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Development and Transformation in Digital Marketing and Branding with Artificial Intelligence and Digital Technologies Dynamics in the Metaverse Universe

Kemal Gökhan NALBANT
Beykent University, Department of Software Engineering, Sariyer Istanbul Turkey,
kemalnalbant@beykent.edu.tr
ORCID: 0000-0002-5065-2504

Sevgi AYDIN
Beykent University, Department of Business (Turkish) Sariyer Istanbul Turkey,
sevgiaydin@beykent.edu.tr
ORCID: 0000-0002-9507-5448

Abstract **- The Metaverse will have a variety of effects on marketing. Businesses need to maintain their identities in the Metaverse realm. Generation Z and Generation alpha will have an easier time adjusting to virtual realms. The augmented reality environment allows buyers to interact with products without leaving the comfort of their own homes. Realization of in-store experiences is possible in the universe of the Metaverse. In addition, there will be an increase in the number of options for branding in the Metaverse. Virtual billboards and the virtual clothing consumers choose to wear will also influence brand awareness. Additionally, Non-Fungible Tokens (NFTs) will be used to produce branded virtual content for end users.**

Examining the influence that technologies powered by artificial intelligence have had on digital marketing and branding will be the primary focus of this research project. In addition, research will be conducted into the applications of the Metaverse, artificial intelligence, and other digital technologies in the marketing field and studies about these subject areas. The research investigated several digital technologies, including the Metaverse, artificial intelligence, blockchain, virtual reality, and augmented reality. It is of the utmost importance for businesses to be able to compete in digital and virtual environments within the context of digital transformation to thrive in an increasingly competitive world. Companies need to invest in the Metaverse, artificial intelligence, and various other forms of digital technology to expand their marketing awareness in virtual environments, expand their customer portfolios, and become brands to take the lead in their respective markets.

Keywords— ***Metaverse, artificial intelligence, virtual reality technologies, digital technologies, digital marketing.***

I. INTRODUCTION

Digital marketing involves the use of digital technologies to build channels for prospective receivers, with the aim of achieving the objectives of the business by more effectively satisfying the customers' requirements. The terms "internet marketing" and "e-marketing" are sometimes interchanged with "digital marketing," which has become more prevalent in recent years. This is a mistake that should not be made. The internet is only one of many channels a customer may be reached; it is not the sole one. In addition to this, there are audio and video equipment and home appliances [1].

The digital transformation process of a firm includes digital marketing as an essential component. It is comprised of modern marketing strategies that apply to the present state of the market and are founded on information and communication technology. Businesses can give more significant levels of customer satisfaction and access more effective tools for managing their relationships with customers due to digital marketing. Because of the interactivity and mobility of these tools and the fact that people are familiar with them and understand them very well, they may fulfill the requirements that people have regarding the search for information and the understanding of it. They are the guardians of conventional marketing ideas, which attempt to enhance sales revenue and profit while concurrently increasing customer happiness. They help companies implement their marketing strategies more effectively, and they do so by assisting [2].

Digital markets are at the center of the public policy discussion due to the vital role digital giants play in the modern economy and their impact on cultural diversity, political pluralism, and privacy, among other things. Any policy argument needs a comprehensive understanding of how these markets work [3].

Despite the relevance of AI and non-fungible tokens to luxury brand customer experiences, the most crucial development may be firms expanding into numerous metaverses. Digital products fill these ultramodern places quickly. Due to pandemic-induced isolation, "real" and "virtual" may become less different for a new generation of customers who consider the internet crucial to their everyday life. In almost two years, global health challenges have drastically impacted human participation in the real world while simultaneously fostering much more substantial virtual connections on social media platforms ranging from Facebook to Tik Tok, Instagram, Twitter, Snapchat, and YouTube. Numerous clients routinely participate in internet activities, such as surfing or online forums and games. Couples have celebrated weddings in virtual environments with avatars for the wedding party and guests. Avatars never need to worry about fundamental earthly issues like changing looks, and bridal outfit designs may be ornately embellished [4].

The transformation brought on by the Metaverse is starting to be absorbed by many business sectors. Many businesses have publicized their plans for the Metaverse, and the

frequency with which they do so is growing daily. The Metaverse has evolved into a venue for the conduct of virtual commercial operations for corporations. A growing number of businesses are holding meetings with distant employees on Metaverse. The workers may use digital avatars to attend and actively engage in the sessions. In addition, numerous business interactions with clients may be arranged when the market is broken down into parts [5].

The idea of a mediated virtual world has been around even before the development of the contemporary internet. It has been the subject of novels, it has been portrayed in movies, and it has been the impetus for plays performed onstage. Despite this, there is currently no commonly accepted definition of the Metaverse that exists, excluding advertising campaigns. While many well-known stories set in metaverses, such as "The Matrix" and "Snow Crash," are predicated on a gloomy future, these narratives cannot help but shed light on the allure of the Metaverse. The use of social media exemplifies the massive appeal of interacting with people and information remotely without the necessity of being present in a particular area. The outcome would be something that transcends the physical world if technology firms could combine the liberties of virtual experiences with natural-feeling interfaces that people have daily in the real world. The metaverse has the potential to provide all types of social and information ecosystems with the same degree of freedom of movement, possibility, and action that is typically associated with playing video games. It would cause a profound change in how people communicate with one another. The rebranding of Facebook, like many other things, has the potential to act as a helpful bellwether by highlighting trends that are already in place. Numerous vital technologies necessary for constructing a Metaverse have already been developed. The outbreak rekindled interest in the concepts behind virtual meeting spaces, which have the potential to serve as a stepping stone to virtual worlds. Several companies have developed more realistic and complicated virtual and augmented reality applications. The eventual realization of the Metaverse will depend on these instruments [6].

Studies in the literature relating to digital marketing that used artificial intelligence were investigated. Dirican [7] intended to convey various behavioral changes through Robotics and Artificial Intelligence in marketing topics. With the advancements in this sector and the necessity for academic research on the future of marketing science and customer relations, he intended to conduct a conceptual and theoretical study on the usage and consequences of AI and Robotics in Marketing Science. Keles et al. [8] assessed the potential use of AI in marketing and recommended innovative applications for this industry. They reviewed research on marketing management decision support in the national-international arena.

Dimitrieska et al. [9] explored the future link between marketers and artificial intelligence robots. In the future, marketers will use more intelligent searches, advertisements, content distribution, bots, continuous learning, fraud, data breach protection, sentiment analysis, picture and voice recognition, sales forecasting, language recognition, predictive customer care, customer segmentation, etc. It was said that more repercussions of artificial intelligence are anticipated. Bayuk and Demir [10] gave information on the use of AI in marketing, its impacts on customers and enterprises, and how artificial intelligence technology has been utilized in the past and will be used in the future. In addition, they sought to demonstrate the emergence, development, and applications of AI for marketing, as well as the technological advancements leading up to the Fourth Industrial Revolution, and to examine its effects on a lot of marketing and the benefits it offers businesses and customers.

Davenport et al. [11] presented a study plan that emphasizes how marketing techniques and consumer behavior will evolve in the future and critical policy problems about privacy, prejudice, and ethics. Moreover, the scientists hypothesized that AI would be more successful if human supervisors were enhanced. Arsenijevic and Jovic [12] studied the existing use and future potential of artificial intelligence as a chatbot marketing tool. Sixty participants were surveyed on their behaviors, habits, and expectations while utilizing various communication channels, emphasizing the benefits and downsides of chatbots compared to other communication channels. The findings revealed that the most significant advantage of employing chatbots in marketing services is the ability to convey essential information fast. Still, participants are also concerned that chatbots would supply them with incorrect information. Jarek and Mazurek [13] investigated the extent to which artificial intelligence is used in marketing and its ramifications for marketing professionals. They studied which marketing applications of AI exist and what impact AI has on marketing managers.

De Bruyn et al. [14] focused on the notion of "high-level learning" that distinguishes artificial intelligence applications from traditional modeling approaches, recent developments in deep neural networks, and the underlying methodologies and learning paradigms. Yeğin [15] discussed the significance and future of artificial intelligence and intelligent robots in marketing strategy. Ergen [16] examined AI's existing application, effect, and future. As part of artificial intelligence, event planners use robotic applications, digital assistants, and chatbots. Vlacic et al. [17] studied AI technology adoption, utilization, and acceptability in marketing, data security and ethics, and institutional support for marketing AI.

Verma et al. [18] reviewed AI in marketing from 1982 through 2020. Huang and Rust [19] created a three-phase framework for strategic marketing planning that uses AI to automate marketing chores and operations, analyze data to derive conclusions, and review interactions and AI experiences. To show the strategic use of AI, they have implemented this framework in many marketing areas governed by marketing 4P/4Cs. Kang [20] aimed to investigate the new course that Metaverse marketing would take. For Metaverse Roadmap 2.0, he examined a case study of Metaverse marketing that concentrated on a jewelry company and the development of IT technology. Jewelry brands evaluate one another and research different Metaverse marketing scenarios to draw implications based on the examined marketing approach. Because of his research, successful Metaverse marketing gives a tailored experience in the virtual environment and is supported by an analysis of the customer journey.

Related studies in the literature are shown in Table 1. It has been found that not much research in the Metaverse sector has been published in the relevant literature. Furthermore, this research will contribute to the existing body of knowledge.

II. The New Marketing World is Metaverse

The Metaverse concept is not recent because it has been discussed for decades concurrently with the expansion of the internet and other forms of technology. The Metaverse development can be traced back to many primary events, some of which are depicted on the timeline shown in Figure 1. These events span from the genesis of the internet and its first recorded mention through the debut of Second Life and more contemporary Metaverse ventures by major technology corporations like Microsoft and Facebook. The phrase "Metaverse" is a combination of the words "Meta" and "Universe" [21, 22], and it may have been used for the first time in the 1992 dystopian cyberpunk book Snow Crash, a virtual reality realm referred to as "the matrix."

The Metaverse is a permanent and enduring multiuser environment that merges physical reality with computer simulation. It is often referred to as the post-reality era. The Metaverse allows users to communicate with one another in real-time and interact dynamically with digital objects. The very first version of it was a network of several virtual worlds that allowed avatars to travel from one to another. Modern Metaverse systems are compatible with MMOGs, open gaming environments, and AR [23].

Three key distinctions separate the Metaverse from AR and VR. First, whereas VR research focuses on physical and graphics, Metaverse offers more enduring content and social significance. This contrasts with the method that VR-related studies use. Second, augmented and virtual reality technologies are not necessarily used in the Metaverse. It is still possible for the application to be a part of the Metaverse, even if the platform does not support virtual reality or augmented reality. Finally, the Metaverse has an environment that can be scaled up to accommodate many users, which is critical for developing social meaning [24].

The internet and the framework of "social media" will not be fundamentally replaced by the Metaverse; instead, it will build atop the internet and transform it into a 3D online social media ecosystem brimming with new and intriguing user experiences. For businesses primarily based in the real world, the Metaverse may be considered a vast testing ground that provides direct access to certain demographic target groups comprised of younger people. Virtual games in online environments such as Roblox and Fortnite are primarily responsible for the widespread awareness of the Metaverse. Developing a user experience that improves the operational capabilities of a company's product or service is a good strategy for firms interested in experimenting with the Metaverse. Augmented reality (AR) is fantastic for doing this kind of thing. For instance, it can assist clients in the cosmetics industry to create foundation colors unique to their preferences. Also, as an illustration, Adidas has implemented AR to permit customers to virtual test several pairs of shoes. Ikea has been incorporating technology for years to help customers envision different pieces of furniture in their own houses [25].

As a result of Mark Zuckerberg's decision to rebrand Facebook as Meta, the Metaverse has emerged as a topic of intense debate. Users can interact with the Metaverse projection that Zuckerberg has created and not only watch it on their screens. This technology will also result in the developing of different technologies that can be combined with Virtual Reality. In his 1992 work of science fiction, Neal Stephenson's "Snow Crash" was the first publication in which the phrase "Metaverse" appeared. The book's story ends with the protagonist using a digital avatar of his creation to go around a virtual world. The technology built for the Metaverse will bring us to the technological sophistication of the future, where people can connect, work, play, and even attend concerts. Not just PCs, cellphones, or TVs are utilized as media; we access them through augmented reality glasses, virtual reality headsets, and other devices [26].

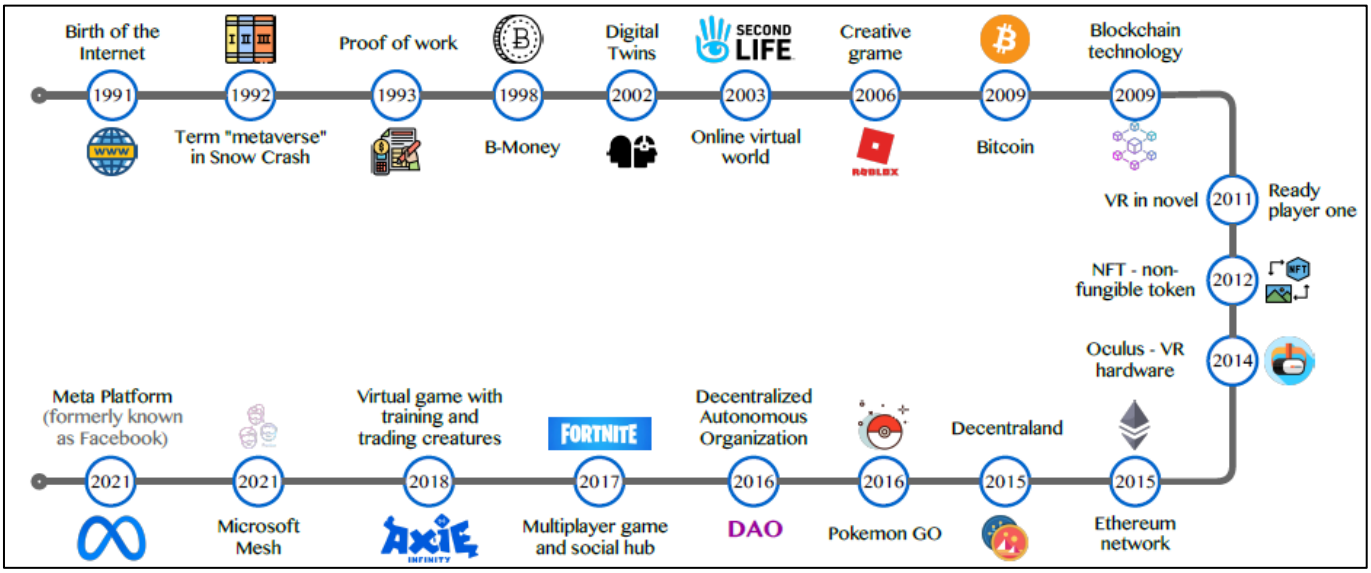

Figure 1. A chronology of the metaverse's growth from 1991 to 2021, detailing the most significant events [21, 22].

Table 1. Related studies in the literature.

Article Name	Journal Name
Digital future of luxury brands: Metaverse, digital fashion, and non-fungible tokens [4].	Strategic Change
A Look at The New Humanity: Metaverse and Metahuman [5].	International Journal of Computers
The Effects of Technological Development and Artificial Intelligence Studies on Marketing [7].	Journal of Management Marketing and Logistics
A Case Study on Metaverse Marketing of Jewellery Brand [20].	Journal of Digital Convergence
Metaverse [23].	Encyclopedia
A Metaverse: Taxonomy, components, applications, and open challenges [24].	Ieee Access
Metaverse–the new marketing universe [25].	Journal of Business Strategy
Digital Marketing Strategy for Balinese Handicrafts Facing the Metaverse Era [26].	CHANNEL: Jurnal Komunikasi
Applying Digital Twins in Metaverse: User Interface, Security and Privacy Challenges [30].	Journal of Metaverse
Metaverse beyond the hype: Multidisciplinary perspectives on emerging challenges, opportunities, and agenda for research, practice, and policy [32].	International Journal of Information Management
Computer vision in the Metaverse [45].	Journal of Metaverse
Metaverse and crypto art during the COVID-19 pandemic [47].	Journal of Urban Culture Research
Meet Your Digital Twin in Space? Profiling International Expat's Readiness for Metaverse Space Travel, Tech-Savviness, COVID-19 Travel Anxiety, and Travel Fear of Missing Out [48].	Sustainability

The term "augmented reality" refers to a technology that creates a simulation of artificial items in a natural setting. AR will be a valuable addition to VR, which already has audio and sensory capabilities. It enables users of the Metaverse to communicate with one another directly. In addition, augmented reality calls for using a camera and a monitor device or head-mounted display (HMD) for extra virtual items to function in real-time. Third, artificial intelligence can link any gadget since it is a technology. It is possible to automate all the devices without physically being there. Both the government and the industrial sectors may benefit from its ease. Computer technology that has intelligence comparable to that of humans is known as artificial intelligence (AI). To accurately simulate human cognitive processes, the universe of the Metaverse needs this. In the future of the Metaverse, financial transactions will necessitate using digital money to conduct financial transactions. This brings us to the fourth point, which is digital currency. The purchase and sale of payments and investment vehicles will be conducted using cryptocurrency in Metaverse. In conclusion, a connection to the internet is required for Metaverse to function correctly. Therefore, a fast internet connection is necessary to deploy Metaverse. The globe is working toward establishing a 5G network, which will assist the Metaverse in the foreseeable future [26].

As was the case with the ideas of cybernetics and cyberspace, the individual who invented this idea was not a scientist but a literary guy. This was the case until October 2021, when Mark Zuckerberg made it renowned worldwide. In his book Snow Crash, published in 1992, science-fiction author Neal Stephenson introduced the term "Metaverse" to describe a three-dimensional and interactive virtual environment in which individuals converse and engage with one another [27].

The followings are many important implications for companies contemplating utilizing the Metaverse for marketing, branding, and advertising [28]:

- Using the Metaverse, businesses can connect with prospective customers in different parts of the world.

- Interactions based on avatars provide a fresh opportunity for businesses to engage with potential customers, and the Metaverse makes this possible.

- In the physical world, it is not possible to create advertising experiences that are as interactive and engaging as those that are accessible in the virtual world of the Metaverse.

- Businesses that use the Metaverse for marketing, branding, and advertising may have a potential competitive advantage over businesses that do not leverage the Metaverse for these purposes.

- Because the Metaverse is still in its infancy, businesses need to be prepared to adjust their strategies as the environment develops to maintain their position as market leaders.

Metaverse may be initially implemented in the following fields [29]:

Entertainment and Game industry: The development of interactive technology has significantly increased the feeling of immersion in gaming, which may substantially improve the user experience as well as the playability and pleasure of the game.

Economy: The use of blockchain technology, decentralization, and the formation and growth of new sectors inside the Metaverse all have the potential to drive economic development successfully.

Social: Social networking is based on a scenario, in-person, and virtual get-togethers, and the formation of new friendships online. The Metaverse eliminates the barriers imposed by time and space and further separates individuals from one another. In the Metaverse, people can converse at any time and location. The term "social contract" can refer to various activities in the Metaverse.

Smart City: Metaverse is a virtual world that coexists with ours and uses digital twin technology, which is also an essential component in developing a smart city. The technology of digital twins can digitally map the real world and construct a digital twin city that is visible, controlled, and managed. It can increase the effectiveness of resource use, optimize urban administration and services, and develop the residents' life quality.

Education: The development of Metaverse has the potential to assist in the promotion of children's education, serious gaming, and educational programming for preschoolers. Education can benefit from the Metaverse in the following ways:

- It can provide a more immersive experience by modeling realistic settings to aid in the comprehension of educational material,

- It can help protect students from the potentially dangerous effects of conducting experiments in the real world.

A Metaverse architecture is broken down into seven primary levels. The seven primary levels of the Metaverse architecture are presented in Figure 2.

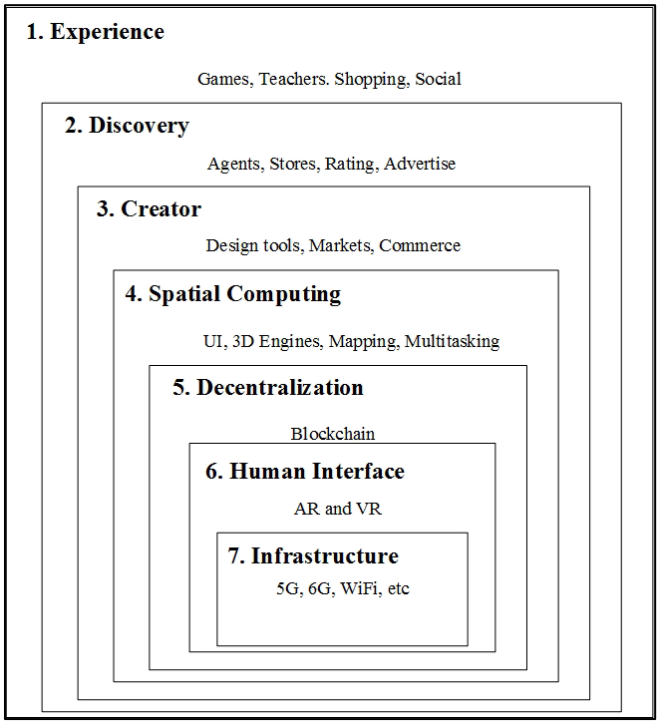

Figure. 2. Structure and major components of the Metaverse [29, 30, 31].

The following paragraphs explain these levels [29, 30, 31].

1. Experience: This layer is closest to consumers' physical reality. Since it is comparable to the application layer in network architectures, it may be regarded as equal; the name is given to this layer.

2. Discovery: Artists and service providers drive this layer to inspire and educate users and communities.

3. Creator: The Creators, who were responsible for the powering of the layer below, are now a part of this layer.

4. Spatial Computing: This layer permits hybrid computing that blurs the distinction between the digital and physical worlds. Additionally, this layer supports distributed computing. It is plausible to assume that this layer acts as the skeleton of the creator layer.

5. Decentralization: Distributed computing is the foundational premise of the Metaverse, which offers a flexible environment for developers and consumer dependability. Decentralization refers to the absence of a central authority or control. Blockchain technology is a crucial component of this layer since it is responsible for inquiries and serves as a support for decentralized infrastructure. This layer is an essential part of the whole system.

6. Human Interface: This layer is responsible for the human interface. In addition to augmented and virtual reality, other technologies like smart eyewear, 3D printers and scanners, biosensors, and even customer neurons might act as translators between the physical and digital worlds.

7. Infrastructure: Users and the devices they use may connect to the digital world via this infrastructure layer, known as the Internet layer. Even if 6G makes, additional improvements to speeds, 4G, 5G, and Wi-Fi are well-known instances of this layer.

III. THE ADVANTAGES AND LIMITATIONS OF DIGITAL MARKETING TRANSFORMATION AND DEVELOPMENT IN THE METAVERSE UNIVERSE

The Metaverse can be exploited with a greater degree of freedom since it is not constrained by the actual world. It has the benefit of freely designing unrealistic items and enabling people to encounter inexperienced things. This gives it a distinct competitive edge. This is because the world is not based on reality [32].

The Metaverse has a wide variety of potential for people, businesses, and even the government. As a result of a more immersive user experience, the Metaverse makes a wealth of data points available to the host on various temporal and spatial dimensions. These data points can then be analyzed with more sophisticated analytical tools to target and retarget prospective customers in real-time. Therefore, the trackability of the target clients would be more potent than conventional digital channels. Using technology classified as extended reality (XR) for the future generation, the Metaverse can create a digital representation of the physical world. Users that engage in fascinating material and interact with the Metaverse using cutting-edge AR and VR technologies will have the opportunity to participate in a fully immersive experience. Metaverse marketers will urge consumers to play a game to gain virtual items and gather preferences. Because so many different people create material, the Metaverse platform will become crammed full of original works of art. It makes it possible for content

producers in gaming, NFTs, entertainment, and other industries. For content producers to exploit these strategies for content production while working inside Metaverse platforms, they will need to be conversant with XR technology [32].

As a result of the disparity in the visual information collected from human organs and eyes, users risk experiencing virtual motion sickness, also known as cyber motion sickness. Some collisions involve focusing displacement and crashes involving binocular occlusion, both of which potentially have adverse consequences (e.g., blinking). There are also specific adverse effects, such as thin and vector motion sickness, as well as other problems, such as physical weariness, the weight of the headset, movement injuries, and hygiene problems arising from continuous use. Measurements of postural stability and physiological parameters are used as tools for determining the severity of motion sickness. This helps to ensure that adverse effects are kept to a minimum. On top of that, different approaches may be used to reduce the visibility of leading indications. Stability of thought and homeostasis of body temperature are two factors that are essential for successful service in the Metaverse. Recently, the scope of Metaverse has been broadened to include the experience of smell and taste to promote a more genuine feeling of immersion. On the other hand, there is an increasing interest in identifying a more sophisticated sensation via the combination of several senses. Fast rendering and data analysis are an absolute need at this moment if one wants to handle enormous volumes of real-time data successfully. Because the whole field of vision is considered during the processing of an image, it is critical that the processing speed be high. As a result, it is essential to reduce the delay time throughout the rendering process by using the anticipated tracking and measurement [24].

IV. The Security and Privacy Challenges of Digital Transformation and Development in the Metaverse Universe

Despite the significant study conducted about Metaverse technology, minimal emphasis has been put on the Metaverse's privacy and security. Privacy and safety concerns are of the utmost importance, just as they are with social networking sites in the Metaverse. Malicious users may watch and gather other users' behavior and biometrics in the Metaverse. This monitoring and collection can take place in real-time. Because the Metaverse is developed in the cyber world, we need to consider cybersecurity and privacy issues to offer users appropriate services in a safe and efficient manner. Users and systems need to be shielded from a wide range of vulnerabilities and dangers that various vulnerabilities and risks may cause. This is what cybersecurity and privacy should give [32, 33].

As a direct consequence, security risks will always be associated with such data. In a virtual environment, on a Metaverse platform, it is possible to fake and discloses private information and material that has been saved. Platforms for the Metaverse would have access to the biometric data of all attendees, including their email addresses, phone numbers, locations, genders, facial expressions, eye movements, and hand gestures, among other types of data. In addition to worries over the user data's security and the potential for manipulation, the most fundamental problem is who controls this data and where it is housed. On the Metaverse, it is necessary to identify a threshold that strikes a balance between tracking data to provide a superior experience for customers and protecting personal information. As a matter of prudence, future studies should also investigate the possibility of generating markers. A score determined by a specific set of factors might assist in flagging privacy risks inside the organization [32].

V. Marketing in the Digital Age with Artificial Intelligence

The area of AI is one in which researchers worldwide are putting in the most significant effort and putting their findings under the most rigorous scrutiny. The field of medicine has been one of the primary areas where artificial intelligence has made substantial advancements and is now present in every facet of our life. The term "artificial intelligence" refers to a collection of computer programs and hardware systems that can perform various tasks, including mimicking human behavior, doing logical calculations, moving, speaking, and perceiving sounds. In a nutshell, artificial intelligence gives computers the ability to think like people do. ML and AI will affect hospitals, medical professionals, and many others working in the healthcare industry [34].

Using customer data in conjunction with artificial intelligence (AI) marketing is a strategy that aims to enhance the overall customer experience by predicting the next step a consumer will take. AI provides a means to bridge the gap between data science and execution by sorting through and analyzing enormous data dumps, a previously impossible task [35]. The field of computer science known as artificial intelligence focuses on developing intelligent computers capable of thinking and reacting as people do. In 1950, the English mathematician Alan M. Turing suggested a test that would assess the intelligence of computers. This examination, known as the Turing test, was carried out to establish whether a computer could attain human-level performance in all cognitive activities. A subfield of artificial intelligence known as machine learning allows computers to automatically learn new things and become better due to their experiences. For this specific purpose, specialized computer systems are developed, and adding new definitions to the database does not need explicit programming [35].

The term "artificial intelligence" is all over the place these days, and it must have a clear and precise definition. It makes machines intelligent because intelligence is the ability to respond correctly and predictably to one's surroundings. Computers with artificial intelligence have been used in the past, are being used now, and will continue to be utilized in the future. The use of and further development of AI technology is essential to the success of future marketing endeavors. Every day, companies improve their operations, lower their costs, shorten the time it takes to deliver their products, and boost their output using software powered by artificial intelligence. Organizations that currently sell AI software will gain from the eventual technical improvement. This is because the pace at which technology is advancing is astoundingly rapid [36].

The requirements of practical applications may be satisfied by using any combination of speech recognition, text and picture recognition, and decision-making domains. For instance, speech recognition software is available for smartphones (e.g., Siri). These systems may be utilized as virtual assistants because they rapidly reply to textual input. Facial recognition is used to verify a person's identity before releasing money, and the system decides whether to release funds after analyzing the two people's faces. There are choices for educational opportunities; IBM Elements was designed to assist students and instructors. Finally, automated robots and vehicles are utilized in industries for inventory management (e.g., in the Amazon Kiva system) [37].

Several subfields within digital marketing are now making use of AI. AI marketing applications include decision-making, autonomous robotics, image, text, and voice recognition. AI technology may also make decisions. The most prominent names in the technology industry, including Amazon, Google, Apple, and Microsoft, all use the artificial intelligence application known as voice recognition. We can forecast that an even more significant number of responsibilities will be automated and simplified. Consequently, experience quality and the degree to which they are satisfied will increase dramatically within the context of the digital marketing platform. Integrating artificial intelligence (AI) technologies, such as augmented reality, virtual reality, automated content production, speech recognition, and so on, may unquestionably generate a better consumer reaction, which eventually results in higher customer satisfaction [37].

VI. Digital Marketing and Branding Tools: Beyond the Conventional Methods

With Augmented Reality (AR), a user's vision of the actual world may be augmented with virtual material. The overarching concept of AR has only been sketched out in broad strokes by the study done so far on AR Marketing. Within the marketing field, augmented reality marketing is a unique and possibly revolutionary subdiscipline. To be more explicit, compared to the introduction of the internet, followed by the growth of internet marketing, SEO, and social media, actions using augmented reality (AR) in marketing can be categorized as AR Marketing [38].

The consumer navigates the shop using a mouse, joystick, or keyboard input in a conventional desktop virtual reality (VR) simulation. They may also grab a box from the shelf by clicking or touching the image of the product shown on the screen. The item will then quickly make its way to the middle of the screen. The customer may "buy" an item by touching an image of a shopping cart, after which they can spin the object to check the packaging information and then "purchase" the item. The computer will record all parts of the interaction in the background while you are shopping. This will include the amount of time spent in each category, the order in which products were interacted with, how long each interaction lasted, and how many goods were bought [39].

A user using mixed reality may see the actual physical environment and items in it in addition to seeing virtual objects that are convincing and responsive to their actions. The goal behind the development of MR was to integrate the most beneficial aspects of AR and VR. Consider the scenario in which a digital suitcase is hidden under a desk, for instance. When utilizing an MR gadget or software, a person wouldn't be able to see the virtual bag unless they bent down and looked at it from beneath the desk. Because the virtual suitcase is tied to a location in the actual world, it is more probable that the individual participating in the MR experience will think that the virtual briefcase is "real." MR is distinct from AR in that it allows the user to perceive depth and perspective. In a mixed reality (MR) encounter, a virtual item will look more diminutive as the user moves their head away from it. This does not commonly occur during an augmented reality experience; the distance to a virtual object would remain the same [40]. A comparison of how each concept is distinct from the others is given in Figure 3.

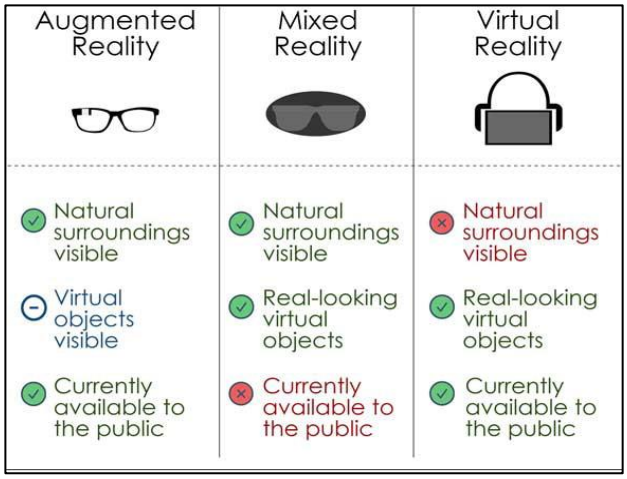

Figure 3. A comparison between augmented reality, mixed reality, and virtual reality [40].

People can gain knowledge relatively rapidly with the assistance of virtual assistants. You can check the time and weather, take quizzes, translate words and phrases, look up unfamiliar keywords, convert units, conduct math, and search for applications on the smartphone [41].

Additional capabilities of virtual assistants include the following [41]:

- Creating alerts and jotting down notes.
- Communicating through text messaging.
- Adding new events to the calendar.
- Displaying impending charges on the invoice.
- Arranging times for appointments and meetings.

Virtual assistants can recognize tunes and TV shows. Some completed activities were watching, reading a book, finding a movie, searching for photographs, and taking photos and videos [41].

A distributed database shared across a computer network's nodes is known as a blockchain. A blockchain may be considered an electronic database that stores information in a decentralized fashion. Blockchains are perhaps best known for maintaining a trustworthy and decentralized record of transactions in cryptocurrency systems like Bitcoin. The blockchain is innovative because it removes third-party involvement to verify, authenticate, and secure data records

while fostering trust among users. A standard database's data structure differs from a blockchain's data structure, which is a distributed ledger. A blockchain stores data in groups of information known as blocks. Each block in the blockchain has its data set. When a block is completely occupied, it will collapse and become connected to the one that came before it. The result of a block being filled up completely is the blockchain, which is a data chain. The following information is compiled into a newly constructed block, which is then added to the chain after it is finished. This process continues until the chain is complete. The Metaverse is a vast virtual arena where users may interact with 3D digital items and 3D virtual avatars of each other [42].

The Digital Market is the primary venue where virtual characters can engage in economic activity analogous to the real world. The mature market of the Metaverse, which should enable the development of items and genuine commerce completed in the Metaverse, must be distinct from the digital market that is already in existence [43]. Many people feel that blockchain is one of the essential infrastructures of the Metaverse because of its ability to connect otherwise disconnected tiny sectors and give a solid economic system. This, in turn, helps establish clear, open, efficient, and trustworthy rules for the Metaverse. For instance, adopting hash algorithms and time stamping technologies as essential components in the data layer of a blockchain might give users the Metaverse traceability and confidentiality of the data stored in the blockchain's bottom layer [43].

NFT, which may alternatively be stated as a sort of crypto money, can represent a valued asset, in contrast to other types of crypto money that are distinct from traditional conceptions of the term "money." One example of a non-financial investment would be anything owned by a person but exists solely in the digital realm. In this sense, non-fiat currencies, such as non-fungible tokens (NFTs). NFTs, like cryptocurrencies like Bitcoin and Ethereum, are linked to a decentralized ledger called a blockchain. This is one of the primary reasons why NFTs are often compared to cryptocurrencies. Many of the goods that are classified as NFTs are collectibles. For instance, non-fungible tokens (NFTs) might be viewed as playing cards in the digital realm. Playing cards were once quite common [5, 44].

VII. Impact of Coronavirus (Covid-19) on Metaverse

Before the release of Covid-19, many people in the community considered the Metaverse to be nothing more than a platform for amusement where they could kill time or play games. But with the epidemic, there emerged in the Metaverse the possibility of a second world for society. The community is having discussions on corporate integration, partnerships, retail merchandising, investment, and how to adapt this model to live in other parts of the world. As a potential answer to several issues, the development of a virtual world has taken on a greater significance in the wake of the epidemic. Having virtual business meetings that are participatory is one illustration of this trend. The pandemic caused by the Covid-19 virus significantly contributed to the quickening of the evolution of the Metaverse world [45].

The coronavirus (Covid-19) pandemic has significantly altered how we live and play games. The virus has caused many individuals to self-isolate and quarantine themselves. These may result in several severe difficulties, including mental and physical health. Simultaneously, the Metaverse, especially virtual and augmented reality, has gained popularity in the disciplines of human-computer interaction and computer science [46].

Due to health and safety concerns, the Covid-19 pandemic has altered one's work life and interpersonal interactions, resulting in a greater distance and estrangement between individuals. Computers, the internet, and software communications platforms allow many to work from home. Computer literacy is becoming a required ability for everyone, not just for communication reasons but also to build more online enterprises during times of censorship [47].

The Metaverse allows digital travelers to have unfathomable experiences (like space travel) in non-virtual reality. COVID-19 travel concern has boosted virtual world interest (e.g., Metaverse travel). FOMO affects travelers' choices for interesting, creative travel experiences [48].

Virtual worlds' functionality, use, and impact will increase with time. Initially, consumer and corporate actions nearly always seem to be "trends" or "fads," yet they subsequently have ongoing societal relevance worldwide. It isn't easy to conceive of anything that might have altered the view of the Metaverse as quickly as COVID-19. As parents looked for indoor activities for their children, millions of digital skeptics have joined in virtual worlds and games like Fortnite and Roblox. Digital meeting platforms (such as Zoom and Teams) have gained popularity and will likely have a metaverse presence in the future [25].

VIII. Discussion

The pandemic process has led to an increase in the Metaverse. With the help of Metaverse, digital marketing and branding have also achieved a significant new level. The Metaverse offers opportunities to produce and market content connected to brands. During the epidemic, our lives have been impacted by introducing a novel approach to networking and attracting prospective clients. In recent years, businesses have begun to invest in developing virtual event platforms. Large corporations have started to modify their operations to accommodate Metaverse realities due to the explosive proliferation of these universes. People in the Metaverse world can carry out various activities that are part of their regular life in virtual realities. For businesses, multiple tasks, including locating their ideal customers, conducting sales, and engaging in marketing endeavors, may be carried out in the realm of the Metaverse.

To adapt to the Metaverse, marketers need to attend various pieces of training and educate themselves on blockchain technology. In the distant future, building up clients' knowledge of your brand in the Metaverse market will be essential. It is the intention of this project, too, over time, to generate virtual content and make the brands recognized in the Metaverse to raise the consumers' level of brand awareness. Since the pandemic, many social events have been relocated to the virtual event environment. These include

concerts, performances, meetings, and other similar gatherings. It is anticipated that these events will be more integrated and engaging in the Metaverse.

New technologies, such as augmented and virtual reality (AR/VR) and artificial intelligence, should be combined to build virtual worlds that are as lifelike as possible. These technologies are vital for the creation of realistic virtual worlds. A wide variety of businesses now use chatbots and virtual assistants powered by artificial intelligence. These kinds of technology will take the form of digital individuals in the realm of the Metaverse. The arrival of digital humans is imminent, thanks to the development of artificial intelligence. They can use various talents, including facial expressions, body language, emotional expressions, and physical engagement inside virtual realms.

A great number of businesses now make use of chatbots and other types of virtual assistants to carry out a variety of functions. The use of artificial intelligence will have the consequence of bringing digital people more in line with humans. Whatever the activities that are required of digital people, whether it be a sales and marketing tool or a customer-employee support representative, digital people are becoming more important. Because technological advancements in the realm of sound will play a more significant role in the Metaverse, people would rather bargain than converse about nothing. Brands are going to decide to spend in this area so that they can provide the finest possible experience for their customers.

IX. Conclusions

It is critical for the growth of nations that the universe of the Metaverse is accorded the appropriate value within the context of digital transformation. Businesses need to ramp up their efforts and initiatives in these areas to remain competitive and stay up with the pace of change. Virtual worlds may have hard-to-achieve numbers. For instance, in a confined space, one activity that may be carried out is the collection of virtual avatars, as millions of them would not fit. He said twelve million people tuned in to see the Travis Scott performance broadcast on the Fortnite app. This is, without a doubt, one of the most significant breakthroughs of our generation. In the distant future, legendary artists can perform concerts in virtual worlds attended by millions of people. When new features like these are introduced, they tend to stir up more interest in marketing. When it comes to marketing, this means that businesses will have an easier time communicating with customers, comprehending the requirements of their target demographic, and delivering superior customer service by addressing the needs of their target audience.

Customers want to be able to rapidly get their hands on the items and brands that they want. As a result, it is anticipated that communication speed will advance to its highest possible level. The Metaverse is in its infancy, and it will be some time before it fully develops. Businesses must build consumer-oriented strategies and create solutions that fulfill customers' requirements. For this reason, investments need to be made in digital technologies such as the Metaverse, AI, blockchain, digital twins, virtual reality, and augmented reality. Metaverse is an emerging trend field. More research should be done in this field to expand the existing body of knowledge.

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