverse market, offering niche platforms that target specific user segments—you sometimes frequent such worlds yourselves, curious to see what exists outside the mainstream perception. When it comes to shops and digital products, almost everything is transferable across the main metaverse worlds; the central metaverse oligopoly has worked internally towards agreements that ensure a seamless experience across all of their platforms. Practically, this means you can buy from whomever you want,

across all major platforms, and carry your digital assets with you from world-to-world.

When preparing to enter the metaverse, you wear a dedicated VR headset and browse through available metaverses/worlds before entering one. Additionally, you have to select an avatar; you have numerous choices on that front—some of which are exclusively customized for you. Avatar skins and accessories—such as clothing, vehicles, body-extensions, and more—have become one of the main product categories in 2032, with metaverse users, such as yourself, amassing a unique array of customizations through their journey. The customization market also has a large-presence of meta-creators—a unique cast of users that use platform creation-tools to manufacture unique digital assets—and you follow a select few of them for buying digital exclusive items/creations. This overwhelming amount of personalization has already added emotional depth to the shopping journey ahead—prepping you for a highly individualized customer experience.

When shopping inside the metaverse, you usually traverse a digital shopping theme-park—within it are uniquely shaped plots that occupied by various retailers. When entering a shop, you do not see the same products/displays as others—retailers utilize your digital data footprint to create a store layout that is uniquely suited to your tastes. When shopping in the metaverse, you are accompanied by a digital companion of your choice—this assistant informs you of brand-specific offers, potential shopping rewards, and available activities that can reward tokens which you can use for purchases. When you pay in the metaverse, you use a specific, platform-based currency.

When in the physical world, you wear light-weight AR glasses that project a metaverse-supported digital overlay onto your surroundings. While shopping, this means that you can see assorted reviews, price-comparisons, shopping tips, offers, messages, and much more just by looking at a product or entering a store. Naturally, such digital AR additions are customized based on your preferences/profile. When shopping in the physical world, you mostly pay with local currencies—while having the option of platform-currencies if supported. Despite the apparent *cool* factor of it all, shopping in the physical world like this is also practical—making your shopping experience that much more functionally streamlined.

4.8.2 An Unpopular Revolution

The year is 2032, and the first metaverse platform launched three years prior. You quietly observed the launch from social media, but never thought to invest in the hardware necessary to access it yourself. Although many of the reviewers and influencers you follow

preached of the metaverse's revolutionary nature—you still were not persuaded enough to buy into this new innovational technology. You always felt that the concept was out of your reach: with the technology being slightly too expensive to justify, the learning curve to use it being too steep, and the practical benefits being too few. Adding to the mix your inherent distrust of big tech-companies—who were the main providers of these metaverses—and the fact that most of your social-circle had also abstained from joining the metaverse wave, and your reasons for buying into this concept seem rather slim. Lately, though, you decided to reconsider this stance of non-participation; you received an exclusive offer in your email, giving you a 30% discount for a starter metaverse kit and a chance to test it at a nearby metaverse café. Still undecided, you drive to the location and prepare to give it a shot— curious to see what awaits you on the other side.

Once there, first test the VR headset—one of your favorite influencers has released a limited edition poster, that comes in both physical and digital forms, and it's exclusively available for purchase through the metaverse. Once you have the headset on, and you've made an account, you're greeted with a launcher—you swipe through various available worlds and select the one you want to enter. Next, you're called to pick an avatar: you pick one of the many pre-set skins, and fiddle with the various customization sliders before moving on—all of this seems new and over-complicated to you, causing you to stall between menus for some time. Once inside, you try to move around, making awkward, choppy movements as you do so. While trying to get to the influencer's digital pop-up store, you are bombarded by an avalanche of notifications: cartoon-like characters appear sporadically around you, showering you with ads, offers, activities to sing-up for, and more. It's overwhelming. Finally, you reach your destination; you enter a digital building that exudes the aesthetic that your chosen influencer is famous for, and you pick up one of the posters. In your hands, the poster comes alive, showcasing many moving elements and effects. When trying to purchase it, you are asked to pay in a unique platform currency—causing you to stall as you try to buy some of said currency, via your bank, to complete the purchase. After your purchase, a pop window informs you that the physical poster will be delivered to your home in two working days. Before leaving, you also test the AR glasses—moving cautiously around the café premises. You are followed by the same cartoon-like creatures from before—overwhelming you and making you question the point of it all. Everything worked well enough, yet the practical value wasn't there. All those bells and whistles, but this technology ended up adding nothing to your need for functional benefit as a customer— losing you in the process.

4.8.3 The Start of Something Great

The year is 2032. The metaverse has only been out for a few months; you, along with many others, pre-ordered the basic metaverse kit and came to face-to-face with the numerous technical issues that riddled the technology. At the launch, as hundreds of thousands of users tried to access the metaverse, digital queues were formed—with servers being unable to handle the downpour of digital traffic, users where looking at waiting times of up to eight hours to access their platform of choice. Once inside, users were prone to encounter latency issues—with movements and actions being delayed, as the technical communication between platform and user was poor—with some outright disconnecting from the platform and being forced to wait-out another lengthy queue. All the major metaverse companies were quick to implement fixes, with major patches hitting most platforms after one month of being online. While these updates fixed many of the issues that plagued the various platforms, there were still issues to be found—with users sharing, on social media, the various technical bugs and glitches they encounter to comedic effect. Despite the issues—and there are many—most users seem to be content; an overarching sense of community has been established, being led by user meta-creators. These meta-creators produce content of their own, flooring the digital metaverse marketplace with UI addons, cosmetics, and other custom-creations that somewhat fill-up the experiential chasm left by the technology's incomplete development cycle.

To access the metaverse, you don your designated VR headset—and after waiting your fair share at the digital queue—you are greeted by a metaverse launcher. After selecting your world of choice—with many platforms being unavailable due to ongoing server updates—you pick your avatar for this session. The options are many, with the amount of potential customization being truly staggering; yet, you pick a rather simple skin to inhabit, knowing full well that the more visually complex options will cause havoc in terms of server latency. Once inside, you make your way towards the store of one of your favorite clothing brand—your selected digital assistant follows you around, having assumed the form of a cartoon-like animal, and informs you of an ongoing treasure hunt that is unfolding nearby. The event is hosted by a major electronics brand, and those participating have the chance to find hidden tokens that can be used at their flagship digital store. You decide to move on, finally reaching your store of choice. The products on display inside, supposedly set to fit your individual preferences, seem at times to be replaced at random—with the relevant algorithm not being very optimized to your purchasing preferences yet. Finally, you decide

to buy a digital hat for your avatar—doing so after receiving a payment error message during your first try. Later in the day, you decide to go outside, putting on your AR glasses. You enter a musical instrument store and notice that your assistant is speaking in an unknown foreign language when you try to get more information on a guitar—you laugh, as this is a known issue amongst the metaverse retail community. You jokingly inform the assistant of your predicament and he informs you of a community-made update pack for digital assistants—costing only 1 meta-dollar. This meta-community, flooded with quirky and niche offerings, is what keeps you emotionally attached to such platforms—supplementing your customer experience in the face of lacking functional and sensory aspects.

4.8.4 A Meta-Mess

It's the year 2032—and the metaverse failed. With the first metaverse world only being around for a few months at this point, you—along with numerous other users—have had to deal with a monumental amount of technical issues. When you tried to log in at launch for your first time, you had to wait for several hours before finally getting in—only to be disconnected a few minutes into your session and having to repeat the queueing process from scratch. While this was expected for the very first day of what was meant to be a revolutionary technology, this problem has yet to be rectified. Several months in, and users still have to deal with hour long queues—yet the problems do not end there. Despite the many technical bugs and glitches that riddled metaverse worlds across the board, as most major companies involved in this space face similar developmental roadblocks, users also noticed cases of server sharding. With some of the servers not being able to handle the amount of users that were trying to access it, the companies involved decided to split their worlds into various identical copies—with each server shard ending up feeling empty and uninhibited. Additionally, the provided creator tools were not present at launch, having only been released in the past few weeks; this staggered the growth of user-made content considerably, as meta-creators have only been working on their own creations for a limited amount of time—furthermore, the creation tools were unresponsive and dysfunctional in their own right.

Wanting to access the metaverse, you don on your VR headset—only to put it right back down after seeing an hour-long waiting time ahead of you. After an hour, you return and select your world of choice—with only a few options available, as the rest are receiving critical updates. You pick your avatar, noticing that many of your accessories won't load on the preview menu, and load into the main shopping district. You decide to go digital clothes

shopping with a friend, picking your favorite digital fashion boutique as the meeting place. On your way there, your digital assistant appears by your side—taking the shape of a miniature version of your digital self—but it freezes in place, becoming progressively pixelated before despawning. Once at the store, you can't seem to find your friend—coming to the unfortunate conclusion that he is at a different server shard. Inside the store on your own, you are bombarded with numerous pop-ups, struggling to focus on any single one. One particular pop-up overwhelms the others, asking you for your banking details—in what is clearly a scam. You decide you've had enough and log-out—opting to go visit a physical store instead. You put on your AR glasses outside and walk into a sporting goods outlet—your assistant downing you with notifications until you disable it. Picking up a pair of running shoes, a pop appears in front of you, asking you "Would like to pay via the metaverse?". You take off your AR glasses and walk towards the cashier while taking out your physical wallet—enough is enough. Nothing worked—nothing at all. At its core, your shopping experience was null—as the lack of base functionality made it devoid of any true experiential shopping value.

5. Conclusion

Having created four final scenarios—by gathering knowledge from a select group of experts and sorting it based on relevant stakeholders, trends, and uncertainties—we were able to create a varied forecasting regarding the metaverse's retail future by the year 2032. Yet, before we can deem these scenarios as valid—and subsequently appropriate for answering our research question—we must first assess their relevance towards the research question/sub-questions, the theoretical implications surrounding them, their overall clarity and limitations, and their potential for improvement beyond the scope of this research.

5.1 Main Findings

For the purpose of answering the main research question—and the subsequent sub-questions—four distinct scenarios were created; each scenario describes a distinct, yet still grounded in reality, future. The fact that a 4x4 scenario matrix was utilized means that there is not singular answer to the research question—and sub-questions—at hand; instead, each scenario presents an equally viable future forecast, calling for the careful consideration of all of them if we are to appreciate the future trajectory of shopping experiences in the metaverse. In the first scenario (The Metaverse Revolution), we experienced a future forecast where metaverse shopping experienced both high technological maturity and a high degree of mass-adoption from the public—leading to a subjectively positive outcome, in terms of the embedded shopping experience, and showing an immersive, functional, and emotionally engaging metaverse shopping experience in the year 2032. The second scenario (An Unpopular Revolution), kept the technological maturity in the metaverse high, but adopted a low degree of mass-adoption—showcasing a future where a technologically mature metaverse retail environment does not manage to attract the public's approval—being seen with distrust due to its complex and, sometimes, non-practical shopping experience and failing to resonate emotionally with consumers. The third scenario (The Start of Something Great) showed a potential future environment where the metaverse manages to get a high degree of mass-adoption—despite a low metaverse technological maturity. Thus, in the third scenario, consumers relied on emotional shopping experiences provided by the related metaverse creator community, overcoming the functional customer experience shortcomings as a result. Lastly, we have the final scenario (A Meta-mess), where both the degree of mass-adoption and the metaverse technological maturity were low, offering a diminished shopping experience across the board; in this instance, retailers and metaverse providers alike failed to engage consumers on either an emotional, functional, or sensory

customer experience basis. To conclude, through their dissimilar structures, each scenario managed to provide vastly different shopping experiences—including different ratios and dynamics regarding the provided emotional, functional, and sensory customer experiences. Thus, the metaverse can provide shopping experiences in 2032 that range from widely successful to unresponsive and shallow—with everything largely depending on how key uncertainties, still interacting with major trends and stakeholders, will fluctuate in the coming years.

5.2 Theoretical Reflection

Reflecting back on the theory utilized, and its resulting conceptual model, the concepts discussed helped formulate an adequate collection of questions for the interview/knowledge-gathering phase of the research. By approaching the metaverse from an evolutionary economics perspective, we were able to gain a concrete appreciation on how the technology/innovation might evolve from various techno-economic standpoints. Primarily, such theoretical nodes helped raise important questions; such as the amount of potential available competition, through the shakeout effect, and the identification of key metaverse players; the importance of the metaverse as a techno-economic phenomenon, through technological revolution theory, in the broader economy; and the potential influence other innovations might have on the metaverse, utilizing innovation theory through evolutionary economics. Moving on, affordance theory showed us how an innovation such as the metaverse might interact with its potential, future user-base—and how both the technology involved and the users' initiative are critical in shaping new/overhauled shopping affordances for the metaverse (Hopkins, 2016). The compounding relationship of such shopping affordances was explored through the concept of customer experience—showcasing how retailers can utilize such affordances to shape various aspects of their attached customer experience (Chylinski et al., 2020) and build up the metaverse's overall shopping experience in the process. Specifically, regarding the theory surrounding customer experience, the segmentation into the categories of emotional, functional, and sensory customer experience helped in gaining a better understanding of the factors that might shape this future metaverse shopping environment—from a customer experience perspective. Thus, all the theoretical concepts discussed helped in gaining a generalized appreciation of how the metaverse might develop in regard to shopping—and aided in the identification and creation of a suitable topic/interview guide to use when interacting with the selected experts (see Appendix A). This theoretically backed topic guide helped derive the most useful and relevant knowledge from the expert interview process—which was of unquestionable

importance for the development of the final scenarios.

5.3 Scenario Evaluation & Limitations

To assess the clarity of our final scenarios, we will be using seven distinct metrics: "manageability", "plausibility", "consistency", "comprehensibility. "relevance", "differentiation", and "transparency" (Dean, 2019, p. 11). With manageability, the total scenario number was the ideal number of four separate scenarios—making the narratives easy to handle and comprehend from a numerical perspective. Moving on to plausibility, all scenarios were conceptually feasible—presenting narrative structures that were grounded in reality, utilizing structural information that supported by the utility-centered knowledge-base of the interviewed experts. In regard to consistency, all four scenarios have predictable causal patterns—with results and conclusions being based on a logic-based sequence of actions and thought processes. With comprehensibility, the scenarios contained enough details to be analytically valuable—while managing to be easy to comprehend by not burdening the reader with details and aspects that were not central to the related narratives. Concerning relevance, all four scenarios deviated considerable from narrative commonalities and unintuitive thinking—presenting use-cases that were believable but still urged the reader to think beyond his/hers temporal biases. The scenarios presented unique aspects that challenge our present-day perception of technology and commerce, and can thusly trigger informative and "unconventional thinking" (Dean, 2019, p. 11). Carrying onto the element of differentiation, all four scenarios presented use-cases that were intrinsically different from one-another. Their clear position within the axis of the critical uncertainties assured that the scenarios portrayed fundamentally dissimilar worlds—and can therefore be used to formulate "distinct sketches of the future" (Dean, 2019, p. 11). Lastly, in terms of scenario transparency, all the methodological steps involved—along with the relevant information collected from the experts—have been clearly laid out, removing any potential doubt regarding the process through which they were created.

Regarding methodological limitations, with the use of scenario planning, one of the main issues encountered was that of embedded biases from the researcher's perspective. As Schoemaker (1995) states, researchers are often inclined to focus on evidence/information that supports their preconceived notion of the future—often ignoring information that is contradictory to that vision as a result. Though it is hard to say that such biases did not affect the scenario-creation process to some extent, the variance regarding the experts interviewed assured to some capacity that an informational polyphony was provided. With such varied

information available, greater focus was given on giving all opinions equal attention—moving the spot-light to both negative and positive opinions as a result and mitigating any major biases as a result. Moving, in an ideal scenario planning setting, it is recommended that all final scenarios are tested by running organizational strategic plans through them (Dean, 2019); this was not possible, as that would require the engagement with organizations and stakeholders that have potentially not yet matured in the metaverse, making it a limitation of the research. With all of the above in mind, the final scenarios are adequate in terms of clarity and usability—and provide use forecasts that attempt to answer the main RQ—yet some notable limitations were, in part, present.

5.4 Further Research

Regarding future research, scenarios should be monitored for an extended time period—with researchers charting the long-term trajectory of uncertainties so as to better understand their path (Dean, 2019). Thus, seeing how such scenarios compare to future developments—even before the year 2032—could be worthy of future research, as we'll gain a better understanding as to which scenario is more valid. Additionally, the metaverse as a whole is a topic that is experiencing rapid development and has garnered considerable media attention—with new information on it being released almost daily. With that in mind, it would of value to revisit the same RQ, and sub-questions, after some time has passed—perhaps a year or two—utilizing new information, both academic and general, to develop better, clearer, and more realistic forecasts.

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Appendices

Appendix A

Topic/Interview Guide

Development of the Metaverse as technology/shopping platform	1. How could the metaverse look like 10 years from now?
	2. What new opportunities could the metaverse allow for shopping?
	3. Could you please describe your own version of a metaverse shopping experience? • Would that experience also interact/extend to the physical world in some capacity? • Would such an experience be feasible to achieve by 2032?
	How will shopping in the metaverse compare to existing digital shopping (internet, mobile internet)? • Could the metaverse replace other forms of shopping by 2032?
	How could various, co-existing versions of the metaverse affect its potential for shops and shopping? • What companies do you think will offer their own versions of the metaverse?

General Customer Experience/Shopping	Will shopping in the metaverse be standalone experience? • Will it happen exclusively is digital shops or will it enhance existing shopping experiences?
	What existing shopping innovations/technologies do you see making their way into metaverse shopping? • Will shopping in the metaverse rely on external shopping platforms/technologies to be successful?
	How prominent will digital only products be in the metaverse when compared to physical ones (ordering something vs buying something completely digital)?
Emotional Customer Experience	How do you think organizations will engage/connect with consumers through metaverse shopping and shops in the future?
	How prominent will customization/personalization be in metaverse shopping (avatars, customized environments, etc)? • What effect will it have on the overall customer journey/shopping experience?
	How could interpersonal communication affect shopping in the metaverse?
	How accessible will shopping in the

Functional Customer Experience	metaverse be (technology/price)?
	How practical will shopping in the metaverse be?
	How mature will the related technology be for shopping in the metaverse by 2032?
	Will metaverse shopping be seamless when other platforms are involved?
	How safe will shopping in the metaverse be?
Sensory Customer Experience	How immersive will shopping in the metaverse be? • How will the lack of some senses affect shopping in the metaverse?

Appendix B

Expert List

Expert Name/Surname	Professional/Relevant Experience
1. Fanis Aritizis	Fanis works as a Retail Marketing Manager & Head at WIND Hellas—one of Greece's top telecommunications providers, boasting a significant retail presence both physically and digitally. Additionally, Fanis has founded and owns the digital consulting agency CATHARSIES—through which he focuses on providing services on the business application of innovation and the future of the metaverse. Lastly, Fanis has been certified, through Meta, as a metaverse strategist.
2. Pavlos Vythoulkas	Pavlos works as a Senior Strategic Planner for ADMINE—a digitally-focused communications agency, that provides e-commerce design and development, with a combined clientele that boasts a significant retail presence. Pavlos has extensive experience and knowledge in creating unique/immersive digital customer journeys.

3. John Gikopoulos	John is the Chief Innovation Officer at QUALCO—a fintech solutions provider—and has worked as consultant, through various major companies, with a focus on the business application of innovation. John holds extensive knowledge in the application and fostering of technological innovations within the broader economy—and within the context of e-commerce especially.
4. William Chen	William works as a Technical Director for Jam3—a design and experience agency catered towards the creation of innovative and unique projects for major international organizations (including Google, Microsoft, Adidas, and others). William has unique insights on the potential workings of a metaverse-bound shopping landscape, having worked for the technical development side of the digital shoppable experience complexland. The aforementioned project is credited as a one-of-kind, gamified shoppable experience with strong metaverse-like qualities.
5. Pedro Barroso	Pedro works as an Associate Creative Director at Jam3. Pedro has also worked on the development of complexland—focusing on the creative development side of the project. His experience puts him in a unique position to comment on the creative development of interactive, metaverse-oriented, online shopping experiences.
6. Geert Eichhorn	Geert is an Innovation Director at MediaMonks—a digital-centric marketing and advertising company that has produced numerous innovative digital events/experiences. Geert has an immense wealth of knowledge over AR, VR, and other such technologies that look to be critical in the future development of the metaverse.
7. Konstantinos Kastanis	Kostantinos is the Deputy CEO at Upstream—a company focusing on digital acquisitions, mobile marketing, and e-commerce services on a B2B basis. Having helped in the design of unique and highly effective digital consumer experiences—across a dense clientele portfolio—Konstantinos

	is highly aware of the intricacies and latest developments in the field of e-commerce.
8. Alex Serbetis	Alex is the Chief Customer & Digital Transformation Officer at ERGO Hellas—a major presence in the ever-competitive Greek insurance market. Along with his extensive experience as a high-profile consultant, working for clients with an international reach, Alex's professional experience allows him to offer an unique glimpse into the working of a successful and effective digital customer journey.
9. Steffen Christiansen	Steffen is the Founder & Creative at Studio 28K, a technologically focused design studio that provides unique digital experiences. Additionally, he was the Executive Creative Director at Jam3, having considerable experience on projects with metaverse-like qualities—such as the digital-retail focused complexland—through that position.
10. Anonymous	This expert wished to remain anonymous due to professional circumstances—with only the supervisor being informed of the individual's identity—therefore neither the person's name, nor the name of the company for which he/she works, will be revealed. Regardless, this individual is a partner at a multi-national business consulting company—having insider access to the company's ongoing research on the future of the metaverse and its potential for business/commerce.

Appendix C

Coding Framework (based on Atlas.ti output)

Selective Codes/Final Themes	Axial Codes	Open Codes
1. Shopping Gamification	Reward systems	• Tokenization • Shopping reward system • shopping gamification

	In-depth customization/personalization	• Avatars
		• customizable metaverse services
		• customization/personalization
		• adaptive world building
		• adaptive sandbox shopping
		• personalized shopping journey
		• personalized digital shopping mall
		• mmo metaverse adaptation
		• data richness/personal data acquisition
	Video-game relevance	• Warcraft
		• Super Nintendo
		• Second Life
		• Roblox
		• relational video-games
		• Pokemon Go
		• Counter Strike
		• Dota
		• Epic Games
		• Grand Turismo
		• Mass appeal of video-game

		narratives
	Digital creator economy	- user generated content - basic user creations - creation tools - creator economy - Low-costs for production of digital goods - Digital good monetization - Digital product prevalence - NFT prevalence - Individual creativity - digital ownership
	Platform-based currency	- unified currency - Mmo currency - crypto currency use - digital wallet for currency - Ethereum - blockchain transactional usage
2. Safety concerns	Psychological safety concerns	- unsafe user behavior - psychological safety - Digital addiction - mental health concerns

	Disingenuous behavior	• Scams
		• Cyber fraud
		• Continuation of existing Web 2.0 criminal activity
	Technical Safety	• technical safety
		• safe crypto
		• metaverse cyber insurance
3. Hybrid metaverse shopping	Physical shopping symbiosis	• physical and digital world co-existence
		• AR and VR co-usage
		• Relational AR use/extension
		• hybrid customer journeys
		• metaverse co-existence with physical and internet shopping
		• hybrid products
		• VR focus/AR sub-focus
	Physical goods within metaverse	• Physical shopping reproduction
		• Physical shopping continuation
		• Physical goods in metaverse
		• Digital good replicas
		• 3D printed goods
	Partial metaverse immersion	• Smell not achievable

		- sensing temperature - Potential for tactile feedback - haptic feedback - price-gated senses - Limited immersion in metaverse - non-complete sense-based immersion - relative immersion due to user perception
4. Multi-metaverse shopping	Multi-platform development	- shake-out effect - platform oligopoly - multi-platform shopping - Metaverses - Large scale geographical/cultural platform variants
	Metaverse commercial potential	- Need for meta-shopping - Web 3.0 - Existing successful metaversal experiences - Complexland - digital shopping convenience - experiential shopping demand

		• metaverse "hype"/media focus
	Niche platforms	• niche platform need • niche experiences • fandoms
	Eventual cross-platform communication	• seamless platforms • controlled platform inter-connectivity • Cross-platform assets • Digital wallet for assets • Limited interoperability at launch
5. Increased brand presence	Brands as digital advisors	• added brand value in metaverse • AI shopping assistants • brand loyalty • brands as problem solvers • digital advisors/ assistants • interactive brands
	Metaverse communications focus	• social shopping experience • attention economy • Influencer prevalence • Instagram popularity • Social media parallels

		• Facebook
6. Uncertain maturity of metaverse technology	Negative technological aspects	• Technological uncertainty • technical over-complexity • server limitations • platform limitations • No metaverse data standards • metaverse digital scale limitations • High production cost for relevant technology • Insufficient technology • Incremental technological developments • limited maturity of critical technologies • technical limitations for portable devices
	Positive technological aspects	• Technological maturity • rapid technological development • wearable tech • metaverse evolving replace other technologies • utilization of existing smart tech

		• Continuous VR improvements
	Uncertain metaverse timeframe	• uncertain metaverse timeframe
		• Metaverse supremacy at decade
		• metaverse market ready years after decade
		• metaverse launch at decade
		• metaverse launch before decade
		• metaverse developing still after decade
		• 5 year metaverse launch
		• Insufficient timeframe for 2032
7. Uncertain degree of mass-adoption	Lack of consumer acceptance	• Uncertain metaverse mass adoption
		• Time-gated demand
		• sensory overload
		• non-adoption of digital value by public
		• non-acceptance of digital exclusivity by consumers
		• non concrete consumer acceptance

		• metaverse not practical
		• Aversion to excessive immersion
		• chaotic customer experience
		• Consumer distrust
		• culture-based consumer demand
		• excessive restructuring of current shopping paradigm
		• Potential flawed delivery
		• Indecisive consumers
		• lack of consumer demand for digital products
		• lack of consumer demand for metaverse
		• Lack of demand for digital only world
		• Unaligned national regulatory frameworks
		• Anti-consumer corporate initiatives
	Metaverse accessibility issues	• unapproachable metaverse
		• user cast-system
		• socio-economic accessibility boundaries

		• Age inaccessibility
		• culture based accessibility
		• Demographically inaccessible metaverse
		• demographically inaccessible technology
		• digital native preferential adoption
		• Limited overall accessibility