

## Banking in the Metaverse: A New Frontier for Financial Institutions

**Purpose:** Technological advancements have often served as the catalyst for disruption in the banking sector. The impact of the metaverse onto the banking sector is no exception. In view of this, the current paper provides valuable insights into four key areas (i.e., corporate banking, retail banking, banking employees, and public policy) that could be significantly disrupted by the metaverse.

**Design/methodology/approach:** Insights into four key areas of the banking sector that could be significantly impacted by the metaverse were gathered from various invited contributors.

**Findings:** The invited contributors first introduce the association between their respective key areas with the metaverse. Subsequently, the opportunities and challenges relevant to the key areas were identified. Finally, future research agendas were proposed for the attention of all relevant stakeholders.

**Originality:** The metaverse's impact on key areas of the banking sector is discussed in this paper. Following the metaverse's potentially wide application in the banking sector, insights from the invited contributions offer great value to the relevant stakeholders.

**Keywords:** Metaverse; financial institutions; corporate banking; retail banking; bank employees, public policy, sustainability.

**Article classification:** Viewpoint.

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## 1. Introduction

It is widely acknowledged that the term metaverse was first referenced by Neal Stephenson within his dystopic 1992 novel titled - Snow Crash, where he depicts the metaverse as a virtual reality (VR) space that incorporates avatars and software agents using internet and augmented reality (AR) technologies (Joshua, 2017). Although Stephenson's novel didn't offer a definitive definition of the metaverse, studies have described it as an evolution of the internet –an element of Web 3.0, that utilises a combination of mixed reality (MR), use of avatars and blockchain technology to develop an immersive environment that integrates the physical and virtual worlds (Dwivedi et al., 2022a; Lee et al., 2022). The launch of Second Life in 2003, by Linden Labs, extended this concept - allowing users to create and use avatars within a virtual environment that operated a thriving economy, growing to a GDP level exceeding \$500m by 2009, allowing users to convert \$55m into real currency that year (Damar, 2021; Gent, 2022). Interactive VR based game platforms – often cited as precursors to the metaverse, such as Minecraft and Roblox, have increased their user base dramatically in the last few years, as the technological infrastructure has progressed to the point where users can experience genuine immersion and virtual interaction with other users within an extended reality (XR) environment (Dick, 2021; Dionisio et al., 2013). Via the use of mixed reality experiences, the future use of the metaverse is likely to magnify our feelings of presence and immersion where users and physical objects are represented in the form of avatars and virtual objects within a fully interactive world, able to convert new digital senses to physical representations (Goldman Sachs, 2022).

Although many of the big tech companies seem to be keeping their metaverse plans under wraps (Financial Times, 2022), events such as the rebranding of Facebook to Meta Platforms in 2021 and reorientation of the organisation toward a metaverse based future, has led to significant debate within the academic and practice-based community, on many of the societal implications for widespread adoption of the metaverse (Fernandez and Hui 2022). Many organisations are reviewing what a metaverse future could look like and are analysing their business models and marketing strategies to identify opportunities for increased levels of brand awareness and customer interaction (Dwivedi et al., 2022a). The trajectory of development and widespread adoption of the metaverse is uncertain. Potential scenarios include a single immersive ecosystem, where users can navigate between worlds or perhaps something more fragmented. However, the general consensus amongst the academic and practice community is that the disruption potential for brands and consumers could be significant (Accenture, 2022).

Researchers have posited the potential financial opportunities that may emerge from the metaverse, highlighting a scenario that could potentially align with adoption of the internet (Dwivedi et al., 2022a). Jensen Huang - CEO of Nvidia the US based graphic technology corporation, has defined the Metaverse as a 3D extension of the internet today and expects the virtual economy to be much larger than the real-world economy (Forbes 2022a). The Market intelligence analysis by Precedence Research on the impact of the metaverse, identifies a potential - \$1.6 trillion global market by 2030 (Globe News Wire 2022). In a review of the potential financial implications of the metaverse, Goldman Sachs believe up to 33% of the global digital economy could shift to the metaverse, highlighting a bullish case market size of \$12.5 trillion (Goldman Sachs 2021). Major brands such as the fashion house Gucci, Italian football club AC Milan, Coca-Cola and Wendy's the US based food chain, have starting to experiment with the metaverse within existing platforms such as Fortnite and Roblox to engage with users within a new XR immersive environment (The

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3 Drum 2022). The metaverse initiative by Nike in 2021 on the Roblox platform, entailed the  
4 creation of a virtual replica of its global headquarters allowing customers to interact with  
5 Nike products but importantly for Nike to engage with new and current customers and build  
6 brand equity through virtual products such as: shoes, apparel, and accessories (Hollensen et  
7 al., 2022).  
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9 The opportunities for organisations to develop a presence on the metaverse and align  
10 their strategies with a mixed physical and virtual element, could be significant. Studies have  
11 identified a number of areas that could deliver transformational change via the metaverse,  
12 including - travel and tourism, health and fitness, retail, and advertising, as well as social  
13 connections and lifestyle (Ball 2022). A sector that could realise significant benefits from the  
14 metaverse, is banking and finance. The metaverse will allow users to purchase or lease digital  
15 assets requiring financial services and the presence of trusted payment rails (Sheehan, 2022).  
16 The ability to create, buy and sell digital assets, virtual land and property using the Ethereum  
17 blockchain on the Decentraland platform (Rosen, 2022), illustrates the potential for new  
18 virtual focused business models within the financial services space (Smith 2022).  
19 Decentraland currently lists a total sales volume of 351.15 million transactions totalling  
20 \$254.42m since 2020 (Decentraland 2022). An emerging metaverse economy could offer  
21 potential for banks to transact payments and offer tailored financial products within the  
22 metaverse economy. In a report published by Accenture on the banking opportunities in the  
23 metaverse, the research highlights the significant potential for new product and service  
24 innovation, and opportunity to restore the dialogues and communication channels that have  
25 been sidelined through greater levels of automation and reduction of branch networks. The  
26 impact on banking and financial services from the metaverse is uncertain, but the change  
27 could be transformational, and banks cannot run the risk of watching from the sidelines and  
28 not exploring its potential to create immersive and highly interactive customer journeys  
29 (Accenture 2022; Dwivedi et al. 2022a). Significant challenges remain, especially in relation  
30 to governance, trust and privacy within XR environments. The widespread acceptance of new  
31 forms of digital trust is likely required by consumers - one that can replace the reassurance of  
32 face-to-face interactions, reliance on gut feelings and perceptions of honesty and trust in the  
33 context of virtual avatar-based interactions (Moradi et al. 2022). This is likely to be a key  
34 challenge facing banking and financial service organisations where a lack of trust in this area  
35 could constrain widespread consumer adoption and engagement.  
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40 This study has followed a multi-perspective approach (Dwivedi et al., 2021ab;  
41 2022abc; von Foerster, 2003) to delivers insight to the implications from the metaverse,  
42 focussing on the banking and finance perspective. This sector could undergo significant  
43 levels of transformation and market disruption from the metaverse. We posit this research  
44 within the emerging debates and discussions within the academic and practice-based  
45 literature that aim to deliver insight to the many opportunities and key challenges from the  
46 metaverse. The remainder of this study is as follows: section two discusses corporate  
47 banking, retail banking is discussed in section three. We discuss the impact on employees in  
48 section four and public policy in section five. We conclude the study in the final section.  
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## 51 **2. Metaverse for Corporate Banking**

### 52 *2.1 Overview*

53 Banking services are an integral part of any economy, it delivers for businesses and people  
54 across the country, ensuring access to credit facilities and financial support and enhancing  
55 swift transactions (Mogaji et al., 2018). Banking services are often classified as retail for  
56 individuals and corporate banking for businesses and larger organizations. Banks providing  
57 retail banking services must regularly engage with various consumers; this engagement can  
58 often be monotonous, which has led to increased digital transformation to improve retail  
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3 banking. However, this digital transformation has not exempted the corporate clients but on a  
4 different scale. Banks have not been shy to explore technology in shaping their business  
5 operations; from the early days of the internet, they have adopted internet banking, later  
6 moving to mobile banking, and now banks are considering going into the metaverse to further  
7 engage with customers and provide financial services. While retail banking – for individuals  
8 may be better suited for the metaverse, it is imperative to explore if and how corporate  
9 banking can succeed.  
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11 The viability of the metaverse in corporate banking is anchored on the growing  
12 popularity of users interacting with a computer-generated environment in 3D through virtual  
13 reality (Falchuk et al., 2018, Dwivedi et al, 2020), Its growing popularity is fueled by  
14 technological innovations and the exponential rise of the experience economy (Maiya, 2022).  
15 The banking, commerce, and financial services industries are lauded to be the next entrants in  
16 the metaverse after gaming, media, and entertainment (Forbes, 2022b). A report by JP  
17 Morgan has indicated that the market and business opportunities for corporate entities in the  
18 metaverse are estimated to be over \$1 trillion in yearly revenues (Dwivedi et al., 2022a).  
19 Other banks, such as KB Koomin Bank in South Korea, have developed VR branches in the  
20 metaverse that enable customers to access banking services using head-mounted VR devices  
21 (Peter, 2021). Banking institutions can explore opportunities in the metaverse by developing  
22 facilities to enable financial transactions, such as providing loans to finance asset purchases  
23 and converting fiat currency into cryptocurrency (Shoolapani and Jinka, 2011). The  
24 increasing relevance of the metaverse in banking can also be associated with the  
25 transformations in the business models towards cloud computing. This era has been built on  
26 the growing influence of the internet, whereby many 'brick-and-mortar' business entities have  
27 transformed into 'click-and-mortar' by integrating the role of the internet in sales and  
28 marketing (Sanka et al., 2021).  
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32 Technology deployed in the metaverse, including VR and AR, in implementing the  
33 business functionalities such as recreating bank branches in the virtual world (Depari et al.,  
34 2022). Shoolapani and Jinka (2011) developed a virtual bank branch using Open Wonderland  
35 to simulate a physical bank branch meant to address customer inquiries about the bank's  
36 products and services. The employees log in to this virtual branch using avatars and avail  
37 themselves in the virtual office to assist. Loan application and approval services are also  
38 offered in the virtual bank branches by incorporating a combination of AR and VR interfaces  
39 alongside social plugins and business services to provide a connected retail and banking user  
40 experience (Momtaz, 2022). Infrastructure as a service (IAAS) and platform as a service  
41 (PAAS) business models are also offered, whereby the content is stored on the cloud, and the  
42 platform can be accessed through various devices such as tablets and personal computers  
43 (Stanley, 2011).  
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## 46 47 *2.2 Opportunities*

48 Metaverse allows augmented engagement, which presents a considerable opportunity for  
49 banks to engage with their clients. From this engagement, there are considerable  
50 opportunities to ethically collect customer data and use it to improve service delivery. As  
51 Lilien (2016) noted that business to business data is not always effectively collected and  
52 adequately analyzed in a meaningful way, suggesting that corporate banks are losing out on  
53 additional datasets to know the customers better and how to serve them effectively  
54 (O'Donnell et al., 2002; Mogaji et al., 2018). As Guo (2018) established that the management  
55 of customer relationships is still very critical for the success of corporate bankers, and  
56 Andaleeb et al. (2016) reiterated relationship banking (intangible factors) as a critical  
57 measure to differentiate corporate bank offerings, using metaverse to engage with their client  
58 is a huge opportunity waiting to be explored.  
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4 With the increasing pace of globalization and competition within the industry,  
5 corporate bankers need to start exploring business opportunities beyond their usual country  
6 base. Metaverse presents opportunities for banks to reach out and engage with diverse  
7 customers, perhaps building on the achievement of technology through teleworking during  
8 the pandemic; there are opportunities for more interactive engagement (Mogaji, 2022).  
9 Notably, the role of customer-facing staff will evolve to effectively use this technology and  
10 deliver a streamlined banking experience (Tyler and Stanley, 2001), especially in situations  
11 where the client is not conversant. Banks can explore the non-fungible token (NFT)  
12 opportunity in the metaverse since many individuals transact in the VR world and invest in  
13 NFTs. NFTs are a vital enabler in the metaverse, and banks can regard them as asset classes  
14 under wealth management (Bushnell, 2022). In this case, the banks and other financial  
15 institutions can launch mutual funds of NFTs where investments appreciate. The metaverse  
16 enables banks to manage customer relationships to enhance loyalty and profitability  
17 (Papagiannidis et al., 2008). The immersive banking experience is an essential customer  
18 relationship management strategy built on increased internet use for banking services. It can  
19 also be harnessed as an essential tool in customer relationship management by enhancing the  
20 effectiveness of online banking through the offline-like service available by avatars (Liu and  
21 Liu, 2019). Since consumers often need social interactions, the metaverse avails an avenue to  
22 enhance their banking experience.

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25 Additionally, the presence of banks in the metaverse is likened to the massively  
26 multiplayer online role-playing games (MMORPGs) that have rapidly evolved into  
27 alternative realities (Manninen and Kujanpää, 2007). This opportunity is even enhanced by  
28 the increasing number of people spending time in the metaverse. The metaverse constitutes a  
29 business and marketing platform as it is a continuous and persistent 3D virtual world  
30 designed for the user with control over almost all aspects of their world and stimulates  
31 creativity and self-expression (Vafopoulos et al., 2006). Corporate banking opportunities in  
32 the metaverse are directly linked to its role in commerce. According to Inengite (2022), the  
33 metaverse avails various solutions that will help bridge the gap between physical retailing  
34 and digital commerce. Therefore, banks will be vital in facilitating commercial activity in the  
35 metaverse by offering banking services and financing various business activities. The  
36 financing services will enable creators to connect design tools and acquire assets needed to  
37 facilitate their activities (Peter, 2021). Azamat (2021) indicated that banking and payment  
38 systems are vital in commercial activities. The introduction of a blockchain-powered  
39 currency has availed many opportunities for banking institutions to support commerce in the  
40 metaverse. It is achieved through cryptocurrencies and NFTs, where the former will support  
41 buying items while the latter supports the purchase of digital assets. Other viable economic  
42 activities include manufacturing, which will be possible through 3D printing and fabrication  
43 technologies. 3D printing technology enables manufacturing activities in the metaverse since  
44 individuals can acquire 3D versions of the products and print them in their homes (Shin et al.,  
45 2022). These technologically enabled commercial activities in the metaverse avail numerous  
46 opportunities for banking institutions to be directly or indirectly involved. According to  
47 Bourlakis et al. (2009), the transition from an industrial-based economy to an information-  
48 oriented economy has availed many economic opportunities in the metaverse. In this case, the  
49 gradual transition from traditional retailing to e-retailing and eventually metaverse-retailing  
50 can be contextualized as a viable opportunity to be explored by banking facilities.

### 51 52 53 54 55 56 *2.3 Challenges*

57 One of the challenges associated with corporate banking in the metaverse is the increased  
58 technological complexity (Reynolds, 2008). Despite enhancing the experience of other users,  
59 this complexity may result in certain aspects of the financial transactions for various users. It  
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3 may give rise to user-friendliness and navigation issues since controlling avatars through  
4 various spheres in the virtual world may not be straightforward and convenient. This  
5 technological complexity may discourage many business clients from engaging in the  
6 metaverse. This lack of engagement presents a considerable challenge for corporate bankers  
7 who may have invested resources in developing their virtual banking lounge. However,  
8 business clients are not capable or willing to interact.  
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10 Another derivative of this technological complexity is how to keep the clients  
11 engaged in the metaverse. Clients who are OK with meeting their corporate bankers in the  
12 metaverse may question the worth of the metaverse interaction if there is not much activity  
13 going on. Looking at the Onyx banking lounge of JP Morgan in Decentraland, which  
14 promised to run banking services virtually just as it does in the physical world, there is not  
15 much activity going on, and there is no interaction and engagement for anyone coming to the  
16 space. It appears like a 'placeholder' until everyone gets used to the metaverse. If retail bank  
17 consumers may find it disengaging and may never visit, it highlights a challenge in attracting  
18 busy business clients to a virtual space that lacks activity. Corporate bankers must, therefore,  
19 critically evaluate their investment in the metaverse if they do not have plans to effectively  
20 engage the clients (Mogaji and Nguyen, 2022a).  
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23 Other challenges include responsiveness, co-presence perceptions, and ease of use  
24 difficulties that the users may experience as they engage with the products (Abdulquadri et  
25 al., 2021; Gadalla et al., 2013). Challenges associated with responsiveness arise due to the  
26 higher expectations of the customers as they anticipate an offline-like service provided by the  
27 avatars. Gadalla et al. (2013) also established that customers wish for better co-presence by  
28 using avatars. The global location of the bank's client may also pose a challenge, even though  
29 metaverse allows virtual access from any part of the world. Accessibility and security issues  
30 may also arise as a challenge from this complex operating environment, especially for those  
31 with limited access to the internet and digital infrastructure to engage. These technologies are  
32 still in their infant stage, and for customers in some countries with structural and institutional  
33 challenges causing digital divides, they may not be able, albeit ready and equipped to engage  
34 in the metaverse.  
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37 The other challenge arises from the legal issues that may arise due to the transactions  
38 in the metaverse. Major legal concerns related to the commercial aspect of the metaverse as a  
39 marketplace, data privacy and protection, and avatar-user interactions within the metaverse  
40 (Lau, 2022). Financial services are highly regulated, especially corporate banking. There are  
41 huge implications on whom to hold responsible on behalf of a company. While individuals  
42 may be held responsible within retail banking on the metaverse, structural and organizational  
43 issues pose a challenge for the companies and the banks. Regarding responsibility and  
44 monitoring, there are possibilities of marketplace exploitation, like the dark web, which may  
45 affect the business operation of the bank and client. The business clients may be exposed to  
46 attacks, impersonation, and fraudulent activities, which may jeopardize the working  
47 relationship between the bank and the client. In addition, the country's regulations and  
48 policies for financial transactions and financial services providers on metaverse must be  
49 recognized as a potential challenge. These legal issues are specifically on the applicability of  
50 the legal rules, listing requirements, and banking and securities legislation when launching  
51 NFTs such as music, digital art, or other creative products (Harvard Business Review, 2021).  
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#### 55 *2.4 Research Agenda*

56 Corporate banking offers a different business arrangement, and future research must validate  
57 the relevance of corporate banking in the metaverse empirically. This relevance is a very  
58 concerning business proposition, and banks must make an informed decision. Interestingly,  
59 this research strand addresses a similar concern raised by the Centre for Financial Services  
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3 Innovation in 1997 when discussing the prospects of corporate banks on the internet. The  
4 report noted that corporate banks are unlikely to adopt the internet because they offer a  
5 “bespoke business in which a low-cost mass-market distribution network is far less  
6 important”. This same concern is raised here, and future research needs to explore this  
7 further; beyond the enormous opportunities for retail banks in the metaverse, does corporate  
8 banking has a chance? Engaging with policymakers, corporate banking, which may be  
9 nurturing this idea, and prospective business clients will be essential. It is also imperative to  
10 diversify the sample size of the business client from small and medium enterprises to large  
11 multination, from businesses in the developed and developing worlds. This research-driven  
12 understanding will help further drive this conversation about the prospects of corporate  
13 banking on the metaverse.

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16 Additionally, future research needs to examine how corporate bankers will utilize the  
17 user-centric philosophy of the metaverses to encourage creativity and allow customers to  
18 create their banking products. This aligns with the challenges raised around engagement on  
19 the platform. There is a need to understand the level of involvement to expect from a business  
20 client when engaging in the metaverse. This level of involvement will also be influenced by  
21 how banks implement e-service quality for their financial services and products in the  
22 metaverse, assuming that customers want to engage constantly if they are treated well. On  
23 this note, future research needs to explore the possible hybrid interaction to establish if and  
24 how engagement on the metaverse can impact the business's financial status in the real world.  
25 Future research would also need to engage with the policymakers, the banks, and business  
26 clients to understand measures, policies and laws that need to be implemented to prevent the  
27 possibility of marketplace exploitation in the metaverse. The dark side of technologies is  
28 inevitable (Mogaji and Nguyen, 2022b), and more so in the metaverse; stakeholders need to  
29 make informed policy implications on what to do to address the possible attack and reassure  
30 the customers about the safety of their transactions.

### 34 **3. Metaverse for Retail Banking**

#### 35 *3.1 Overview*

36 Interestingly, an increasing number of daily activities, which were predominantly carried out  
37 physically in the past, are now performed digitally. The waves of digitalization have  
38 consistently revolutionized the retail banking sector. In the past, deposits and withdrawals  
39 could only be made physically at the bank with the assistance of a teller. After some time, the  
40 automated teller machine (ATM) provided a digital alternative to performing such activities.  
41 More recently, an online option for these activities known as electronic banking (e-banking)  
42 was introduced.

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45 A recent technological development that is highly anticipated to play a key role in  
46 shaping the future is the metaverse. It is believed to be the next evolution of the Internet  
47 experience built on technologies such VR and AR. Essentially, the Metaverse is a digital  
48 world in which people can meet and interact with one another and create, buy, and sell digital  
49 assets (e.g., land, properties, items, and avatars). Companies such as KPMG, Goldman Sachs,  
50 and Citi have indicated that the Metaverse can become a multitrillion-dollar economy  
51 (Fortune, 2022a; 2022b). It is thus not surprising that companies such as Alphabet (parent  
52 company of Google), Apple, Microsoft, Meta (previously known as Facebook), and others  
53 have invested heavily in the Metaverse (Bloomberg, 2022)

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56 Following that, the metaverse will provide a continuum of emerging use cases and  
57 experiences. Given the general applicability of the Metaverse's utility, it has great potential  
58 to disrupt and even revolutionize many sectors (Koohang et al., 2023). Particularly in the retail  
59 banking sector, many financial institutions worldwide have taken their first steps towards the

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3 Metaverse. For example, JP Morgan (U.S.), CaixaBank (Spain), and DBS Bank (Singapore)  
4 are leveraging the Metaverse to engage, educate, and entertain their customers (Global  
5 Finance, 2023). With that said, the Metaverse still has a lot to offer regarding maximizing the  
6 effectiveness and efficiency of the banks' operations.  
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8 Overall, the metaverse is appealing to managers as it can be applied to all aspects of  
9 business; from the individual customer and employee to the entire company, and from the  
10 physical to digital settings. While the metaverse is expected to play a role in revolutionizing  
11 the banking sector, it can also be a double-edged sword. This is because banks that can  
12 successfully integrate their banking services with the metaverse will undoubtedly gain many  
13 growth opportunities. However, the failure to address the challenges inherent to such  
14 integration will only cause more complications and setbacks.  
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### 17 *3.2 Opportunities*

18 The purchase of digital assets such as cryptocurrencies and real estate is frequently carried  
19 out in the metaverse, (Forbes, 2022c). Banks can therefore look into providing innovative  
20 products and services, such as offering mortgages for customers buying real estate in the  
21 metaverse and allowing cryptocurrency to serve as collateral for a loan. Regarding the  
22 former, TerraZero Technologies was one of the first to facilitate a mortgage to purchase a  
23 virtual property in the metaverse (Rosen, 2022). As such, banks can also leverage the  
24 metaverse to attract new customer segments, such as gamers and technology enthusiasts, by  
25 offering metaverse-specific products and services.  
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27 While e-banking enables customers to carry out key banking activities anywhere and  
28 anytime, it is devoid of the personal engagement that one would get by going to the physical  
29 bank. That said, the metaverse would allow for better humanization of the banking  
30 experience and engagement. In the metaverse, customers are to create a unique avatar for  
31 themselves and can have more lifelike interactions with others. With that said, they will not  
32 only be able to interact with bank employees but also with other customers in the metaverse.  
33 These interactions open up the possibilities for co-creation among the different parties. banks  
34 such as JP Morgan have set up a virtual lounge in the metaverse (Raj, 2022).  
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36 Furthermore, customers have pointed out that they would like excitement in their  
37 banking activities (Khurana, 2022). Given this, the metaverse can give customers more  
38 hedonic value as banks can better personalize their operations to each customer's journey.  
39 This can come in the form of a personalized avatar and interactive environment. In other  
40 words, customers would be able to conduct banking activities (e.g., view account balance,  
41 transfer money, pay bills) in a(n) creative and immersive setting. This would better position  
42 the banks to attract new customers, especially younger crowds who resonate with these  
43 benefits.  
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45 Moreover, banks that are able to seamlessly link their physical operations with the  
46 virtual world can create powerful synergies. Given the virtual nature of the metaverse, it can  
47 be an alternative channel for customers who may find it difficult to physically carry out  
48 banking activities. With the help of automation and Artificial Intelligence, banks can set up  
49 their virtual presence in the metaverse to allow customers access to their services anytime and  
50 anywhere. One example is Union Bank of India which showcases its products and services in  
51 the metaverse (Raj, 2022). As such, this would bring added value to banks that cannot operate  
52 24/7 because of high operating costs.  
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### 55 *3.3 Challenges*

56 The first challenge is the high financial obligation needed for the metaverse's research,  
57 development, and application into the bank's business model. More precisely, the necessary  
58 infrastructure (hardware and software) must be thoroughly developed and maintained.  
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Therefore, this implies hiring qualified metaverse specialists for such an undertaking. However, “there are not enough qualified people to deal with the complexity of the architecture and develop secure solutions for the metaverse” (Dwivedi et al., 2022a, p.10). As such, the cost of hiring such talent will come at a premium as the demand continues to outpace the supply. In addition, there is the cost of training the employees to competently provide banking services to customers in the metaverse. Overall, smaller banks with limited financial resources could not afford such an undertaking.

The second challenge involves the policies pertaining to the operation of banking activities in the metaverse. In particular, the lack of comprehensive policies surrounding banking activities in the metaverse will further embolden criminals to commit cybercrimes. Identity theft is a major concern in this setting (Forbes, 2022d). This is because criminals can construct a lookalike avatar or hack other people’s avatars to carry out illegal activities in the Metaverse. Therefore, it is important for banks to properly identify which banking activities can be integrated into the metaverse and to what extent. Any issues arising from such integration will only erode customers’ confidence and trust towards the banks.

The third challenge concerns the limited accessibility to the metaverse. At present, the general public lacks the necessary resources, knowledge, and skills to proficiently use the Metaverse for banking purposes. This is because many still do not have the specialized hardware (e.g., virtual reality headset) to enter and engage in the metaverse. As prices to purchase such technologies remain relatively high, people in the middle- and lower-income groups will not be able to afford them. While such technology will only become cheaper, easier to use, and more accessible over time, there will still be an initial widening of the digital divide in the early stages.

The fourth challenge comes in the form of resistance from customers. People naturally prefer the status quo because it provides a sense of security, familiarity, and comfort (Loh et al., 2022a). However, integrating banking services into the metaverse will undoubtedly lead to changes in how customers carry out their banking services (e.g., balance checks and fund transfer). As such, the likelihood of errors would increase as customers need more familiarity and relevant information to handle more advanced banking activities in the metaverse. In view of this, banks will need to allocate sufficient resources to educate and train customers to ensure they can competently perform banking activities in the metaverse.

### *3.4 Research Agenda*

It is important to understand how the metaverse can be integrated with banking operations to enhance performance. However, massive gaps have yet to be explored given the metaverse’s nascency. In other words, there is a plethora of opportunities for future studies to be carried out. This includes the effects of the Metaverse on the different stakeholders in the retail banking sector, which are detailed below:

#### *3.4.1 Corporate Perspective*

It will be a massive undertaking for banks to integrate their operations with the metaverse. This is because of the metaverse’s novelty which would undoubtedly involve many strategic decisions. With that said, a bank’s internal environment comprises multiple parties; from the Board of Directors and C-Suite Executives to the departmental heads and employees. Hence, there will be differing perceptions, hesitancy, and readiness towards integrating the Metaverse into the business model. Thus, future research can look into the following research questions:

- What are major decisions that top management will need to address before, during, and after integrating the metaverse with their operations?

- What would be the optimal blend for omnichannel engagement between the banks and their customers?
- How can banks leverage the metaverse to develop their brand and enhance relationships with customers (e.g., acquisition, retention)?
- What factors would facilitate positive post-adoption outcomes among customers when it comes to using the metaverse for banking purposes (e.g., satisfaction, word of mouth, continued usage, loyalty)?
- What policies can be enacted to protect customers from banking-related cybercrimes (e.g., fraud, scam, impersonation, identity theft) in the metaverse?

### 3.4.2 Customer Perspective

The customer is undoubtedly the most important stakeholder that banks must consider when integrating their business operations with the metaverse. This is because they play a significant role in determining its success and sustainability. However, current literature has largely overlooked the study of customers' resistance, adoption, and usage of the metaverse in the retail banking sector. With that said, a multi-dimensional approach should be employed to look into the customers' behaviour (Loh et al., 2022b). Therefore, the research questions that can be addressed by future research include:

- What are the major factors influencing customers' perceptions, decision-making, and motivations to perform banking activities in the metaverse?
- What would affect customers' resistance to conduct banking activities in the metaverse (e.g., perceived complexity, privacy concerns, security threats)?
- How would customers' resources (e.g., access to technology, finances, self-efficacy) affect their propensity to carry out banking activities in the metaverse?
- How would customers' resistance, adoption, and usage of the metaverse for banking purposes differ among individuals with different characteristics (e.g., age, gender, risk appetite, preference for the status quo)?
- How would customers' interactions with banks differ in the metaverse and reality over time?

## 4. Metaverse from the Bank Employees' Perspective

### 4.1 Overview

The inception of metaverse has transformed the way of operation for the players in the financial industry. Driven by the use of NFT, blockchain, virtual reality, digital currencies, augmented reality, and decentralized finance (DeFi), the disruptive attributes of metaverse have enable virtual banking with more immersive and personalized experience for both financial service providers and consumers (Gunasundaram, 2022). Hence, banks must see these benefits as an opportunity to become the potential avenue that empowers digital banking and online commerce. Given the metaverse's potential, it was reported that several major banks around the world have incorporated such innovation into their offerings (Zainurin et al., 2023). For example, KB Kookmin Bank, one of South Korea's leading financial companies, is reportedly creating the KB metaverse VR Branch Testbed technology, which allows customers to access banking services within the metaverse realms and could be used for educational and training purposes. Similarly, JPMorgan became the first Wall Street bank to establish a virtual lounge in Decentraland, which is a browser-based 3D metaverse platform (Michelle, 2022). The establishment and intervention of the metaverse have benefited banks in terms of their operation and service provision. Fuelled by the combination of artificial intelligence (AI) and automation, the benefits of metaverse could assist bank officers in performing their tasks effectively and efficiently (Sudeep, 2022). For instance, the use of metaverse could help the bank employees to build stronger relationships with the

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3 clients, handle challenging conversations, and responding to their queries with empathy.  
4 Additionally, metaverse could also help the management team of the banks in crafting their  
5 business and marketing strategies that could improve their engagement with customers.  
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#### 7 8 *4.2 Opportunities*

9 The revolutionary disruption brought by the metaverse has provided the banking industry  
10 with various benefits from an operational perspective that involves bank employees. From the  
11 employee and customer experience standpoint, the implementation of metaverse technology  
12 can aid banks in their virtual banking operations by providing customers with engaging  
13 experiences whereby they do not need to visit the bank physically and facilitating bank  
14 employees in serving their customers from any location (Bjat et al., 2022; Zainurin et al.,  
15 2023). Apart from that, the use of the metaverse can also help bank employees to offer  
16 personalized experiences to customers and engage them in a meaningful way. This approach  
17 will benefit the banks from a marketing standpoint as it can help them enhance their branding  
18 and corporate image, which could be an advantage in attracting new (virtual) customers while  
19 retaining the existing ones.  
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21 Since the metaverse is still a relatively a new innovation, the early adoption of the  
22 metaverse allows bank managers to explore, learn, and experiment with the most optimal way  
23 to operate virtually on the metaverse platform. Such benefits enable employees to develop  
24 innovative solutions and strategies to improve the operation and process within the metaverse  
25 platform to banks clients. Grounded on the trial-and-error approach, such an initiative allows  
26 bank employees to change how they perform their daily activities and help them build  
27 solutions around the metaverse at an affordable cost. Furthermore, with proficiency in dealing  
28 with the metaverse among the employees, banks will be able to compete with other  
29 established financial institutions on an equal footing. To sum up, the metaverse is considered  
30 the future, and by early adoption, banks can significantly benefit from this innovative and  
31 evolving technology.  
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#### 34 35 *4.3 Challenges*

36 Among the possible challenges that the finance and banking industry may face in involving  
37 employees in disruptive metaverse technology is technical difficulties. Although the  
38 metaverse might offer endless opportunities to the employees in the finance and banking  
39 industries, such as providing a whole new experience of training and servicing customers, the  
40 current reality indicates a range of technical hurdles await to be resolved. The use of  
41 metaverse may not be as simple and straightforward given the limitations of interface and  
42 hardware issues. Much consideration needs to be taken into account, including the type of  
43 hardwares and its accessibility to the employees. On top of that, there is a possibility of  
44 physical health concerns that impede the transforming metaverse as the next workplace for  
45 employees. It has been contended that prolonged use of virtual reality gear can induce eye  
46 strain and fatigue, which in turn affect employees' productivity and performance. In addition,  
47 shifting employees to the metaverse may raise issues pertaining to virtual presenteeism and  
48 burnout. Metaverse will hardly gain a place in the banking service platforms without this  
49 problem resolving first. Lastly, financial and banking services are typically considered as  
50 high involvement services, it would be challenging for employees to provide banking  
51 services and market financial products in the metaverse world where avatars instead of real  
52 human touch prevail.  
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#### 56 57 *4.4 Research Agenda*

58 The rise of metaverse represents the next stage of development for the banking and fintech  
59 sectors. The transformation of traditional bank service to digital-oriented service has largely  
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3 automated the banking service process. However, consumers' relationship with a typical bank  
4 becomes neither personalised nor engaging, as compared to commercial or retail brands. On  
5 this note, it is worth exploring how banking and financial service employees can find new  
6 ways to deliver an engaging customer experience and enhance their relationship marketing  
7 strategies in the metaverse world. This is particularly relevant given that the interactions  
8 between bank employees and customers will largely realised through digital avatars, and we  
9 are still in the infancy stage of understanding avatar-based bank marketing. Furthermore,  
10 future research can be devoted to understanding employee service failure in the metaverse.  
11 While initial metaverse endeavours have been exerted by a few banking and financial service  
12 providers, it remains largely unknown the expectations or experiences of encountering  
13 service failure on metaverse. Would customers' responses and expectations be different  
14 compared to that of online (mobile and web) and offline banking services? How should  
15 employees act in respond and more importantly, how can they leverage metaverse attributes  
16 to handle the crisis? How will it unfold throughout the metaverse development? Apart from  
17 that, it will be important that future research can investigate how metaverse can be served as  
18 the new learning and community platform for financial and banking service employees. The  
19 well-being of employees represents a valuable avenue to be explored in the context of bank  
20 marketing.  
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## 25 **5. How should Metaverse and Public Policy evolve for Sustainability?**

### 26 *5.1 Overview*

27 The metaverse is increasingly gaining prominence in how the current social media platforms,  
28 virtual worlds and digital economy business may integrate in the very near future and create  
29 digital platforms touching upon many stakeholders in an unprecedented way (Dwivedi et al.,  
30 2022a). While these platforms are going to be extremely immersive and engaging, the extent  
31 that users and stakeholders may interact over these platforms would be unprecedented. While  
32 the journey in this evolution is definitely going to be extremely exciting, this also leads to  
33 major disruptions in the traditional ways of technology usage by individuals, groups,  
34 organization and society. There are recent evidences that extended reality is often more  
35 demanding and may have higher load on the users in terms of mental demand, temporal  
36 demand, effort, performance and frustration (Xi et al., 2022). Further there will be major  
37 governance issues stemming from this disruption.  
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40 The functional objectives of metaverse would be to create a virtual socio-economic  
41 ecosystem where stakeholder may interact and engage with each other by extending social  
42 interaction through virtual reality, ownership, and exchange of digital assets, form digital  
43 identity and communities in shared virtual spaces. While this means that new forms of  
44 societies would be formed, it means there is a pressing need to understand the nuances these  
45 societies may face, so that policy interventions may be planned for the stakeholders when  
46 needed. Evidences are present that in existing platforms which may evolve into metaverse  
47 platforms with meta-stakeholders, like virtual tourism, how stakeholders engage using  
48 emerging technologies result in unintended consequences from interaction among  
49 stakeholders and demand variability within the ecosystem (Verma et al., 2022).  
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52 Some of the technological artefacts that will be useful to build the functional  
53 objectives of metaverse platforms would be mature technologies like networking and internet,  
54 which would be extended through the use of emerging technologies like unstructured and  
55 non-relational data storage and sharing technologies, edge computing platforms and wireless  
56 heterogeneous platforms. Further there may be emerging technology artefacts like virtual  
57 reality, augmented reality, blockchain, internet of things, wearable devices and many more  
58 which will make the ecosystem viable for meeting the functional objectives of metaverse.  
59 The interaction and use of these technology artefacts by the user groups and stakeholders  
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3 would generate huge volumes of data, which may be mined by the new age artificial  
4 intelligence algorithms, like reinforcement learning, federated learning and deep learning.  
5 These technologies in conjunction would enable mobility, interoperability, scalability, real  
6 time information processing, identity management, smart contracts and shared  
7 responsibilities which will enable the sustenance of the virtual communities.  
8

9 The use of these technology artefacts integrated in an ecosystem would inherently  
10 need policy planning if these platforms continue to create value for the stakeholders without  
11 creating unwanted disruptions. Without policy making by governments and institutions, these  
12 platforms may witness unintended consequences at a scale that may disrupt the social  
13 infrastructure beyond repair. In this article, we discuss about opportunities, challenges and  
14 future research agendas surrounding metaverse which should impact.  
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### 17 *5.2 Opportunities*

18 Metaverse presents a new socio-economic knowledge ecosystem for governments. The  
19 stakeholders of metaverse would be organizations and individuals who are highly skilled,  
20 educated and economically well established. This ecosystem is therefore likely to generate  
21 traction from profit seeking firms in a big way, since the economic value being generated and  
22 exchanged in this ecosystem is going to be significantly large. The economic opportunity  
23 itself presents excitement from firms and stakeholders who may engage and transact across  
24 geographical realities, and therefore governments would need to plan to develop a legal  
25 framework for operations which may have acceptance across geographies for the  
26 enforcement of contracts for financial consideration. Contracts may be enabled by  
27 technological advancements like smart contracts, and immense opportunities are present for  
28 multi-party entities to be engaged together on these platforms and co-create economic value.  
29

30 Metaverses present opportunities to get honest signals from users and stakeholders.  
31 Interaction in metaverse in extended reality for social networking, collaboration and personal  
32 dialogues may get unshackled from the social norms in this immersive platform. This  
33 interaction will create huge amount of user data between user-to-user interaction and user to  
34 non-living character interaction. These interactions will be stored within the platforms.  
35 Individuals will share their experiences from service encounters through gamified platforms  
36 with others and these experiences may present immense opportunities to improve services  
37 and products for firms onboarded on these platforms.  
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39 Metaverse may enable new business models where new types of digital assets and  
40 services may be created. Users on metaverse may purchase and consumer these services.  
41 These services may lead to different models of platform economics to be created whereby  
42 multiple parties may engage together and co-create value for the consumers. A lot of these  
43 new models of business and service consumption may be for entertainment purposes through  
44 gaming or companionship. Through models like extended reality integrated with emerging  
45 artefacts like digital twins, consumers and users may customize their services and needs by  
46 tweaking processes in a way that hyper-personalization may happen in these platforms to  
47 create value for users that was unprecedented.  
48

49 Metaverse creates personas of individual whereby they can interact with others  
50 without the apprehension of being attributed to, watched, and judged for their personal  
51 preferences and choices. Therefore, individuals may feel inclined to interact and create social  
52 networks beyond social barriers like religion, class, creed or ethnicity. This may help to  
53 create networks beyond geographical borders in a way that was unprecedented. Such  
54 interaction may potentially unite sections of the society who may be sharing similar values,  
55 spiritual sentiments, political ideologies, hobbies, interests and concerns. This may also help  
56 create self-help groups and supportive social infrastructure among the society beyond  
57 borders.  
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3 Last but not the least, metaverse promises to be a platform beyond social interaction  
4 and enable economic interactions among parties. This would be an opportunity for financial  
5 institutions to create products that will have value within these platforms. Further the  
6 financial institutions may create mechanisms of digital currencies that may have acceptance  
7 and usage beyond the borders of individual metaverse platforms and allow interoperability.  
8 Blockchain as a technology may enable this interoperability of value across platforms  
9 engaged together in metaverse. To enable a self-sustaining digital economy, metaverse users  
10 should be able to exchange non-fungible tokens (digital goods, assets, etc) for cryptocurrency  
11 to buy other metaverse entities or choose to cash out for fiat money at any moment. How  
12 should financial institutions like banks also enable the role of new age entrepreneurs and  
13 influencers, who can operate their businesses in the metaverse with endless opportunities?  
14 How should these business entities be taxed while they generate revenue in metaverse? Also  
15 individual users on the metaverse are going to accrue huge amounts of assets with financial  
16 value over time, and this opens up opportunities for new models of financial institutions to  
17 manage these assets. Needless to say, this evolution of economic ecosystem within the  
18 extended reality creates huge financial opportunities for banks and other related financial  
19 institutions interconnected through these platforms and generating value.  
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### 24 *5.3 Challenges*

25 A more complex area which presents a huge challenge in the era of metaverse are contractual  
26 legal frameworks. In the metaverse, contracts may be enabled and automated by blockchain  
27 through smart contracts. The parties engaging may be geographically dispersed. The  
28 contracts present exciting opportunities for governments to enable multi-party collaboration  
29 through exchange of consideration, which could be financial, digital currencies and non-  
30 fungible tokens as well. As organizations and institutions engage, the legal framework  
31 surrounding norms for mutual consent, expressions of validity of offer and acceptance;  
32 adequacy of consideration; capacity; and legality need to evolve in this virtual ecosystem.  
33

34 Interaction among stakeholders in extended reality would generate real time very high  
35 velocity user generated private content. Information assurance and data privacy would be a  
36 major challenge in these virtual ecosystems. Ownership of data and legal framework  
37 surrounding possible misuse of data for commercial benefits would need attention. Further  
38 unintended usage of private information beyond the purpose for which the data was created  
39 would require policy interventions as current mechanisms would be inadequate to capture this  
40 data storage, access, and distribution. Will firms create profiles and persona about their  
41 customers that would only be used to serve their needs or will these information assets be  
42 utilized for other purposes as well. Will users know about how their information and virtual  
43 persona may be used for others? Governments would need to bring in policy frameworks for  
44 protection of privacy rights.  
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46 Hyper-personalization of business processes through new business models may make  
47 meta-verse extremely engaging. Through extended realities, the new business models may  
48 create service and entertainment models whereby frequent users slowly get disconnected  
49 from physical reality. This may further drastically increase user engagement on these  
50 platforms leading to even addiction to these services or digital assets. Highly immersive  
51 problem games (e.g., Blue Whale Challenge) have led to social disruption among addicted  
52 users to an extent that users abused themselves and even committed suicides (Erevik et al.,  
53 2022). Over 10 studies investigated the association between immersive problem gaming  
54 behaviour among users and suicidal ideation found statistically significant, positive  
55 associations. Addiction to extended reality may adversely impact the mental health of a large  
56 section of the society whereby groups of users and even communities face unforeseen  
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3 consequences of overuse of metaverse. Policy intervention may be needed surrounding fair  
4 usage of metaverse platforms along with permissible business models.

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6 Since metaverse users may be having a virtual personality in the platforms, users may  
7 resort to behaviour knowing they may not be attributed to the action by their social circles.  
8 This may also bring out behavioral changes in the individual and group level. Therefore,  
9 divergent behavior may become very common under these circumstances when users may  
10 feel they may not be identifiable and therefore engage in activities which would otherwise be  
11 socially ostracized. This may lead to activities like social shaming, cyber bullying, extortions,  
12 and sexual harassments on these platforms. There would be need for policy guidelines to  
13 enable reporting of these cases and actions which could be taken against the miscreants on  
14 these extended reality platforms, built within the platforms itself.

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16 Since users and entrepreneurship ventures may connect with financial institutions  
17 through metaverse, these new age firms are less likely have physical infrastructure. The  
18 banks will have high exposure to financial exchanges and transactions undertaken on the  
19 metaverse. However, this may also create risks if transactions fail and financial losses are  
20 incurred. How can insurance evolve for covering losses in metaverse? Banks may face  
21 greater challenges from recovering debts incurred from small start-ups if they fail after  
22 having incurred large debts. To what extent banks can provide credits to risky ventures as bad  
23 debt will also adversely impact the investors and account holders of the banks, which may  
24 move towards bankruptcy or mismanaged cases of financial lending. How can federal banks  
25 and government create legal frameworks for economic exchanges of financial institutions  
26 within metaverse?  
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#### 29 30 *5.4 Research Agenda*

31 The future research in the space of public policy and government intervention could be  
32 extremely exciting in the years to come. We foresee different areas where metaverse research  
33 can add high impact and societal value, as the technology artefact is relatively in its infancy  
34 and still the adverse impacts of its adoption in the socio-economic ecosystem is relatively less  
35 explored. In this context, we frame the following research agenda for the future:

- 36 • How will contracts and inter-organizational interaction evolve on metaverse  
37 ecosystems? How should government intervene for protecting rights and  
38 responsibilities of parties engaged in contracts in metaverse?
- 39 • How would service delivery change when organizations and consumers use metaverse  
40 and how would the service consumption be affected by this change?
- 41 • How would government develop frameworks for the protection of rights and  
42 privileges surrounding ownership of artefacts, goods and experiences of users in  
43 metaverse?
- 44 • How should governments intervene for the nature of advertisements, expectation  
45 setting and fulfillment of services for consumer protection in metaverse?
- 46 • How can government create policies for the transferability of assets like digital  
47 currencies and digital good across metaverse platforms?
- 48 • How will information storage be governed in metaverse so that users and their  
49 identities are protected without adversely impacting the rights of others?
- 50 • How can we develop frameworks for data governance and data distribution for  
51 protecting the privacy of individuals?
- 52 • How can information privacy and security be assured for used across different parties  
53 engaged over metaverse platforms?
- 54 • How can guidelines surrounding fair usage and permissible business models be  
55 developed to protect overuse and adverse impacts of immersive metaverse platforms?  
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- How can government empower individuals and institutions to intervene in cases of unforeseen and unintended usage leading to adverse outcomes?
- How can governments preempt divergent behaviour of individual and groups in metaverse?
- What could be new types of disruption that social fabric may witness because of interaction among users and groups in metaverse?
- How can policy intervention be introduced to prevent phenomenon like cyber bullying and extortion among naïve users?
- What kind of legal frameworks may be suitable for the governance of institutional funding for new business ventures in metaverse?
- How can taxation be enabled for the financial ecosystem of metaverse where transactions and value creation happen across geographic borders?

While metaverse is here for the future, some of these challenges may need policy planning before metaverse is adopted by the communities at large. However, a lot of these challenges may be discovered as we continue to explore metaverse. As the interaction of the society increases, newer challenges which may require policy interventions may be witnessed.

## 6. Conclusion

While implementing the metaverse is still in its infancy, the potential in the banking industry seems endless. The banking industry has the opportunity to establish meaningful relationships with customers at every stage of the customer journey, enhance customer engagement and experience and also offer innovative financial products and services. However, all these benefits are also associated with risks such as regulatory compliance, ensuring data privacy and security, as well as managing the complexity of a new technology. The study followed a multi-perspective approach on different viewpoint (Dwivedi et al., 2023) focusing on the banking and finance perspectives, such as corporate banking, retail banking, employee and public policy from 11 expert contributors. Furthermore, the study put forth a comprehensive analysis of potential opportunities, key challenges, and future research agenda.

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