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Metaverse Technologies and its effect on Brand Identity through Artificial Intelligence Marketing Activities as a mediating variable in the tourism industry: Testing the moderating role of Brand Excitement (A field study)

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Abstract:

Purpose – The main purpose of the article is to clarify how Metaverse Technologies (Virtual Reality (VR), Augmented Reality (AR), 3D Modelling and Simulation, and Haptic Feedback) can change the tourism experiences and transform tourism marketing strategies in Egypt and its brand identity. It also aims to conceptualize the meaning and characteristics of metaverse in the tourism industry, examine its technologies and the artificial intelligence marketing activities affected by it. Building on what was said before, this study explores how brand excitement moderates the relationship between brand identity and artificial intelligence marketing activities.

Design/methodology/approach – A structured questionnaire was used to conduct a survey with a sample of 520 tourists of different Arab nationalities. The conceptual model was analyzed using structural equation modelling (SEM) in this study. Scholars recommend Partial Least Squares Structural Equation Modelling (PLS) as the most fully developed and general system for variance-based structured equation modelling. Also, researchers test the measurement model for reliability and validity assessment through confirmatory factor analysis (CFA) using Covariance-based structured equation modelling software (AMOS V. 24).

Findings – The structural model results indicated that Metaverse Technologies significantly influences Brand Identity. In addition, that all dimensions of Metaverse Technologies have significant influence on Brand Identity Except Augmented Reality. Moreover, Metaverse Technologies significantly influences AI Marketing Activities. On the contrary AI Marketing Activities construct has no influence on Brand Identity and it doesn't mediate the relationship between Metaverse Technologies and Brand Identity. Furthermore, statistical results show that Metaverse Technologies construct has a positive and significant effect on Brand Excitement. Also, all dimensions of Metaverse Technologies have significant influence on Brand Excitement. Finally, Brand Excitement has positive and significant effect on Brand Identity and significantly moderates the relationship between AI Marketing Activities and Brand Identity.

Originality/value – This article was carried out because only a few studies have examined the influence of Metaverse Technologies (Virtual Reality (VR), Augmented Reality (AR), 3D Modelling and Simulation, Haptic Feedback), Artificial Intelligence Marketing Activities and Brand Excitement on Brand Identity specially in the field of tourism marketing in Egypt. Finally, this study fills the gap in the existing literature and concludes with a discussion on the contributions, limitations as well as suggestions for future research.

Keywords – Metaverse Technologies, Artificial Intelligence Marketing Activities, Brand Identity, Brand Excitement, Virtual Reality (VR), Augmented Reality (AR), 3D Modelling and Simulation, Haptic Feedback, Tourism industry in Egypt.

1- Introduction:

According to Central Bank of Egypt (CBE) the number of tourists visited Egypt hit a record of 14.9 million almost 15 million tourists in 2023, including 3.6 million visiting the country in the fourth quarter of 2023. The country has planned to double the number by 2028. Additionally, From December 2022 to December 2023, Egypt had achieved a historic surge in hotel room numbers, with an additional 14,209 new rooms marking the highest growth rate in the past 15 years and reaching seven per cent which created around 15,600 direct job opportunities and 70,000 indirect job opportunities. Moreover, for the first four months of 2024, the majority of the growth in the tourism industry was attributed to visitors from Arab nations. From January to April, the number of Arab visitors increased by 54% compared to the same time in 2023. The tourism ministry is planning to grow tourist arrivals to 25–30 percent in order to reach its target of 30 million visitors annually by 2030. Based on the above, the Egyptian Ministry of Tourism must use modern technological tools and means in marketing Egyptian tourism to achieve its goals in 2030. In contrast, the tourism sector has always had to adapt to a world where technology has replaced its eyes and ears. Metaverse is projected to completely transform travel and tourism marketing, even if it is still in its experimental stages. With digital twins, it strengthens coordination and management, as well as destination awareness, positioning, and branding. Through trip planning, engagement, and interaction, metaverse and AI marketing activities can effectively change consumer behaviour. It is anticipated that virtual travel will encourage actual travel rather than replacing it.

The academic and practical worlds have recently shown a renewed interest in metaverse (Cheng et al., 2022). A McKinsey & Company (2022) research states that since 2022, metaverse has received over 1,200 billion dollars in investments, with 79% of active users spending money there. Furthermore, it affects a number of industries, such as gaming, tourism, business, and health management (Cheng et al., 2022). For instance, metaverse commerce incorporates immersive technology such as (Virtual Reality (VR), Augmented Reality (AR), 3D Modelling and Simulation, Haptic Feedback) to offer different approaches to improve product presentation, product trial, and multidimensional experientially, in contrast to standard e-commerce (Riar et al., 2023). As a result, it opens up new business opportunities and immerses people in more dynamic and immersive living and working environments (Huang and Liao, 2017). Accepting the Metaverse is not only a trendy; but also, it is a transformative path that gives the tourism sector a unique chance to prosper in the digital era.

In the sphere of tourism marketing, artificial intelligence has become increasingly popular (Pehlivan, 2018). In the tourism and hospitality sectors, artificial intelligence and robotic technology applications have also begun to be employed. These applications offer fresh opportunities for customers to make decisions about their travels, purchases, payment methods, and travel advisory services (Zlatanov & Popesku, 2019). Since artificial intelligence can carry out tasks that require human intelligence, the tourism industry finds this technology to be interesting and desirable (Revfine, 2020).

In the tourism industry, artificial intelligence is applied in a variety of ways, according to (Ibis,2019). Examples of these applications include receptionists, luggage carriers, luggage storage robots, and hoover cleaners. It is said that by utilizing artificial intelligence's natural language processing and feature identification capabilities, tourism services can be continuously provided instantly, seven days a week (Huang et al ,2021).

It is believed that when service robots are used more frequently, they will contribute significantly to the customer experience. It is stressed that future marketing activities and customer experience development in the travel and hospitality sectors may be impacted by human-robot interactions. Furthermore, it is emphasized that the firm will benefit from these prospects, which include "managing customer relationship management databases and establishing customer employee relations," as they will strengthen customer loyalty (Murphy, Gretzel & Pesonen, 2019).

The main element of any organization's brand is its identity, as brand identity is what makes an organization's brand unique when compared to competitors (Iglesias et al., 2020; Ianenko M., 2020) in a way that is consistent with its values and is relevant to its customers (Alvarado-Karste & Guzmán 2020). Brand identity positions the organization's brand in the minds of customers (Dash et al., 2021). Applying this concept to the tourism sector, brand identity includes the unique features associated with the tourist destination or hotel, which enable tourists to easily distinguish between the destination or hotel brand and other brands (Yen et al., 2020).

Cai & Mo (2020) define brand excitement as the state of being pleased and desiring a certain product or brand. It is the overall amount of interest and affection that consumers have for a certain brand (Kang et al.,2019). Among other things, a brand's ability to be considered interesting depends on its ability to be stylish and innovative. Additionally, brand excitement is used by tourism organizations to set themselves apart from rivals. The most important factor that travel agencies use to set themselves apart as "cutting-edge" brands for their particular programs is brand excitement (Hohenberger & Grohs 2020).

Finally, the main objective of the study is to clarify the expected effect of using Egyptian tourism authorities metaverse technologies and artificial intelligence marketing activities on creating brand identity for tourism organizations in Egypt for tourists of different Arab nationalities.

2- Problem Formulation:

The global trend has made people more opened to explore and implement new metaverse technologies that facilitate mixed reality and virtual environment experiences. For example, metaverse tours utilizing 3D visuals, 360-degree movies, and augmented reality technologies are available on museum websites (Hoffman, 2020; Schulmeister and Edwards, 2020). Travel industry participants have

integrated metaverse technologies into their operations, such as metaverse theme parks and escape rooms. According to statistics from Google Trends, the search phrase "virtual reality" garnered significant attention between 2014 and 2024, outpacing both virtual tourism and the metaverse. Furthermore, consumers from Generation Z (born 1997–2010) and Generation Alpha (born 2011–2020) are used to a range of metaverse scenarios because they grew up in mixed virtual and real-world environments (Scholz & Vyugina, 2019). Compared to previous generations, potential tourists from Generations Alpha and Z are more accustomed to metaverse environments and technologies (Setiawan et al., 2018). Digital generation visitors are likely to bring electronic devices with them, use multi-platform media to recollect their experiences, and like going beyond traditional physical encounters (Go & Gretzel, 2009). Additionally, the results of pilot study show that 63 % of participant say that Metaverse Technologies and Artificial Intelligence Marketing Activities will replace traditional tourism. Also 71% of participants confirm that metaverse and AI marketing activities do not meet their expectations till now. On the other hand, 77% of participants especially young travelers say that they use Mobile AR applications while travelling. In addition,82% of male participants say that visiting touristic places with 3d simulation will be more attentive. Therefore, the problem can be summarized as follows: "Tourism in Egypt faces many geopolitical challenges as a result of the events taking place in the region. Therefore, tourism authorities in Egypt must use metaverse technology and marketing through artificial intelligence to stimulate tourism in Egypt due to its great importance to the Egyptian economy, as it is one of the important sources of income.". Accordingly, the problem of the study is represented in the following questions:

1- **What is the effect of using metaverse technologies (Virtual Reality (VR), Augmented Reality (AR), 3D Modelling and Simulation, Haptic Feedback) on tourism brand identity in the Egyptian market?**
2- **What is the impact of using metaverse technologies (Virtual Reality (VR), Augmented Reality (AR), 3D Modelling and Simulation, Haptic Feedback) on AI marketing activities in the Egyptian market?**
3- **What is the impact of using artificial intelligence marketing activities on enhancing tourism brand identity in the Egyptian market?**
4- **Is there a significant mediating effect of artificial intelligence marketing activities on the relationship between using metaverse technologies (Virtual Reality (VR), Augmented Reality (AR), 3D Modelling and Simulation, Haptic Feedback) and tourism brand identity in the Egyptian market?**
5- **What is the effect of using metaverse technologies (Virtual Reality (VR), Augmented Reality (AR), 3D Modelling and Simulation, Haptic Feedback) on tourism brand excitement in the Egyptian market?**
6- **Does brand excitement affect tourism brand identity in the Egyptian market?**

7- Is there a significant mediating effect of brand excitement on the relationship between using metaverse technologies (Virtual Reality (VR), Augmented Reality (AR), 3D Modelling and Simulation, Haptic Feedback) and tourism brand identity in the Egyptian market?

8- Does the brand excitement moderate the relationship between artificial intelligence marketing activities and tourism brand identity in the Egyptian market?

3- Theoretical background:

3.1: Metaverse:

With the help of augmented and virtual reality technology, metaverse has the potential to expand our understanding of the physical world. A new version of the internet that combines block chain technology, virtual reality headsets, and avatars with a fresh merging of the real and virtual worlds is called metaverse (Hollensen et al., 2022). The technology to enable the establishment of the metaverse is rapidly evolving with the usage of VR headsets, haptic gloves, AR, and Extended Reality (XR), which allows users to fully experience the high levels of engagement and immersive experience, (Fernandez & Hui, 2022).

The phrase "metaverse," which is a combination of the Greek words "beyond" and "universe," was first used by science fiction author Neal Stephenson in his 1992 book Snow Crash. The Metaverse, as seen in that novel's image, is an expansive virtual environment that coexists with the real world. The word "digital twin" more accurately captures this. The Metaverse arises as a lifelike immersive virtual reality by layering on top of the physical world and merging the virtual and physical realities into a single, flawlessly connected one. Using devices that support immersive technologies, including smart glasses and MR/VR headsets, users may move through this area with ease for business and social interactions (Zhang & Ye, 2021). As explained by (Dwivedi et al.,2022), "immersive and interactive multimedia style.

It is said that Metaverse is "a continuous integration of our digital and physical lives, creating a unified, virtual community where we can transact, socialize, work, play, and relax." by (Moy and Gadgil,2022) from J.P. Morgan. Damar (2021) defined metaverse as "the layer between you and reality," describing it as a "3D virtual shared world where all activities can be carried out with the help of augmented and virtual reality services." Most definitions define metaverse as a virtual environment that simulates reality and provides a setting for immersive user interaction (Dwivedi et al., 2022).

While some argue that Metaverse primarily pertains to the virtual realm, most definitions now in use understand Metaverse as the merging of the virtual and physical realms. hotel chains like EV Hotel Corporation and Citizen M begin creating virtual hotels in Sandbox in order to interact with other similar-minded hotel patrons (Sheper & Speros, 2022). Restaurant brands, like McDonald's, have

expressed interest in building virtual stores in the Metaverse and have already submitted applications to the US Patent and Trademark Office (Inc., 2022). As the top supplier to the airline industry, SITA, has already begun developing solutions for metaverse and projects that by 2030, metaverse operations will be commonplace at the best airports, helping to optimise workflows, prevent disruptions, and enable intuitive, immersive control of intelligent airports.

Important information is delivered in immersive and/or interactive formats, such as augmented reality, virtual reality, or 3D simulations, through the growing usage of digital experiences as communication and teaching tactics (Nayyar, Mahapatra, Le, & Suseendran, 2018). In order to present local cultural heritage or instruct tourists on heritage preservation, the tourism industry can investigate the use of digital technology and experience. These methods are already being used at museums to provide visitors with an extensive and engaging educational experience (Kang & Yang, 2020).

3.1.1: Virtual Reality (VR):

Since virtual reality is still a relatively new and evolving technology, its meaning is constantly changing. Additionally, researchers frequently argue on what characteristics an experience must have in order be accepted as virtual reality (VR) (McFee et al., 2019). Because of this, the majority of definitions rely on technical terms, concepts, theories, and various technologies (Gibson & M. O'Rawe, 2018). A "set of images and sounds, produced by a computer, that seem to represent a place or a situation that a person can take part in" is how the Cambridge Dictionary defines "VR" (Cambridge Dictionary, 2018a). "VR," according to J. Kaminski, is a "three-dimensional, computer-generated "virtual environment" that users can explore and engage with instantly" (Kaminski, 2017). According to the Virtual Reality Society, virtual reality is a computer-generated, three-dimensional environment that can be examined and interacted with in person. That person becomes part of this virtual world or is immersed within this environment as well as being able to manipulate items or complete a sequence of actions (Virtual Reality Society,2017a).

When defining virtual reality (VR), tourism scholars also primarily refer to D.A. Guttentag's commonly accepted definition, which states that VR is the use of a computer-generated environment that a user can navigate, explore, and potentially interact with by selecting and moving objects within the virtual environment, thereby simulating one or more of their five senses in real time (Guttentag, 2020). According to W.C. Hunter, virtual reality (VR) is a type of information technology that allows users move around in computer-simulated settings where users are immersed in an interactive, three-dimensional digital representation of locations or real-world scenarios (Hunter,2016).

There doesn't seem to be a consensus definition of virtual reality (VR) in travel literature, despite the fact that many academics in the field of tourism offer their own interpretations of the term. This is because academics frequently fail to define the term "VR" in relation to tourism (Beck et al., 2018). "Virtual representation of

an actual attraction, destination, or visitor experience that is designed as an introduction to travel or to extend previous experiences," according to M.J. Kim and M.C. Hall, is what VR tourism is all about (Kim, S.S. & King, B. 2019). "VR technology enables viewers to virtually experience and explore destinations by immersing them into a VR and creating a feeling of 'being present,'" according to J. Hopf et al.'s explanation of the concept's definition (Hopf.j. et al., 2020).

A number of academics have lately investigated the advantages of virtual reality in the context of tourism. According to many travelers (e.g., Castro et al., 2017; Guttentag, 2010; Jung, Lee, Chung, & tom Dieck, 2018; Tromp, 2017), the primary advantages of virtual reality (VR) are the improvement of travel experiences (Bonetti, Warnaby, & Quinn, 2018; Moorhouse, tom Dieck, & Jung, 2018).

VR is capable of dealing with the problems that the tourist industry is facing; in particular, the COVID-19 global pandemic has had, and will continue to have, a significant impact on social and behavioural shifts in the tourism industry. Particularly, places will have to deal with the idea of under tourism and significantly lower tourism traffic.

Additionally, virtual tourism experiences have been shown to improve mental and physical health by helping people deal with emotional and cognitive difficulties like anxiety, which can worsen during times of loneliness, isolation, and uncertainty (Higuera et al., 2020; Tussyadiah, Wang, Jung, & tom Dieck, 2018). To build on the previous point, the Egyptian government is promoting a virtual city through the use of virtual reality. The goal of this megacity is to provide visitors from all over the world with an insight into the majesty of ancient Egyptian culture and all that it has to offer, aside from its renowned pyramids. This super city was constructed by a team of students from the Academy of Scientific Research and Technology under the direction of the Ministry of Tourism and Antiquities. Visitors can use the TUTERA website to take a virtual reality tour of METATUT on their phone, PC, or tablet.

3.1.2: Augmented Reality (AR)

By combining computer-generated content (such as avatars, 3D models, and interactive features) over the user's direct view through a device, augmented reality (AR) improves the real-world environment and provides context-sensitive information of the user's immediate surroundings (e.g. Han, Jung, & Gibson, 2014; tom Dieck & Jung, 2017; Yung & Khoo-Lattimore, 2017). Over the past five years, augmented reality (AR) has been more popular, drawing more attention from the academic and industry sectors. As a result, AR is currently regarded as "one of the most revolutionary inventions in recent years" (He, Wu, & Li, 2018).

Increasing number of studies has been done to examine the value that augmented reality (AR) brings to the travel and tourist industry in the recognition of its advantages. According to these studies, augmented reality (AR) can enhance interpretation and education (Tom Dieck & Jung, 2017), customize content to visitors' individual preferences (Kounavis, Kasimati, & Zamani, 2012), improve interactivity (Tom Dieck, Jung, & Han, 2016), and enhance entertainment and engagement (Xu, Buhalis, & Weber, 2017). According to Tussyadiah, Jung, and

Tom Dieck (2018), augmented reality (AR) improves user experiences and is a popular technology for improving interaction with and perception of the real-world environment. AR offers many opportunities to add value, providing tourists with a new and innovative way to explore unknown surroundings (Cranmer, tom Dieck, & Jung, 2018). The use of technology has reached the point that it has become fully integrated into our daily lives (Wang, Xiang, & Fesenmaier, 2016). For example, Kuoni Travel collaborated with AR suppliers Aurasma to create AR advertising and magazine content promoting their services, goods, and deals in an effort to draw in more tourists and boost sales (Hassan, Ekiz, Dadwal, 2018). According to (Xu et al.,2017) "tourists are now seeking more personal, unique, and memorable experiences, which require deeper engagement and a multisensory stimulation", these AR apps satisfy these growing requirements.

AR devices can be wearable (like AR Smart glasses), mobile (like AR displays in museums), or stationary (like interactive displays in museums) (Rauschnabel, Felix, & Hinsch, 2019). One of the first AR Smart Glasses (ARSG) to be tested in a tourism setting was Google Glass, which allowed for more realistic hands-free experiences (Han, tom Dieck, & Jung, 2019). But despite its early popularity, Google Glass development stopped due to issues including heavy and unpleasant hardware (tom Dieck et al., 2016). As a result, current use cases examine the potential of smart devices like Microsoft Hololens (Hammady & Ma, 2019). Because Microsoft Hololens incorporate virtual information into the user's immediate field of view using a device that resembles glasses, they are categorized as Augmented Reality Smart Glasses (ARSG) (Kalantari & Rauschnabel, 2018).

The pre-booking, information-gathering, and on-site experience improvement phases are when augmented reality shows its greatest value. AR has reportedly assisted in the booking process by helping to promote travel, lodging, and tourist activities (Gerrity, 2018).

3.1.3: 3D Modelling and Simulation

In order to achieve a certain goal, models are constructed by abstracting what we believe to be the essential components of a real system. A simulation is a process representation that sits on top of a model and enables the exploration of various assumptions, setups, and dynamic evolutions. For many academics, educated to examine phenomena and systems by watching, trying and testing a real situation, these abstractions could offer big doubts about their power to provide knowledge. With the widespread use of digital numerical tools, the philosophical debate concerning models and simulations and their ability to represent reality has grown. This debate includes a variety of theoretical, formal, and practical issues and occurs in a variety of academic fields. The most important issues are whether models and simulations accurately represent the target systems or phenomena, whether they can teach us about the nature of reality or are limited to representing a subset of the world we study, and whether they can serve as a reliable alternative to traditional empirical methods for understanding, characterizing, or forecasting configurations and behaviors (Baggio & Rodolfo, 2020).

In any case, the conclusion is that a model of any kind and a computational simulation have the same legitimacy as an actual observation or an experiment,

provided that certain reliability and validity requirements—which are usually methodological—are achieved. Therefore, a well-designed and validated model, along with the simulations that go along with it, have every right to be included in and contributed to the various ways that experiments in the tourist and hospitality area can be conducted (Viglia & Dolnicar, 2020).

Among the few methods available to describe and forecast the composition and dynamics of complex structures, such as the social, political, and economic entities that the tourism and hospitality research community is interested in, are modelling and simulations. When it is difficult to "experiment" with various settings and configurations in a living environment due to time constraints, financial constraints, moral dilemmas, etc., they enable modelling and simulation (Baggio & Rodolfo, 2020).

3.1.4: Haptic Feedback:

Recently, there has been a lot of studies that focused on haptic feedback in virtual reality to enhance the reality of the experience. The results of haptic feedback systems are difficult to compare because of their wide differences in technologies, feedback options, and general realism. Haptic feedback in a virtual reality system is a different procedure than that of sensing devices for a closed-loop tactile interaction. While audio, visual, and smell perception have advanced in VR technology, virtual tactile perception remains a weak point because to the necessity for feedback interfaces that correspond to skin tone and the requirement for flexible, high-resolution, and scalable characters. Currently, there are efforts to provide haptic feedback through methods like mechanical vibration (Tremblay et al., 2020), ET (Zhou et al., 2023; Kourtesis et al., 2022), DEA (Ankit et al., 2021), and so forth (Mazzotta et al., 2021; Wang et al., 2020; de Tinguy et al., 2020). These methodologies have improved virtual reality applications in immersive games, virtual communication, and tele-operated robotics.

Over the past three decades, there has been a shift in the relationship between museums, societies, and communities, with a focus on improving the visitor experience and creating immersive elements that effectively engage visitors. This trend has been particularly evident in the application of virtual reality technologies (Neuburger & Egger, 2017).
The quality of the interaction between the visitor and the virtual product can be improved by using force feedback devices, such as haptic tools, to enhance the level of immersions in virtual environments. In fact, force feedback devices add tangible information that enhances the level of visitor engagement and the accessibility of virtual reality (VR) systems, as well as the exploration of virtual items (Ceccacci, 2021). Because the degree of diversity that individuals with disabilities can experience is linked to the frequency of participation opportunities in cultural and social contexts, haptic device technology can therefore also increase the level of cultural integration while improving the experience of visitors (Shogren et al., 2022).

3.2: AI Marketing Activities

The idea of artificial intelligence (AI) is the creation of computer systems that are capable of tasks that would typically need human intelligence. Examples include the ability to recognize voices, recognize images, make complex decisions on difficult problems, and distinguish among languages. (Oxford University Press, 2019).
Tanveer (2021) asserts that marketing operations are automated by artificial intelligence (AI). Computers can now more accurately identify user behavior and predict which groups are most likely to become customers because of artificial intelligence-based deep learning (Tanveer et al., 2021). Programs may give specialized information on which elements are most likely to convert, helping marketers to focus their efforts on the most qualified factors without spending time on fewer qualified prospects (Tanveer et al., 2021). It also makes it possible to customize products (Tanveer et al., 2021). This entails determining potential customers based on a variety of criteria, including purchase history, location, and buying demography (Tanveer et al., 2021). It also includes tracking and linking customer information to the products themselves (Tanveer et al., 2021).
Tanveer et al. (2021) reported that Under Armour created "Record," a customized health and fitness tracking application, by combining their own customer data with that of external parties with the usage of IBM's Watson.

In order to perform intellectual tasks, such as problem solving and logical thinking independently, machines must be able to mimic human cognitive and instrumental functions. This is known as artificial intelligence (De Bruyn et al., 2020). Al can gather vast amounts of data and offer individualized recommendations, alternatives, and solutions to customers' enquiries or problems, even the most complex ones (Xu et al., 2020). According to (Sadek et al.,2015), artificial intelligence is also capable of providing marketing communications pertaining to its customers.
Four categories are used to categorize the dimensions of artificial intelligence marketing activities: personalization, information, accessibility, and engagement. The social interaction factor is seen as an essential element of the customer experience when customers engage or interact with artificial intelligence agents. Interaction refers to the interactions that take place between customers and the brand's AI agents (Godey et al., 2016). Information is the term used to describe how artificial intelligence analyses vast amounts of data to inform consumers about goods, services, or the brand itself. According to (Sultan and Wong ,2019), accessibility is the ability of artificial intelligence systems to assess and process consumer data, react to it, and offer customer support at the appropriate time during the week. This enhances the quality of the services provided and positively impacts the brand's performance and image.
The term "personalization" describes how every marketing campaign can offer consumers tailored support to suit their demands. Brands may help customers express their personalities and foster deeper brand relationships and loyalty by personalizing services enabled by AI (Godey et al, 2016).

Artificial intelligence is growing in popularity in the marketing industry and may be found in many different marketing sectors (Pehlivan, 2018). In order to give customers additional options in travel decision-making, payment systems, and travel

consultancy; artificial intelligence and robotic technology applications have begun to be used in the tourist and hospitality industries (Zlatanov & Popesku, 2019). The tourism industry finds this technology exciting since artificial intelligence can do jobs that require human intelligence (Revfine, 2020). It is believed that when service robots are used more frequently, they can add significantly to the customer experience. It is emphasized that future marketing initiatives and customer experience development in the travel and hospitality sectors may be impacted by human-robot interactions. Furthermore, it is highlighted that the firm would benefit from these opportunities, which include "managing customer relationship management databases and establishing customer employee relations," as they will increase customer loyalty (Murphy, Gretzel & Pesonen, 2019).

In the tourism and hospitality industry, robotic applications and artificial intelligence are used in hotels, restaurants, and airports for tasks like cooking, cleaning, delivering goods, carrying luggage, and cleaning (Trejos, 2016; Osawa, Akiya, Koyama, Ema, Kanzaki, Ichise & Kubo, 2017; Yalçın Kayıkçı & Kutluk Bozkurt, 2018; Ohlan, 2018; Ibiş, 2019; Devitt, 2019; Zlatanov & Popesku, 2019; Bozkurt Uzan & Cute, 2020; Vatan & Doğan, 2021; Lu, Zhang & Zhang, 2021). (İbiş, 2019) claims that artificial intelligence is utilized in the tourism industry in a variety of ways, including vacuum cleaners, luggage carriers, receptionists, and luggage storage robots.

3.3: Brand Identity:

Customers prefer brands that make them feel valuable (Lein S., 2021). Businesses can benefit greatly from branding and brand identification since it affects decision-making and makes it easier. It becomes clear how to communicate with the target audience, through which channels, what tone of communication to employ, and what kind of advertisement to generate once the company establishes its core values and brand strategy. Additionally, a strong brand identity promotes brand recognition, fosters trust, and draws in loyal customers (Jones, K.,2021). In order to develop a brand identity, the business must assess its existing position in the market. After that, it's critical to evaluate the company's assets and financial status.

The present marketing initiatives should then be updated. A marketing analysis should compare the product to competitors and define the target market based on psychographics, behavioural, demographic, and geographic factors. Next, it is necessary to build the brand's identity, positioning, and platform (Ianenko, M., Stepanov, M. et al., 2020).

According to (Goldstein, 2021), brands want to offer their customers a same experience across all platforms as this maintains credibility and fosters customer loyalty. Because brand identity provides answers to the what, how, and why questions, it makes the choice to buy easier (The logo creative, 2021). According to (Trivette H.,2021) companies that possess a strong brand identification can launch new products and reach a larger audience with less resources than unfamiliar businesses. Every organization's identity is its main element since it is what sets it apart from competitors in a way that aligns with its core values and appeals to its target market (Alvarado-Karste & Guzmán 2020). Brand identity positions the company's brand in the mind of customers (Dash et al., 2021). In the context of the

tourism industry, brand identity refers to the distinctive attributes of a hotel or destination that make it simple for visitors to differentiate between that brand and other brands (Yen et al., 2020).

3.4 : Brand Excitement :

The term "excitement of the brand" refers to the feelings experienced by a user of the product, which influences how the brand's identity is formed and modified in the minds of consumers (Rather, 2020; Rather & Hollebeek, 2020). Exciting travel agencies attract a lot of attention and seem appealing, by drawing attention and encouraging a trial. (Bajaj & Bond, 2018) claim that perceptions of brand enthusiasm are influenced by visual brand elements.
Brand experiences are thus the result of various customer interactions with a brand at multiple touch-points (Rather, 2020; Schmitt & Zarantonello, 2013). Ultimately, it can be confirmed that a brand that creates an enjoyable experience for customers achieves what is known as brand excitement. Brand experiences have been conceptualized as "sensations, feelings, cognitions, and behavioral responses evoked by brand-related stimuli that are part of a brand design and identity, packaging, communications, and environments" (Brakus et al., 2008).

The management of destination branding has emerged as a major trend in modern tourism in recent years (Rather & Hollebeek, 2020; Tsaur et al., 2016). In order for a tourist location to stand out from its competitors in the target market, destination branding is essential (Kim & Malek, 2017; Kumar & Kaushik, 2017; Najar, 2018). "Name, symbol, logo, word, or other graphic that both identifies and differentiates the destination; furthermore, it conveys the promise of a memorable travel experience that is uniquely associated with the destination; it also serves to consolidate and reinforce the recollection of pleasurable memories of destination experience," according to (Rather & Hollebeek, 2020) was the definition of destination brand.
Accordingly, destination marketers can employ the process of destination branding to attract travellers and/or gain a competitive edge over other comparable places (Berrozpe et al., 2019; Tsaur et al., 2016). Additionally, employing tourism organizations to oversee the destination brand increases customer desire and excitement for the brand, both of which promote brand loyalty.

4- Research Hypotheses and Conceptual Framework:

According to the reviewed papers, there are several researches that investigate the relationship between metaverse technologies and customer loyalty. The impact of metaverse technologies on customer experience has been examined in other studies. But very few researches have looked into the connection between brand identity and artificial intelligence marketing activities. As far as the authors are aware, no research has examined the connection between metaverse technologies, artificial intelligence marketing activities, brand excitement, and brand identity.
The following conceptual framework was created to fill this gap in the literature (Figure 1).

H1: There is a positive significant impact of using metaverse technologies on brand Identity

H1.1: Virtual reality significantly influences brand identity

H1.2: Augmented reality significantly influences brand identity

H1.3: 3D modelling and simulation significantly influences brand identity

H1.4: Haptic feedback significantly influences brand identity

H2: There is a positive significant impact of using metaverse technologies on artificial intelligence marketing activities

H2.1: Virtual reality significantly influences artificial intelligence marketing activities

H2.2: Augmented reality significantly influences artificial intelligence marketing activities

H2.3: 3D modelling and simulation significantly influences artificial intelligence marketing activities

H2.4: Haptic feedback significantly influences artificial intelligence marketing activities

H3: There is a positive significant impact of using artificial intelligence marketing activities

on brand identity

H4: There is a positive significant impact of metaverse technologies on brand excitement

H4.1: Virtual reality significantly influences brand excitement

H4.2: Augmented reality significantly influences brand excitement

H4.3: 3D modelling and simulation significantly influences brand excitement

H4.4: Haptic feedback significantly influences brand excitement

H5: There is a positive significant impact of brand excitement on brand identity

H6: Artificial intelligence marketing activities mediate the relationship between metaverse technologies and brand identity

H6.1: artificial intelligence marketing activities mediate the relationship between Virtual reality and brand identity

H6.2: artificial intelligence marketing activities mediate the relationship between Augmented reality and brand identity

H6.3: artificial intelligence marketing activities mediate the relationship between 3D modelling and simulation and brand identity

H6.4: artificial intelligence marketing activities mediate the relationship between Haptic feedback and brand identity

H7: Brand excitement mediates the relationship between metaverse technologies and brand identity

H7.1: Brand excitement mediates the relationship between Virtual reality and brand identity

H7.2: Brand excitement mediates the relationship between Augmented reality and brand identity

H7.3: Brand excitement mediates the relationship between 3D modelling and simulation and brand identity

H7.4: Brand excitement mediates the relationship between Haptic feedback and brand identity

H8: Brand excitement significantly moderates the relationship between AI Marketing Activities and Brand Identity

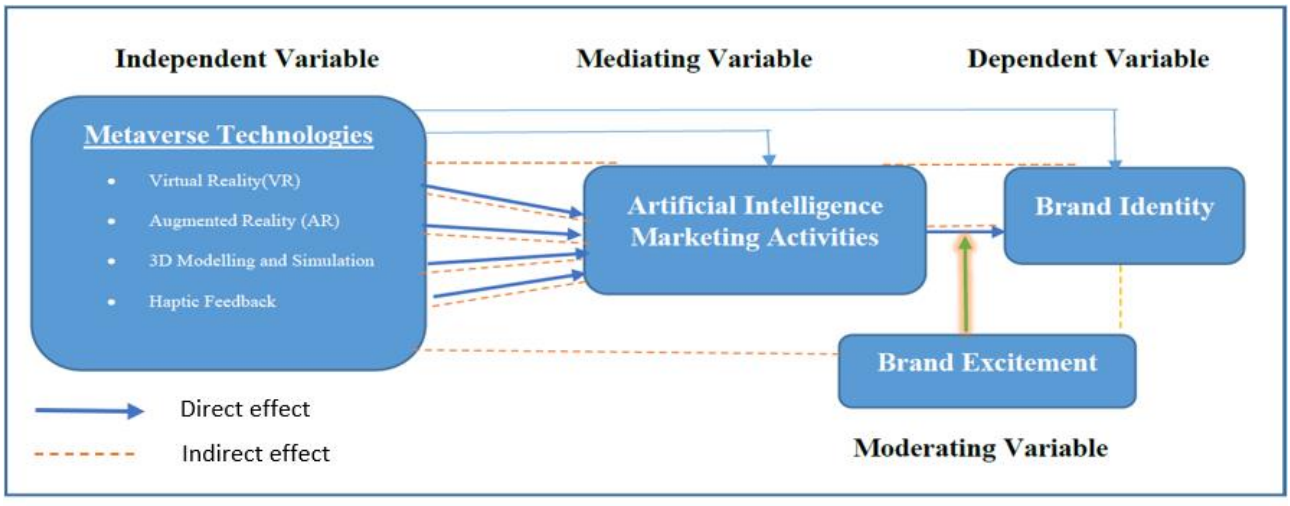

Figure 1: Conceptual Framework

5- Data Collection and Sample

The study employed the questionnaire method to gather data for model testing from a post-positive perspective. Consequently, the investigation utilized non-probability sampling, specifically the purposive sample approach. In order to incorporate the Snowball sampling technique into the data collection process. Moreover, the study was limited to tourists from different Arab nationalities throughout the entire research period. The sampling method was chosen to collect data for the field study of consumers due to the large size of the customer base, as well as the timing and cost factors that serve as limitations for research. After considering the principle of large numbers, the size of the sample was evaluated and determined to be 520 participants.

A questionnaire was used to collect data, and a Likert scale of five points ranging from strongly disagree (1) to strongly agree (5) was used to analyse every attitude item. We collected 527 responses, 520 were kept for analysis, the data gathering lasted about six months (from June 2024 to Augst 2024).

As shown in Table (1), certain previous studies have been conducted to obtain the measurements of the variables included and the number of items. The study encompassed four types of variables: Metaverse Technologies as the independent variable, Brand Identity as the dependent variable, Artificial Intelligence Marketing Activities as the mediating variable and Brand Excitement as moderating variable. The questions were formulated and revised based on the guidance provided by literature, and the responses were evaluated using a Likert scale consisting of five points.

Table 1: The measures used in the study

Variable	Number of items	Reference
Metaverse Technologies	29	(Fernandez & Hui, 2022; (Zhou el al.,2023; Kourtesis et al.2022;Baggio & Rodolfo, 2020; Kang & Yang, 2020; J. Hopf et al.,2020; Han et al., 2019)
Brand Identity	5	(Goldstein J., 2021; Jones, K., 2021)

Artificial Intelligence Marketing Activities	**5**	**(Xu et al, 2020;Bozkurt Uzan & Cute, 2020; Vatan & Doğan, 2021; Lu, Zhang & Zhang, 2021)**
Brand Excitement	**5**	**(Avery, 2020; Rather, 2020; Rather & Hollebeek, 2020).**

Data was cleaned by deleting incorrect answers, defective questionnaires, or data editing with a simple misinterpretation case or loss of focus. The fields were left empty for the incomplete entries.

6- Research Methodology:

In the rapidly evolving landscape of Metaverse Technologies, the integration of Artificial Intelligence (AI) Marketing Activities has revolutionized how brands engage with consumers. This study delves into the intricate relationships between Metaverse Technologies, AI-driven marketing Activities and their impact on Brand Excitement and Brand Identity. As businesses strive to create immersive and engaging experiences within the metaverse, understanding these dynamics becomes crucial. To explore these complex relationships, we employ the Partial Least Squares - Structural Equation Modeling (PLS-SEM) technique, utilizing the powerful capabilities of SmartPLS 3 software. PLS-SEM is particularly well-suited for this study due to its ability to handle complex models and its robustness in estimating causal relationships. The primary objective of our statistical analysis is to unravel the pathways through which Metaverse Technologies influence AI marketing activities, brand excitement and identity. By doing so, we aim to provide actionable insights for marketers seeking to harness the full potential of AI in creating compelling brand experiences in virtual environments. Employing PLS-SEM in this context is not only innovative but also essential especially when dealing with both moderating and mediating effects. The method's flexibility in modeling latent constructs and its proficiency in managing measurement errors make it an ideal choice for our study. Furthermore, the use of SmartPLS 3 enhances our analytical precision, enabling us to derive nuanced and reliable conclusions. To detect common method bias (CMB), a single-factor test suggested by Harman was conducted. The findings from this examination indicated that the initial component explained just 29.17% of the total variance. According to Podsakoff et al. (2003), it was determined that the issue of CMB was not present as the percentage was below fifty.

6.1 Measurement model assessment

In statistical analysis, the accuracy and reliability of measurements play a crucial role in ensuring the validity of research findings. The measurement assessment section of this paper focuses on evaluating the quality of data collection methods and instruments used in the study. By examining the precision, consistency, and validity of measurements, researchers can determine the extent to which the data accurately reflects the underlying constructs of interest. This section will discuss the various techniques employed to assess measurement reliability and validity, highlighting the

importance of rigorous measurement procedures in producing meaningful and trustworthy results.

Table 2: Item Loading

Item <- Construct	Loading	t-value	P-value	95% CI for Loading	
				LL	UL
V1 <- Virtual Reality	0.564	16.649	<.001	0.494	0.626
V2 <- Virtual Reality	*Deleted*				
V3 <- Virtual Reality	0.708	26.335	<.001	0.648	0.753
V4 <- Virtual Reality	0.615	18.309	<.001	0.542	0.673
V5 <- Virtual Reality	0.606	16.117	<.001	0.527	0.671
V6 <- Virtual Reality	0.8	48.681	<.001	0.763	0.828
V7 <- Virtual Reality	0.587	14.678	<.001	0.494	0.653
V8 <- Virtual Reality	0.689	25.038	<.001	0.631	0.739
V9 <- Virtual Reality	0.643	17.157	<.001	0.559	0.708
V10 <- Augmented Reality	0.779	36.012	<.001	0.733	0.817
V11 <- Augmented Reality	0.64	16.684	<.001	0.561	0.709
V12 <- Augmented Reality	0.559	12.046	<.001	0.466	0.644
V13 <- Augmented Reality	0.794	53.006	<.001	0.763	0.822
V14 <- Augmented Reality	0.644	22.636	<.001	0.583	0.696
V15 <- Augmented Reality	0.694	30.524	<.001	0.644	0.735
V16 <- Augmented Reality	0.786	37.622	<.001	0.739	0.822
V17 <- Augmented Reality	0.608	13.548	<.001	0.508	0.684
V18 <- Augmented Reality	0.849	63.481	<.001	0.818	0.872
V19 <- Augmented Reality	0.645	19.649	<.001	0.574	0.703
V20 <- 3D Modelling and Simulation	0.684	20.076	<.001	0.612	0.742
V21 <- 3D Modelling and Simulation	0.666	19.827	<.001	0.593	0.723
V22 <- 3D Modelling and Simulation	0.82	40.846	<.001	0.778	0.855
V23 <- 3D Modelling and Simulation	0.783	27.043	<.001	0.717	0.83
V24 <- 3D Modelling and Simulation	0.497	10.312	<.001	0.4	0.586
V25 <- Haptic feedback	0.714	18.184	<.001	0.628	0.784
V26 <- Haptic feedback	0.717	19.882	<.001	0.636	0.78
V27 <- Haptic feedback	0.655	8.609	<.001	0.477	0.754
V28 <- Haptic feedback	0.664	8.936	<.001	0.48	0.763
V29 <- Haptic feedback	0.778	25.779	<.001	0.719	0.83
V30 <- AI Marketing Activities	0.795	39.765	<.001	0.749	0.829
V31 <- AI Marketing Activities	0.797	31.602	<.001	0.74	0.839
V32 <- AI Marketing Activities	0.813	35.947	<.001	0.764	0.852
V33 <- AI Marketing Activities	0.713	22.632	<.001	0.651	0.771
V34 <- AI Marketing Activities	0.66	16.529	<.001	0.57	0.727
V35 <- Brand Excitement	0.765	29.081	<.001	0.713	0.814

V36 <- Brand Excitement	0.852	51.472	<.001	0.814	0.878
V37 <- Brand Excitement	0.727	26.748	<.001	0.671	0.776
V38 <- Brand Excitement	0.772	29.91	<.001	0.717	0.819
V39 <- Brand Identity	*Deleted*				
V40 <- Brand Identity	0.93	165.933	<.001	0.919	0.94
V41 <- Brand Identity	0.893	85.043	<.001	0.87	0.911

CI = Confidence Interval; LL = Lower Limit; Upper Limit.

The comprehensive establishment of reliability and validity indicators in the measurement model assessment is commendable. By meticulously evaluating the reliability of the measurement instruments through techniques such as internal consistency, the study ensures the consistency and stability of the measurements over time. According to Fornell and Larcker (1981), researchers have established reliability indicators such as Cronbach's Alpha, rho_A, and composite reliability (CR) with a minimum value of 0.6. According to the data presented in Table 2, the reliability indicators of each construct for the current study were found to be more than the threshold value. Additionally, the confirmation of validity indicators, including convergent, and discriminant validity, strengthens the credibility and accuracy of the measurement model. This rigorous approach not only enhances the robustness of the study findings but also instills confidence in the interpretation of results. The outer (Item) loadings of each item for all constructs ought to be equal to or greater than 0.40 (Hair et al., 2021). In the current study, all of the individual item loadings in Table 1 are above 0.4 (Except V2 and V39). A recommendation made by Hair et al., 2021 is that the average variance extracted (AVE) should be at least 0.50 in order to evaluate the convergent validity of each component, however, values above 0.4 are likewise acceptable if the values of CR are more than 0.6 (Fornell and Larcker, 1981). The AVE for all items has surpassed the needed threshold of 0.4, demonstrating that the constructs utilized in this analysis have sufficient convergent validity (see Table 2).

Table 3: Measurement Model Assessment Indicators

	3D Modelling and Simulation	AI Marketing Activities	Augmented Reality	Brand Excitement	Brand Identity	Haptic feedback	Virtual Reality
Reliability & Convergent Validity							
Cronbach's Alpha	0.73	0.813	0.885	0.79	0.798	0.769	0.807
rho_A	0.751	0.817	0.897	0.804	0.821	0.776	0.815
CR	0.823	0.87	0.907	0.861	0.907	0.833	0.856
AVE	0.489	0.574	0.498	0.609	0.83	0.5	0.43
Discriminant Validity (HTMT)							
3D Modelling and Simulation							
AI Marketing Activities	0.665						
Augmented Reality	0.746	0.788					
Brand Excitement	0.396	0.656	0.599				
Brand Identity	0.445	0.651	0.635	0.857			
Haptic feedback	0.472	0.352	0.365	0.301	0.442		
Virtual Reality	0.744	0.727	0.829	0.488	0.566	0.271	

CR = composite reliability; AVE= average variance extracted; HTMT = Heterotrait-Monotrait.

Another way proposed to verify validity issues; authors require HTMT (Heterotrait-Monotrait) ratio to test for discriminant validity. Gaskin et al., (2018) proposed that the value of constructions should not exceed 1. The results in Table 2 indicate that the greatest value of a construct found 0.857, consequently the discriminant validity is established.

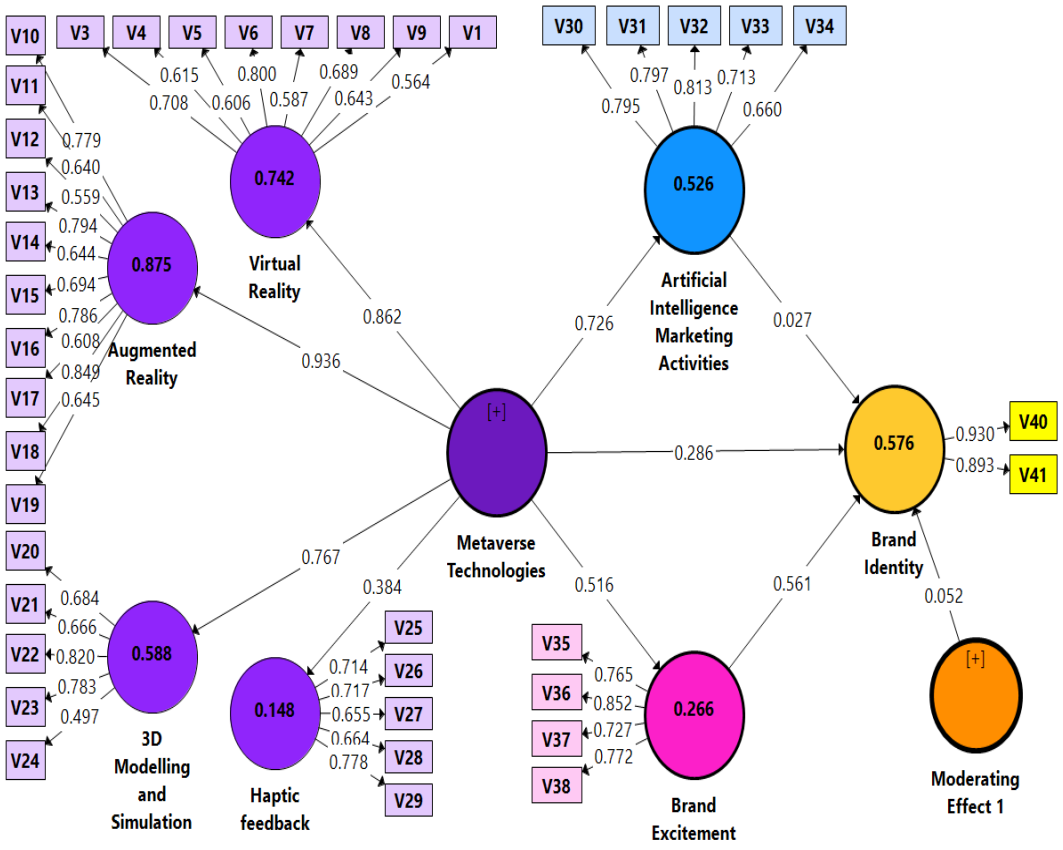

Figure 1: Measurement Model

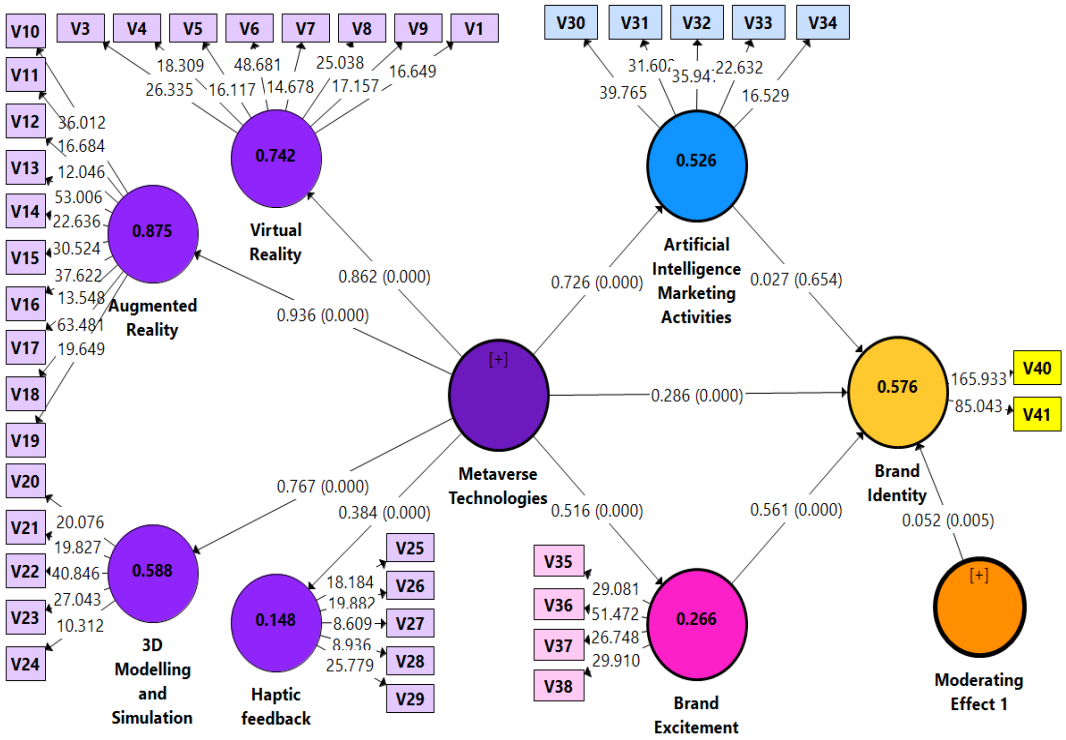

Figure 2: Structural Model (Main Hypotheses)

6.2 Descriptive statistics and Multiple correlations

The objective of this section is to provide several descriptive statistics and a range of correlations among the different constructs that were selected. As indicated in Table 3, these statistics encompass the mean (M), standard deviation (SD), Skewness, and Kurtosis.

Table 4: Descriptive Statistic

Descriptive statistic								
	VR	**AR**	**3DMS**	**HF**	**MVT**	**AIMA**	**BEX**	**BID**
M	3.320	3.669	3.626	3.268	3.471	3.782	3.708	3.439
SD	0.649	0.559	0.593	0.647	0.455	0.628	0.633	0.772
Skewness	-0.540	-0.699	-0.516	0.123	-0.235	-0.875	-0.059	-0.279
Kurtosis	0.080	0.354	0.521	0.039	-0.165	0.874	-0.565	0.078
Correlation matrix								
Virtual Reality	--							
Augmented Reality	.691***	--						
3D Modelling and Simulation	.576***	.584***	--					
Haptic feedback	.180***	.188***	.243***	--				
Metaverse Technologies	.821***	.811***	.797***	.557***	--			
AI Marketing Activities	.589***	.671***	.502***	.218***	.658***	--		
Brand Excitement	.389***	.499***	.136**	.208***	.411***	.524***	--	
Brand Identity	.450***	.537***	.325***	.344***	.554***	.523***	.681***	--

*****P<0.001; **P<0.01; M=Mean; SD=Standard Deviation.**

AI Marketing Activities has higher mean (M=3.782) compared to Brand Excitement (M= 3.708), Metaverse Technologies (M= 3.471), and Brand Identity (M= 3.439). However, Metaverse Technologies has the lowest variability (SD= 0.455) while Brand Identity has the highest variability (SD= 0.772). Between the dimensions of Metaverse Technologies, Augmented Reality has the highest mean (M=3.669) while Haptic feedback has the lowest mean (SD= 3.268). Further, Augmented Reality has the lowest variability (SD= 0.559) while Virtual Reality has the highest variability (SD= 0.649). Based on Hair et al. (2014) and Byrne (2016), it is suggested that skewness levels between -2 and +2, as well as kurtosis values between -7 and +7, are

indicative of a normal distribution within the dataset. The findings presented in Table 3 indicate that the skewness and kurtosis values of the variables analyzed were within the acceptable range.

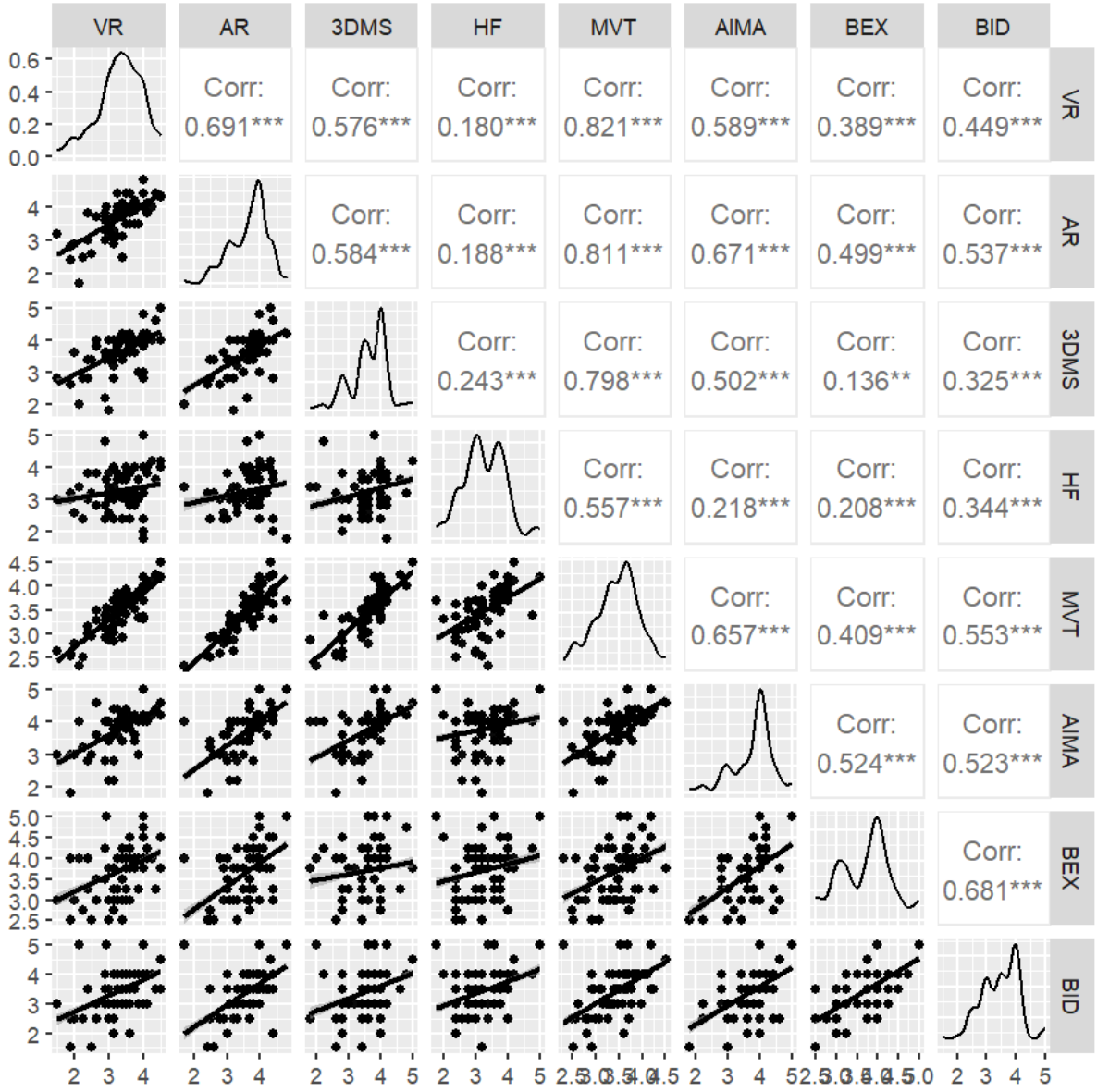

Figure 3: Visualization of Scatter Plots, Distributions and Correlations

The Pearson product-moment correlation coefficient was employed to determine the degree of connection between the mentioned constructs and the direction of the association (Table 3 & Fig. 3). On the left side of Figure 3, scatterplots are presented for each pair of numeric variables with the associated fitted line, revealing an ascending pattern that signifies a positive linear relationship between the constructs. On the right side, the Pearson correlation coefficients are depicted along with their

corresponding significance values. Additionally, the diagonal element of the figure displays the variable distribution with the fitted normal curve, confirming the assumption of normality. The results indicated that:

- **Virtual Reality has significant positive moderate relationship with AI Marketing Activities ($r(520) = .589, P < 0.001$), Brand Excitement ($r(520) = .389, P < 0.001$) and Brand Identity ($r(520) = .450, P < 0.001$).**
- **Augmented Reality has significant positive moderate relationship with AI Marketing Activities ($r(520) = .671, P < 0.001$), Brand Excitement ($r(520) = .499, P < 0.001$) and Brand Identity ($r(520) = .537, P < 0.001$).**
- **3D Modelling and Simulation construct has significant positive moderate relationship with AI Marketing Activities ($r(520) = .502, P < 0.001$), week with Brand Excitement ($r(520) = .136, P < 0.01$) and moderate with Brand Identity ($r(520) = .325, P < 0.001$).**
- **Haptic feedback construct has significant positive week relationship with AI Marketing Activities ($r(520) = .218, P < 0.001$), week with Brand Excitement ($r(520) = .208, P < 0.01$) and moderate with Brand Identity ($r(520) = .344, P < 0.001$).**
- **Metaverse Technologies construct has significant positive moderate relationship with AI Marketing Activities ($r(520) = .658, P < 0.001$), Brand Excitement ($r(520) = .411, P < 0.001$) and Brand Identity ($r(520) = .554, P < 0.001$).**
- **AI Marketing Activities construct has significant positive moderate relationship with Brand Excitement ($r(520) = .524, P < 0.001$) and Brand Identity ($r(520) = .523, P < 0.001$).**
- **Brand Excitement construct has significant positive moderate relationship with Brand Identity ($r(520) = .681, P < 0.001$).**

6.3 The Direct Effect

In this study, we developed a PLS structural model to examine the relationships among several latent variables, including Metaverse Technologies, Artificial Intelligence Marketing Activities, and Brand Identity. These latent variables are hypothesized to influence each other in specific ways, as outlined in our conceptual

framework. The model also includes Brand Excitement which serves as moderating as well as a mediating effects. According to Baron and Kenny (1986), a variable can potentially play dual roles as both a mediator and a moderator in a study, provided that it meets the criteria for each role.

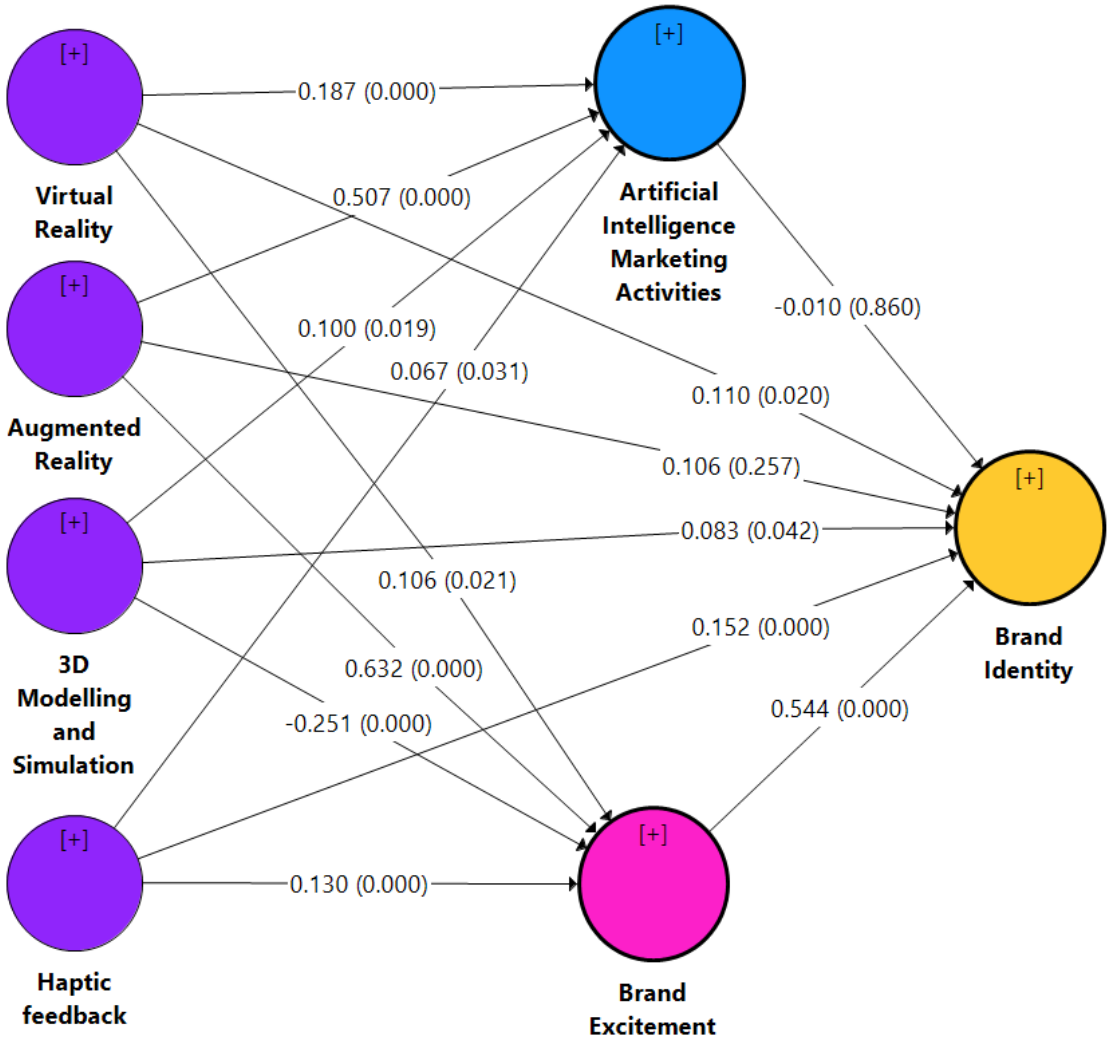

Figure 4: Sub-Hypotheses Model

Table 5: Path coefficients for the Direct Effects

H	*Path*	*B*	*t-value*	*P-value*	*95% BCCI*		Remark
					LB	*UB*	
H1	***Metaverse Technologies -> Brand Identity***	**0.286**	**3.666**	**<.001**	**0.13**	**0.433**	**S**
H1.1	*Virtual Reality -> Brand Identity*	0.11	2.33	0.02	0.024	0.207	S

H1.2	*Augmented Reality -> Brand Identity*	0.106	1.133	0.257	-0.089	0.28	NS
H1.3	*3D Modelling and Simulation -> Brand Identity*	0.083	2.033	0.042	0.001	0.163	S
H1.4	*Haptic feedback -> Brand Identity*	0.152	5.517	<.001	0.096	0.204	S
H2	***Metaverse Technologies -> Artificial Intelligence Marketing Activities***	**0.726**	**30.578**	**<.001**	**0.67**	**0.764**	**S**
H2.1	*Virtual Reality -> Artificial Intelligence Marketing Activities*	0.187	4.724	<.001	11.40%	26.70%	S
H2.2	*Augmented Reality -> Artificial Intelligence Marketing Activities*	0.507	15.074	<.001	0.442	0.574	S
H2.3	*3D Modelling and Simulation -> Artificial Intelligence Marketing Activities*	0.1	2.354	0.019	0.015	0.184	S
H2.4	*Haptic feedback -> Artificial Intelligence Marketing Activities*	0.067	2.159	0.031	0.002	0.124	S
H3	***Artificial Intelligence Marketing Activities -> Brand Identity***	**0.027**	**0.448**	**0.654**	**-0.085**	**0.144**	**NS**
H4	***Metaverse Technologies -> Brand Excitement***	**0.516**	**14.402**	**<.001**	**0.437**	**0.577**	**S**
H4.1	*Virtual Reality -> Brand Excitement*	0.106	2.302	0.021	0.01	0.193	S
H4.2	*Augmented Reality -> Brand Excitement*	0.632	12.502	<.001	0.539	0.738	S
H4.3	*3D Modelling and Simulation -> Brand Excitement*	-0.251	4.203	<.001	-0.369	-0.134	S
H4.4	*Haptic feedback -> Brand Excitement*	0.13	3.637	<.001	0.053	0.194	S
H5	***Brand Excitement -> Brand Identity***	**0.561**	**17.547**	**<.001**	**0.502**	**0.625**	**S**

BCCI=Bias-Corrected Confidence Intervals; LB= Lower Bound; UB=Upper Bound; S= Supported; NS= Not Supported.

We examined the structural model by evaluating the path coefficients, t-values, and significance levels to test our hypotheses. Additionally, we assessed the overall model fit using metrics such as the R-squared (R^2) values for the endogenous constructs, the f-squared (f^2) values for the paths, and the Stone-Geisser Q^2 values for predictive

relevance. The structural model results indicated that Metaverse Technologies significantly influences Brand Identity (β = 0.286, t=3.666, P < 0.001). All dimensions of Metaverse Technologies have significant influence on Brand Identity (*Except Augmented Reality*) as Virtual Reality -> Brand Identity (β = 0.11, t=2.33, P < 0.05), 3D Modelling and Simulation -> Brand Identity (β = 0.083, t=2.033, P < 0.05), and Haptic feedback -> Brand Identity (β = 0.152, t=5.517, P < 0.001). Moreover, Metaverse Technologies significantly influences AI Marketing Activities (β = 0.726, t=30.578, P < 0.001). All dimensions of Metaverse Technologies have significant influence on AI Marketing Activities as Virtual Reality -> AI Marketing Activities (β = 0.187, t=4.724, P < 0.001), Augmented Reality -> AI Marketing Activities (β = 0.507, t=15.074, P < 0.001), 3D Modelling and Simulation -> AI Marketing Activities (β = 0.1, t=2.354, P < 0.05), and Haptic feedback -> AI Marketing Activities (β = 0.067, t=2.159, P < 0.05). The results in hypothesis three indicated that AI Marketing Activities construct has no influence on Brand Identity since (β = 0.027, t=0.448, P > 0.05).

Furthermore, *H4* shows that Metaverse Technologies construct has positive and significant effect on Brand Excitement (β = 0.516, t = 14.402, p <0.001). All dimensions of Metaverse Technologies have significant influence on Brand Excitement as Virtual Reality -> Brand Excitement (β = 0.106, t=2.302, P < 0.05), Augmented Reality -> Brand Excitement (β = 0.632, t=12.502, P < 0.001), 3D Modelling and Simulation -> Brand Excitement (β = -0.251, t=4.203, P < 0.001), and Haptic feedback -> Brand Excitement (β = 0.13, t=3.637, P < 0.001). Finally, *H5* shows that Brand Excitement has positive and significant effect on Brand Identity (β = 0.561, t = 17.547, p <0.001).

6.4 The Mediating Effect

To assess the mediation effect, we employed a series of statistical tests, including the bootstrapping methods, and the evaluation of indirect effects through path analysis. These methods enabled us to rigorously examine the significance and strength of the mediation pathway, ensuring robust and reliable results. Our analysis was guided by established criteria for mediation, including the significance of the indirect effect and the reduction in the direct effect when the mediator is included in the model.

Table 6: Path coefficients for the Indirect Effects

H	*Path*	*B*	*t-value*	*P-value*	*95% BCCI*		Remark
					LB	*UB*	
H6	***Metaverse Technologies -> Artificial Intelligence Marketing Activities -> Brand Identity***	**0.019**	**0.448**	**0.654**	**-0.064**	**0.102**	NS
H6.1	*Virtual Reality -> Artificial Intelligence Marketing Activities -> Brand Identity*	-0.002	0.175	0.861	-0.022	0.022	NS
H6.2	*Augmented Reality -> Artificial Intelligence Marketing Activities -> Brand Identity*	-0.005	0.176	0.86	-0.065	0.052	NS
H6.3	*3D Modelling and Simulation -> Artificial Intelligence Marketing Activities -> Brand Identity*	-0.001	0.148	0.882	-0.018	0.01	NS
H6.4	*Haptic feedback -> Artificial Intelligence Marketing Activities -> Brand Identity*	-0.001	0.161	0.872	-0.009	0.008	NS
H7	***Metaverse Technologies -> Brand Excitement -> Brand Identity***	**0.289**	**12.449**	**<.001**	**0.245**	**0.339**	S
H7.1	*Virtual Reality -> Brand Excitement -> Brand Identity*	0.058	2.242	0.025	0.008	0.109	S
H7.2	*Augmented Reality -> Brand Excitement -> Brand Identity*	0.344	9.675	<.001	0.283	0.423	S
H7.3	*3D Modelling and Simulation -> Brand Excitement -> Brand Identity*	-0.137	3.868	<.001	-0.212	-0.074	S
H7.4	*Haptic feedback -> Brand Excitement -> Brand Identity*	0.071	3.421	0.001	0.029	0.11	S

BCCI=Bias-Corrected Confidence Intervals; LB= Lower Bound; UB=Upper Bound; S= Supported; NS= Not Supported.

the <u>mediation analysis</u> in *H6* showed that AI Marketing Activities construct doesn't mediate the relationship from Metaverse Technologies to Brand Identity since P-value is above 0.05 as (β_{IND} = 0.019, t = 0.448, p >0.05). Also, all dimensions of Metaverse Technologies have no indirect effect on Brand Identity through AI Marketing Activities, since the relationship from AI Marketing Activities to Brand Identity is not significant as indicated in H3. However, the <u>mediation analysis</u> in *H7* yielded a statistical significant indirect effect from Metaverse Technologies to Brand Identity by mediating Brand Excitement since P-value is less than 0.05 as (β_{IND} = 0.289, t = 12.449, p <0.001). All dimensions of Metaverse Technologies have

significant indirect effect on Brand Identity through Brand Excitement, as for Virtual Reality (β_{IND} = 0.058, t = 2.242, p <0.05), Augmented Reality (β_{IND} = 0.344, t = 9.675, p <0.001), 3D Modelling and Simulation (β_{IND} = -0.137, t = 3.868, p <0.001), and Haptic feedback (β_{IND} = 0.071, t = 3.421, p <0.001).

Table 7: Summary of mediation analysis

Independent	Mediator	Dependent	Direct Effect	Indirect Effect	Mediation
Metaverse Technologies	AI Marketing Activities	Brand Identity	✓	×	No
Virtual Reality	AI Marketing Activities	Brand Identity	✓	×	No
Augmented Reality	AI Marketing Activities	Brand Identity	×	×	No
3D Modelling and Simulation	AI Marketing Activities	Brand Identity	✓	×	No
Haptic feedback	AI Marketing Activities	Brand Identity	✓	×	No
Metaverse Technologies	Brand Excitement	Brand Identity	✓	✓	Partial
Virtual Reality	Brand Excitement	Brand Identity	✓	✓	Partial
Augmented Reality	Brand Excitement	Brand Identity	×	✓	Full
3D Modelling and Simulation	Brand Excitement	Brand Identity	✓	✓	Partial
Haptic feedback	Brand Excitement	Brand Identity	✓	✓	Partial

Based on the study by Nitzl et al. (2016), full mediation is indicated when the direct effect is not significant but the indirect effect is significant. On the other hand, partial mediation is suggested when both the direct and indirect effects are significant. The results of the mediation analysis are outlined in Table 6.

6.5 The Moderating Effect

In our study, the incorporation of a moderator variable within the Partial Least Squares Structural Equation Modeling (PLS-SEM) framework offers a sophisticated lens through which we can examine the conditional effects on the relationships between our latent constructs. A moderator variable influences the strength or direction of the relationship between an exogenous and endogenous

variable, thus highlighting the contextual factors that shape these interactions. In this research, we posited that Brand Excitement plays a moderating role in the relationship between AI Marketing Activities and Brand Identity. By integrating Brand Excitement into our PLS-SEM analysis, we aim to discern whether and how the effect of AI Marketing Activities on Brand Identity varies across different levels of Brand Excitement. This approach not only enriches our understanding of the primary relationships but also reveals the underlying complexities and conditional dynamics within our theoretical model.

Table 8: Summary of moderation analysis

H	*Path*	*B*	*t-value*	*P-value*	*95% BCCI*		Remark
					LB	*UB*	
H8	**Moderating Effect 1 -> Brand Identity**	**0.052**	**2.79**	**0.005**	**0.018**	**0.092**	**S**

BCCI=Bias-Corrected Confidence Intervals; LB= Lower Bound; UB=Upper Bound; S= Supported; NS= Not Supported.

To test for moderation within the PLS-SEM framework, we employed interaction effects by creating interaction terms between AI Marketing Activities and Brand Excitement (Moderating Effect 1). We then assessed these interaction effects using bootstrapping methods to determine their significance and to understand the nature of the moderating influence. Our moderation analysis results indicate that Brand Excitement significantly moderates the relationship between AI Marketing Activities and Brand Identity. Specifically, the interaction term was found to be significant ($\beta_{INT} = 0.052$, $t = 2.79$, $p < 0.01$). Additionally, we conducted simple slope analysis (Interaction Plot) to interpret the interaction effects and to illustrate how the relationship between AI Marketing Activities and Brand Identity changes at different levels of Brand Excitement.

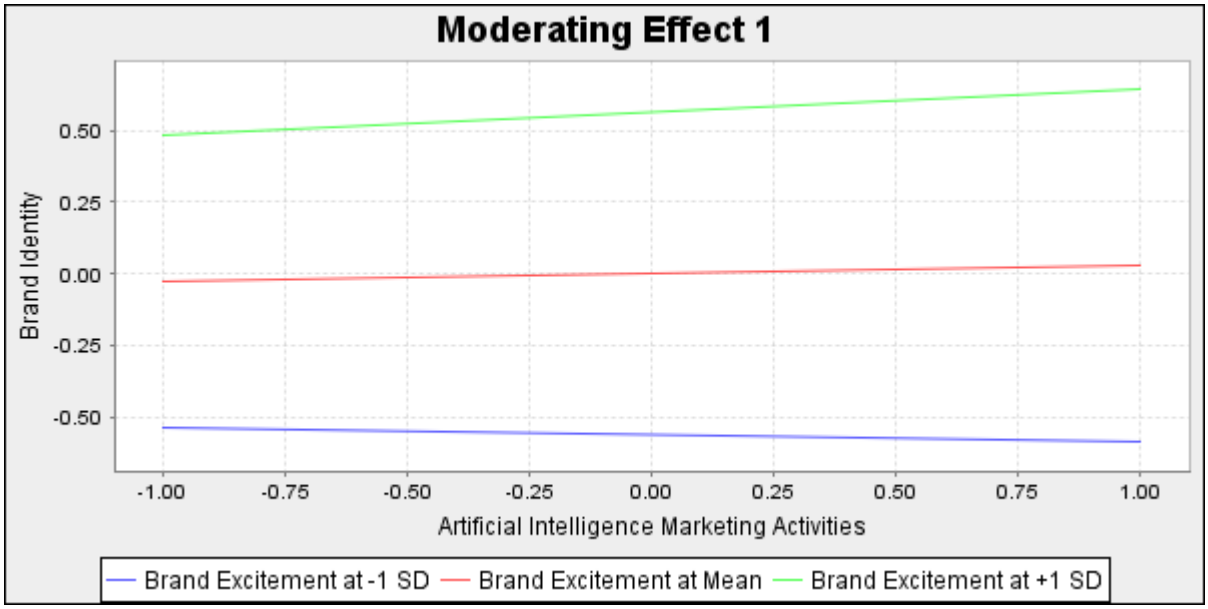

Figure 5: Interaction Plot

Figure 5 shows three lines, each representing the slope of the relationship between Artificial Intelligence Marketing Activities and Brand Identity at one standard deviation below the mean, at the mean, and one standard deviation above the mean of Brand Excitement. The blue line represents the relationship when Brand Excitement is low (one standard deviation below the mean), indicating no notable change in Brand Identity with an increase in AI Marketing Activities. The red line is flat, suggesting that there is no significant change in Brand Identity as AI Marketing Activities increase when Brand Excitement is at an average level. Finally,

the green line representing high Brand Excitement (one standard deviation above the mean), showing a positive slope that indicates that as AI Marketing Activities increase, Brand Identity also increases when Brand Excitement is high. Overall, the plot suggests that the influence of AI Marketing Activities on Brand Identity is somewhat dependent on the level of Brand Excitement.

6.6 The Structural Model Assessment

Multicollinearity diagnostics, coefficient of determination (R^2), effect size (f^2), and predictive relevance (Q^2) criteria are all utilized in the process of analyzing the structural model.

Table 9: Structural model assessment

Path	f-Square	VIF	R-Square	Q-Square
Cut-off	*>0.02*	*<5*	*>0.1*	*>0*
Metaverse Technologies -> Brand Identity	0.088	2.187	0.576	0.467
Artificial Intelligence Marketing Activities -> Brand Identity	0.001	2.585		
Brand Excitement -> Brand Identity	0.481	1.542		
Virtual Reality -> Brand Identity	0.013	2.3	0.587	0.474
Augmented Reality -> Brand Identity	0.007	3.693		
3D Modelling and Simulation -> Brand Identity	0.008	1.984		
Haptic feedback -> Brand Identity	0.05	1.12		
Metaverse Technologies -> Artificial Intelligence Marketing Activities	1.112	1	0.526	0.296
Virtual Reality -> Artificial Intelligence Marketing Activities	0.036	2.217	0.559	0.313
Augmented Reality -> Artificial Intelligence Marketing Activities	0.214	2.72		
3D Modelling and Simulation -> Artificial Intelligence Marketing Activities	0.012	1.822		
Haptic feedback -> Artificial Intelligence Marketing Activities	0.009	1.089		
Metaverse Technologies -> Brand Excitement	0.362	1	0.266	0.147
Virtual Reality -> Brand Excitement	0.008	2.217	0.386	0.219
Augmented Reality -> Brand Excitement	0.239	2.72		
3D Modelling and Simulation -> Brand Excitement	0.056	1.822		
Haptic feedback -> Brand Excitement	0.025	1.089		

Cut-off values: Chin (1998), Cohen (1988), Falk & Miller (1992) Hair et al. (2017), Wetzels et al. (2009).

The results from the effect size analysis revealed that Metaverse Technologies construct had the most Substantial and large impact (f^2= 1.112) on AI Marketing Activities, followed by effect of Brand Excitement on Brand Identity (f^2= 0.481) and effect of Metaverse Technologies on Brand Excitement (f^2= 0.362). Upon examining collinearity using variance inflation factors (VIF), it was determined that all values were below the threshold of 5 (Hair et al., 2017). Furthermore, all coefficient of determination (R^2) values exceeded the cutoff of 0.10, indicating an acceptable level of explained variance. Additionally, the cross-validated redundancy (Q^2) method

was employed to assess the influence of latent variables, with all Q^2 values being above zero, demonstrating the model's predictive relevance.

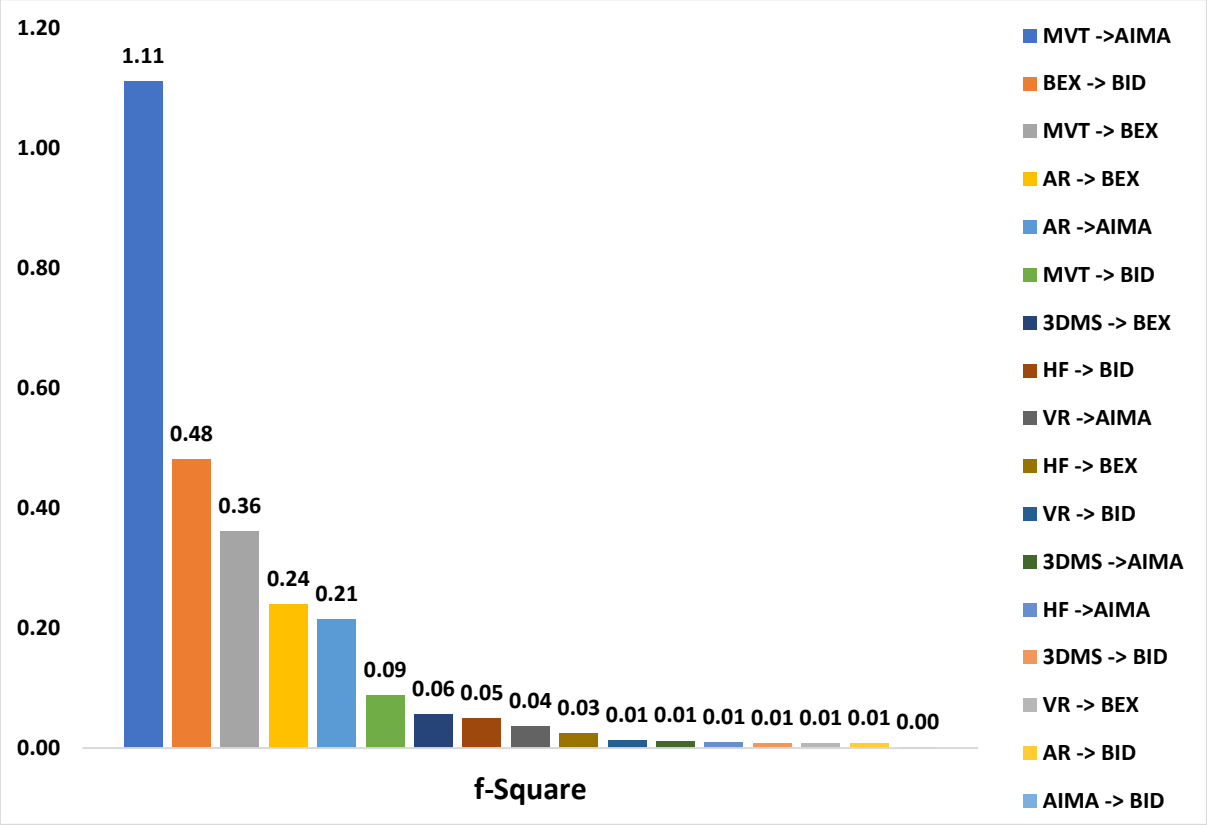

Figure 6: Visualization of Effect Size

6.7 Importance Performance Map Analysis

The combination of importance and performance dimensions' analysis, known as Importance Performance Map Analysis (IPMA), was employed to gain further insights. By utilizing IPMA, one can identify areas that require action. Specifically, it allows for the identification of process elements that are relatively important but perform poorly, enabling the implementation of management methods that bring about necessary changes. In Figures 7,8, and 9, the constructs influencing the Endogenous Variables Brand Identity, AI Marketing Activities, and Brand Excitement respectively are depicted. The IPMA findings are presented in a two-dimensional graph, where the horizontal axis represents the "importance" (total effect) of influential factors on a scale of 0 to 1, and the vertical axis represents their performance on a range of 0 to 100.

Table 10: Structural model assessment

Endogenous Variable	Exogenous Variable	Importance	Performances
Brand Identity	AI Marketing Activities	0.034	65.712
	Brand Excitement	0.683	65.64
	Metaverse Technologies	0.923	62.014
AI Marketing Activities	3D Modelling and Simulation	0.104	63.856
	Augmented Reality	0.536	64.418
	Haptic feedback	0.065	54.08
	Virtual Reality	0.18	58.274
Brand Excitement	3D Modelling and Simulation	-0.271	63.856
	Augmented Reality	0.689	64.418
	Haptic feedback	0.131	54.08
	Virtual Reality	0.105	58.274

Figure 7 show that Metaverse Technologies (0.923) was the most important construct, followed by Brand Excitement (0.683), and AI Marketing Activities (0.034). Moreover, AI Marketing Activities performed the best (65.712%), followed by Brand Excitement (65.64%), and Metaverse Technologies (62.014%).

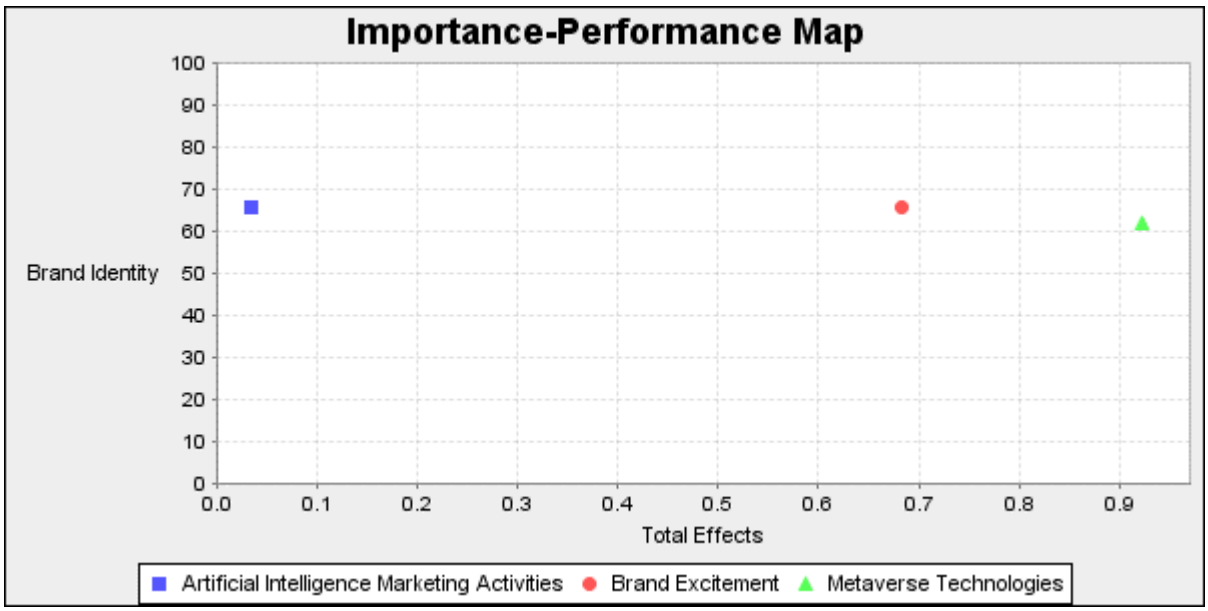

Figure 7: Importance Performance Map for Brand Identity

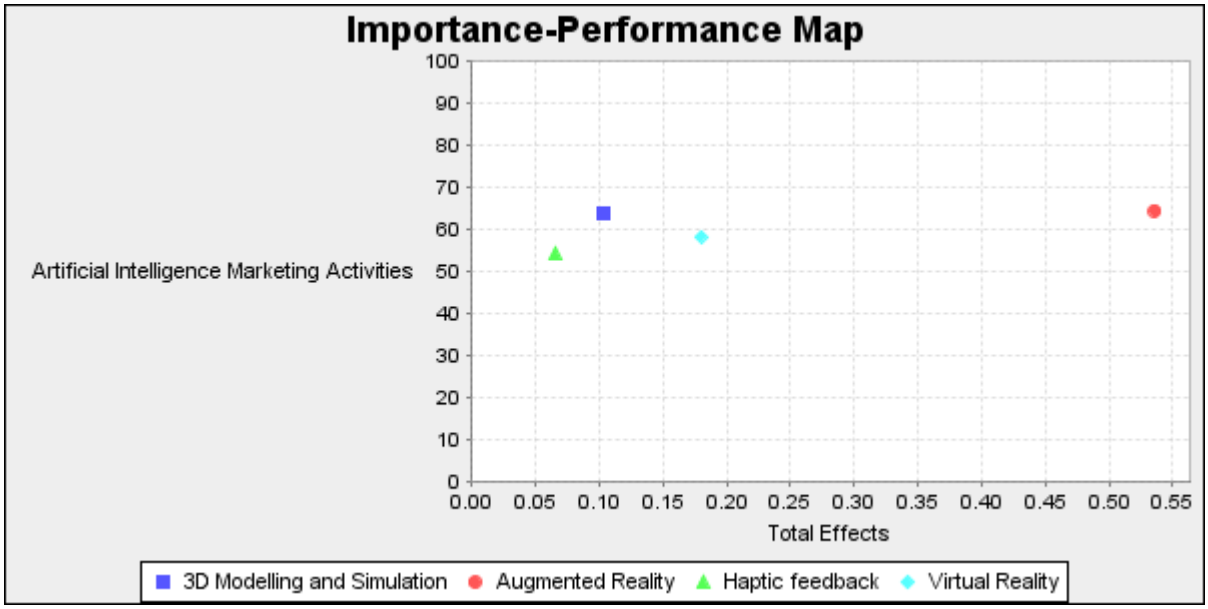

Figure 8: Importance Performance Map for AI Marketing Activities

Figure 8 show that Augmented Reality (0.536) was the most important construct, followed by Virtual Reality (0.18), 3D Modelling and Simulation (0.104) and Haptic feedback (0.065). Moreover, Augmented Reality performed the best (64.418%), followed by 3D Modelling and Simulation (63.856%), Virtual Reality (58.274%) and Haptic feedback (54.08%).

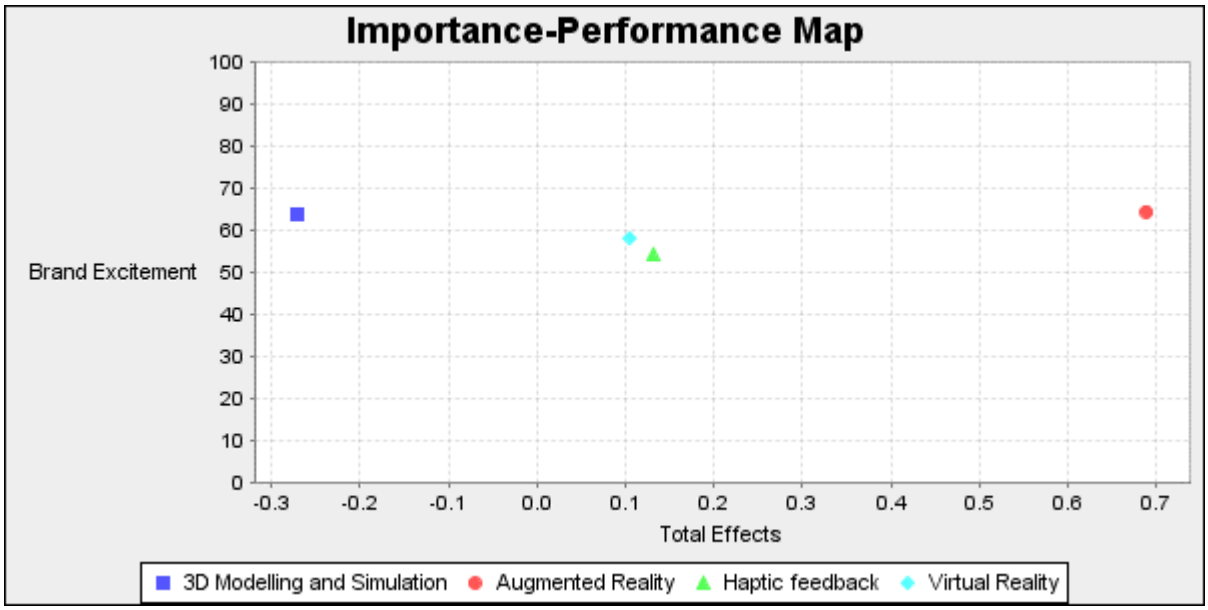

Figure 9: Importance Performance Map for Brand Excitement

Figure 9 show that Augmented Reality (0.689) was the most important construct, followed by Haptic feedback (0.131), Virtual Reality (0.105) and 3D Modelling and Simulation (-0.271). Moreover, Augmented Reality performed the best (64.418%), followed by 3D Modelling and Simulation (63.856%), Virtual Reality (58.274%) and Haptic feedback (54.08%).

7- Conclusion and Discussion:

In the tourism industry, metaverse and artificial intelligence marketing activities effectively interconnect virtually with actual reality, by providing active participation opportunities in immersive experiences. By using ambient intelligence to improve actual environments, goods, and services, metaverse provides a parallel virtual universe that develops into a shared, collective virtual space for value co-creation. Moreover, it is belief that artificial intelligence marketing activities are the future of the world but much recognition has not been given to the technology as it's an opportunity companies can tap into personalized their interactions with customers for better consumer brand identity and global marketing and advertising effectiveness in the world.

Finally, an overall conclusion is shown through (Table 11) which builds the theoretical contribution to the field of Metaverse Technologies. The table points out the relationship between Metaverse Technologies and Brand identity. Additionally, it investigated whether the relationships are mediated by AI marketing activities as well as answering the research questions and presenting its objectives.

Table 11: Summary of study conclusion

Study questions	Objectives	Hypotheses	Results
What is the effect of using metaverse technologies (Virtual Reality, Augmented Reality, 3D Modelling and Simulation, Haptic Feedback) on tourism brand identity in the Egyptian market?	Explain and illustrate the effect of using metaverse technologies (Virtual Reality, Augmented Reality, 3D Modelling and Simulation, Haptic Feedback) on tourism brand identity in the Egyptian market	H1 Metaverse Technologies -> Brand Identity H1.1 Virtual Reality -> Brand Identity H1.2 Augmented Reality -> Brand Identity H1.3 3D Modelling and Simulation -> Brand Identity H1.4 Haptic feedback -> Brand Identity	Supported These findings align with prior research (Dwivedi, Hughes et al., 2021; Dwivedi, Hughes, & Kar, 2022; Dwivedi, Hughes, Cheung et al., 2022).

What is the impact of using metaverse technologies (Virtual Reality (VR), Augmented Reality (AR), 3D Modelling and Simulation, Haptic Feedback) on AI marketing activities in the Egyptian market?	**Explain and illustrate the impact of using metaverse technologies (Virtual Reality, Augmented Reality, 3D Modelling and Simulation, Haptic Feedback) on AI marketing activities in the Egyptian market**	**H2 Metaverse Technologies -> Artificial Intelligence Marketing Activities** **H2.1 Virtual Reality -> Artificial Intelligence Marketing Activities** **H2.2 Augmented Reality -> Artificial Intelligence Marketing Activities** **H2.3 3D Modelling and Simulation -> Artificial Intelligence Marketing Activities** **H2.4 Haptic feedback -> Artificial Intelligence Marketing Activities**	**Supported** **These findings align with prior research (Gonz´alez et al., 2013).**
What is the impact of using artificial intelligence marketing activities on enhancing tourism brand identity in the Egyptian market?	**Explain and illustrate the impact of using artificial intelligence marketing activities on enhancing tourism brand identity in the Egyptian market**	**H3 Artificial Intelligence Marketing Activities -> Brand Identity**	**Supported** **These findings align with prior research (Tanveer et al., 2021, Xu et al, 2020)**
Is there a significant mediating effect of artificial intelligence marketing activities on the relationship between using metaverse technologies and	**Explain how can artificial intelligence marketing activities mediate the relationship between using metaverse technologies and tourism brand**	**H6 Metaverse Technologies -> Artificial Intelligence Marketing Activities -> Brand Identity** **H6.1 Virtual Reality -> Artificial**	**Not supported** **There are no studies that have examined the relationship between the study variables combined, and this represents**

tourism brand identity in the Egyptian market?	**identity in the Egyptian market**	**Intelligence Marketing Activities -> Brand Identity H6.2 Augmented Reality -> Artificial Intelligence Marketing Activities -> Brand Identity H6.3 3D Modelling and Simulation -> Artificial Intelligence Marketing Activities -> Brand Identity H6.4 Haptic feedback -> Artificial Intelligence Marketing Activities -> Brand Identity**	**the research gap for this study**
What is the effect of using metaverse technologies (Virtual Reality (VR), Augmented Reality (AR), 3D Modelling and Simulation, Haptic Feedback) on tourism brand excitement in the Egyptian market?	**Explain and illustrate the effect of using metaverse technologies (Virtual Reality, Augmented Reality, 3D Modelling and Simulation, Haptic Feedback) on tourism brand excitement in the Egyptian market**	**H4 Metaverse Technologies -> Brand Excitement H4.1 Virtual Reality -> Brand Excitement H4.2 Augmented Reality -> Brand Excitement H4.3 3D Modelling and Simulation -> Brand Excitement H4.4 Haptic feedback -> Brand Excitement**	**Supported There are no studies that have examined the relationship between the study variables**
Does brand excitement affect tourism brand identity in the Egyptian market?	**Explain how can brand excitement affect tourism brand identity in the Egyptian market**	**H5 Brand Excitement -> Brand Identity**	**Supported These findings align with prior research**

			(Rather, 2020; Rather & Hollebeek, 2020)
Is there a significant mediating effect of brand excitement on the relationship between using metaverse technologies (Virtual Reality (VR), Augmented Reality (AR), 3D Modelling and Simulation, Haptic Feedback) and tourism brand identity in the Egyptian market?	**Explain how can brand excitement mediate the relationship between using metaverse technologies and tourism brand identity in the Egyptian market**	**H7 Metaverse Technologies -> Brand Excitement -> Brand Identity** **H7.1 Virtual Reality -> Brand Excitement -> Brand Identity** **H7.2 Augmented Reality -> Brand Excitement -> Brand Identity** **H7.3 3D Modelling and Simulation -> Brand Excitement -> Brand Identity** **H7.4 Haptic feedback -> Brand Excitement -> Brand Identity**	**Supported** **There are no studies that have examined the relationship between the study variables combined, and this represents the research gap for this study**
Does the brand excitement moderate the relationship between artificial intelligence marketing activities and tourism brand identity in the Egyptian market?	**Explain and discuss the moderating role of brand excitement on the relationship between artificial intelligence marketing activities and tourism brand identity in the Egyptian market**	**H8 Moderating Effect 1 -> Brand Identity**	**Supported** **There are no studies that have examined the relationship between the study variables combined, and this represents the research gap for this study**

Table 12: Demographic Characteristics

Variable	Category	N	%
Age	**15-25**	**208**	**40.0%**
	26-35	**50**	**9.6%**
	36-46	**64**	**12.3%**
	More than 46	**198**	**38.1%**
Gender	**Male**	**367**	**70.6%**
	Female	**153**	**29.4%**
Education	**Bachelor's**	**364**	**70.0%**
	Master's	**70**	**13.5%**
	Phd	**86**	**16.5%**
Nationality	**Egyptian**	**38**	**7.3%**
	Saudi	**61**	**11.7%**
	Qatari	**37**	**7.1%**
	Kuwaiti	**30**	**5.8%**
	Emirati	**29**	**5.6%**
	Iraqi	**7**	**1.3%**
	Yemeni	**19**	**3.7%**
	Palestinian	**27**	**5.2%**
	Jordanian	**34**	**6.5%**
	Syrian	**14**	**2.7%**
	Bahraini	48	9.2%
	Sudanese	27	5.2%
	Tunisian	33	6.3%
	Algerian	40	7.7%
	Libyan	33	6.3%
	Moroccan	31	6.0%
	Omani	12	2.3%

Table 12 shows the demographic data of the study sample in order to describe the study sample, which indicates that more than half of the sample members are males as their percentage reached (70.6%) and females (29.4%). Also, Most of the sample members ages ranges between 15 _ 20 years old with a percentage of (40%), and more than 46 years old with a percentage of (38.1%). When talking about the level of education we can see that most of the sample members are having a bachelor degree as their percentage reached (70%) and it was taken into consideration the PhD and master level of education with percentages (16.5% & 13.5 respectively). Additionally, different nationalities were chosen to be able to reach different

responses and different points of view from Arab countries as mentioned in the previous table (12). Moreover, the researchers noted that the percentage of women surveyed was small due to the culture of Arab societies, in which women usually travel with their families and do not travel alone.

7- Study Implications:

7.1- Theoretical Implications

The paper contributes to theory by further exploring a concept that has surprisingly not been extensively studied in the academic literature. The concept of Metaverse technologies (Virtual Reality, Augmented Reality, 3D Modelling and Simulation, Haptic Feedback) is crucial in defining brand identity, yet it has not been adequately examined as a research concept. The focal point of this study lies in offering a theoretical foundation for investigating the effect of Metaverse technologies on Artificial Intelligence marketing activities, Brand Excitement, and Brand Identity in the Egyptian tourism market. Our study analyses how Metaverse technologies products affects the tourism brand identity through Artificial Intelligence marketing activities in Egyptian market. To understand more what affects brand identity; brand excitement was analysed as a moderating variable between Artificial Intelligence marketing activities and tourism Brand Identity in Egyptian market. To advance theory-based research in the field of Metaverse technologies. Based on the findings of this study, further research will be conducted in this field.

In addition, this study makes a valuable contribution to the existing literature by providing a conceptual framework for building a strong brand identity to reach brand loyalty and satisfaction. It also suggests a new framework that combines and connects brand identity with the metaverse technologies, artificial intelligence marketing activities, and brand excitement together. Furthermore, the study conducted empirical tests to assess the validity and reliability of these variables.

7.2- Practical Implications

Travellers' payment and reservation processes could be completely transformed by metaverse technology. In an engaging virtual setting, travellers can quickly look for the sights and activities they want, evaluate their alternatives, and pay.
Travellers using Metaverse can securely complete the payment procedure, browse various lodging options in a virtual setting, and confirm their reservations all from within the digital world. Additionally, the Metaverse could make it easier to buy tickets for events and activities. Travellers can also safely keep all of their travel documents in one location for convenient access by using Metaverse technology.

Travelling is not just about having fun; it's also about learning of other cultures and locations throughout the world. We may now investigate and learn more about history and culture in a way that has never been done before due to metaverse technology. For instance, museums, landmarks, and other historical locations can be explored through an immersive experience created with virtual reality (VR).

Through a virtual tour, travellers can also use technology to learn more about the culture of a certain nation or area.

There are no simple solutions to the complicated problem of artificial intelligence in tourism. This technique has both possible advantages and disadvantages. Understanding these problems and having a careful understanding about how artificial intelligence will develop in the travel and tourism sector are essential. The results of this study will also assist managers of tourism-related firms in better understanding on how artificial intelligence may enhance their brand identity. The recommendations provided in this paper can also be used by managers to enhance certain aspects of their companies that are keeping the brand from being widely known. In order to help managers to comprehend the significance and advantages of integrating artificial intelligence, this study also shows the benefits of doing so. Therefore, the results of this study demonstrate that the use of artificial intelligence in tourism enterprises can help them create brand excitement and increase the number of their clients.

8- Recommendations:

The researchers developed an action plan that includes a set of recommendations for each of the variables of the study, based on scientific literature and a field study of the Egyptian market, as well as the nature and culture of the Egyptian consumer. These recommendations help marketers in developing an integrated strategy to encourage tourism businesses to incorporate metaverse technologies into their operations and use the artificial intelligence marketing activities to be able to enhance tourism brand identity and accordingly reach tourists loyalty and satisfaction. The following (Table 12) shows the study action plan:

Table 13: Recommendation action plan

Area of Recommendations	Recommendations	How to implement (Implementation Mechanisms	Time Factor	Department
Develop a key strategy	Develop a strategic plan	Establish clear aims and objectives for the tourism sector's utilization of metaverse and how it will advance your company or destination.	Long term	Marketing Department
Understand your audience	Define your target market	-Understand your target customer and the kind of environment he is used to -Assess your target audience's requirements and preferences, then modify your metaverse products accordingly.	Short term	Marketing Department

Area of Recommendations	Recommendations	How to implement (Implementation Mechanisms	Time Factor	Department
Test and iterate	**Monitoring, comparing, and correcting**	**-Determine any areas that would require modification to guarantee optimal results for users.** **- Before launching your metaverse products to a wider audience, test them with a small group of people.** **- Gather feedback and make any required adjustments.**	**Medium and Long term**	**R&D Department**
Foster collaboration	**Competitive advantage**	**- Collaborating with companies, travel destinations, and industry professionals to exchange best practices and expertise and create new products** **- Think about how you can utilise metaverse to connect many stakeholders and establish chances for cooperation (many travel agencies, hotels, and tourist boards participating in the creation of travel applications, etc.).**		**Public Relation Department**
Measure and analyse	**Performance evaluation**	**- Make data-driven decisions about next developments and assess the success of your metaverse offers with metrics and analytics.** **- To ensure you have measurable outcomes to assess, set clear objectives and KPIs for your metaverse installation in tourism. (enhancing the customer experience, cutting acquisition expenses, or raising customer retention)** **- Make decisions based on facts, gather information from customer surveys, and examine consumer behaviour.**	**Long term**	**R&D Department**

Area of Recommendations	Recommendations	How to implement (Implementation Mechanisms	Time Factor	Department
Keep it accessible	**Accessibility**	**-The availability of metaverse offerings to the greatest number of individuals by taking into account elements like internet connectivity and device compatibility. - Examine how your target audience can use the technology easily. -Take into account its client's different ages, nationalities, and languages. - Think about the audio-based content that is accessible to those who are deaf.**	**Short term**	**IT Department**
Keep security in mind	**Privacy and Security**	**- Given the rise in cybercrime, travelers need to be reassured that their data and personal information are protected. - Use the strongest authentication and encryption techniques possible to protect their clients' data. - Take into account any local laws and rules pertaining to the security and privacy of data.**	**Short term**	**Cybersecurity Department**
Virtual Reality (VR) strategies	**1.Regular Updates: Ensure continuous flow of fresh content. 2. Beta Testing: Gather user feedback for refinement.**	**1. Craft Immersive Experiences: Develop captivating VR environments for unique and memorable customer interactions. 2. Interactive Content: Create engaging content like virtual events and simulations, enhancing user participation**	**Long term**	**IT Department**
Augmented Reality (AR) strategies	**1. AR Shopping: Enable users to visualize products in real-world settings. 2. AR Assistance: Provide real-time guidance through AR-based customer support.**	**1- User Tutorials: Educate users on AR features. 2. Feedback Loop: Continuously improve based on user input 3- Conversion Rates: Measure AR interactions translating into sales. 4- Customer Satisfaction: Collect feedback on AR assistance.**	**Long term**	**IT Department**

Area of Recommendations	Recommendations	How to implement (Implementation Mechanisms	Time Factor	Department
Artificial Intelligence (AI) strategies	1. Personalized Experiences: Use AI for tailored user experiences. 2. Chatbots: Implement AI-driven chatbots for instant support. 3. Real-World Integration: Merge virtual and physical experiences. 4. Location-Based Offers: Provide geo-targeted discounts.	1. Continuous Learning: Adapt AI to changing preferences. 2. A/B Testing: Experiment with AI features for optimization 3. Marketing Campaigns: Effectively promote location-based offers. 4. User Surveys: Collect feedback on augmented shopping experiences.	Long term	IT Department

10- Limitations and Future research:

The study was limited to Arab tourists and did not include all tourists visiting Egypt. Also, it did not include all metaverse tools, nor did it address the individual impact of each of the artificial intelligence marketing activities. In addition, the study focused on the tourism sector and did not include any other sector.

Although earlier studies looked at the effectiveness of Metaverse technology in terms of brand recognition, awareness, and consumer attitudes, but none that have looked at how it affects brand stewardship, brand personality. Therefore, it is recommended that future studies build on the existing body of work by exploring how Metaverse technologies and AI marketing activities affect consumers' propensity to buy, brand stewardship and brand personality. Additionally, using other moderating variables such as the strategic flexibility of senior management and agile systems. The study can also be applied to other business fields such as sports and electronic products, for example, but not limited to.

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