

Consumer Metaverse - How Businesses Are Driving Value Through Enhanced Customer Experiences - A Critical Literature View

Research Paper - Shabir Ali MSc. Digital Transformation

[ALISHABIR](#)

Contents

1. Introduction.....	3
2. Problem Statement.....	3
3. Aims and Objectives	1
4. Research Methodology, Plan and Outcomes	1
4.1. Research Process & Scope	1
4.2. Research Gap & Proposition.....	1
5. Background of Metaverse	1
5.1. What is Metaverse?	2
6. Applications in Consumer Metaverse.....	0
6.1. Metaverse for Gaming.....	0
6.2. Metaverse for Retail	0
6.3. Metaverse for Construction Industry.....	1
6.4. Metaverse for Marketing and Customer Experience.....	1
7. Drivers of Digital Marketing & Customer Engagement in Metaverse	4
8. Business Value Generation in Metaverse	5
8.1. Business Models Proposed for Consumer Metaverse	6
9. Metaverse Mass Adoption - Broad Challenges	11
9.1. Technological	11
9.2. Data Privacy and Security	11
9.3. Ethical.....	11
9.4. Legal.....	12
9.5. Interoperability	12
9.6. Economical.....	13
9.7. Social.....	13
9.8. Business.....	14
9.9.....	4
9.10. Perceived Value of the Metaverse for Small And Medium Enterprises (SMEs)	4
9.10.1. Increased Visibility	4
9.10.2. Increased Customer Engagement	4
9.10.3. Decreased Physical Infrastructure Cost.....	1

9.10.4.	Flexibility	1
9.10.5.	The Next Gen Digital Marketing Tool.....	1
9.11.	Drivers for Metaverse Adoption by SMEs	2
9.11.1.	Technology	2
9.11.2.	Government Support	2
9.11.3.	Role of Mass Media, Business & Technology Ecosystems and Non-Governmental Organizations	3
9.12.	Steps for SMEs to prepare for Metaverse Mass Adoption	3
9.12.1.	Meta-as-a-Service (MaaS) for SMEs	5
10.	Conclusion	6
11.	Recommendations.....	6
12.	Future Research	7
	References.....	2

1. Introduction

With the ever-evolving landscape of technology, information technology has revolutionized every aspect of life. From artificial intelligence to virtual reality, businesses are exploring these technologies to improve customer experiences and create value. The Metaverse has emerged as one of the latest innovations in this realm and presents vast opportunities for businesses to tap into. As the concept of the Metaverse has been introduced and Facebook, a famous social media platform, rebranded under Meta (Meta, 2023), the curiosity among customers and the business community has risen, and the means to adopt ways to become part of the Metaverse are being analyzed by researchers and professionals.

The Metaverse is a collective virtual shared space, created by the convergence of multiple physical and virtual environments, including augmented reality and virtual reality, where users can interact with a computer-generated environment and other users, often in real time. It is a highly immersive and interactive platform where users can engage in a range of activities, including gaming, socializing, learning, and commerce, and may even have their own virtual identities (Gregerson, 2023).

The research has been carried out on Metaverse technology from various perspectives. Metaverse being a new concept, is undergoing several challenges when it comes to mass adoption, and businesses are keenly interested in knowing

the risks and potential that Metaverse holds for them. Metaverse provides two-way opportunities, as participants and providers can have control over what they purchase and use in Metaverse and earn by contributing to it.

The World Economic Forum predicts that *“Experiences, not technology, will be the bedrock of the Metaverse”* (Stephen Hall, 2023). Hence, as an extended reality platform, it is crucial to understand the importance of enhancing customer experiences in order to derive maximum value from this new and exciting platform.

2. Problem Statement

There are three key areas for new products, services, and experiences within the Metaverse (Synthetic world, 2021): (1) Consumer Metaverse, (2) Enterprise Metaverse, or (3) Industrial Metaverse. Existing literature and studies show businesses in multiple industries are investing in the Consumer Metaverse to reach new customers and create new customer experiences. While the Metaverse market is expected to grow 10 times between 2022 and 2024 (Lee, 2022), practical adoption so far, has been limited to large corporations and big brands. Researchers argue that Metaverse business models are likely to be shaped by ‘experiences’, not just by technology (Stephen Hall, 2023). As evidenced by past trends, such as the internet, small and

medium sized enterprises (SMEs) ¹ are crucial to the mass adoption of new technologies. However, the value proposition for SMEs to leverage the technology is still uncertain and under debate.

3. Aims and Objectives

Creating such Metaverse experiences may require extensive and costly investments and other challenges, as evident from current adoption trends led by large companies and brands only. This raises the question of mass adoption and how Metaverse can provide value to consumer businesses of all scales and sizes, not just large retailers and brands, as tried to address

in the following sections. This paper aims to explore the perceived value and benefits of the Consumer Metaverse and the potential for adoption by SMEs to engage their customers to generate value for the business as well as the customers. The output of this critical literature review is a set of actionable recommendations for SMEs to adopt Metaverse for expanding their online presence and engaging with customers.

4. Research Methodology, Plan and Outcomes

The following table summarizes the research plan followed to conduct this study.

Table 1: Research Plan

Research Format	<ul style="list-style-type: none">○ Qualitative Study○ Critique on existing literature on 2018 onwards
Research Keywords	<ul style="list-style-type: none">○ Metaverse○ Consumer Metaverse○ Customer Experiences in the Metaverse○ Use-Cases of the Metaverse

¹ According to the Government of the UK, SME can be defined as a business entity with a workforce of no more than 250 employees and either annual revenue under €50 million

or a total balance sheet value under €43 million (Gov.UK, 2022).

	<ul style="list-style-type: none"> ○ Business Value in Metaverse through enhanced customer experiences ○ Metaverse Mass Adoption ○ Challenges in Metaverse Adoption
Research Sources	<ul style="list-style-type: none"> ○ Research Articles ○ Published Reports ○ News Articles

4.1. Research Process & Scope

This study focuses on conducting a critical literature review on Metaverse technology particularly from a business value perspective. As Metaverse is an emerging field, adopted the standard practice of studying and analyzing literature, research articles primarily from the last five years, 2018-2023. Roughly 50+ papers, reports, and articles were reviewed for this paper conducted over the last 6 months. The studied material for the paper was shortlisted for relevance against the ascribed keywords mentioned in Table 1. Major areas of interest were the benefits of the Metaverse to businesses, examples of use cases and applications, available business models for value generation, the current and anticipated challenges, and future implications and predictions for Metaverse growth and adoption. Using a qualitative critical literature review methodology, the gaps in the existing literature have been identified.

4.2. Research Gap & Proposition

My preliminary research suggests that existing literature has failed to address

Metaverse adoption for SMEs. To address this gap, analyzed existing Metaverse business models and frameworks and identified what impediments SMEs may be facing in leveraging the platform.

Although the literature on Metaverse is limited, this study aims to provide a comprehensive understanding of the background of Metaverse, identify some of its use-cases, and analyze how businesses are leveraging it to create value for their customers. To achieve this, I first present an overview of Metaverse and then examine consumer Metaverse and customer experiences in detail, providing real-world examples Business models for Customer Experiences as proposed in existing literature are highlighted and critiqued through the lens of mass adoption for consumer businesses of all sizes and scale.

With this, aim to further existing research on Consumer Metaverse and offer insights to SMEs on how they can generate value for their businesses and customers.

5. Background of Metaverse

Metaverse was first introduced by writer Neal Stephenson in his book “Snow Crash” (Lawton, 2022), which served as an inspiration to the IT industry and Sci-Fi is being taken to not just reality but Extended Reality, an umbrella term for AR, VR, and MR (Tremosa, 2022). For a comparison of these different technologies, please see the following table.

Table 2: Comparison Table for AR, VR, MR & XR

Augmented Reality	Extended Reality	Virtual Reality	Mixed Reality
Augmented reality (AR) adds a digital display to the real-life view of the user's surroundings. (Vasarainen, 2021)	Extended reality, commonly known as XR, is a computer-generated environment that blends components from both real and virtual environments. XR covers mixed reality, virtual reality, and augmented reality. (Vasarainen, 2021)	A computer-generated 3D environment that allows users to engage with digital objects using wearable devices such as gloves and headsets, or a mouse is referred to as virtual reality. (Vasarainen, 2021)	Blend of AR and VR technologies to provide an environment where physical and virtual (digital) objects co-exist and interact in real-time. (Vasarainen, 2021)
Devices: Iron Man Helmet, Smartphone (an entertainment application called Pokemon Go allows users to interact with digital characters using their smart phones) (Moore, 2023)	Metaverse (Xi, 2022)	Devices: Google's Cardboard, Meta's Oculus Rift, and Sony's PlayStation VR2. (Moore, 2023)	Device: MR headset. For instance, An MR can project a virtual keyboard onto a desk that the wearer can then use to type. (Moore, 2023)

5.1. What is Metaverse?

The idea of the Metaverse is of great interest to businesses as they strive to create business value through innovations and advanced technologies like the Internet of Things, Robotics, Artificial Intelligence, Edge computing, Virtual Reality etc. (Hoyer, 2020). Metaverse is the new “real version” of society, where humans interact physically and socially in an extended reality.

One study proposes an architectural framework for organizing the Metaverse at a macro level consisting of three layers: interaction, infrastructure, and ecosystem (Duan H, 2021). The study also suggests that the Metaverse has the potential to create a social world with universal accessibility by removing geographical limitations.

The internet has interconnected the whole world, but it has not been able to replace physical interactions. During the COVID pandemic, meetings and conferences were held virtually, and graduation ceremonies happened in virtual conferences. This deprived many graduates of experiencing the real joy of graduation ceremonies, which is a dream of every student. The concept of

Metaverse aims to bridge this gap by providing an immersive and real-time experience to its users, ensuring equal accessibility to everyone regardless of their physical location.

Another aspect that is expected from Metaverse for social good is equality, as every consumer of Metaverse will be given equal capabilities, which will eliminate the discrimination based on race, gender, or disabilities (Duan H, 2021). The example can be taken of Decentraland, which is a platform, where users can explore a 3D virtual world and communicate with each other (Guidi B, 2020). Decentraland practices the attribute of democracy effectively by providing voting rights to every participant. They are able to propose or vote for policies to maintain social order. This is achieved through a Decentralized Autonomous Organization (DAO) (Duan H, 2021).

The Metaverse literature covers many domains. For the purpose of study, looked into key areas where Consumer Metaverse can be adopted.

6. Applications in Consumer Metaverse

There are many ways in which the Metaverse can be utilized in reality, a few of which are already being observed in the real world.

6.1. Metaverse for Gaming

Gaming is one of the most popular applications of the Metaverse as the Metaverse and AR/VR components have been widely utilized in the gaming industry for many years. This technology is continually advancing to produce games that are visually impressive and offer more natural interaction with the virtual environment. The aim is to enhance the graphics and visuals to the point where users feel like they are in a real-life setting. Metaverse gaming is an extensive system that is increasingly popular for creating lifelike experiences. The possibilities of the Metaverse redefine how people interact online, own content, and even engage in real-world trading. One example of a platform that enables such experiences is Cens World, a 3D virtual game that has been marketed as the "Future Metaverse Open-World Game of the Century." This platform empowers players to create their own stories and shape the personalities of their characters. This is a current example of using modern technologies to deliver immersive gaming experiences that are bound to happen (Srivastava, 2023) . According to a statement from Walmart's Chief Marketing Officer, William White, the company

recognizes that customers are spending significant amounts of time on Roblox, a gaming platform established in 2004 and a key player in the Metaverse. Although tech giants such as Facebook, Microsoft, and Epic Games have announced plans to enter the Metaverse, Roblox remains a leader. In March of last year, Roblox debuted on Wall Street and immediately achieved a valuation of \$45 billion (Maruf, 2022) . Hence, in the Gaming Industry, businesses can invest in technologies to offer immersive gaming experiences in order to create business value.

6.2. Metaverse for Retail

Another potential application that can utilize the concept of Metaverse is the Retail Industry. With its distinctive features, the Metaverse presents unprecedented opportunities to market and promote brands. These tools enable brands to interact with customers on a deeper level, which can result in a more favorable response rate from potential customers (Gupta, 2023). The term "Metaverse" refers to a virtual world created by the combination of various technologies such as Augmented Reality (AR), Virtual Reality (VR), The Internet of Things (IoT), and Artificial Intelligence (AI). These technologies merge into a mega-technology that will transform how we live, play, work, and shop. In the Metaverse, retailers will be able to transport customers into a virtual reality space where they can browse products and engage in immersive sensory experiences. Holographic products with captivating 3D graphics will

allow customers to view the product from all angles. They can also adjust the product's size to get a better sense of it, interact with others, learn more about the product(s), and make authentic purchases.

Furthermore, businesses can utilize virtual reality booths that allow customers to test out clothes before buying them. Suppose you're uncertain about how a dress will look on you while browsing in a store. In that case, you can scan the product and modify its fit in a virtual dressing room that appears on the wall. By adjusting it to fit your body precisely, you can find the perfect dress for your upcoming party. The idea of using blockchain for transactions in the Metaverse is thrilling. Corporations like Walmart, Ikea, H&M, etc. are utilizing the groundbreaking idea of Metaverse to attract customers, boost sales, and offer seamless transaction experiences (Metaxr, 2022).

This approach is crucial in improving customer response rates and could potentially boost sales figures. One notable instance evident is with IKEA, a furniture retail company. Customers have the option to virtually place furniture in their own space through the IKEA Place app, which utilizes marketing VR to verify the suitability of the item's shape, size and utility for the customer's area. The size of the item is adjusted as per the dimensions of the customer's room by the software. As such, the retail industry has the unique opportunity to enable its customers to try their products and services before

purchasing them from the comfort of their homes.

6.3. Metaverse for Construction Industry

Virtual reality technology like Metaverse offers numerous benefits for architects, builders, and construction workers. By using VR tools, architects and builders can visualize their designs and make necessary adjustments before construction begins, which can save time and resources while also ensuring that the final product meets the desired specifications. In addition, construction workers can receive safety training and familiarize themselves with construction sites before starting work, reducing the risk of on-site accidents. Ennead Architects, a New York-based company, uses VR to help customers visualize their projects in 3D (Gupta, 2023). This technology allows architects to create a 3D environment and generate virtual worlds with structures, foliage, and other natural elements. By presenting their ideas to clients through VR, architects can better communicate their vision, receive feedback, and increase client satisfaction by bringing their ideas to life in the real world.

6.4. Metaverse for Marketing and Customer Experience

The Metaverse has the potential to greatly benefit marketing and customer experience, in addition to its current applications in gaming and retail. Furthermore, it offers promising opportunities for Media and Social Media (Gupta, 2023). The Metaverse presents a novel opportunity for e-

commerce by establishing a virtual environment where buyers and sellers can convene and engage with each other. As a result, the Metaverse has the potential to transform the way business is conducted. The use of the Metaverse can facilitate the creation of virtual showrooms, showcasing products and demonstrating their features. This approach is highly effective in providing prospective customers with an up-close and personal experience of your offerings.

The Metaverse can serve various purposes for companies, such as marketing, product development, customer service, and training. Businesses can reap numerous advantages from utilizing the Metaverse, such as heightened flexibility, better collaboration, and increased customer engagement. The Metaverse can offer various customer experience applications.

Different marketing strategies have been used by brands that use gaming, brand avatar experiences, virtual influencers, interactive live events, and Non-Fungible Tokens (NFTs) (Simpson, 2022).

- **Brand Avatar Experiences:** The creation of virtual avatars offers customers a more personalized interactive experience in real-time that can enhance their satisfaction and loyalty. Certain businesses have taken advantage of this trend by providing unique opportunities for avatars. The Genies app has generated over 2 million avatars, and consumers spend up to 75 seconds

engaging with branded design wheels. For example, a personalized design wheel by Cheetos allowed users to select orange clothing for their custom avatars. Genies users eagerly consumed the snack brand's Halloween promotion (Simpson, 2022).

- **Gaming:** Wendy's marketing team targeted the 24 million daily "Fortnite" players through a creative approach. They joined the Food Fight mode on the game's branded channel and aligned with Team Pizza to eliminate all burger freezers in the game, promoting their fresh, never frozen beef to the game's massive fan base. Tens of thousands of players joined the effort (Simpson, 2022).
- **NFTs:** NFTs are unique digital assets, like photos, videos, or audio, stored on a blockchain that can be sold and traded. Their value is based on demand, as the blockchain only contains a finite number of NFTs. Yuga Labs became famous with its Bored Ape Yacht Club NFTs, while luxury brand Louis Vuitton used a simpler NFT marketing strategy to create a game where avatars win NFTs by collecting clothing and accessories. With over 2 million downloads, the game was a success due to consumers' love of prizes (Simpson, 2022).

Some of the companies are already trying out the most obvious way of making use of the Metaverse - through advertising. Examples have been reported of companies using video games, augmented reality features, and digital copies to create early instances of how they could develop familiarity and involvement with consumers on platforms similar to the Metaverse. Based on patents filed by Meta, it seems that advertising and sponsored content will play a considerable role in their strategy for the Metaverse (Stephen Hall, 2023).

Another potential application of Metaverse lies in Customer Experience. The Metaverse can offer various customer experience applications. One of them is the creation of virtual avatars that can interact with customers in real-time, providing them with a more personalized and captivating experience that can enhance their satisfaction and loyalty.

Hyundai's virtual space offers visitors the chance to interact, play games, and experience customized avatars. Through the space, visitors can drive Hyundai vehicles, including the NEXO and IONIQ 5, as well as operate transportation devices like purpose-built vehicles and urban air mobility devices. Users can create their own avatars, upgrade their virtual parking garages, and engage in social activities. Hyundai Mobility Adventure targets younger consumers through virtual exploration to enhance brand familiarity and promote future mobility solutions (Khandaker, 2021).

This way, the Metaverse is enabling the development of immersive customer experiences, such as virtual tours or product demos, which may help customers learn more about products and services and increase their inclination to make purchases. The Metaverse holds immense potential to transform commerce, communication, and entertainment, and companies are beginning to recognize its value. There are multiple avenues through which companies can leverage more value from the Metaverse.

One way is to establish virtual shops where customers can explore and buy products. Oana Vlad, Senior Director of Coca-Cola's Global Strategy, explains that the brand's foray into NFTs and the Metaverse is intended to offer customers a comparable and positive experience in the digital realm, akin to what they have been accustomed to in the physical world. This strategy is logical for Coca-Cola, given their extensive background in creating and marketing tangible collectibles (Khandaker, 2021).

Another approach is to design virtual encounters that enable customers to engage with brands in novel and creative ways, as mentioned in the example of Hyundai above. Ultimately, companies can leverage the Metaverse to establish deeper connections with their customers, fostering loyalty and expanding their customer base. As the Metaverse adoption rate grows, businesses that can utilize its potential will enjoy a substantial edge over their rivals (Vivian, 2022).

While the prospects for Metaverse applications for engaging customers sound exciting, it is pertinent to consider why the need for them exists in the first place and what drivers will influence the process. It is explored in the next section.

7. Drivers of Digital Marketing & Customer Engagement in Metaverse

As Gen Z and Alpha generations spend more time online, the Metaverse will have a significant impact on marketing. It is important for businesses to adapt their strategies and maintain virtual identities to effectively reach their target audiences. The Metaverse offers a new space for businesses to connect with these generations, making it essential to adapt to this virtual world. (Nalbant K, 2023). As a result,

- Businesses must start preparing by understanding emerging consumer preferences.
- Incorporate these consumers' needs into every aspect of Metaverse experiences and products.
- Investing in digital technologies like the Metaverse for marketing and engaging customers is critical (Peterson B, 2022).

The branding and customer opportunities of the environment, such as virtual billboards, consumer-selected virtual clothing, and other applications discussed in the previous section, can greatly impact brand recognition. Therefore, it becomes

important for businesses to adapt and invest in digital technologies like Metaverse for marketing and engaging their customers. This will help the businesses to lead in their respective markets and be able to survive the growing competition in this extended reality.

Due to the rapid growth of Metaverse, major corporations have started adjusting their operations accordingly. For businesses, the Metaverse offers opportunities to find their target audience, generate sales, and engage in marketing efforts. Marketers must undergo various training programs and familiarize themselves with underlying technologies to adapt to this new environment. In the long term, it will be critical to establish brand recognition among customers in the Metaverse market (Nalbant K, 2023).

In the Metaverse, sound technology will also play a significant role, and brands will likely invest in this area to provide customers with the best digital experiences so that they can best enjoy the experience of gaming, cinema, musical concerts, etc. happening in the Metaverse (Nalbant K, 2023). In order to effectively reach consumers who are spending more time in new and emerging digital spaces, brands and retailers must ensure their presence wherever the consumer is and actively engage with them (Peterson B, 2022).

Brand relationships are being redefined in Metaverse as not only brands are creating them but consumers also participate in the

idea of co-creation. Success in the metaverse will be driven by coordinating loyal customer bases who can participate in co-creating and re-defining products, services, and experiences offered to them, such as developing their own collectibles, games, and code (Peterson B, 2022).

In today's digital market, customers are seeking more from the brands they choose to purchase in terms of complete experiences, not just products. Engaging experiences can greatly impact a brand's success, but it can be challenging to offer such experiences for SMEs, which may not have the required investments to interact with their customers as opposed to the examples of large enterprises explored above; especially when face-to-face interactions with customers are not possible. While still considered to be in its early stages of adoption, the Metaverse market is expected to grow 10 times from USD 72.8 billion to USD 783.3 billion by 2024 (Lee, 2022). The potential for businesses to benefit from customer engagement in the Metaverse, and raises the question of whether small and medium-sized enterprises (SMEs) will participate in the adoption of this technology, which could play a significant role in its widespread use.

In the next section, I look at existing business models and frameworks proposed for customer engagement and value generation within the Metaverse.

8. Business Value Generation in Metaverse

According to the World Economic Forum's (WEF) report (World Economic Forum, 2023), Metaverse presents a chance to revolutionize the methods by which a varied group of creators, brands, and companies produce and distribute value. To accomplish this objective, it is crucial to develop the Metaverse with an economic approach that values learning from previous errors and promotes a sustainable and equitable economic environment for creators in this novel epoch of verified ownership. By facilitating a mutually beneficial exchange of value, creators, participants, and providers can create new opportunities for fair and impartial digital economies. Brands and platform providers can profit from empowering and amplifying creators, who are attuned to consumer preferences. The impact of the creator economy is not restricted to content creation and will revolutionize the Metaverse, as creators have the power to innovate and disrupt the conventional approach, hastening the pace of Metaverse adoption.

To ensure significant value exchange and distribution in augmented or immersive worlds, individuals and businesses must identify their position within the Metaverse economy and establish a clear Metaverse strategy, objectives, and target audience. They need to assess their existing products and services, competently integrate them into Metaverse environments, or be willing

to adapt their business models to accommodate the potential changes.

8.1. Business Models Proposed for Consumer Metaverse

Business model innovation is crucial for corporations to innovate, increase profits, and adapt to changing environmental conditions. The example of Facebook demonstrates how business model innovation can be effective in volatile business climates. As the Metaverse continues to grow, it presents new opportunities for making money beyond traditional methods and provides novel experiences for consumers. Economic frameworks will develop into a mutually dependent network involving all players, fueled by engaging experiences, effortless purchasing options, and a foundation that supports both (Krishna, 2023). both. The World Economic Forum (WEF) (World Economic Forum, 2023) has proposed various economic models to enable this development. In this context, the proposed models will be discussed, which are tailored to the needs of consumers in the Metaverse.

i. Digital Products and Assets

The emergence of the metaverse has generated interest in exploring potential business models in recent years, with Facebook's CEO, Mark Zuckerberg, announcing the company's new name, Meta Interfaces Inc., in line with its mission to

bring the metaverse to life. This has generated interest in exploring the potential business models for the consumer metaverse, particularly in the area of digital products and assets. including those related to digital products and assets. Similarly, digital tokens, for instance, enable fractional ownership of virtual assets like NFTs and avatars and generate passive income through transactions and royalties in the Metaverse². Examples include "phygital" products, digital assets owned in Decentraland, and consumables. For mass adoption of Metaverse, it is being proposed by the World Economic Forum that novel economic frameworks leveraging digital assets may emerge. These frameworks may involve designing particular assets tailored to specific groups as a form of incentive for their involvement. Additionally, some frameworks, like converting the bond between a brand and its consumers into tokens, may allow for increased involvement, cooperation, and innovation, where users' imaginative contributions are acknowledged and compensated. By doing so, these frameworks may foster a feeling of unity, motivation, and allegiance (World Economic Forum, 2023). This suggests a shift towards a metaverse-focused business model, which is indicative of the direction of an evolving landscape in the digital market.

In the realm of Digital Products and Assets, brands and retailers are recognizing the

² For more details on NFTs see <https://www.xaxis.com/a-guide-to-web3-nfts-and-the-metaverse/>

importance of involving consumers in the product design and financial processes. Digital twins are being incorporated into products to cater to the next generation of buyers, including pro-consumers. Unlike traditional consumers, pro-consumers want to be actively involved in the development of the product and establish a sense of loyalty and engagement with the brand. This shift has been particularly noticeable among Gen-Z consumers who are actively participating in the development of products (Periyasami, 2022).

ii. Access and Influence

The Metaverse's pay-to-access economic model will require payment for premium and exclusive offerings, and the pricing structure will be designed to complement the customer experience, with examples such as play-to-earn, premium tier access, and usage-based tolls^{3 4}. Play-to-earn allows users to earn rewards for their participation, while premium-tier access offers exclusive features and benefits to subscribers. Usage-based tolls will enable customers to pay for the actual usage of products or services within the Metaverse, similar to how tolls are charged on a usage basis in the physical world (World Economic Forum, 2023).

iii. Immersive Commerce

The Metaverse is expected to drive the next stage of commercial development. Retail businesses will create experiences that

blend the virtual and physical worlds, enhancing shopping expeditions by offering virtual fitting trials or integrating virtual elements, and new retail strategies will emerge to facilitate the transactions of digital items. Virtual merchandise and services will enhance virtual experiences and create connections between physical and virtual goods and services. Illustrations of these strategies include a marketplace, an immersive trade, and cross-channel shopping. The expansion of business models based on tokens and the decentralization of certain elements of the commerce value chain could pave the way for a possible shift towards a decentralized future of commerce (also known as commerce 3.0), where decentralized commerce (DeCo) platforms gain widespread adoption (World Economic Forum, 2023).

iv. Payments and Currency

In the Metaverse both users and creators engage in transactions of buying and selling merchandise, calling for a payment system that supports a digitally native economy. As novel digital assets and currencies emerge, there will be a need for financial services that promote interoperability between physical and virtual environments. Examples of such services include in-platform tokens with utility, custody of digital wallets, and fractional lending. A possible mass adoption of this model, as predicted by the report (World Economic Forum, 2023) would

³ For more details see, [Payments in a Metaverse economy \(quantoz.com\)](https://quantoz.com)

⁴ For more details see, [Play-to-Earn Business Model: How It Works, Where Value Comes From \(businessinsider.com\)](https://businessinsider.com)

involve integrating digital wallets into the realm of financial and business services.

v. Asset Monetization

In the context of Metaverse SMEs, asset monetization refers to the process of generating revenue by leveraging the assets within the virtual environment. This includes various digital assets such as virtual real estate, virtual goods, and virtual services. By creating and monetizing these assets within the Metaverse, SMEs can generate new revenue streams and potentially create sustainable business models (Krishna, 2023). The Metaverse offers unique opportunities for asset monetization; similar to physical assets, virtual assets stored in digital wallets can be utilized to create new products and store value. However, unlike physical assets, virtual assets do not always appreciate in value independently. To address this issue, virtual assets must be able to produce a passive income or yield for their owners. This can be achieved through a variety of monetization methods; such as staking, earning, airdrops, and credit or loans. These methods allow virtual assets to generate revenue and create new streams of income for their owners in the Metaverse. Additionally, end-users, creators, brands, and businesses can rent out virtual spaces and digital products, providing further opportunities for generating passive income. As the mass adoption of asset monetization grows, the potential for new and innovative revenue streams within the Metaverse is immense (World Economic Forum, 2023).

vi. Advertising and Marketing

The marketing and advertising landscape is set to change dramatically, as the industry moves towards dynamic and experiential models that feature personalized and non-intrusive advertisements. These new models will incorporate elements of physical and digital environments, as well as predictive technology. Gamification will also play a significant role in the emerging marketing landscape, with virtual brand universes and loyalty programs that utilize tokens. Immersive ads will provide engaging experiences to consumers, and content creation will evolve towards more organic, immersive, and user-friendly experiences.

As a result of these changes, novel concepts will emerge, ranging from large-scale programmatic advertising to hyper-personalized brand interactions that allow users to fully immerse themselves in a brand's world. Virtual and augmented reality channels will be seamlessly integrated across different platforms. All of these approaches will be built upon a foundation of secure user identity, where individuals have control over their own data. As a result, customers have the opportunity to share in the profits made from their information.

This marketing and advertising shift is closely linked to the trend of pro-consumerism, where consumers are actively participating in the product design process, community engagement, and loyalty programs. Digital twins are being integrated into products, and Gen-Z consumers are demanding a more

active role in the process. Brands and retailers are responding by engaging with their communities and involving them in the development of digital products.

Hence, the emerging marketing landscape will be more dynamic, immersive, and user-friendly, with personalized and non-intrusive advertisements that incorporate elements of physical and digital environments. Gamification will play an integral role, and virtual brand universes and loyalty programs will utilize tokens. This shift is closely linked to the trend of pro-consumerism, where consumers are demanding a more active role in the product design process and community engagement. The foundation of this shift will be built upon secure user identity, where individuals have control over their own data, and have the opportunity to share in the revenue generated by their information (Periyasami, 2022) (World Economic Forum, 2023).

vii. Creator Economy

The Metaverse is expected to have a significant impact on the Creator Economy, providing creators with new opportunities to monetize their intellectual property. Through usage fees, transactional fees, and create-to-earn models, creators will be able to generate income based on their creations' usage and transactions. These models will promote collaboration and partnerships between creators and businesses, resulting in a surge of creator-driven content and experiences that blur the boundaries between creators and consumers. With the

emergence of new tools and partnerships, the Creator Economy is poised to see unprecedented growth and innovation as creators take advantage of the Metaverse's multidimensional capabilities. Additionally, the impact of the Metaverse on other industries such as tourism, real estate, fashion, and furniture shopping is expected to provide new opportunities for businesses to offer efficient cost structures, while also establishing robust communities for long-term client connections. Overall, the Metaverse's impact on the Creator Economy and other industries will be significant, and companies that are agile and forward-thinking are likely to reap the benefits of this rapidly evolving landscape. (World Economic Forum, 2023) (Krishna, 2023).

viii. Metaverse-Native Services

Various tech companies like Microsoft and NVIDIA are developing Metaverse-native services to enable users to interact and collaborate in virtual environments (Krishna, 2023). These services support remote learning, digital manufacturing, and digital design. Meta Interfaces Inc. has entered this market, where Microsoft and NVIDIA have established Metaverse-native services (Periyasami, 2022). As the Metaverse emerges, new virtual services will be required to meet customer needs. Examples include smart contracts, digital twins, and rendering-a-service (World Economic Forum, 2023). The demand for these services will increase as more worlds become interoperable in the Metaverse.

The convergence of industry platforms, product platforms, pipeline platforms, and digital infrastructure has led to the development of multi-sided platform businesses that are more efficient, sustainable, and transparent. The Metaverse infrastructure comprises distributed ledger technology such as blockchain. It merges and interacts with different platforms to build new business models. The retail and FMCG industries are examples of industries where customer experience and personalization are crucial. Meanwhile, the Metaverse's foundation is based on experiences, which opens up new avenues for monetization and the development of business models that promote and sell products, goods, and services (World Economic Forum, 2023). Customer experiences will play a key role in generating value in the Metaverse, and these new virtual services will be crucial in creating these experiences.

Realizing Metaverse's full potential is not without challenges, especially for SMEs. In the upcoming sections, explored how these business models can be leveraged by SMEs to interact with and grow their customer bases, what impediments they may face, and the drivers and implications for mass adoption of the Metaverse.

9. Metaverse Mass Adoption - Broad Challenges

Undoubtedly, Metaverse offers numerous benefits, as discussed in previous sections, but there are certain challenges posed by Metaverse that need to be overcome in order to make its early and mass adoption easier. Some of the broad perspective challenges discovered by experts are discussed below:

9.1. Technological

Computer science researchers envision the Metaverse as a collection of interconnected virtual realms that operate on three-dimensional platforms. In these digital spaces, people engage with both digital content and each other (Signé Landry, 2022). The Metaverse could be achieved by combining augmented reality (AR), virtual reality (VR), cryptocurrencies, the internet of things (IOT), 5G internet, 3D modeling, artificial intelligence (AI), cybersecurity, and non-fungible tokens (Qureshi, 2022). Hence, to ensure mass adoption, the first and foremost challenge is to make access to these technologies available to everyone (Viñuela, 2022).

9.2. Data Privacy and Security

Metaverse technologies generate and collect a significant amount and variety of data, which poses significant challenges to data privacy and security, as described in (Chen C, 2023) and (Signé Landry, 2022). For instance, the OpenSea NFT marketplace was subjected to an attack in 2022 due to smart contract flaws and phishing. This hacking

compromised the accounts of 17 users, resulting in a loss of \$1.7 million (Wang, 2022). According to (Alegría, 2022) the significant potential of the Metaverse brings a significant responsibility, which will require the enhancement of security systems to a higher level. Metaverse highly depends on the identity of its users (Huang Y, 2023) because, to facilitate interaction in a virtual venue, users must create an avatar to navigate the environment, and authentication and identity information are essential for this purpose (E-Spin, n.d.). Therefore, new methods of data protection as well as the heritage of the virtual world are required to ensure its adoption at large-scale as the amount of data that identifies us today is expected to multiply in Metaverse (Alegría, 2022).

9.3. Ethical

The safety concerns of the Metaverse which is set to be the next phase of the internet (Fernandez C. B, 2022) need to be addressed proactively due to its immersive nature. Online abuse experienced by users will likely worsen once transferred to virtual and augmented reality environments. The literature identifies that virtual threats are perceived by humans similarly to actual threats, and users who experience abuse in virtual and augmented realities find it "*far more traumatic than in other digital worlds*". Women report experiencing discrimination and violence more acutely in VR and AR environments, where online harassment has been prevalent since the internet's inception. While people can feel more

connected through these virtual technologies, they can also cause more realistic harm. Online harassment disproportionately affects minorities and is likely to be replicated in the Metaverse. Without policies to prevent such abuse, safety concerns could impede the mass adoption of Metaverse (Signé Landry, 2022).

9.4. Legal

A major issue in the Metaverse is the absence of regulations. Being a distinct realm, any existing Metaverse currently operates without any legal framework. Consequently, the Metaverse would resemble with “Wild West” (Qureshi, 2022). Hence, a number of questions arises as a challenge to Metaverse becoming an accepted and adopted reality; such as:

- Which legal authority is applicable within the Metaverse?
- What actions are permissible and which are prohibited?
- How can we ensure legal assurance for the numerous users who will engage in the same virtual environment concurrently, originating from various nations? (Alegría, 2022)

Unlike other digital environments, regulations in the Metaverse need to be proactive and promote positive behavior while also having effective measures to report, prevent, and address negative behavior (Signé Landry, 2022).

9.5. Interoperability

The interoperability of technologies in the Metaverse is crucial for the seamless integration of virtual and physical environments (Wang, 2022). For example, (Shih, 2021) highlighted the significance of interoperability standards for the Metaverse because they permit the fusion of disparate technologies and applications, allowing users to travel effortlessly between virtual and real worlds. According to the study, a standard data format, communication protocol, and middleware are required for Metaverse interoperability in order to provide a consistent user experience across various platforms and technologies. Since the Metaverse is a fusion of various technologies and trends (E-Spin, n.d.), its global accessibility would necessitate a high level of interoperability among the technologies used to create it.

As a result, multiple international standardization organizations would need to implement numerous regulations (Viñuela, 2022). Such as:

- The success of the Metaverse would depend on the ability of different worlds and spaces to connect and interact with each other.
- To achieve interoperability, creating open standards and APIs for Metaverse technologies and platforms is crucial.
- Multiple international standardization organizations,

such as the International Organization for Standardization (ISO) and the Institute of Electrical and Electronics Engineers (IEEE), are developing standards for virtual reality (VR) and augmented reality (AR) technologies.

- These organizations are working towards creating guidelines for interoperability, quality, and safety, which could also be extended to the Metaverse in the future.

9.6. Economical

The Metaverse entails the interaction of numerous users from diverse countries; therefore, it is crucial that all users utilize a common economy facilitated by one or more digital currencies to enable payments and transactions. For instance; all users in Decentraland use the same currency called as "Mana" which is a meta-coin (Akkus H T, 2022) that makes the transactions simpler (Alegría, 2022). According to (Alegría, 2022), "Without the crypto world, the Metaverse cannot unfold its full potential." As individuals spend more time in the Metaverse and conduct transactions there, cryptocurrencies may become more prevalent in economic activities, potentially leading to a transformation of the global economy (Signé Landry, 2022). The Metaverse will disrupt the present-day work and the economy, which will increase the risks of the automation of several jobs and

the emergence of new jobs. This will be quite challenging for those who are unprepared with the necessary skills or guidance. Furthermore, the widespread use of unstable cryptocurrencies lacking robust regulatory frameworks may affect trust in Metaverse economies. Cryptocurrencies are vulnerable to theft, as evidenced by their recent history, presenting an obstacle to adoption (Alegría, 2022).

9.7. Social

The Metaverse represents more than just a novel technological advancement; it also signifies a significant shift in society (Fernandez C. B, 2022). Similar to the rise of social media marketing over a decade ago, the rapidly growing Metaverse has the potential to fundamentally alter how people interact with each other for business, leisure, and trade (Jung, 2023). This will bring multiple challenges as activities in Metaverse range from shopping, virtual Healthcare, co-creating tools to Training and Education. These challenges may include, Access Inequality, protection for children, legal issues (asset ownership, harassment laws, regulation and policy making), Desensitization (Violence, racial discrimination and Misogyny), Identity Theft and Health Concerns (Marr, 2022) as the impact of XR technologies on our health still needs to be studied (Viñuela, 2022).

Businesses are likely to face challenges related to the technological advancement required for Metaverse adoption, along with the cost required to upgrade human resource or train the existing ones.

Moreover, there is going to be challenge in terms of legality as regulations regarding Metaverse are still under debate and interoperability will also affect businesses as they enter Metaverse. The existing literature reflects some insights into how these challenges will cause impediments for business adopting Metaverse but the challenges pertaining to SMEs' adoption of Metaverse still need to be explored. The challenges related to businesses and the implications for mass adoption are discussed in the next section.

9.8. Business

Whenever there is an introduction of a new technology trend, numerous questions arise, with the crucial one being whether it is a sound decision to adopt it. There is no doubt that the adoption process is difficult, particularly for a technology that is still in its early developmental stage. The value proposition of Metaverse includes immersive experiences that necessitate hardware such as; glasses controllers and (Alegría, 2022) virtual headsets (E-Spin, n.d.), which are currently only accessible to

a small portion of the population (Alegría, 2022). The expenses involved in establishing a virtual environment and procuring the necessary equipment for its implementation, such as virtual headsets, and licenses for virtual reality content, as well as training and education, vary (E-Spin, n.d.). In essence, the inception of the Metaverse is costly, and careful investment planning is crucial to ensuring its adoption is worthwhile. The adoption of Metaverse, which offers fresh opportunities like increased collaboration through mixed reality, will likely prompt modifications in business tactics, procedures, policies, and structures as businesses face new challenges and possibilities in Metaverse (Ariana Polyviou, 2022). Another issue with the mass adoption of Metaverse is that the equipment required to utilize it comes with a high price tag. Currently, AR/VR headsets, cryptocurrency, 5G, and fast internet connections are costly (Qureshi, 2022). The table below summarizes the different challenges discussed above and their implications for mass adoption.

Table 3: Metaverse Adoption Challenges for Businesses and Implications

Types of Issues	Description	Implications	References
Technological	Metaverse is possible through the use of augmented reality (AR), virtual reality (VR), cryptocurrencies, the internet of things (IOT), 5G internet, 3D modeling, artificial	For mass adoption, everyone needs access to these technologies, and currently they are quite expensive and only a very small number of people	(Qureshi, 2022) and (Viñuela, 2022)

	intelligence (AI), cybersecurity, and non-fungible tokens.	have access to them, which may hinder the growth of businesses adopting Metaverse. Metaverse is in its infancy, and it will take time for businesses to consider it a need to be adopted unless they see a return that outweighs the benefits (Yawised, 2022).	
Data and Privacy	Metaverse technologies generate and collect a significant amount and variety of data, which poses significant challenges to data privacy and security.	For any business to thrive in the digital domain the trust of customers is important, and the fear of identity theft and other privacy concerns would impact the business in terms of gaining a customer base and retention. There is a lack of regulatory bodies authorized to govern what and how things happen in Metaverse. The absence of governing, regulatory, and compliance bodies may cause security breaches for businesses, leading to	(Signé Landry, 2022), (Chen C, 2023) and (Huang Y, 2023)

		abuse of customer data through unauthorized access.	
Ethical	Harassment, discrimination, and violence issues; minorities are more likely to be targeted by online harassment, and this pattern is expected to be replicated in the Metaverse.	Any customer needs a safe environment, and unaddressed ethical concerns may cause problems for businesses trying to attract and engage their customers.	(Signé Landry, 2022) and (Fernandez C. B, 2022)
Legal	Absence of laws and regulations	Owing to existing legal and regulatory blind spots and potential cybercrimes, businesses might fail to build a good brand image.	(Alegría, 2022)
Interoperability	Metaverse being a combination of various technologies, requires interoperability to be adopted.	While standardization of merging technologies is still nascent, there is uncertainty and complexity regarding the setting up of Metaverse infrastructure, raising the question of security as well as compatibility with businesses' existing IT infrastructures or the necessitation of	(Viñuela, 2022) and (Wang, 2022)

		developing new, standardized ones.	
Economical	Cryptocurrencies will be the way of conducting transactions, and new skills will be demanded for jobs. The Metaverse will cause a disturbance in the current job market and economy, leading to an increased likelihood of automation for some jobs and the emergence of new ones.	The skill set required for jobs will shift, and businesses will face a shortage of uniquely skilled HR, designers, and marketers to operate in Metaverse. Also, not being familiar with trading in cryptocurrencies, digital asset exchanges, etc. may hinder the performance of businesses in Metaverse.	(Alegría, 2022) and (Akkus H T, 2022)
Social	Metaverse redefines how people leisure, interact, and trade.	Businesses would require innovative ways to offer products that meet the social and product/service needs of their customers.	(Viñuela, 2022) , (Jung, 2023) and (Fernandez C. B, 2022)
Businesses	The costs associated with setting up a virtual environment and obtaining the required equipment for its execution, including virtual headsets, licenses for virtual reality content, and	The inception of the Metaverse is costly, and careful investment planning is crucial to ensuring its adoption.	(E-Spin, n.d.) and (Qureshi, 2022)

	training and education, can differ.		
--	-------------------------------------	--	--

Despite the challenges, the discussion above highlights that the potential value and applications of Metaverse cannot be ignored. I tried to unpack this in the next section, focusing on SMEs in particular for the scope of this paper.

9.9.

9.10. Perceived Value of the Metaverse for Small And Medium Enterprises (SMEs)

As large enterprises have already started to invest in Metaverse, it is high time for small and medium enterprises to prepare for the upcoming challenge. The types of industries that will be affected are manufacturing, retail/e-commerce, real estate, and tourism. Currently, the advantages of the Metaverse (discussed in previous sections) for small businesses are mostly hypothetical, however, they have the potential to be substantial (Kalibbala, 2022).

Small businesses can benefit from the Metaverse in several ways; some of them are discussed ahead in this section, supported by a case study from Indonesia of Lasem Batik SMEs. Lasem is a sub-district in Indonesia that is known for its classical style of coastal batik craft. The batik produced in Lasem is characterized by its vibrant colors and diverse motifs, which reflect the blend of Javanese culture with various immigrant cultures, including Champa (Vietnam), India, China, and the Netherlands. Unlike other coastal batik styles, Lasem batik is renowned for its use of bright colors such as red (bang-

angan), blue, yellow, and green (Hastuti T D, 2022).

9.10.1. Increased Visibility

Metaverse can enhance SMEs' visibility and allow them to expand their audience (Kalibbala, 2022). A case study on Lasem Batik SMEs was conducted; this study aimed to explore the potential for Lasem Batik small and medium-sized enterprises (SMEs) to use Metaverse technology as a marketing tool to boost their sales. A total of 40 owners of batik businesses were interviewed, and their responses concluded that utilizing the Metaverse will provide them with numerous advantages, particularly concerning the expansion of their market (Hastuti T D, 2022).

9.10.2. Increased Customer Engagement

The immersive and interactive nature of the Metaverse can improve customer engagement, which can be beneficial for small businesses. Companies have the opportunity to connect with customers within the Metaverse, and this can be achieved in various ways, such as by organizing virtual events, conferences, meetings, and meetups. They can also use

virtual reality (VR) technology to create captivating and interactive marketing campaigns or develop digital versions of physical products that can be used within virtual worlds (Kalibbala, 2022). As major consumers of Metaverse will be Gen Z, they are already quite tech savvy as they have grown up in the internet era; therefore, to engage Gen Z customers, significant modernization is needed to create experiences that are truly transformative (Buhalis D, 2022). Lasem Batik SME's participated in a group discussion for a case study on Metaverse and 15% of participants stated that they had to always maintain good relations with customers and expand their relationships. This means that businesses have the opportunity to dive into Metaverse for increased customer engagement, which is one of their major needs.

9.10.3. Decreased Physical Infrastructure Cost

The Metaverse can lower costs for small businesses as it eliminates the need for physical infrastructure (Kalibbala, 2022). Small and Medium Businesses can operate through online stores using digital technologies without having to have physical outlets where they display their products. This way, Metaverse will provide them the opportunity to delimit the geographical constraints while minimizing the operational costs of staff, display outlets, and their maintenance. An example can be given of Batik SMEs, which encountered losses during COVID-19 as physical access to stores was not possible and sales were also

impacted due to a shift in road infrastructure, which limited customers as the area where they have their physical outlets became less visited. Metaverse offers customers the space to visit stores of their choice from the comfort of their homes.

9.10.4. Flexibility

SMEs are afforded great flexibility in experimenting with fresh business models and strategies in the Metaverse. The Metaverse also provides a unique opportunity for small businesses to compete with larger enterprises on a global level by taking advantage of its benefits (Kalibbala, 2022). For example, a company can launch its product in Metaverse before manufacturing it physically and garner initial customer response for improvements. The user can experience the product in Metaverse and provide feedback thereby providing the company with the benefit of tracking the feedback of its potential customers before investing in real-time product development. This will help the businesses reduce the risks of losses that are incurred due to decreased sales.

9.10.5. The Next Gen Digital Marketing Tool

The Metaverse can be utilized by small businesses to generate interactive marketing experiences in 3D that seize attention and involve potential customers in novel approaches - traits that customers are inclined to accept (Kalibbala, 2022). The marketing of Lasem Batik has faced difficulties due to economic conditions, and

various efforts have been made to promote it through both offline and online channels. The online marketing strategy includes live streaming on Instagram. The COVID-19 pandemic and transportation changes have also affected Lasem Batik's marketing efforts. The company has responded by using social media platforms such as Facebook, WhatsApp, and Instagram to market their products more aggressively. The research explored the potential of Lasem Batik SMEs using Metaverse technology for marketing purposes. Batik entrepreneurs were inquired about using Metaverse as a marketing tool and 48% of them agreed to realize the potential of Metaverse in terms of marketing and will use it. The paper proposes a prototype exhibition space for Batik designs using Metaverse assets to reach a global audience (Hastuti T D, 2022).

The benefits discussed above suggest that Metaverse has the opportunity to add business value for SMEs. However, there are certain drivers necessary for Metaverse mass adoption. I discussed these in the next section.

9.11. Drivers for Metaverse Adoption by SMEs

9.11.1. Technology

Currently, the only way to access the virtual world in the Metaverse is through the use of VR headsets and Mo-cap gloves, but this limitation is expected to be resolved with the progress of technology (Ravi, 2022) and Meta and Apple are creating augmented

reality and virtual reality devices and working to make them more available to average consumers (Richard, n.d.).

Small business owners have the opportunity to try out VR and AR technology, as platforms like Shopify introduce tools to provide virtual experiences on their e-commerce sites. Shopify has added support for 3D models on its product pages, which enables customers to view products in AR. Additionally, Shopify has a support team to assist businesses in creating these models.

9.11.2. Government Support

Support is required from the governments for access to finance, skills development and training, digital infrastructure, facilitating partnerships, and competitive development to incentivize businesses in order to adopt Metaverse technology (Hastuti T D, 2022). For example, the UAE government launched its Dubai Metaverse Strategy in 2022, which aims to advance Dubai's position in the Metaverse industry by fostering innovation, collaborating on research and development, and creating ecosystems that attract companies and projects to Dubai. Moreover, this strategy plans to encourage the development of talent and invest in future capabilities by providing adequate support for Metaverse education focused on enhancing the skills of developers, content creators, and users of digital platforms within the Metaverse community (Riaz, 2022). Seoul is another example of being one of the first governments to launch its own metaverse platform with an alliance of 500 firms to improve healthcare, the economy

and infrastructure, investing \$26 million in state-backed financing (Robinson, 2022).

9.11.3. Role of Mass Media, Business & Technology Ecosystems and Non-Governmental Organizations

The provision of IT support can help dispel uncertainties related to the usage of the Metaverse and foster a strong sense of conviction that encourages active participation and exploration of business development opportunities (Hastuti T D, 2022). The participation of both mass media and non-governmental organizations can play a role in supporting the willingness of small and medium-sized enterprises (SMEs) to adopt the Metaverse. For example, mass media can help Lasem Batik's SMEs to get the attention of the government in terms of necessary support for their development of Batik SMEs (Hastuti T D, 2022). In addition, recognized businesses in the technology ecosystems can help develop talent, share skillsets and expertise for Metaverse application development, such as the establishment of the Metaverse Academy in France (AFP, 2022). Through resource sharing, mentorships, and partnerships, such initiatives can have a trickle-down effect across the business community, enabling mass adoption.

As the existing literature lacks discussion on practical steps for adoption of Metaverse by SMEs, discussed and highlighted a few recommendations that can be taken by

SMEs to jumpstart their journey of Metaverse.

9.12. Steps for SMEs to prepare for Metaverse Mass Adoption

i. Increase Your Online Presence through Metaverse

Since the Metaverse is essentially the next-generation internet, the initial step towards success is developing a website. A simple website builder like Shopify can be used to create an official webpage, with e-commerce capabilities being the ideal approach to selling virtual products and services on your site. Furthermore, the software platform has an extensive app marketplace that can be utilized to integrate third-party metaverse add-ons onto your website, such as an AI or VR chatbot. (Young H. , 2022). Shopify has added support for 3D models on its product pages, which enables customers to view products in AR. Additionally, Shopify has a support team to assist businesses in creating 3D models (Heaslip, 2022). Maintaining an online presence is crucial for small businesses, as it helps to attract traffic to their website or physical store and prevents customer frustration from a lack of information (Dodhia, 2022).

ii. Adjust Your Business Model

Business models (BM) often have a limited lifespan, especially in rapidly changing environments such as the digital world. Even if a BM was successful in the past, it may lose effectiveness in serving customers and generating profits. As a result, companies

must constantly seek out new and better combinations of BM elements, even before external pressures arise and force them to do so (Kraus, 2022). To better perform your operations in virtual reality, it could be beneficial to modify your business model in anticipation of the Metaverse. (Young H. , 2022). Metaverse applications can provide brands with the chance to either expand their existing position in the physical world or entirely redefine their brand image in a novel virtual environment (Suwinto, 2022).

iii. Start Conducting Customer Research

Conducting customer research is effective for SMEs to understand their target audience and improve their business strategy. Customer research helps SMEs gain valuable insights into customer behavior and preferences, which can be used to optimize their products, services, and marketing efforts. By collecting data on customer needs, preferences, and pain points, SMEs can tailor their Metaverse strategy to meet the needs of their target audience. Effective customer research can lead to improved customer engagement, increased customer loyalty, and ultimately, business growth (Young H. , 2022).

iv. Know Your Niche

As small and medium scale enterprises (SMEs) plan to enter the Metaverse, it is crucial to choose the right platform that aligns with their business goals and niche (Dodhia, 2022). To do so, businesses should evaluate the features and capabilities of

different Metaverse platforms and consider their intended use cases; such as, a retail-focused Metaverse would not meet the needs of an outdoor fitness niche product seller. It is essential to identify the narrow niche of the industry and potential customers' needs in the physical world to determine the best type of Metaverse to integrate with (Young H. , 2022). Additionally, as each business has a unique interpretation of entering the Metaverse, businesses should focus on what they do best and consider how to leverage the strengths of their business in the Metaverse. For instance, a startup might focus on creating more intelligent AI to tackle customer queries, while another might build an entire virtual reality world. By choosing the right Metaverse platform and leveraging their strengths, SMEs can enter the Metaverse and thrive in this new business frontier (Kalibbala, 2022).

v. Getting Started in The Metaverse

To successfully leverage the Metaverse, SMEs need to invest in training, upskilling, or hiring the right talent. This includes individuals with knowledge of VR/AR technologies, game development, or 3D modeling, who can create engaging and immersive experiences for their customers. Additionally, as discussed in the case study of Lasem Batik entrepreneurs, it is important to study the Metaverse with new knowledge and techniques never considered before. This could include understanding the behavior and preferences of customers in virtual environments as well as the technical

skills needed to build and maintain Metaverse platforms (Hastuti T D, 2022).

In addition, SMEs can collaborate with companies that are providing Meta-as-service (MaaS) platforms as an extension to earlier solutions like cloud-as-a-service, software-as-a-service, and platform-as-a-service. Readily available solutions would allow SMEs to skip the hassle and investment in adopting Metaverse capabilities from scratch and significantly reduce the launch time for exhibiting and interacting with customers in the Metaverse. I tried to explore in the following section.

9.12.1. Meta-as-a-Service (MaaS) for SMEs

SMEs can adopt Metaverse capabilities quickly without extensive investment by collaborating with companies offering Meta-as-a-Service (MaaS) platforms. MaaS solutions reduce the launch time for exhibiting and interacting with customers in the Metaverse, enabling SMEs to focus on creating compelling experiences. By leveraging MaaS platforms, SMEs can gain a competitive advantage and establish themselves as leaders in their industries.

Metaverse-as-a-service (MaaS) allows companies to customize their Metaverse products for target audiences without coding expertise (Sandeep, 2023) It also enables them to create their own Metaverse equivalents that compete with established platforms and benefit from existing Metaverse technologies. Existing MaaS

platforms, including Lovelace World, PropelMaaS, Touchcast, and MetaVerseBooks, offer various services for businesses to enter the Metaverse economy without incurring substantial costs. Lovelace World provides VR game monetization, NFT experience development, platform integration, and smart contract operations across blockchain networks. PropelMaaS specializes in smart contract creation and deployment for Metaverse environments, with integration services for gaming and NFT. Touchcast offers scalability, agile services, and easy integrations (Shahid, 2022), while MetaVerseBooks develops and manages virtual reality environments, NFTs, and decentralized applications. (Maticz, n.d.).

SMEs can develop Metaverse products and engage with customers globally through MaaS platforms, providing an opportunity for Metaverse adoption. The discussion and findings are concluded in the final chapters below.

10. Conclusion

The Metaverse offers businesses a way to enhance customer experiences and create value, with gaming, construction, marketing, and retail being its main focus areas. However, challenges such as social, technological, data privacy, business, and legal issues may hinder its mass adoption. While existing business models have been studied, their implications for SMEs have not been comprehensively researched. To address the challenge of mass adoption, especially for SMEs, recommend leveraging Metaverse-as-a-Service (MaaS). MaaS provides SMEs with access to customized microservices, enabling them to select a service provider that suits their business needs, as per their budget and niche, and scale their operations in the Metaverse accordingly. Companies like Happiest Minds can provide support to SMEs towards setting up a Metaverse product strategy and Metaverse application development through their platform engineering expertise (Ritesh Gupta, 2022). With this, SMEs can reach their target audiences, including younger and elderly individuals who can access the platform from their homes.

SMEs can use Sokin, a startup offering e-commerce payment solutions in the Metaverse, to expand their operations. Establishing a strong online presence and considering changes before implementation is crucial. Flexibility towards shifting business models, as shown by Pixelmax, is also important for leveraging the Metaverse (Young H. , 2022). These companies

demonstrate the importance of testing and being prepared for challenges in Metaverse adoption (Jung, 2023).

11. Recommendations

The emerging consumer metaverse presents significant opportunities for SMEs to generate revenue and enhance the customer experience. To capitalize on these opportunities, SMEs must create digital products and assets tailored for the metaverse, and explore the exciting possibilities of fractional ownership of virtual assets through digital tokens. Furthermore, SMEs can shift towards novel business models that use digital assets to motivate specific consumer groups, leading to increased engagement and brand loyalty. SMEs can also enhance the customer experience by creating virtual showrooms and immersive experiences. To further enhance their business models, SMEs can leverage new payment and currency systems, such as accepting digital currencies like Bitcoin or Ethereum, and licensing intellectual property to other businesses or individuals in the metaverse. By adapting their advertising and marketing strategies, exploring immersive advertising, and collaborating with influencers, SMEs can reach new audiences in the metaverse. Small and medium-sized enterprises (SMEs) can enhance their digital marketing strategy by leveraging the power of Metaverse influencers and virtual brand ambassadors. This approach can help them reach a larger audience and promote their products and services effectively. One way to produce

distinctive content in the Metaverse is by incorporating gamification into marketing strategies. Companies have the ability to create virtual games and challenges that serve the dual purpose of entertaining customers while also educating them about their products and services. An SME that specializes in sustainable products can develop a virtual game that encourages customers to reduce their carbon footprint by making eco-friendly choices in a simulated environment. These types of games have the ability to not only capture the attention of customers, but also increase their awareness of the brand's values and mission.

Lastly, SMEs can take advantage of the unique characteristics of the metaverse by exploring metaverse-native services that cater to the immersive nature of the metaverse, such as virtual concierge services or personalized shopping experiences. Implementing these recommendations will enable SMEs to position themselves for success in the evolving Metaverse market.

12.Future Research

Recognizing the potential of Metaverse adoption for SME growth, propose following research areas for business owners and academic researchers.

Since SMEs can leverage the Metaverse to create innovative digital marketing strategies, customer satisfaction scores, conversion rates, engagement rates, and other KPIs can be used to measure the effectiveness of marketing in the Metaverse for any organization.

To ensure well-rounded and sustainable implementation of the steps outlined in the recommendations section, business owners and researchers must be mindful of the socio-economic impacts of the Metaverse. The Metaverse has the potential to significantly impact customer behavior, employment opportunities, and income distribution. As discussed earlier, Metaverse technology may also lead to the displacement of traditional jobs and exacerbate income inequality. Such impacts need to be deeply studied for Metaverse to become ubiquitous.

To mitigate these potential negative impacts and maximize the benefits of the Metaverse, SMEs, should conduct their own thorough qualitative and quantitative research and analysis by studying case studies and conducting surveys on SMEs that have successfully implemented Metaverse strategies and have derived business value. Also, social acceptance of Metaverse is a potential area of study that will assist in Metaverse mass adoption.

In conclusion, there is still much to be learned about the Metaverse and its impact on SMEs. Through research and experimentation, SMEs and academicians can understand the socio-economic impacts, learn from successful case studies, and measure performance quantitatively.

References

- AFP. (2022, June 12). *Meta to launch 'metaverse academy' in France*. Retrieved from Business Recorder: <https://www.brecorder.com/news/40179579/meta-to-launch-metaverse-academy-in-france>
- Akkus H T, G. S. (2022). Metaverse and metaverse cryptocurrencies (meta coins): Bubbles or future? *Journal of Economics Finance and Accounting*, 22-29.
- Alegría, Á. (2022, July 8). *Main challenges for the adoption of the metaverse*. Retrieved from Telefonica: <https://business.blogthinkbig.com/main-challenges-for-the-adoption-of-the-metaverse/>
- Ariana Polyviou, I. O. (2022). Chasing Metaverses: Refecting on Existing Literature to Understand. *Information Systems Frontiers*, 1-22.
- Bolton, M.-K. J. (2018). Customer experience challenges: bringing together digital, physical and social realms. *Journal of service management*, 776-808.
- Bolton, R. N. (2016). Service excellence: creating customer experiences that build relationships. *Business Expert Press*.
- Buhalis D, K. N. (2022). Mixed Reality (MR) for generation Z in cultural heritage tourism towards metaverse. *Information and Communication Technologies in Tourism* (pp. 16-27). ENTER 2022 eTourism Conference: Springer International Publishing.
- Buhalis, D. M. (2022). Metaverse as a driver for customer experience and value co-creation: implications for hospitality and tourism management and marketing. *International Journal of Contemporary Hospitality Management*, 701-716.
- Chen C, L. Y. (2023). Privacy Computing Meets Metaverse: Necessity, Taxonomy and Challenges. *IEE Internet of Things*.
- Dodhia, Z. (2022, February 7). *6 Ways to Get Your Small Business Ready for the Metaverse*. Retrieved from Entrepreneur: <https://www.entrepreneur.com/money-finance/6-ways-to-get-your-small-business-ready-for-the-metaverse/411969>
- Du, H. B. (2023). Rethinking quality of experience for metaverse services: A consumer-based economics perspective. *IEEE Network*.
- Duan H, L. J. (2021). Metaverse for social good: A university campus prototype. *29th ACM international conference on multimedia*, (pp. 153-161).

- E-Spin. (n.d.). *What are the challenges related to Adoption of Metaverse?* Retrieved from E-Spin: <https://www.e-spincorp.com/what-are-the-challenges-related-to-adoption-of-metaverse/>
- Fanbytes. (n.d.). *The 17 Best NFT Examples, Explained* . Retrieved from Fanbytes: <https://fanbytes.co.uk/nft-examples/>
- Fernandez C. B, H. P. (2022). Life, the Metaverse and everything: An overview of privacy, ethics, and governance in Metaverse. *IEEE 42nd International Conference on Distributed Computing Systems Workshops (ICDCSW)* (pp. 272-277). Bologna: IEEE.
- Gov.UK. (2022, January 27). *Small to Medium Sized Enterprise (SME) Action Plan*. Retrieved from Gov.UK: <https://www.gov.uk/government/publications/fcdo-small-to-medium-sized-enterprise-sme-action-plan/small-to-medium-sized-enterprise-sme-action-plan#:~:text=An%20SME%20is%20any%20organisation,is%20in%20the%20below%20table.>
- Gregerson, E. (2023, March 14). *Metaverse*. Retrieved from Britannica: <https://www.britannica.com/topic/metaverse>
- Guidi B, M. A. (2020). Social games and Blockchain: exploring the Metaverse of Decentraland. *IEEE 42nd International Conference on Distributed Computing Systems Workshops (ICDCSW)* (pp. 199-204). IEEE.
- Gupta, M. (2023, January 12). *Metaverse Applications in the Real World*. Retrieved from Forbes: <https://www.forbes.com/sites/forbestechcouncil/2023/01/12/metaverse-applications-in-the-real-world/?sh=a38614e48a23>
- Hamstra, M. (2022, June 20). *How to Monetize the Metaverse: Big Brands' Tech Partners Share Tips*. Retrieved from U.S. Chamber of Commerce : <https://www.uschamber.com/co/good-company/launch-pad/tips-for-monetizing-the-metaverse>
- Hastuti T D, S. R. (2022). The Readiness of Lasem Batik Small and Medium Enterprises to Join the Metaverse. *Computers*, 5.
- Heaslip, E. (2022, November 14). *What Small Businesses Need to Know About the Metaverse (and How They Might Use It)*. Retrieved from CO-By US Chamber: <https://www.uschamber.com/co/run/technology/what-small-businesses-should-know-about-the-metaverse>

- Hoyer, W. D. (2020). Transforming the Customer Experience Through. *Journal of Interactive Marketing*, 57-71.
- Huang Y, L. Y. (2023). Security and privacy in metaverse: A comprehensive survey. *Big Data Mining and Analytics*, 234-247.
- IBM. (n.d.). *Digital Experience*. Retrieved from IBM: <https://www.ibm.com/topics/digital-experience>
- Jung, J. (2023, March 21). *How to Take Your Small Business Into The Metaverse*. Retrieved from Venteur: <https://www.venteurmag.com/articles/how-to-take-your-small-business-into-the-metaverse/>
- Kalibbala, J. (2022, August 9). *The Value of the Metaverse for Small Businesses*. Retrieved from IT Business Edge: <https://www.itbusinessedge.com/applications/metaverse-for-small-businesses/>
- Khandaker, T. E. (2021, July 1). *5 BRANDS CREATING OUTSTANDING CUSTOMER EXPERIENCE IN THE METAVERSE*. Retrieved from Irish Tech News: <https://irishtechnews.ie/5brands-outstanding-customer-experience-metaverse/>
- Kraus, S. D. (2022). Facebook and the creation of the metaverse: radical business model innovation or incremental transformation? *International Journal of Entrepreneurial Behavior & Research*.
- Krishna, P. V. (2023). INVESTIGATING THE EFFECTS OF THE METAVERSE ON BUSINESS MODELS. *Journal of Advances in Management*.
- Laeq, K. (2022). Metaverse: why, how and what. How and What.
- Lawton, G. (2022, Nov 18). *History of the metaverse explained*. Retrieved from TechTarget: <https://www.techtarget.com/searchcio/tip/History-of-the-metaverse-explained#:~:text=1992%20%2D%20American%20sci%2Dfi,an%20alternative%203D%2C%20connected%20reality>
- Lee, H. J. (2022). Empirical Research on the Metaverse User Experience of Digital Natives. *Sustainability*, 14747.
- Marr, B. (2022, April 04). *The Effects of the Metaverse on Society*. Retrieved from Forbes: <https://www.forbes.com/sites/bernardmarr/2022/04/04/the-effects-of-the-metaverse-on-society/?sh=19abdf88765b>

- Maruf, R. (2022, September 26). *Walmart enters the metaverse with Roblox experiences*. Retrieved from CNN : <https://edition.cnn.com/2022/09/26/business/walmart-roblox-metaverse/index.html>
- Maticz. (n.d.). *What is Metaverse as a Service (MaaS)?* Retrieved from Maticz: <https://maticz.com/metaverse-as-a-service>
- Meta. (2023, October 28). *Introducing Meta: A Social Technology Company*. Retrieved from Meta: <https://about.fb.com/news/2021/10/facebook-company-is-now-meta/>
- Metaxr. (2022, January 20). *Immersive Retail, the Future of Retail with the Metaverse*. Retrieved from Metaxr: <https://hello-metaxr.medium.com/immersive-retail-the-future-of-retail-with-the-metaverse-8bd86a564c4d>
- Moore, L. (2023, April 19). *Augmented Reality vs. Virtual Reality vs. Mixed Reality*. Retrieved from TechTarget: <https://www.techtarget.com/searcherp/feature/AR-vs-VR-vs-MR-Differences-similarities-and-manufacturing-uses>
- Nalbant K, A. S. (2023). Development and Transformation in Digital Marketing and Branding with Artificial Intelligence and Digital Technologies Dynamics in the Metaverse Universe. *Journal of Metaverse*, 9-18.
- Narin, N. G. (2021). A content analysis of the metaverse articles. *Journal of Metaverse*, 17-24.
- Periyasami, S. a. (2022). Metaverse as future promising platform business model: Case study on fashion value chain. *Businesses*, 527-545.
- Peters D, C. R. (2018). Designing for motivation, engagement and wellbeing in digital experience. *Frontiers in Psychology*, 797.
- Peterson B, B. F. (2022, Oct 20). *How meeting customers in the metaverse can unlock lasting value*. Retrieved from Ernst and Young: https://www.ey.com/en_gl/consumer-products-retail/meet-customers-in-the-metaverse-to-unlock-lasting-value
- Qureshi, O. (2022, September 25). *Metaverse: a new world of opportunities and challenges*. Retrieved from Business Recorder: <https://www.brecorder.com/news/40194674>
- Ravi, K. (2022, December 6). *How to prepare your business for Metaverse trends in 2023*. Retrieved from BusinessofApps: <https://www.businessofapps.com/insights/how-to-prepare-your-business-for-metaverse-trends-in-2023/>

- Riaz, S. (2022, May 23). *'Metaverse' is the future of tech, and Dubai does not want to be left behind*. Retrieved from Business Recorder: <https://www.brecorder.com/news/40175011>
- Richard, C. (n.d.). *The Metaverse and its Impact on Small Businesses*. Retrieved from Ondeck: <https://www.ondeck.ca/resources/the-metaverse-and-its-impact-on-small-businesses/>
- Ritesh Gupta, M. S. (2022). *AN OVERVIEW OF THE METAVERSE AND ITS INCREDIBLE POTENTIAL & EMERGING BUSINESS OPPORTUNITIES*. Happiest Minds.
- Robinson, J. (2022). *Exploring the Metaverse and the digital future*. GSMA Association.
- Sandeep, S. (2023, April 17). *Metaverse-as-a-Service platform – Unlocking new avenues for business*. Retrieved from Appinventiv: <https://appinventiv.com/blog/metaverse-as-a-service-platform-for-enterprise/>
- Shahid, M. (2022, November 25). *What is Metaverse as-a-Service (MaaS)?* Retrieved from Softtik: <https://softtik.com/blogs/what-is-metaverse-as-a-service>
- Shih, P. C. (2021). Standardization of the Metaverse: A review and implications for future research. *Frontiers in Virtual Reality*, 12.
- Signé Landry, D. H. (2022, July 21). *A Proactive approach towards addressing the Challenges of the Metaverse*. Retrieved from Brookings: <https://www.brookings.edu/techstream/a-proactive-approach-toward-addressing-the-challenges-of-the-metaverse/>
- Simpson, M. L. (2022, October 3). *5 Metaverse Marketing Strategies for Your Brand to Explore*. Retrieved from Backstage: <https://www.backstage.com/magazine/article/metaverse-marketing-examples-explained-75173/#:~:text=Metaverse%20marketing%20strategy%201%3A%20Gaming,-RossHelen%2FShutterstock&text=The%20marketing%20team%20for%20fast,other%20by%20eliminating%20team%20members.>
- Srivastava, S. (2023, February 17). *How Could Metaverse be a Game Changer for the Virtual Gaming Industry?* Retrieved from Appinventiv: <https://appinventiv.com/blog/metaverse-gaming/>
- Stephen Hall, C. L. (2023, February 3). *This is how the metaverse might be monetized*. Retrieved from World Economic Forum: <https://www.weforum.org/agenda/2022/02/metaverse-monetization-business-guide/>
- Suwinto, J. (2022). METAVERSE AND ITS IMPLICATION IN LAW AND BUSINESS. *Jurnal Hukum Progresif*, 153.

- Synthetic world, r. e. (2021). *THE METAVERSE, BEYOND FANTASY*. Retrieved from <https://www.adlittle.com/cn-en/insights/report/metaverse-beyond-fantasy>
- The Fashion Law. (2021, May 05). *A digital only Gucci bag sold for USD 4115 on Roblox as brands continue to look to gaming as reach Gen-Z*. Retrieved from The Fashion Law: <https://www.thefashionlaw.com/a-digital-only-gucci-bag-sold-for-4115-on-roblox-as-brands-continue-to-look-to-gaming-as-reach-gen-z/>
- Tremosa, L. (2022). *Beyond AR vs. VR: What is the Difference between AR vs. MR vs. VR vs. XR?* Retrieved from Interaction Design Foundation: [https://www.interaction-design.org/literature/article/beyond-ar-vs-vr-what-is-the-difference-between-ar-vs-mr-vs-vr-vs-xr#:~:text=Mixed%20Reality%20\(MR\)%3A%20a,AR%2C%20MR%2C%20and%20VR.](https://www.interaction-design.org/literature/article/beyond-ar-vs-vr-what-is-the-difference-between-ar-vs-mr-vs-vr-vs-xr#:~:text=Mixed%20Reality%20(MR)%3A%20a,AR%2C%20MR%2C%20and%20VR.)
- Vargo, L. (2022, July 5). *How The Metaverse Is Shaping Consumer Behavior*. Retrieved from Forbes: <https://www.forbes.com/sites/forbesbusinessdevelopmentcouncil/2022/07/05/how-the-metaverse-is-shaping-consumer-behavior/?sh=17ca93c30795>
- Vasarainen, M. S. (2021). A systematic literature review on extended reality: Virtual, augmented and mixed reality in working life. *Internationa Journal of Virtual Reality*.
- Viñuela, Y. R. (2022, October 31). *Opportunities and challenges related to the Metaverse*. Retrieved from Telefonica: <https://www.telefonica.com/en/communication-room/blog/opportunities-and-challenges-related-to-the-metaverse/>
- Vivian. (2022, November 22). *10 Fascinating Examples and Applications of the Metaverse for Business and IT Leaders*. Retrieved from Vection Technologies: <https://vection-technologies.com/blog/10-Fascinating-Examples-and-Applications-of-the-Metaverse-for-Business-and-IT-Leaders/>
- Wang, Y. S. (2022). *A survey on metaverse: Fundamentals, security, and privacy*. IEEE Communications Surveys & Tutorials.
- World Economic Forum. (2023). *Demystifying the Consumer Metaverse*. World Economic Forum.
- XAXIS. (2023). *A Guide to Web3, NFTs and the metaverse*. Retrieved from XAXIS: <https://www.xaxis.com/a-guide-to-web3-nfts-and-the-metaverse/>
- Xi, N. J. (2022). The challenges of entering the metaverse: An experiment on the effect of extended reality on workload. *nformation Systems Frontiers*, 1-22.

Yawised, K. D. (2022). From traditional business shifted towards transformation: The emerging business opportunities and challenges in 'Metaverse'era. *INCBAA* (p. 175). Researchgate.

Yogesh K. Dwivedi, L. H.-N.-D. (2022). Metaverse beyond the hype: Multidisciplinary perspectives on emerging challenges, opportunities, and agenda for research, practice and policy. *International Journal of Information Management*.

Young, H. (2022, December 18). *The metaverse: How should small businesses prepare?* Retrieved from Startups.: <https://startups.co.uk/business-ideas/the-metaverse-for-small-businesses/>

Young, H. (2022, December 18). *The metaverse: How should small businesses prepare?* Retrieved from Startups.: <https://startups.co.uk/business-ideas/the-metaverse-for-small-businesses/>

Zhang G, W. J., & Chen Y, W. Y. (2022). Towards Understanding Metaverse Engagement via Social Patterns and Reward Mechanism: A Case Study of Nova Empire. *IEEE Transactions on Computational Social Systems*.