REVIEW ARTICLE

Conceptual Framework of Metaverse Retail Application Characteristics and Consumer Behavior

Md. Hasan Sheikh

Bangladesh University of Textiles, Bangladesh.

Corresponding Author: Md. Hasan Sheikh, Bangladesh University of Textiles, Bangladesh.

Abstract

This study develops a comprehensive conceptual framework mapping relationships between metaverse retail characteristics and consumer behavior, addressing a critical gap in understanding how emerging virtual retail environments influence purchase decisions. Through systematic review of 39 peer-reviewed articles (2000-2023), the research identifies five key metaverse retail characteristics: digital avatars, human interfaces, data accessibility, seamless technology, and creator economy. The framework demonstrates how these characteristics influence purchase intentions through three mediating pathways: consumer experience, response, and gratification (hedonic, utilitarian, and social). Using Khan et al.'s (2003) five-step methodology combined with MacInnis's (2011) framework building principles, the study reveals how technological features integrate with consumer behavior patterns in virtual retail environments. The findings suggest that successful metaverse retail strategies require balanced attention to both technological capabilities and behavioral dynamics. The framework addresses theoretical gaps while providing practical guidance for retailers entering the metaverse space, particularly valuable as the market approaches $800 billion by 2024. This research contributes to both academic understanding of virtual retail behavior and practical implementation of metaverse strategies, while identifying opportunities for future empirical validation across different cultural contexts and consumer segments.

Keywords: Metaverse Retail, Consumer Behavior, Virtual Retail, Digital Avatars, Purchase Intention.

1. Introduction

The metaverse represents a transformative evolution in retail, with the market projected to reach $800 billion by 2024 as major brands like Nike, Gucci, and Adidas invest heavily in virtual retail spaces (Far et al., 2022). This emerging digital landscape combines physical and digital worlds through immersive technologies, creating a three-dimensional collaborative environment that enables unprecedented levels of consumer involvement (Bourlakis et al., 2009). With predictions suggesting that one in four people will spend at least an hour daily in the metaverse by 2026 (Zallio& Clarkson, 2022), understanding consumer behavior in this novel space becomes crucial for business success.

The metaverse retail environment distinguishes itself through several unique characteristics that fundamentally reshape consumer interaction patterns. Digital avatars enable users to express themselves and personalize their shopping experience (Shen et al., 2021), while sophisticated human interfaces create immersive interactive environments that transcend traditional e-commerce limitations (Wu, 2005). Universal data accessibility ensures seamless engagement across devices (Gefen et al., 2003), and the creator economy empowers consumers to participate actively in content creation and modification (Wang et al., 2023). These features, combined with recent technological advances in virtual reality (VR), non-fungible tokens (NFTs), machine learning (ML), and blockchain, have expanded metaverse retail capabilities beyond conventional digital commerce (Joy et al., 2022).

Small and medium-sized retailers face particular challenges in understanding and implementing metaverse retail strategies, despite growing consumer interest (Dwivedi et al., 2022). This research addresses this critical gap by developing a comprehensive conceptual framework that maps the relationships between metaverse retail characteristics and consumer behavior. The framework is especially relevant given the rapid adoption of metaverse technologies by Generation Z and Millennials, who demonstrate the highest adaptability to these emerging platforms (Szymkowiak et al., 2021).

The significance of this research extends across multiple stakeholder groups. Retailers benefit from clear insights into how application characteristics influence purchase decisions, enabling them to develop more effective virtual retail strategies. Marketers gain understanding of virtual engagement mechanisms, while developers can identify key features driving consumer adoption. Researchers receive a structured approach to studying metaverse consumer behavior, facilitating further academic investigation in this emerging field.

2. Literature Review

The metaverse retail landscape presents significant research gaps despite growing academic interest. While studies examine individual aspects of virtual retail, a comprehensive framework linking application characteristics to consumer behavior remains underdeveloped. Critical analysis of existing literature reveals several key gaps. First, research on consumer experience in metaverse retail shows limited scope. Baker et al. (2019) studied virtual presence perception but confined their analysis to a single virtual world site, limiting generalizability. Similarly, Hwang and Koo (2023) identified aesthetic influences on metaverse utilization but left performance content unexplored. Son et al. (2023) examined perceived agility in luxury brand contexts but neglected broader cultural differences.

Consumer response research demonstrates methodological limitations. Xie et al. (2023) identified influential factors motivating virtual shopping participation, their study focused exclusively on young Chinese consumers, leaving cross-cultural and multi-generational perspectives unexplored. Franke et al. (2022) examined virtual influencers but failed to establish comprehensive understanding of their impact on consumer behavior across different market segments. Gratification studies reveal conceptual gaps. Research by Wakefield and Baker (1998) on

hedonic benefits lacks investigation of temporal effects and special promotional impacts. Bourlakis et al. (2009) explored utilitarian gratification but didn't determine critical success factors across retail levels. Rauschnabel et al. (2017) studied social gratification but left key drivers of widespread interest unexplored. Purchase intention research shows integration gaps. Gan (2017) examined online buying intentions, the study lacked diverse sample representation across demographics and cultures. Researchers noted limited representation of women and older consumers, while Papagiannidis et al. (2017) identified gaps in understanding cultural and demographic influences on virtual retailing. These gaps highlight the need for a unified framework connecting metaverse retail characteristics to consumer behavior. Current literature fails to integrate technological features, consumer psychology, and behavioral outcomes comprehensively.

The study aims to develop a comprehensive conceptual framework mapping relationships between metaverse retail application characteristics and consumer behavior. Specifically, it seeks to:

1. Identify and analyze key metaverse retail characteristics that influence consumer behavior

2. Map and examine the pathways through which these characteristics affect purchase intentions

3. Identify mediating roles related to customer satisfaction in the metaverse retail environment

The framework addresses critical gaps by integrating technological and behavioral elements. It provides both theoretical foundation for future research and practical guidance for retailers entering the metaverse space. This purpose aligns with identified research needs highlighted by several scholars. Dwivedi et al. (2023) called for better understanding of metaverse consumption patterns, while Researchers emphasized the need for comprehensive analysis of application features' impact on consumer experience. The framework responds to these calls by providing structured approach to analyzing metaverse retail dynamics. The study's significance lies in its potential to bridge theoretical and practical gaps in metaverse retail understanding. For researchers, it provides systematic framework for investigating virtual retail behavior. For practitioners, it offers insights into effective metaverse retail strategy development, particularly valuable as businesses navigate this emerging space. Theoretical contribution centers on integrating disparate research streams into coherent framework explaining metaverse retail consumer
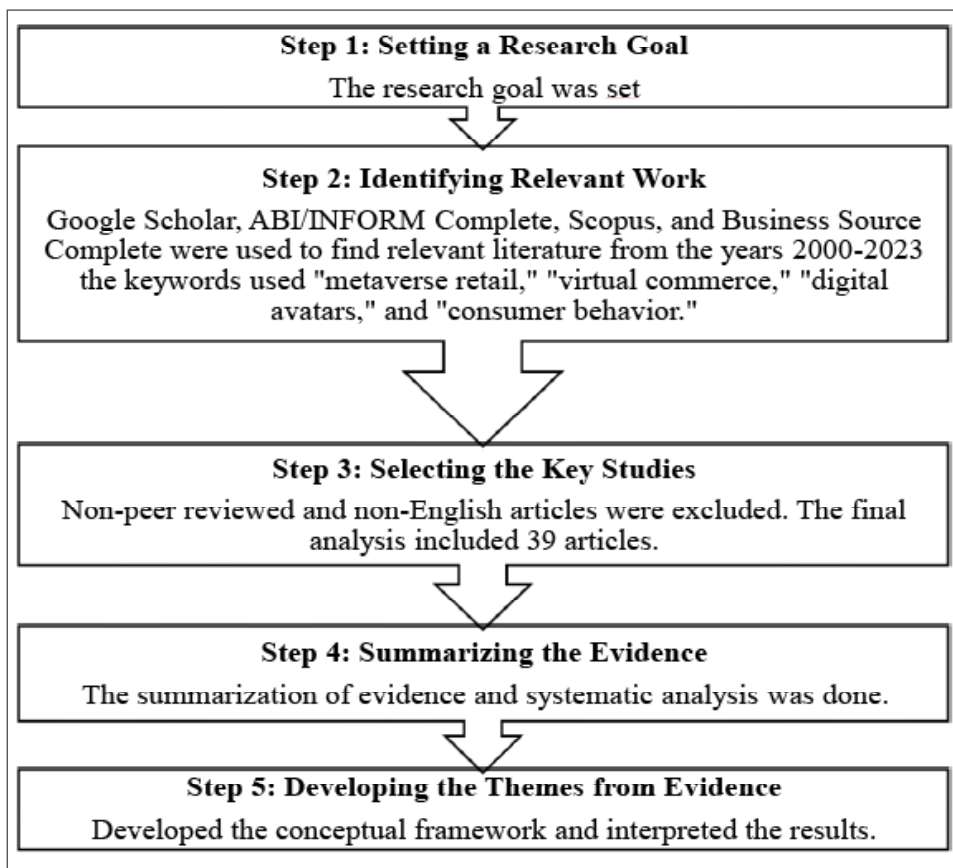
behavior. Practical contribution focuses on providing actionable insights for retailers developing metaverse strategies, especially important as market projected to reach $800 billion by 2024 (Far et al., 2022).

3. Methodology

The study employs a systematic review approach following Khan et al.'s (2003) five-step methodology, combined with conceptual framework building principles from MacInnis (2011). This hybrid approach was selected for its rigorous systematic process while allowing theoretical integration necessary for framework development.

The methodology proceeded through structured phases

Step 1: Setting a Research Goal

The research goal was set

Step 2: Identifying Relevant Work

Google Scholar, ABI/INFORM Complete, Scopus, and Business Source Complete were used to find relevant literature from the years 2000-2023 the keywords used "metaverse retail," "virtual commerce," "digital avatars," and "consumer behavior."

Step 3: Selecting the Key Studies

Non-peer reviewed and non-English articles were excluded. The final analysis included 39 articles.

Step 4: Summarizing the Evidence

The summarization of evidence and systematic analysis was done.

Step 5: Developing the Themes from Evidence

Developed the conceptual framework and interpreted the results.

The research began with setting clear goals and searching major databases (Google Scholar, EBSCO/INFORM, Scopus, Business Source) using keywords related to metaverse retail and consumer behavior between 2000-2023. Key studies were selected by excluding non-peer-reviewed and non-English articles, resulting in 39 relevant articles for analysis. The evidence was systematically summarized and analyzed to identify patterns and relationships. Finally, the analysis culminated in developing a conceptual framework identifying key themes around metaverse retail characteristics, consumer experience, response, gratification, and purchase intention.

4. Findings and Discussion

The framework illustrates how Metaverse Application Characteristics (e.g., digital avatars, human interfaces, data accessibility, seamless technology, and creator economy) influence Consumer Experience, Consumer Response, and Gratification (hedonic, utilitarian, and social). These three factors collectively impact Purchase Intention, shaping consumers' willingness to buy within the metaverse environment. Table 1 showed identified variables with study examples.

The metaverse retail experience conceptual framework integrates technological features with consumer behavior patterns to explain purchase intentions in virtual retail environments. At its core, the framework identifies five fundamental metaverse retail characteristics that drive consumer behavior through multiple pathways.

Digital avatars serve as the primary interface between consumers and the metaverse retail environment, enabling personalized expression and interaction (Shen et al., 2021). These avatars facilitate emotional connection and identity projection, particularly important for younger generations who view digital representation as extension of self. Human interfaces create immersive environments that transcend in con

traditional e-commerce limitations, allowing consumers to interact with products and spaces in three-dimensional reality (Wu, 2005). This immersion level significantly influences both experience quality and purchase decisions.

Table 1. *Identified Variables from Literatures*

| Category	Variable	Study Examples
Application Characteristics	Digital Avatars	Consumer self-expression (Shen et al., 2021); Virtual identity creation (Wu, 2005); Avatar customization (Kim et al., 2022); Social presence through avatars (Baker et al., 2019)
	Human Interfaces	Immersive interaction environments (Kim et al., 2022); Interactive engagement features (Kozinets, 2023); User experience design (Hausman &Siekpe, 2009); Interface effectiveness (Wu, 2005)
	Data Accessibility	Cross-device synchronization (Gefen et al., 2003); Universal information access (Hausman &Siekpe, 2009); Data integration (Wang et al., 2023); Platform connectivity (Park & Kim, 2022)
	Seamless Technology	Persistent experience delivery (Wang et al., 2023); Continuous functionality (Babin & Burns, 1998); Technology integration (Kozinets, 2023); System reliability (Son et al., 2023)
	Creator Economy	User-generated content tools (Wang et al., 2023); Design customization features (Rijsdijk &Hultink, 2009); Content creation platforms (Joy et al., 2022); Creator empowerment (Dwivedi et al., 2022)
Consumer Behavior	Consumer Experience	Virtual presence perception (Baker et al., 2019); Aesthetic platform utilization (Hwang & Koo, 2023); Immersive experiences (Han et al., 2022); Digital engagement (Lee & Kwon, 2022)
	Consumer Response	Promotional engagement (Xie et al., 2023); Virtual influencer effectiveness (Franke et al., 2023); Response behavior (Wongkitrungrueng&Suprawan, 2023); Consumer feedback (Romano et al., 2022)
Gratification Types	Hedonic Gratification	Emotional satisfaction (Rese et al., 2017); Entertainment value (Holbrook & Hirschman, 1982); Shopping enjoyment (Wakefield & Baker, 1998); Experiential benefits (Papagiannidis et al., 2017)
	Utilitarian Gratification	Information gathering (Bourlakis et al., 2009); Decision support features (Rese et al., 2017); Shopping efficiency (Nisar & Prabhakar, 2017); Functional benefits (Maity& Dass, 2014)
	Social Gratification	Community engagement (Rauschnabel et al., 2017); Social presence (Shen et al., 2021); Network effects (Li et al., 2015); Social interaction (Cheung & Lee, 2010)
Outcome	Purchase Intention	Buying behavior (Gan, 2017); Purchase decisions (Papagiannidis et al., 2013); Consumer loyalty (Devaraj et al., 2002)
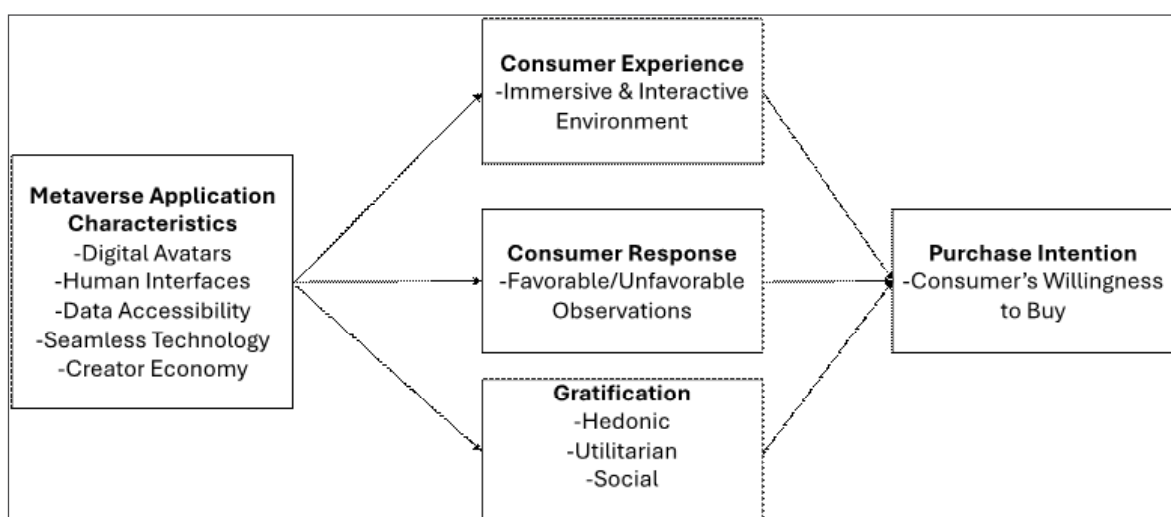
Figure 1. *Conceptual Framework from Literature Review*

Data accessibility ensures seamless cross-platform engagement, enabling consumers to maintain consistent shopping experiences across devices (Gefen et al., 2003). This continuity supports both utilitarian and hedonic aspects of shopping behavior. Seamless technology integration provides persistent experience delivery, maintaining immersion and engagement throughout the consumer journey (Kozinets, 2023). The creator economy empowers users to participate in content generation and customization, fostering deeper engagement and investment in the platform (Wang et al., 2023).

These characteristics influence purchase intentions through three primary mediating pathways: consumer experience, response, and gratification. The experience pathway demonstrates how immersion level, aesthetic appreciation, and virtual presence perception shape shopping behavior. Technology Acceptance Model explains this relationship, showing how perceived usefulness and ease of use influence adoption patterns (Baker et al., 2019).

Consumer response pathway captures reactions to promotional elements, entertainment features, and social interactions. Uses and Gratifications Theory supports understanding of how different features motivate engagement and response (Xie et al., 2023). This pathway particularly affects Generation Z and Millennial consumers, who show higher responsiveness to interactive and social elements.

Gratification manifests in three distinct forms: hedonic, utilitarian, and social. Hedonic gratification emerges from emotional satisfaction and fantasy fulfillment in virtual environments (Rese et al., 2017). Utilitarian gratification reflects information gathering efficiency and decision-making support (Bourlakis et al., 2009). Social gratification derives from community engagement and relationship building opportunities (Rauschnabel et al., 2017).Purchase intention emerges as ultimate dependent variable, influenced by combined effects of all pathways. The Theory of Planned Behavior explains how attitudes, subjective norms, and perceived behavioral control shape buying decisions in metaverse environments (Gan, 2017). This relationship becomes particularly strong when all three gratification types align positively.

5. Implication

The metaverse retail conceptual framework delivers significant implications across theoretical development, business practice, and future research directions. For academic theory, it advances understanding by integrating multiple theoretical perspectives into a cohesive model explaining virtual retail behavior. The framework combines Technology Acceptance Model principles with Uses and Gratifications Theory, creating comprehensive explanation of how technological features influence consumer decisions (Baker et al., 2019; Xie et al., 2023).For retail practitioners, particularly small and medium-sized businesses, the framework provides structured guidance for metaverse strategy development. Understanding the relationship between technological features and consumer behavior helps

prioritize investments and resource allocation. The identification of three distinct pathways - experience, response, and gratification - enables retailers to develop targeted approaches for different consumer segments (Dwivedi et al., 2022).Development teams gain clear direction for feature prioritization based on consumer impact. Understanding how different characteristics influence purchase intentions through multiple pathways helps focus technical development efforts. This becomes especially valuable as metaverse retail technology continues evolving and market competition intensifies (Son et al., 2023).

Educational institutions benefit through structured approach to teaching metaverse retail management. The framework helps organize curriculum development around key relationship pathways and consumer behavior patterns. Business schools can build programs addressing both technical and behavioral aspects of virtual retail management.Policy makers gain insights for developing appropriate regulatory frameworks. Understanding how different features influence consumer behavior helps identify areas requiring consumer protection or market regulation. The framework advances societal understanding of virtual retail's impact on consumer behavior patterns. This helps anticipate and address potential social implications of increased metaverse retail adoption, particularly regarding digital divide and accessibility issues.The framework suggests several priority areas for investigation for market researchers: empirical validation of proposed relationships, cross-cultural comparison studies, longitudinal tracking of adoption patterns, Investigation of moderating factors, development of measurement scales for key constructs. Organizations can implement the framework through systematic assessment of current capabilities, strategic planning for feature development, and structured consumer research programs. Performance metrics can be developed around key relationship pathways, while training programs can address both technical and behavioral aspects of metaverse retail management. The framework's value extends beyond immediate business applications to broader industry development. Understanding relationship patterns helps predict future trends and identify potential barriers to adoption. This supports industry-wide planning and standard development. Research institutions benefit from structured approach to investigating emerging retail technologies. The framework provides common language and conceptual structure for studying metaverse retail phenomena, facilitating comparison across studies and accumulation of

knowledge. Technology developers gain insights into feature impact on consumer behavior, helping prioritize development efforts. Understanding how different characteristics influence purchase intentions through multiple pathways supports efficient resource allocation and feature prioritization. The framework's comprehensive nature ensures relevance across stakeholder groups while maintaining theoretical rigor and practical applicability. This broad impact advances both understanding and implementation of metaverse retail strategies, supporting industry development while maintaining focus on consumer needs and preferences. Looking forward, the framework provides foundation for continued research as metaverse retail technology evolves. Its structured approach to understanding relationship patterns helps anticipate future developments and adapt strategies accordingly. This forward-looking perspective supports long-term planning and strategic development across industry sectors.

6. Conclusion

The conceptual framework developed in this study provides a comprehensive understanding of how metaverse retail characteristics influence consumer purchase intentions through multiple pathways. By integrating technological features with consumer behavior patterns, the framework demonstrates that digital avatars, human interfaces, data accessibility, seamless technology, and creator economy elements collectively shape shopping experiences in virtual environments. The three mediating pathways - consumer experience, response, and gratification - highlight the complex interplay between technical capabilities and behavioral outcomes. This integration addresses critical gaps in current literature while providing practical guidance for retailers entering the metaverse space. The framework's value extends across stakeholder groups, offering retailers strategic insights for feature development, marketers understanding of engagement mechanisms, and researchers structured approach for investigating virtual retail behavior. As the metaverse retail market continues expanding toward its projected $800 billion value by 2024, this framework provides essential foundation for both theoretical advancement and practical implementation of virtual retail strategies.

7. Future Research

Several promising directions emerge for future research based on this conceptual framework. First, cross-cultural studies could examine how pathway relationships vary across different markets and consumer segments, particularly important given the global nature of metaverse retail. Longitudinal research could track the evolution of these relationships as technology matures and consumer familiarity increases. Empirical validation studies should test the proposed relationships using quantitative methods, potentially developing and validating measurement scales for key constructs. Investigation of moderating factors, such as age, technology proficiency, and cultural background, could provide deeper understanding of how different consumer groups interact with metaverse retail environments. Research could also explore the framework's application in specific retail sectors, examining how relationships vary between luxury goods, everyday items, and service offerings. Additionally, studies focusing on privacy concerns, digital identity management, and trust building in metaverse retail environments could extend the framework's practical utility. The impact of emerging technologies like artificial intelligence and blockchain on framework relationships presents another valuable research direction.

8. References

1. Babin, L. A., & Burns, A. C. (1998). A modified scale for the measurement of communication-evoked mental imagery. *Psychology and Marketing*, *15*(3), 261–278. https://doi.org/10.1002/(SICI)1520-6793(199805)15:3<261::AID-MAR4>3.0.CO;2-8

2. Bourlakis, M., Papagiannidis, S., & Li, F. (2009). Retail spatial evolution: Paving the way from traditional to metaverse retailing. *Electronic Commerce Research*, *9*(1–2), 135–148. https://doi.org/10.1007/s10660-009-9030-8

3. Cheung, C. M. K., & Lee, M. K. O. (2010). A theoretical model of intentional social action in online social networks. *Decision Support Systems*, *49*(1), 24–30. https://doi.org/10.1016/j.dss.2009.12.006

4. Devaraj, S., Fan, M., & Kohli, R. (2002). Antecedents of B2C channel satisfaction and preference: Validating e-commerce metrics. *Information Systems Research*, *13*(3), 316–333. https://doi.org/10.1287/isre.13.3.316.77

5. Dwivedi, Y. K., Hughes, L., Baabdullah, A. M., Ribeiro-Navarrete, S., Giannakis, M., Al-Debei, M. M., Dennehy, D., Metri, B., Buhalis, D., Cheung, C. M. K., Conboy, K., Doyle, R., Dubey, R., Dutot, V., Felix, R., Goyal, D. P., Gustafsson, A., Hinsch, C., Jebabli, I., … Wamba, S. F. (2022). Metaverse beyond the hype: Multidisciplinary perspectives on emerging challenges, opportunities, and agenda for

research, practice and policy. *International Journal of Information Management*, *66*, 102542. https://doi.org/10.1016/j.ijinfomgt.2022.102542

6. Dwivedi, Y. K., Hughes, L., Wang, Y., Alalwan, A. A., Ahn, S. J. (Grace), Balakrishnan, J., Barta, S., Belk, R., Buhalis, D., Dutot, V., Felix, R., Filieri, R., Flavián, C., Gustafsson, A., Hinsch, C., Hollensen, S., Jain, V., Kim, J., Krishen, A. S., … Wirtz, J. (2023). Metaverse marketing: How the metaverse will shape the future of consumer research and practice. *Psychology & Marketing*, *40*(4), 750–776. https://doi.org/10.1002/mar.21767

7. Far, S. B., Bamakan, S. M. H., Qu, Q., & Jiang, Q. (2022). A Review of non-fungible tokens applications in the real-world and metaverse. *Procedia Computer Science*, *214*, 755–762. https://doi.org/10.1016/j.procs.2022.11.238

8. Franke, C., Groeppel-Klein, A., & Muller, K. (2023). Consumers' responses to virtual influencers as advertising endorsers: Novel and effective or uncanny and deceiving? *Journal of Advertising*, 1–17. https://doi.org/10.1080/00913367.2022.2154721

9. Gan, C. (2017). Understanding WeChat users' liking behavior: An empirical study in China. *Computers in Human Behavior*, *68*, 30–39. https://doi.org/10.1016/j.chb.2016.11.002

10. Gefen, Karahanna, & Straub. (2003). Trust and TAM in online shopping: An integrated model. *MIS Quarterly*, *27*(1), 51. https://doi.org/10.2307/30036519

11. Han, D.I. D., Bergs, Y., & Moorhouse, N. (2022). Virtual reality consumer experience escapes: Preparing for the metaverse. *Virtual Reality*, *26*(4), 1443–1458. https://doi.org/10.1007/s10055-022-00641-7

12. Hausman, A. V., & Siekpe, J. S. (2009). The effect of web interface features on consumer online purchase intentions. *Journal of Business Research*, *62*(1), 5–13. https://doi.org/10.1016/j.jbusres.2008.01.018

13. Holbrook, M. B., & Hirschman, E. C. (1982). The experiential aspects of consumption: Consumer fantasies, feelings, and fun. *Journal of Consumer Research*, *9*(2), 132. https://doi.org/10.1086/208906

14. Hwang, S., & Koo, G. (2023). Art marketing in the metaverse world: Evidence from South Korea. *Cogent Social Sciences*, *9*(1), 2175429. https://doi.org/10.1080/23311886.2023.2175429

15. Joy, A., Zhu, Y., Peña, C., & Brouard, M. (2022). Digital future of luxury brands: Metaverse, digital fashion, and non-fungible tokens. *Strategic Change*, *31*(3), 337–343. https://doi.org/10.1002/jsc.2502

16. Khan, K. S., Kunz, R., Kleijnen, J., & Antes, G. (2003). Five steps to conducting a systematic review.

Journal of the Royal Society of Medicine, 96(3), 118–121. https://doi.org/10.1177/014107680309600304

17. Kim, G., Kim, S., Kim, H., Lee, J., Badloe, T., & Rho, J. (2022). Metasurface-empowered spectral and spatial light modulation for disruptive holographic displays. *Nanoscale*, *14*(12), 4380–4410. https://doi.org/10.1039/D1NR07909C

18. Kozinets, R. V. (2023). Immersive netnography: A novel method for service experience research in virtual reality, augmented reality and metaverse contexts. *Journal of Service Management*, *34*(1), 100–125. https://doi.org/10.1108/JOSM-12-2021-0481

19. Lee, J., & Kwon, K. H. (2022). Future value and direction of cosmetics in the era of metaverse. *Journal of Cosmetic Dermatology*, *21*(10), 4176–4183. https://doi.org/10.1111/jocd.14794

20. Li, X., Chen, W., & Popiel, P. (2015). What happens on Facebook stays on Facebook? The implications of Facebook interaction for perceived, receiving, and giving social support. *Computers in Human Behavior*, *51*, 106–113. https://doi.org/10.1016/j.chb.2015.04.066

21. MacInnis, D. J. (2011). A framework for conceptual contributions in marketing. *Journal of Marketing, 75*, 136–154. https://doi.org/10.1509/jmkg.75.4.136.

22. Maity, M., & Dass, M. (2014). Consumer decision-making across modern and traditional channels: E-commerce, m-commerce, in-store. *Decision Support Systems*, *61*, 34–46. https://doi.org/10.1016/j.dss.2014.01.008

23. Mystakidis, S. (2022). Metaverse. *Encyclopedia*, *2*(1), 486–497. https://doi.org/10.3390/encyclopedia2010031

24. Nisar, T. M., & Prabhakar, G. (2017). What factors determine e-satisfaction and consumer spending in e-commerce retailing? *Journal of Retailing and Consumer Services*, *39*, 135–144. https://doi.org/10.1016/j.jretconser.2017.07.010

25. Papagiannidis, S., Pantano, E., See-To, E. W. K., & Bourlakis, M. (2013). Modelling the determinants of a simulated experience in a virtual retail store and users' product purchasing intentions. *Journal of Marketing Management*, *29*(13–14), 1462–1492. https://doi.org/10.1080/0267257X.2013.821150

26. Papagiannidis, S., Pantano, E., See-To, E. W. K., Dennis, C., & Bourlakis, M. (2017). To immerse or not? Experimenting with two virtual retail environments. *Information Technology & People*, *30*(1), 163–188. https://doi.org/10.1108/ITP-03-2015-0069

27. Park, S.-M., & Kim, Y.-G. (2022). A metaverse: Taxonomy, components, applications, and open challenges. *IEEE Access*, *10*, 4209–4251. https://doi.org/10.1109/ACCESS.2021.3140175

28. Rauschnabel, P. A., Rossmann, A., & tom Dieck, M. C. (2017). An adoption framework for mobile augmented reality games: The case of pokemon go. *Computers in Human Behavior*, *76*, 276–286. https://doi.org/10.1016/j.chb.2017.07.030

29. Rese, A., Baier, D., Geyer-Schulz, A., & Schreiber, S. (2017). How augmented reality apps are accepted by consumers: A comparative analysis using scales and opinions. *Technological Forecasting and Social Change*, *124*, 306–319. https://doi.org/10.1016/j.techfore.2016.10.010

30. Rijsdijk, S. A., & Hultink, E. J. (2009). How today's consumers perceive tomorrow's smart products. *Journal of Product Innovation Management*, *26*(1), 24–42. https://doi.org/10.1111/j.1540-5885.2009.00332.x

31. Romano, B., Sands, S., & Pallant, J. I. (2022). Virtual shopping: Segmenting consumer attitudes towards augmented reality as a shopping tool. *International Journal of Retail & Distribution Management*, *50*(10), 1221–1237. https://doi.org/10.1108/IJRDM-10-2021-0493

32. Shen, B., Tan, W., Guo, J., Zhao, L., & Qin, P. (2021). How to promote user purchase in metaverse? A systematic literature review on consumer behavior research and virtual commerce application design. *Applied Sciences*, *11*(23), 11087. https://doi.org/10.3390/app112311087

33. Son, S.-C., Bae, J., & Kim, K. H. (2023). An exploratory study on the perceived agility by consumers in luxury brand omni-channel. *Journal of Global Scholars of Marketing Science*, *33*(1), 154–166. https://doi.org/10.1080/21639159.2022.2153261

34. Szymkowiak, A., Melović, B., Dabić, M., Jeganathan, K., & Kundi, G. S. (2021). Information technology and Gen Z: The role of teachers, the internet, and technology in the education of young people. *Technology in Society*, *65*, 101565. https://doi.org/10.1016/j.techsoc.2021.101565

35. Wakefield, K. L., & Baker, J. (1998). Excitement at the mall: Determinants and effects on shopping response. *Journal of Retailing*, *74*(4), 515–539. https://doi.org/10.1016/S0022-4359(99)80106-7

36. Wang, Y., Su, Z., Zhang, N., Xing, R., Liu, D., Luan, T. H., & Shen, X. (2023). A survey on metaverse: Fundamentals, security, and privacy. *IEEE Communications Surveys & Tutorials*, *25*(1), 319–352. https://doi.org/10.1109/COMST.2022.3202047

37. White Baker, E., Hubona, G. S., & Srite, M. (2019). Does "Being There" Matter? The impact of web-based and virtual world's shopping experiences on consumer purchase attitudes. *Information & Management*, *56*(7), 103153. https://doi.org/10.1016/j.im.2019.02.008

38. Wongkitrungrueng, A., & Suprawan, L. (2023). Metaverse meets branding: Examining consumer responses to immersive brand experiences. *International Journal of Human–Computer Interaction*, 1–20. https://doi.org/10.1080/10447318.2023.2175162

39. Wu, G. (2005). The mediating role of perceived interactivity in the effect of actual interactivity on attitude toward the website. *Journal of Interactive Advertising*, *5*(2), 29–39. https://doi.org/10.1080/15252019.2005.10722099

40. Xie, J., Yoon, N., & Choo, H. J. (2023). How online shopping festival atmosphere promotes consumer participation in China. *Fashion and Textiles*, *10*(1), 5. https://doi.org/10.1186/s40691-022-00325-5

41. Zallio, M., & Clarkson, P. J. (2022). Designing the metaverse: A study on inclusion, diversity, equity, accessibility and safety for digital immersive environments. *Telematics and Informatics*, *75*, 101909. https://doi.org/10.1016/j.tele.2022.101909