

Metaverse and Artificial Intelligence in Strategic Business Transformation: A Comparative Analysis of Global Trends, Local Realities, and Emerging Professions

Hakan Kaya¹

Abstract

The metaverse, powered by the convergence of augmented and virtual reality (AR/VR), artificial intelligence (AI), blockchain, digital twins, and next-generation networks (5G/6G), represents the next evolutionary phase of the internet (Web 4.0). The chapter conducts a comparative analysis of global and Turkish brand strategies in the metaverse, discusses the changes it brings to business processes, value-chain analysis, and organizational models, and identifies AI and explores the metaverse newly emerging professions at their point of intersection. This paper is mainly based on a qualitative content analysis of academic literature, industry reports and corporate case studies reveals a significant gap between comprehensive global implementations and market-oriented Turkish initiatives. The suggested AI & Metaverse Integration Model (five dimensions: Technology Layer, Integration, Value-Chain, Performance, Regulatory Factors) offers a strategic framework for the sustainable adoption. Policy recommendations for Turkey are provided to close the global-local divide.

1. Introduction

The metaverse represents a persistent, synchronous, and 3D virtual world in which users participate through digital identities (avatars) (Ning et al., 2021). Its role as the next iteration of the internet implies impacts that extend beyond technological innovation to include important aspects related to economics, society, culture, and governance (Wang et al., 2023; Rejeb et al., 2023; Gao et al., 2024).

¹ Dr., T.C. Kestel Municipality, hakanware@hotmail.com, 0000-0002-0812-4839

Global brands have moved beyond experimental marketing to strategic engagement in the metaverse. These include Nike (SWOOSH), Gucci (Vault Land in The Sandbox), Balenciaga, and JPMorgan (Onyx Lounge in Decentraland) (JPMorgan, 2022; SanMiguel et al., 2024). In contrast, Turkish brands (Doğtaş, LC Waikiki, Damat Tween, Turkcell, Vestel, İş Bankası, Aktif Bank) are mostly in the pilot or single marketing campaign phase (Bas, 2022; Pehlivan, 2022). The Deloitte Turkey (2023) estimates that it has the potential to create an additional \$37.5 billion in economic value for Turkey by 2035 (Türkeköle, 2023).

This chapter contributes to the global literature by providing a systematic and comparative analysis of Metaverse- and AI-driven strategic transformation. The chapter specifically answers four research questions: (1) How do the Metaverse and AI transform fundamental business processes and strategic value-chains? (2) What are the differences between global benchmark practices and local implementations in emerging economies? (3) What new professional roles and competencies are emerging within the Metaverse world? (4) What kinds of policy and management frameworks are required to facilitate sustainable and inclusive adoption? In this way, this chapter frames the metaverse as a strategic and institutional phenomenon rather than a technological fad.

2. Conceptual Framework and Research Methodology

This research was designed using a qualitative content analysis method to explore the strategic positioning of global and Turkey-based brands in the metaverse ecosystem. Content analysis is a qualitative research method that enables researchers to systematically examine text-based data according to predefined thematic categories. This method is appropriate to use in examining the strategic proclivity of brands related to metaverse and artificial intelligence integration.

To ensure conceptual consistency, the research is informed by an integrated framework that will be referred to as the AI-Metaverse Integration Model. The integrated framework will be comprised of five interrelated dimensions, including the technology layer, integration into organizational processes, impacts along the value-chain analysis, performance and competitive outcomes, and finally, regulatory, ethical, and governance considerations. This model will visually explain the evolutionary journey of the metaverse from Web 2.0 to Web 4.0 and will be guided by theoretical frameworks that will be derived from existing literature, reports, and studies. Figure 1 illustrates the research methodological process in.

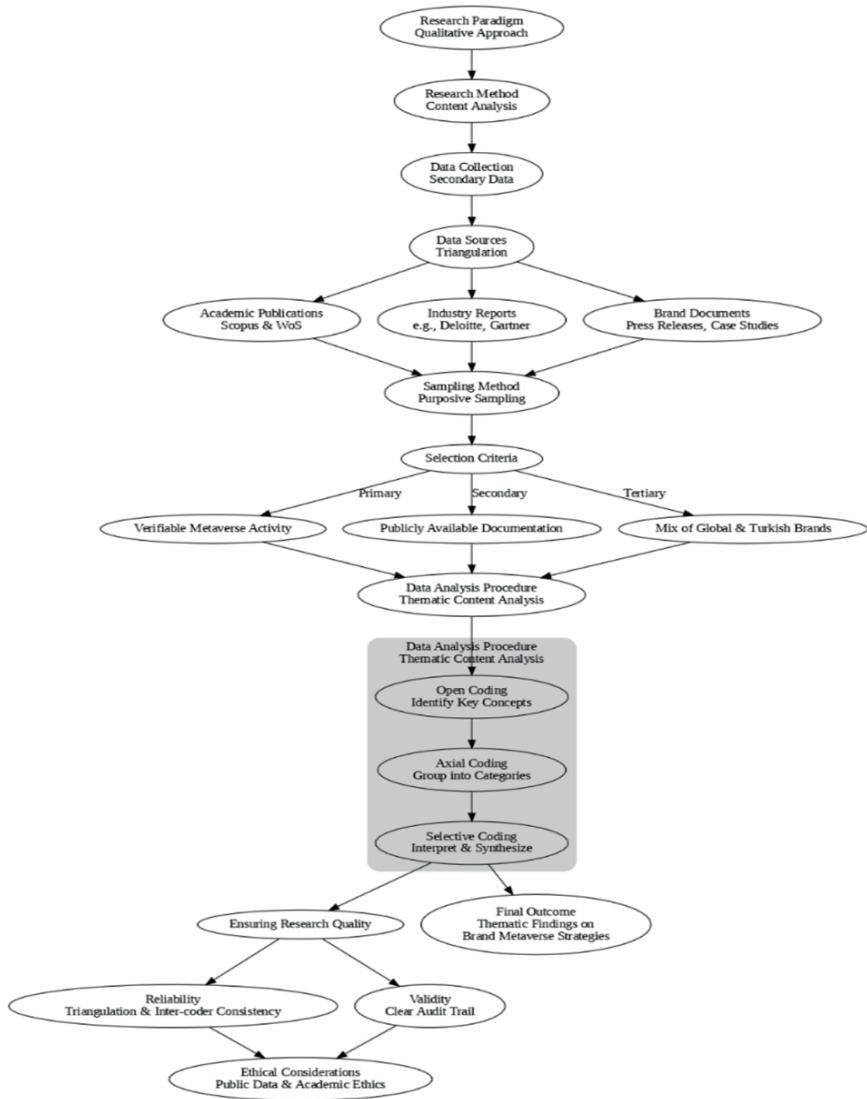


Figure 1. Research Methodology Flowchart

Source: Author's own drawing.

As shown in Figure 2 elaborates on the five dimensions around which the model is built. The Technology Layer covers the core components of AI and the metaverse. Integration is about the manner in which the new technologies are embedded within business processes. The Value-Chain depicts how the technology can impact the organization's operations according to the Porter value-chain model. Performance refers to the business and competitive

advantages that these technologies can disclose. Finally, Regulatory Factors encompass the environmental and institutional constraints that impact their adoption and.

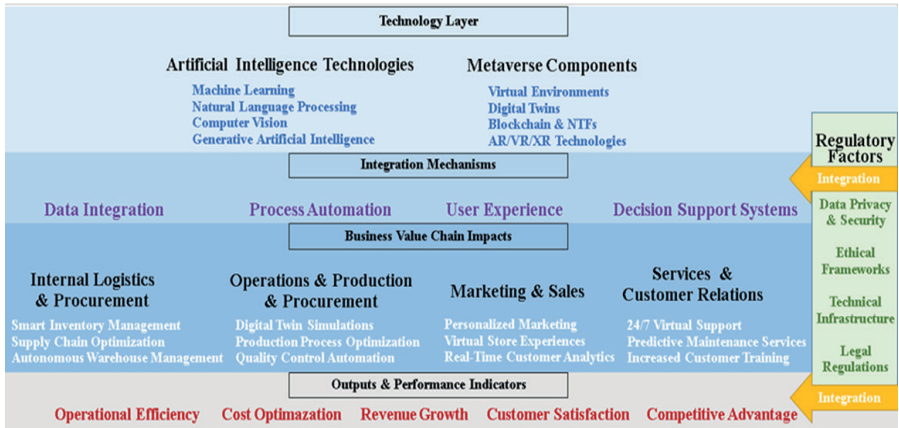


Figure 2. AI & Metaverse Integration Model

Source: Author's own drawing.

3. Evolution of the Metaverse and Strategic Business Integration

The overall changes in the Metaverse can be further traced to not only a shift in the way that we interact with each other via digital mediums but also beyond platform-centricity (Dwivedi et al., 2022). Although Web 2.0 was mainly about allowing users to engage and create their own content, it inadvertently also resulted in the centralization of data and the domination of a few platforms. Decentralization and user ownership were the main features that Web 3.0 brought to the table via blockchain technologies, which were widely available. Web 4.0 represents the integration of digital intelligence with the physical world through ubiquitous connectivity, autonomous systems, and contextual awareness (Anwar, 2022; Chada et al.,).

From a strategic management perspective, the creation of the Metaverse represents a paradigm shift in value creation and value capture. One of the ways in which the application of the digital twin enables the simulation and optimization of supply chains in real-time, thereby improving their sustainability and resilience. Likewise, an avatar and AI-based immersive Technologies improve human resource management, including recruitment, training, motivation, and performance evaluation. In the field of financial services, decentralized finance (DeFi) and smart contracts redefine the

mechanisms and governance of transactions and trust. In the same manner, immersive technologies redefine the field of education and training.

The development of metaverse technology gradually continues to evolve. The development of metaverse technology has progressively followed a path of technological evolution through the stages of foundational, advanced, and maturity (Lee et al., 2024). Table 1 shows the progress of metaverse technology.

Table 1. Metaverse Technology Evolution Process

Layer	Stage 1 (Foundation)	Stage 2 (Advanced)	Stage 3 (Maturity)
Interaction	Smart devices, apps, discrete experiences	Multimodal interfaces, immersive experiences (AR/MR/VR)	Device-agnostic, advanced virtual assistants, smart spaces
Content	Social networks, games, e-commerce, dev tools, sensor tech, Internet of Things (IoT)	Geotagged & persistent data, digital currencies & tokens, digital experience platforms, environmental mapping	Graphics technologies, spatial data integration
Infrastructure	Web3, wireless connectivity (5G), multi-user platforms	Edge cloud services, blockchain, spatial protocols	Spatial registries, P2P services, high bandwidth/low latency networks (e.g., 6G), interoperability frameworks

Sources: Lee et al., 2024; Papadopoulos et al., 2021; Shi et al., 2016; Voshmgir, 2020; Wang et al., 2021.

Table2 illustrates that Web 4.0 changes the emphasis from platform-centred to ecosystem-centred logic, thus promoting autonomous economies and co-evolutionary human-machine .

Table 2. Web 2.0, Web 3.0, and Web 4.0 Comparative Analysis

Feature	Web 2.0 (Social/ Participative Web)	Web 3.0 (Semantic/ Intelligent Web)	Web 4.0 (Symbiotic/ Intelligent Web)
Core Focus	User participation, content sharing, and social interaction	Giving data meaning, personalization, and decentralization	Human-machine integration, contextual awareness, and virtual-physical convergence
Key Technologies	AJAX, APIs, RSS, JavaScript, CSS3	Artificial Intelligence, Blockchain, Ontologies, Natural Language Processing	Internet of Things (IoT), AI, Augmented & Virtual Reality (AR/VR), Blockchain
Data Structure	Dynamic, user-generated, platform-specific	Structured, linked, semantic (machine-understandable)	Contextual, real-time, integrated from physical and digital worlds
Ownership & Control	Controlled by platforms/ corporations. User data is stored on centralized servers.	Controlled by users. Data and digital assets are stored on decentralized networks.	Distributed/ Autonomous. Control is shared among humans, machines, and intelligent agents.
User Role	Content Creator and Consumer	Data Owner and Service Participant	Symbiotic Partner and Digital Self Owner
Trust Model	Trust in Intermediaries: Trust in third-party platforms is mandatory.	Trust in Code/ Math: Trust through transparent protocols and smart contracts.	Trust in the Network/ Intelligent Systems: Trust in distributed consensus and contextual AI systems.
Economic Model	Attention Economy: Advertising, personal data in exchange for free services.	Token Economy: Crypto assets, DeFi, incentives for user contribution.	Autonomous Economy: Machine-to-machine (M2M) transactions, tokenized physical assets.
Typical Applications	Facebook, YouTube, Wikipedia, Instagram	Decentraland, Brave Browser, Uniswap, Signal	Smart Cities, AR Navigation, Autonomous Vehicle Fleets, Personal AI Assistants
Core Emphasis	Community & Collaboration	Meaning & Autonomy	Integration & Autonomy

Source: Author's own elaboration based on the literature review.

History of the concept of the metaverse goes down far before the digital era and it has been based on fictional concepts as well as simple interactive digital environments. The idea of a fictional world dates back to the literature of the 19th century, and the interactive idea is related to digital game environments such as “World of Warcraft” (2004) and “The Sims” (2000) (Reiter et al., 2025). Nowadays, places like Decentraland and The Sandbox are advertising the idea of a Web 3.0- oriented metaverse where people have complete ownership rights via the use of blockchain technology, whereas big tech companies like Meta are still sticking to the idea of a centralized .

4. Global and Local Brand Strategies: A Comparative Perspective

Worldwide enterprises are progressively viewing the Metaverse as a fundamental element of their future vision and strategy. Global fashion, finance, technology, and consumer goods brands are not only utilizing the Metaverse for promotional activities but also for co-creating and monetizing their digital assets. This indicates that these brands are evolving towards hybrid value propositions.

Nevertheless, metaverse initiatives in Turkey are still at the experimental . Although leading brands in telecommunications, manufacturing, retail, and finance have ventured into the metaverse by launching their virtual stores, NFT projects, and their own metaverse platforms, these projects have not yet reached the stage of strategic integration. This could be partly because of structural factors such as the lack of digital infrastructure and institutional coordination. The high digital engagement and youthfulness of the Turkish population are indicators of immense potential, especially when best global practices are applied.

Tables 3 and 4 present the positioning of global and local brands in the metaverse ecosystem. The differences in terms of innovation and strategic integration are evident. The tables present the brand/organization, industry, type of metaverse platform/application, key activity/description, and references. The references are presented as per the original text.

Table 3. Global Brands' Metaverse Initiatives by Sector

Sector	Representative Brands / Projects	Main Platforms/ Technologies	Key Features / Contributions
Fashion & Luxury	Nike (.SWOOSH), Adidas (Into the Metaverse), Gucci (Vault Land), Burberry, Valentino, Tommy Hilfiger, Balenciaga, Louis Vuitton, Versace,	Roblox, The Sandbox, Decentraland, NFTs, Proprietary Games	Digital wearables, NFT-based products, meta-avatar styling, immersive storytelling, brand heritage games
Automotive	Hyundai (Mobility Adventure)	Roblox	Virtual test drive and next-generation mobility showcase
Finance & Banking	JPMorgan (Onyx Lounge)	Decentraland	First metaverse branch for financial interaction
Retail & Consumer Goods	McDonald's, Coca-Cola	Proprietary VR, Blockchain	Virtual restaurants; NFT collectibles for campaigns
Technology & Electronics	Samsung (Create, Collect and Connect), Epic Games (Unreal Engine), Cryptovoxels	Unreal Engine, Blockchain	Sustainability campaigns; 3D universe development; decentralized user spaces
Art & Entertainment	Sotheby's (Next Stop: The Metaverse), Musée Dezentral, NBA Top Shot, Louis Vuitton	AR, NFTs, Web3	Virtual auctions; digital museum; collectible sports moments
Biotechnology	Neuralink	Brain-Computer Interface	Neuro-digital connection enabling sensory data transfer
Social & Cultural	Virtual Wedding Example	Proprietary VR	Symbolic merging of physical and digital social rituals
Research & Industry Studies	Bridges, Trujillo & Bacciu, Flexe.io, GWI, Mileva, Sethi	—	Metaverse marketing taxonomies, consumer behavior, and NFT campaigns

Sources: Alcantara & Michalack, 2022; Beer, 2021; Bissada, 2022; Bridges, 2023; Coca-Cola Company, 2022; Epic Games, n.d.; Flexe.io, 2025; GWI, n.d.; Haigney, 2021; Heller et al., 2019; Hyundai Motor Company, 2021; JPMorgan, 2022; Lal, 2025; Mileva, 2025; Nike, Inc., 2022; Ooi et al., 2023; Samsung Newsroom, 2022; Sethi, 2024; Syed, 2021; Trujillo & Bacciu, 2023; Turi, 2023.

Although the global brands have located the metaverse at the heart of their comprehensive strategies, the applications of the metaverse in Turkey are limited to individual campaign or pilot-level applications. This is because there is a significant gap between developed countries and Turkey with regard to the infrastructure of technology and the maturity of digital culture (Türkeköle, 2023; Pajo, 2025). However, the need to conform to the digital culture of younger generations is rapidly increasing the interest of Turkish brands regarding the metaverse (Flexe.io, 2025; GWI, n.d.). Turkish brands can secure a sustainable competitive advantage with the help of global brand examples, including avatar personalization, virtual store experiences, NFT loyalty programs, and the presence of multiple platforms (Ki et al., 2025; Agarwal & Mogaji, 2024). The metaverse strategies are not limited to the advancements of technology but also include the processes of user experience, digital identity, and community building (Komariyatin, 2025). Thus, with the convergence of the global path towards the “hybrid consumer experience” that includes the integration of physical and virtual experiences (Alexander et al., 2025), the use of the metaverse is growing rapidly in the communications, retail, tourism, and automobile industries of Turkey (Pajo, 2025). This is also aligned with the vision of the Turkish digital economy, and with the incorporation of GovTech transformations, it can be used as a guide for the branding strategies of the country.

Table 4. Turkish Brands' Metaverse Initiatives by Sector

Sector	Representative Brands / Projects	Main Platforms / Technologies	Key Features / Contributions
Telecommunications	Vodafone Turkey, Turkcell	Proprietary Metaverse, VR Meetings	First metaverse store; virtual HR meetings and employee integration
Automotive	Otokoç Otomotiv	MMA Global Platform	Digital experience transformation in automotive sector
Technology & Defense	BİTES (XperVerse, EduVerse, CityVerse, etc.)	XR, AI, Blockchain	National metaverse platform; multi-sector XR applications
Electronics & Manufacturing	Vestel	IoT, AR, AI	Smart factories, 3D printing, robot-assisted production
Fashion & Retail	Orka Group (Damat Tween, D'S Damat)	GoArt Metaverse	Virtual store experience with AR/VR

Food & FMCG	Sagra (Tadelle)	Proprietary Metaverse	Virtual chocolate factory and interactive sales
Construction & Design	Qua Granite	Sandbox, Exclusable	First in sector; virtual villas and digital real estate events
Finance & Banking	Garanti BBVA Portfolio (MET Fund), Aktif Bank	Blockchain, Decentraland	Metaverse-focused investment fund and virtual banking touchpoint
Advertising & Media	Tazefikir Group	Proprietary Metaverse	First metaverse-based advertising agency platform
Culture & National Identity	Metapotamians Project, Virtual Republic Exhibitions	Domestic Platforms	Cultural heritage and national identity promotion

Sources: Aktif Bank, n.d.; Cellat, 2023; Garip, 2022; Günyol, 2022; Inbusiness, 2022; JR Editor, 2022; Kurtar & BİTES, 2022; Marketing Türkiye, 2023; MMA Global, 2023; Öztürk, 2022; Sagra, n.d.; Topcu, 2022; Türk, 2022; Yıldırım, 2022; Yılmaz, 2022.

5. Metaverse Professions: Domains of Expertise within the Emerging Digital Economy

The growth of the metaverse infrastructure is significantly transforming not only digital consumerism but also work patterns, jobs, and professionals. This new digital economy that is deeply intertwined with both the physical and digital worlds is giving birth to new fields of work that demand the merging of different skill sets at the intersection of AI, blockchain, AR & VR, and data science (Wang et al., 2022; Gilmour, 2023). It is possible to categorize this new digital economy into three main domains:

- Creative and cultural professions focus;
- Technical, legal, and cybersecurity-related professions play;
- Strategic and economic professions.

The Table 5 serves as an example of how it is possible to explore new career opportunities while highlighting the interdisciplinary skills and digital literacy that are essential in this constantly changing.

Table 5. New Occupational Fields Emerging in the Metaverse Ecosystem and Required Competencies

Job Description	Definition	Required Skills and Competencies
Digital Fashion Designer	Designs wearable digital clothing for avatars and NFT-based fashion collections; shapes the virtual identity of luxury brands.	3D modeling, NFT marketing, blockchain basics, trend analysis
Metaverse Tour Guide	Virtual museums offer immersive tours of historical sites or cultural events, increasing the accessibility of digital heritage.	Cultural heritage information, XR (AR/VR/MR) platforms, multilingual communication, user experience design
Smart Contract Lawyer	Oversees the legal validity, intellectual property protection, and data ownership of smart contracts running on the blockchain.	Crypto law, contract law, DAO structures, international data regulations (GDPR, etc.)
Metaverse Cybersecurity Expert	Protects virtual assets, digital identities and user data against cyber threats and develops security protocols.	Cryptography, authentication systems, cyber threat analysis, data privacy principles
Metaverse Hardware Developer	Designs physical-digital interaction tools such as haptic feedback, biosensor integration, and low-latency AR / VR devices.	Hardware engineering, sensor technologies, user ergonomics, 6G/edge computing infrastructure
Data Bounty Hunter	Analyzes user behavior data by anonymizing it; it creates value in the reward-based data economy.	Data mining, ethical data use, GDPR/KVKK compliance, AI-powered analytics
Ecosystem Developer	Ensures the sustainability of Metaverse platforms by managing community dynamics, token economy, and user participation.	Token economy design, DAO management, user psychology, platform strategy

Sources: Alsharida et al., 2025; Business Insider, 2022; Gilmour, 2023; Janssen, 2024; Juicharoen et al., 2024; Kasiyanto & Kilinc, 2022; Quan et al., 2024; Rehman et al., 2023; SanMiguel et al., 2024; Wang et al., 2022; Zhang & Liu, 2022.

6. Conclusion and Recommendations

6.1. Discussion

Besides marketing, the Metaverse is helping to reshape businesses in such aspects as the supply chain (risk management through digital twins), human resources (avatar-based staff engagement), finance (DeFi and smart contracts), and education (immersive learning). Though international brands

(Nike, Gucci, JPMorgan) are embracing the Metaverse as a part of their overall strategies, local startups in Turkey (Turkcell, Vestel, Qua Granite) still seem to be at the stage of experimenting and fragmentation. The reason for this disparity can be technological infrastructure and digital maturity. New occupations (digital fashion designer, Metaverse cybersecurity specialist) call for creative, technical, and strategic skills, thus mirroring the rise of the digital economy.

6.2. Contribution to the Literature

In this research, extend a holistic viewpoint to the existing literature by examining at the combination of the metaverse and AI not just as a technological advancement but also as a strategic and socioeconomic transformation tool. Results concur with the findings of scholars such as Dwivedi et al. (2022) and Hollensen et al. (2023) who claim that the metaverse enables hybrid consumer experiences and leads to the transformation of business models.

Besides that, it deepens the theoretical concentration of the literature (Wang et al., 2023) through the inclusion of hands-on case studies and introduces a novel integration model (AI & Metaverse Integration Model). Additionally, it helps to develop an interdisciplinary framework as it categorizes the Metaverse careers into three segments (creative, technical, and strategic).

On top of that, as studies like Wang et al. (2022) and Gilmour (2023) forecasted, this paper validates the claim with examples that the metaverse has led to the emergence of new-generation digital professions such as cybersecurity specialists and smart contract lawyers. However, the limitations specific to Turkey in terms of infrastructure and strategic maturity are supported by the local studies such as Bas (2022) and Türkeköle (2023).

This paper adds to the body of knowledge by delving into the Metaverse-enabled business transformation from a global-local angle. It addresses the gap in the literature concerning the local applications by evaluating the brand positioning in Turkey against the global .

6.3. Future Directions and Research Questions for the Metaverse

The ever-changing Metaverse comes with several; multidisciplinary research areas that need to be explored deeply. To that end, research questions below will serve as a crucial guide to decision-makers and industry players especially in a developing country like Turkey which has a predominantly young population: (1) What are the measures to assess the long-term economic impacts of the Metaverse in Turkey? (2) How can professional development programs for new occupational fields be structured? (3) To what extent do ethical and legal

complications in the Metaverse depend on cultural differences? (4) What role does AI play in increasing Metaverse's ?

6.4. Recommendations

The metaverse is an inevitable digital evolution for business and society, and therefore a multi-layered approach should be taken to strategically benefit from this transformation. From a brand perspective, instead of just chasing after technology, a long-term metaverse strategy should be formulated that puts customer experience and operational efficiency first. Successful applications should be ramped up by initiating small-scale, testable pilot projects. In addition, competitiveness should be fostered by examining at global innovations for ideas such as avatar personalization, virtual store experiences, and NFT-based loyalty programs.

Lawmakers should focus on upgrading the cloud computing infrastructure and ensuring fast and extensive internet access (5G/6G) as these two are the base of the transformation and the creation of publicly supported innovation hubs for 6G, blockchain, and AI-based Metaverse platforms should be next on the agenda. Public institutions can play their part by raising people's awareness through prototype development in the areas of cultural heritage and local services. In addition, digital literacy and metaverse-oriented technical skills training (digital design, blockchain law, cybersecurity) should be a part of curricula, and "metaverse professions" focused programs should be promoted through university-private sector collaboration.

Meanwhile, a clear, creative, and trustful legal framework should be set up for virtual assets, data privacy, cybersecurity, and digital identities; R&D for domestic platforms and initiatives should be encouraged and backed up; and green metaverse strategies in line with sustainability should be worked out, considering energy use and carbon footprint. At its core, the Metaverse and AI ecosystem are not just digital innovation but new grounds for economic competitiveness, professional transformation, and cultural interaction. Turkey's potential to be an active player in this change hinges on the simultaneous reinforcement of integrated policymaking, education, technology, and ethical .

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