THE EFFECT OF AI ON CONSUMER EXPERIENCE, ENGAGEMENT ON SOCIAL MEDIA THROUGH THE MEDIATING ROLE OF CHATBOTS, VIRTUAL INFLUENCERS, AND AUGMENTED REALITY

Manzar Ahmed[1] and Nermin Gouhar[2*]

[1,2]*Assistant Professor, College of Business, Effat University, Email: nermgouhar@effatuniversity.edu.sa*

Corresponding Author: Nermin Gouhar
(nermgouhar@effatuniversity.edu.sa)

ABSTRACT

This research aims to examine the effect of AI on consumer experience in social media (measured by cognitive, emotional, physical, sensorial, and social elements), and consumer engagement on social media through the mediating role of chatbots, virtual influencers, and augmented reality. This study follows the positivist philosophy. Quantitative research relies on consistent assumptions based on the positivist model, the behavior of the research subject, and analysis. The data were collected via a questionnaire for the tourism booking websites. The findings indicate that artificial intelligence (AI) demonstrates partial significance in shaping overall consumer experience, while its direct effect on consumer engagement is insignificant. However, AI shows strong and significant positive effects on Chatbots, Virtual Influencers, and Augmented Reality. In turn, Chatbots significantly enhance consumer engagement, while Virtual Influencers and Augmented Reality significantly improve consumer engagement as well. The results also reveal varying mediation patterns: Chatbots partially mediate the effect of AI on both consumer experience and engagement; Virtual Influencers provide full mediation for both outcomes; and Augmented Reality exhibits partial mediation for both consumer experience and engagement. These findings collectively highlight the critical roles of AI-enabled interactive technologies, particularly virtual influencers in shaping consumer experience and engagement.

KEYWORDS: AI, Consumer Experience In Social Media, Cognitive, Emotional, Physical, Sensorial, And Social Elements, Consumer Engagement On Social, Chatbots, Virtual Influencers, And Augmented Reality.

1. INTRODUCTION

Artificial intelligence plays a vital role in shaping the way people and firms connect and communicate in the online world these days. AI provides systems and machines that mimic the way humans think and handle jobs like learning and figuring things out, along with planning ahead and guessing what happens in the future (Saranya and Subhashini, 2023). Machine learning and deep learning have pushed this further, so machines now sift through data and spot patterns on their own, without people stepping in every time. Such changes keep reshaping jobs, how we talk, and even what buyers do. Industries changed a lot with AI, and the real issue seems to be less about machines taking over from humans and more about pairing them well with human smarts and feelings (Xu et al., 2021).

AI growth lines up with how the web and phones have spread out, altering online chats in big ways. Companies turn to smart setups now for easy, custom talks with folks. Chatbots serve as a clear case here, these AI tools chat back via words or sound. They take in what users say, figure out the point, and reply right away by linking up services like texts, directions, and mail. Built to mimic real talks, chatbots boost workflow and make customers happier, evidence from Zhang and team in 2024 points out. Quick replies, tips fitted to the person, and help any hour of the day turn them into must-haves for keeping users hooked online.

Alongside chatbots come virtual influencers, another step forward in AI for dealings with people. Made with AI and sharp graphics, these fake figures seem and behave like actual persons. Virtual influencers work well in ads, showing feelings, starring in promo shots, and chatting on social sites. They skip body limits that real people face, and brands can tweak them to match exact styles and ideas. Firms like Samsung already tap ones such as Lil Miquela to reach young tech fans, as Cho discusses in 2025. Steady posts and a set look draw marketers who want real-seeming yet steady pushes on social feeds.

What users experience and stick around for on social media depends on things like how the screen looks, if posts fit needs, how fast replies come, data safety, and custom touches (Dhruti et al., 2024). AI goes deeper into these sites, touching not only the basics of online swaps but also wider parts of what happens, such as thoughts, moods, body sense, senses, and group ties. Five core parts cover these user sides, cognitive ones, emotional layers, physical feels, sensory inputs, and social links. Chatbots, virtual influencers, and added reality play into each

in their own way, affecting views of brands and pulls toward online stuff.

Thus, this study investigates how AI affects the experience of customers in social media (cognitive, emotional, physical, sensorial, and social elements) and consumer engagement on social media as chatbots, virtual influencers, and augmented reality play a mediating role. This is done through:

- Examining the conceptual background for artificial intelligence, consumer experience, engagement on social media, chatbots, virtual influencers, and augmented reality
- Study the way Artificial Intelligence (AI) affects customers' experience in social media.
- Check out how AI changes the way people engage with social media, including how they interact, react, and form opinions about content driven by AI.
- Look at the role of chatbots, virtual influencers, and augmented reality in how AI shapes people's experience on social media.
- Advise marketers and businesses on using AI tools in a way that is both ethical and effective to improve how people experience and engage online.

2. LITERATURE REVIEW

In this section, the researcher elaborates on the concepts of this study, in addition to discussing the previous literature that focused on the variables of the current research, which investigates the effect of AI on consumer experience, engagement on social media through the mediating role of chatbots, virtual influencers, and augmented reality.

2.1. Conceptual Framework

Conceptual frameworks are used in research for outlining possible options or for presenting the preferred approach, namely, defining the problem and purpose, conducting a literature review, devising a methodology, data collection, and final analysis (Suman, 2014)

2.2. Artificial Intelligence

The history of artificial intelligence began in 1950, when Alan Turing, often called the "father of computer science," wrote a paper called Computing Machinery and Intelligence. He suggested a test, now known as the Turing Test, where a human asks questions to both a computer and a person and tries to figure out which answers come from the computer. This test addressed questions like "Can machines think?" and marked a significant milestone in AI history (Haenlein and Kaplan, 2019).

In 2011, IBM created Watson, a system that could answer questions on a wide range of topics. Watson became famous when it beat top Jeopardy! players Ken Jennings and Brad Rutter, showing how AI can understand and work with natural language. In 2016, DeepMind developed AlphaGo, a deep neural network, which won against world Go champion Lee Sedol in a series of five games. The win was impressive because Go is an extremely complex game. Later, Google acquired DeepMind for $ 400 million. By 2023, large language models like ChatGPT had changed how AI performs. These models learn from huge amounts of raw, unlabeled data, opening up new possibilities to improve business value and automate tasks (Grzybowski et al., 2024).

At the operational level for commercial use, artificial intelligence (AI) is based on a suite of technologies that rely heavily on machine learning, deep learning, data analytics, prediction, object classification, natural language processing, recommendations, intelligent data retrieval, and more. Artificial intelligence (AI) makes existing programs and products smarter. Studies confirm that AI capabilities will improve the quality of many products we already use. This is done by creating various technologies that usually combine things like automation, chatbots, robots, and smart machines with large amounts of data (Shrivastava, 2024).

2.3. Chatbots

Back in 1950, Alan Turing asked if a machine could have a conversation so natural that people wouldn't be able to tell it wasn't human. This idea led to the creation of chatbots and is now known as the Turing Test. The first chatbot, named Eliza, appeared in 1966. It was made to take what people said and turn their statements into questions. Eliza's language skills were limited, but it still sparked more interest in chatbot development cause it worked through matching patterns and using preset response templates. Chatbots have been evolving since day one, in 2016, chatbots became much more popular as social media platforms let businesses create them right inside messaging apps. By the end of that year, there were over 34,000 chatbots working in areas like marketing, healthcare, and education. The Internet of Things (IoT) has helped advance the way chatbots interact with devices. One of the most notable updates was Microsoft's XiaoIce, which added emotional intelligence to its cognitive skills. XiaoIce chatbots have been able to build long-term, culturally aware relationships with users. Today's chatbots differ significantly from their predecessors, such as Eliza. They are capable of sharing opinions, expressing emotions, and even behaving in human-like ways, though they have sometimes been found to mislead others. Since 2016, interest in chatbot research has grown a lot, with the United States leading in the number of studies, followed by the United Kingdom and Japan (Adamopoulou and Moussiades, 2020).

Modern AI assistants emerged in the second decade of the 21st century. Apple's Siri, launched in 2010, was the first voice-activated personal assistant. It offered recommendations and could learn from user behavior, but it required an internet connection and supported a limited number of languages. It was later adapted for use in the business and healthcare sectors. Google debuted in 2012 and grew into Google Assistant by 2016. This assistant provided predictive and conversational features, though it raised some privacy concerns because of how it handled data. Microsoft's Cortana and Amazon's Alexa both launched in 2014. They expanded chatbot use to tasks like automating work and controlling smart home devices. Both, however, raised some security worries (Adamopoulou and Moussiades, 2020).

Chatbots help in purposes beyond simply mimicking human interaction or providing entertainment. They are used in education, business, e-commerce, healthcare, and entertainment. While productivity is the primary reason users interact with chatbots, other motivations include entertainment, social interaction, and innovation. In business, chatbots are widely used because they reduce service costs and allow for the simultaneous management of multiple clients. Compared to static FAQ pages, chatbots offer a more interactive and user-friendly experience, providing efficient and personalized assistance by directly addressing users' questions and problems (Adamopoulou and Moussiades, 2020).

How much users trust chatbots depends on their behavior and appearance, and factors related to their creator, privacy issues, and security. The development of this trust relationship is further supported by the chatbot's level of human-likeness, which depends on its visual characteristics, the resemblance of its name to the user, its personality, and its proficiency in human language (Joe and Sundar, 2019). Emotions play a big role in making chatbots feel more human, and there are several ways to create chatbots that understand feelings (Pamongkas, 2019). As artificial intelligence improves, chatbots are getting better at having conversations that seem more natural. Still, talking to

a chatbot is quite different from talking to a person. Chats with bots tend to be longer, and people often use short sentences with simple words or even poor grammar when they do this (Adamopoulou and Moussiades, 2020). One key difference between chatbots and people is empathy. Chatbots don't understand feelings the way humans do, so they find it harder to really get the meaning behind conversations. But things are improving, and chatbots are starting to pick up on the emotions of whoever they're chatting with (Fernandez, 2018).

2.4. Virtual Influencers

Today, virtual influencers, AI-generated influencers, or digital avatars are an upcoming sensation in marketing. These computer-generated characters look like real people but, basically, run managed social media accounts by marketers or agencies. virtual influencers can embody all the human traits and personalities that are now used to promote all sorts of products online. One reason they are so in demand today is that they are consistent and easy to control. In contrast to the rather unpredictable nature of human influencers, a virtual one will follow algorithms that allow a brand to precisely manage its tone, message, and behavior. This level of control minimizes risks and costs when working with them, hence making them more appealing to those in charge compared with their human counterparts (Gerlich, 2023).

Technically, brands create these influencers by generating 3D images that are then animated using software that enables realistic interactions. The exact modus operandi is usually kept secret because companies rarely share the technologies, they make use of. These avatars are later used on social media platforms to manage campaigns and engage with followers (Gerlich, 2023).

2.5. Augmented Reality

Augmented reality first came about in 1992. A Boeing researcher named Thomas Preston Caudell developed an early industrial system to assist with assembly tasks. Over the years, definitions have varied a bit. Still, the one from Paul Milgram and Fumio Kishino stands out the most. They introduced the idea of a reality-virtuality continuum. This places augmented reality somewhere in between the real world and a fully virtual one. It breaks things down into four main areas. Those include the real environment, augmented reality itself, augmented virtuality, and pure virtual reality. Sources back this up in various discussions (Arena et al., 2022).

Studies indicate that artificial intelligence lifts customer satisfaction levels. Automated systems and ones with multiple agents adjust services to fit needs. They fine-tune how people connect with brands (Xie et al., 2022). The reach of artificial intelligence in social media shapes customer interactions broadly. It impacts personalization, how brands reply, and overall digital engagement. Research by McLean and Wilson in 2019 demonstrates how augmented reality seamlessly blends the physical and online worlds on these platforms. This creates experiences that feel more interactive and livelier. Factors such as easy access, quick responses, and changing user behavior all play a role. In the end, augmented reality has an important role in customer journeys powered by artificial intelligence today.

2.6. Consumer Experience In Social Media

Customer experience is a multidimensional construct encompassing cognitive, emotional, behavioral, sensorial, and social components that emerge through direct or indirect interactions between consumers and firms. It represents a holistic process in which individuals interpret and respond to brand-related stimuli and digital touchpoints across their journey (Lemon and Verhoef, 2016).

On social media, how customers experience brands changes through different interactive moments. These moments include content created by companies, conversations with other users, and personalized suggestions based on algorithms. This digital space mixes technology with more personal communication, making the experience more engaging for our minds, feelings, senses, and social connections.

- The thinking part involves how people notice, understand, and process brand information and their online experiences.
- The emotional part covers feelings like happiness, trust, or frustration that come up during interactions and stories shared by brands.
- The sensory part is about how things like videos, sounds, and visuals grab our attention and make the experience feel more real.
- The social part looks at how friends, groups, and what others do online influence our views and choices.

2.6.1. Cognitive

The cognitive side of things shows us the way our minds handle activities such as thinking, understanding, using language, and solving problems (Dwivedi et al., 2021). Speaking of customer experience, we point to the way people feel

and react when they use products or services. According to Lu et al. (2019), this comes down to factors like how well something works, how fast it responds, and how easy it is to use. These aspects show how users judge whether their experience is efficient and simple.

Potdar et al. (2018) investigated the emotional side of customer experience, but these feelings occur when customers think about what happened. Emotions like enjoyment, regret, annoyance, or surprise come from how customers process and understand their experience (Hsiao and Chen, 2016). Deska et al. (2018) connected thinking to feeling more human during digital interactions. They say that when people respond with both thought and emotion, it helps build a stronger human connection. Still, there isn't much research on how using different communication channels at the same time affects how customers see quality and their overall experience across these channels.

2.6.2. Emotional

The emotional side of user experiences on social media is about how people feel when they interact with digital content, brands, and platforms. According to Potdar et al. (2018), these feelings can be positive, like enjoyment or satisfaction, but they can also be negative, such as regret or annoyance, and even feelings of surprise or wonder (Hsiao and Chen, 2016). These emotions often shape how people think about and remember their time online, which affects how involved they are and how loyal they remain.

A big part of how we feel emotionally is called affective attachment. This is the emotional connection someone builds with a brand, an object, or a platform. Rioux et al. (2017) explain it as an emotional connection that grows over time, which aims to help people feel connected to and respond to the brand or platform. On social media, this attachment happens when users feel emotionally linked to brands or AI systems that seem human. Hicks et al. (2012) highlight that satisfaction is what starts this connection. When people have positive experiences, their emotional bond gets stronger, and they feel closer to the brand.

2.6.3. Physical & Sensorial

Customers' physical and sensory experiences differ between online and offline contexts. Offline experiences consider artifacts, lighting, signage, and layout. whereas online experiences consider easier-to-navigate interfaces and more apparent design (Bilal et al., 2023).

The sensory aspect of social media use relates to how people engage with their senses when interacting with digital content, platforms, and brand messages. Gentile et al. noted in 2007 that customer experience stems from a series of interactions that evoke emotions and perceptions. In 2017, Agapito et al. highlighted sensory experience as a fundamental component of the overall experience, explaining its importance in shaping users' emotions and interactions. On social media, sensory experiences originate from elements such as visuals, sounds, and sometimes even tactile features embedded in the content. Images, colors, sounds, and video quality all influence how people perceive a brand and the emotions they associate with it. These sensory details capture attention, enhance the experience, and influence how users feel about the content or product. Building on earlier studies, sensory experience happens when people interact with their surroundings through one or more senses, which creates sensory information that shapes how they understand and respond. For social media, this could be the look of an ad, the tone of a video voice-over, or the immersive feel of augmented reality filters and effects. The more engaging and consistent these sensory experiences are, the stronger the user's connection and feelings toward the brand become, according to Kandampully et al. in 2018.

2.6.4. Social Elements

The social element reveals consumers' experiences of using social media and how interactions with others—such as family, friends, or online communities—influence user perceptions and behaviors. Social connections illustrate how individuals interpret and interact with content, products, and brands. Positive experiences are evident when users feel socially connected or see validation from their peers in digital spaces (Bilal et al. 2024)

In social media, social influences come through likes, shares, comments, and recommendations, and these affect what users think and decide. Platforms use artificial intelligence to study user data and how people interact to better understand social preferences and relationships. in agreement with Bilal et al. (2024), AI improves social experiences through finding the best ways to connect with users based on their networks, habits, and shared interests. When technology makes interactions feel meaningful, it builds engagement, trust, and emotional connections within online communities.

2.7. Consumer Engagement In Social Media

Consumer engagement on social media represents how users actively interact with brands through likes, shares, comments, and content creation. Artificial Intelligence (AI) plays a crucial role in shaping this engagement by providing firms with tools to personalize experiences and predict user behavior (Bilal et al., 2024). AI enables companies to assess the effectiveness of online marketing strategies by anticipating consumer responses and fostering more dynamic interactions on social platforms (Jang et al., 2021).

By gathering and analyzing product and user data, AI enhances the quality of online shopping experiences, narrowing the gap between consumers and firms (Liu et al., 2018). It also addresses operational challenges, such as processing large volumes of social media data, through predictive analytics and automated information mining (Potdar et al., 2018). The Stimulus, Orientation, and Response (S-O-R) framework individuals' reactions to digital environments are shaped by psychological and behavioral factors (Pandita et al., 2021). So, AI-driven personalization encourages greater engagement, as users are more likely to participate when they can easily compare product and service features or receive tailored recommendations (Zhou et al., 2018).

2.8. Research Hypotheses Development

In this section, research hypothesis development was discussed by reviewing the previous studies related to the topic of the current study.

Recent studies have highlighted the increasing impact of artificial intelligence technologies in enhancing digital marketing experiences through chatbots, virtual influencers, and augmented reality technologies. They provided a comprehensive review of the tools and explained how artificial intelligence technologies, augmented and virtual reality, and social media bring about a transformation in the ways companies interact with customers, which opens new horizons for developing digital communication in services. Likewise, both Bilal et al. (2024) and Omeish et al. (2024) used quantitative methods, relying on the analysis of equation methods. Structural: Their results showed that artificial intelligence techniques contribute significantly to improving the user experience, interaction through social media, and increasing purchase intention. These studies also showed that chatbots, virtual influencers, and augmented reality technologies work as factors that enhance the experience, developing emotional connections and interactive value within digital environments.

In the same context, Lampropoulos (2025) used bibliometrics to show that integrating artificial intelligence with advanced technologies, augmented and virtual realities, leads to educational, personal, interactive, and immersive environments. These results are balanced with the fields of marketing, where fusion and interactive similarity are key factors in strengthening the relationship between the consumer and the brand, as two studies have shown... through qualitative and mixed approaches, that virtual influencers supported by artificial intelligence are reshaping consumers' trust and their influence on advertisements, despite continuing concerns about authenticity and the extent of similarity to humans. Studies such as Denecke et al. (2021), Pham et al. (2022), and Altamimi et al. (2023) have confirmed the effectiveness of chatbots in improving communication and user experience, pointing out the ethical and relational challenges that restrict their full application.

Based on this, the test hypothesis was stated as follows:

H1: There is a significant effect of Artificial Intelligence on Chatbots.

H2: There is a significant effect of Artificial Intelligence on Virtual Influencers.

H3: There is a significant effect of Artificial Intelligence on Augmented Reality

Other studies indicate that artificial intelligence has become one of the most important factors influencing the shaping of consumer experience through social media, through technologies such as chatbots, augmented reality, and virtual influencers. Studies such as Omeish et al. (2024) and Beyari and Hashem (2025) using quantitative approaches based on analyzing models with structural equations (PLS-SEM), artificial intelligence applications contribute to enhancing the user experience through immediate customization of content, increasing real-time interaction, and improving customer satisfaction and purchase intentions. The results also showed that smart tools contribute to building stronger relationships between the brand and the consumer.

In the same context, studies such as Rahima (2025) and Sahut and Laroche (2025) have combined literary and methodological analysis to confirm that artificial intelligence enhances personalized communication and human-like interaction, but it raises challenges related to trust, transparency, and privacy. Their results indicated that maintaining a balance between automation and human interaction is a basic condition for building a reliable and sustainable digital consumer experience, and studies have also

supported such as Nguyen and Le (2025). These results are based on a quantitative model in the banking sector, where it was shown that features of chatbots, such as understanding, customization, and human interaction, increase cognitive value, satisfaction, and continued use.

From a conceptual perspective, Chen and Prentice (2025) integrated a framework that explains the role of artificial intelligence in improving the consumer experience along the customer journey through customized services, customer assistance, and more digital interactions. Thus, it is clear from the overall literature that artificial intelligence contributes to creating more interactive, efficient, and personalized digital experiences, which enhances user satisfaction and loyalty in building social media.

Based on this, the test hypothesis was stated as follows:

H4: There is a significant effect of Chatbots on Consumer Experience in social media

H5: There is a significant effect of Virtual Influencers on Consumer Experience in social media.

H6: There is a significant effect of Augmented Reality on Consumer Experience in social media.

H 11: There is a significant effect of Artificial Intelligence on Consumer Experience in social media.

Also, some studies such as Gupta and Khan (2024) through a systematic review and bibliometric analysis explained that artificial intelligence represents a major axis in creating value through customer engagement, as it highlighted four main axes, which are the concepts of engagement, the value of participation, social media strategies, innovation based on big data, and the importance of artificial intelligence in service industries. Likewise, Muneta (2024) conducted a bibliometric analysis of the development of research over the past three decades, stressing that artificial intelligence has become one of the fundamental determinants of customer engagement and digital advertising. While identifying future research gaps related to understanding interactive behavior across social platforms. As for Asante et al. (2023) and Filipović and Šapić (2025) conducted behavioral models to explain how artificial intelligence elements such as chatbots, recommendation systems, and smart search affect consumer behavior and engagement with electronic and social platforms. The results showed that the effectiveness of these elements increases the behavioral and cognitive engagement of consumers, especially when they are supported by ease of use

and perceived benefit. When pointing out the presence of organizational factors, such as social comparison, that may modify the strength of these relationships.

On the other hand, Teepapal (2025) focused on the role of AI-driven personalization in enhancing engagement on social media, confirming that trust and perceived usefulness represent key mediators in the relationship between personalized incentives and consumer engagement, while concerns related to privacy did not have a significant impact. These results complement the findings with Jayasingh (2025) about virtual influencers based on artificial intelligence, where it was found that the credibility and human nature of the content enhance consumer engagement and purchase intentions, which enhances the new dimension of the influence of artificial intelligence in the social engagement of a brand.

Finally, Studies such as Bag et al. (2022) and Shoeb and Zillul (2025) also provided supporting empirical evidence that the use of artificial intelligence techniques leads to an increase in digital interaction and purchase conversions through personalized marketing, especially in light of the accelerating digital transformation after the Corona pandemic, while pointing to the necessity of balancing customization with ethical considerations such as data privacy. Finally, studies such as Żyminkowska and Zachurzok (2024) confirmed through a systematic review that the effectiveness of artificial intelligence in enhancing consumer engagement through social media depends on the readiness of digital and cultural institutions, especially in service sectors.

Based on this, the test hypothesis was stated as follows:

H7: There is a significant effect of Chatbots Consumer Engagement on social media

H8: There is a significant effect of Virtual Influencers on Consumer Engagement on social media.

H9: There is a significant effect of Augmented Reality Consumer Engagement on social media.

H 10: There is a significant effect of Artificial Intelligence on Consumer Engagement on social media.

On the other hand, Studies such as Damaševičius and Zailskaitė (2024) have indicated that augmented and virtual reality and the role of virtual influencers have a major role in enhancing consumer engagement by building emotional connections and innovative interactive experiences, while pointing to

challenges such as reliability and ethical considerations. Likewise, Magas (2024) concluded through a systematic review that chatbots, virtual influences, and augmented reality technologies work together to enhance personalization, engagement, and immersion, which increases consumer satisfaction and loyalty despite continuing challenges related to privacy and technological adaptation. A study also Moriuchi (2021) showed that a theoretical model that was field-tested in e-commerce environments, that chatbots and augmented reality technologies contribute to raising consumers' motivation, engagement, and efficiency in decision-making. It also Cunha and Krupsky (2025) confirmed that augmented and virtual reality technologies enhance the perception of products, consumers' confidence, and their connection to the brand, despite their high initial costs, pointing to their long-term benefits in increasing engagement and conversion. In the context of retail business, Zeng et al. (2025) emphasized through the theory of Social Presence. They found that augmented reality technologies within stores enhance emotional engagement and value based on cultural differences between British and Chinese consumers. Singh (2025) also pointed out in a concept analysis that augmented and virtual reality technologies are redefining the shopping experience by providing immersive and personalized experiences, but he pointed out the lack of empirical evidence about their long-term effects on loyalty.

Based on this, the test hypothesis was stated as follows:

H 12: Chatbots, Virtual Influencer, and Augmented Reality play the mediating role between Artificial Intelligence and Consumer Experience in social media.

H 13: Chatbots, Virtual Influencer, and Augmented Reality play the mediating role between Artificial Intelligence and Consumer Engagement on social media.

Based on the previous studies, such as Omiesh et al. (2024), is that it focused on the role of chatbots in improving customer experience and interaction across digital platforms, but it did not look at the complementary impact of this technology with other artificial intelligence tools, such as augmented reality or virtual influencers, in enhancing consumer loyalty or purchasing decisions. As for the study, Beyarie and Hashem (2025) addressed the role of virtual influencers in building trust and credibility towards the brand, but they overlooked the behavioral and cognitive aspects of consumers and the extent of their actual response to the content. What these

influencers offer compared to real influencers. While Chu et al. (2025) focused on the impact of augmented reality in improving the consumer experience and engagement with the brand, it did not address how to integrate this technology within a comprehensive digital marketing system that combines various artificial intelligence elements. Other studies, such as Pham et al. (2022) and Denceke et al. (2025) focused on the effectiveness of chatbots from a technical perspective without analyzing their impact on the emotional dimensions and long-term trust between the consumer and the brand, thus highlighting the gap in Previous literature, in the absence of studies that address the interactive integration between chatbots, virtual influencers, and augmented reality technologies in a single framework, explains their joint mediating role in enhancing consumer experience and engagement in digital environments.

3. RESEARCH METHODOLOGY

This research aims to examine the effect of AI on consumer experience in social media (measured by cognitive, emotional, physical, sensorial, and social elements), and consumer engagement on social media through the mediating role of chatbots, virtual influencers, and augmented reality. This study follows the positivist philosophy, which means it uses deductive reasoning and number-based analysis to reach its goals. Quantitative research relies on consistent assumptions based on the positivist model, the behavior of the research subject, and analysis. Of course, some of its procedures are like those used by physicists in observing certain phenomena (Mahardini et al., 2024)

The hypotheses come from theoretical ideas, and the research uses a descriptive explanatory design to explain the relationships between the variables. The research framework and the variables are shown in
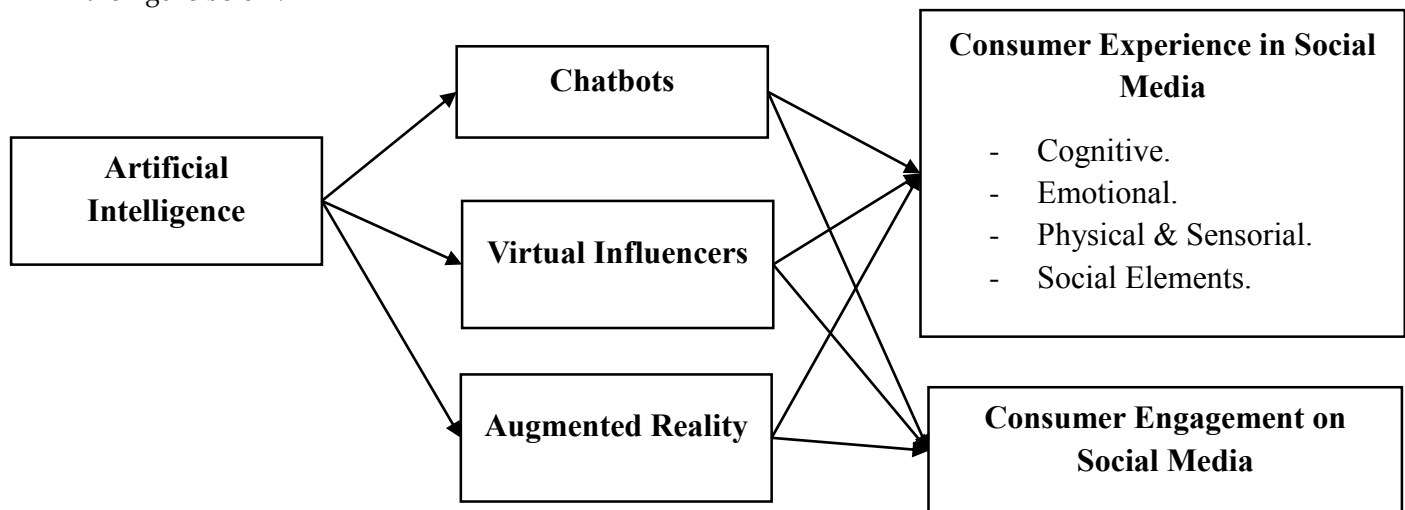
the figure below.

Figure 1: Research Framework.

- **Independent Variable:** Artificial Intelligence
- **Mediator Variable**: Chatbots, Virtual Influencers, and Augmented Reality.
- **Dependent Variables**: consumer experience in social media (measured by cognitive, emotional, physical, sensorial, and social elements), and consumer engagement on social media

The following research hypotheses are based on both the prior variables and the study's framework:

H1: There is a significant effect of Artificial Intelligence on Chatbots

H2: There is a significant effect of Artificial Intelligence on Virtual Influencers

H3: There is a significant effect of Artificial Intelligence on Augmented Reality

H4: There is a significant effect of Chatbots on Consumer Experience in social media

H5: There is a significant effect of Virtual Influencers on Consumer Experience in social media

H6: There is a significant effect of Augmented Reality on Consumer Experience in social media

H7: There is a significant effect of Chatbots Consumer Engagement on social media

H8: There is a significant effect of Virtual Influencers on Consumer Engagement on social media

H9: There is a significant effect of Augmented Reality Consumer Engagement on social media

H 10: There is a significant effect of Artificial Intelligence on Consumer Engagement on social media

H 11: There is a significant effect of Artificial

Intelligence on Consumer Experience in social media

H 11: There is a significant effect of Artificial Intelligence on Consumer Engagement on social media

H 12: Chatbots, Virtual Influencer, and Augmented Reality play the mediating role between Artificial Intelligence and Consumer Experience in social media.

H 13: Chatbots, Virtual Influencer, and Augmented Reality play the mediating role between Artificial Intelligence and Consumer Engagement on social media.

3.1. Population And Sample

This study focuses on AI-driven social media marketing in tourism (chatbots for booking, AR/VR destination previews, virtual influencers promoting travel). Meanwhile, the target population was travelers and social media users between the ages of 18–45 who use digital platforms to plan or book tourism services. The sample was collected through a stratified random sampling approach, which ensures that the sample covers the whole population (Hair et al., 2019). 350–450 respondents, purposive sampling via online travel communities, social media (Instagram/TikTok), and tourism booking platforms. The Data were gathered from a questionnaire that participants filled out themselves online. We chose respondents because they have experience with tourism booking platforms.

To collect the data needed for this study, the researcher used a questionnaire based on several previous studies. This questionnaire was designed to look at specific factors: Industry 5.0 Internet of

Things adoption as the independent variable, sustainable performance of manufacturing small and medium-sized enterprises as the dependent variable, and supply chain integration as the factor in the middle. The data was gathered through an online questionnaire shared on websites that the target group often visits. The questions used a five-point scale where answers range from 1 meaning "Strongly Disagree," 3 meaning "Neutral," to 5 meaning "Strongly Agree" (Mazurek et al., 2021).

Table 1: Research Variables Measurement.

Variables	Statements	References
Artificial Intelligence		
Artificial Intelligence	1- AI assists me in finding the right products.	Omeish et al. (2024) Bilal et al. (2024)
	2- AI presents personalized shopping details.	
	3- AI helps me make buying decisions.	
	4- AI simplifies my shopping experience.	
	5- AI suggests products that match my needs.	
	6- AI enhances my online shopping efficiency.	
	7- AI presents useful product recommendations.	
	8- AI improves the experience of my online shopping.	
	9- I perceive AI to be helpful.	
	10- I consider AI fascinating.	
	11- I prefer interacting with AI more than with humans online.	
	12- I often see AI tools on social media.	
	13- My experience with AI in social media was positive.	
	14- My attitude towards AI in social media was positive.	
	15- I have some concerns regarding the dangers of AI in social media.	
	16- I see AI in social media as restricted.	
	17- I am concerned about the safety of my data on social media that uses AI.	
Chatbots		
Chatbots	1- Chatbot responses are clear to follow.	Omeish et al. (2024)
	2- Chatbot responses are appropriate.	
	3- Chatbot responses provide useful and relevant information	
	4- Chatbots are difficult to use.	
	5- Chatbots often do not understand many of my inputs.	
Virtual Influencers		
Virtual Influencers	1- I sometimes follow virtual influencers on social media.	Omeish et al. (2024)
	2- I am often willing to buy products that virtual influencers promote.	
	3- I find that virtual influencers are trustworthy in their Advertising.	
	4- I find virtual influencers related to them.	
	5- I sometimes do not give attention to posts with virtual influences when I suspect that they are fake.	
Augmented Reality		

Augmented Reality	1- I find that augmented reality filters on social media are enjoyable.	Omeish et al. (2024)
	2- I find that augmented reality is easy in social media.	
	3- I find that augmented reality helps me to find information about products at the most suitable time and place.	
	4- I find that augmented reality in social media is easy to communicate with.	
	5- I find that augmented reality usage is complicated on social media.	
Consumer Experience in Social Media		
Cognitive	1- The recommendations of AI shift the way I think about products.	Bilal et al. (2024)
	2- The usage of AI improves my purchase decisions.	
	3- AI-driven content stimulates my curiosity.	
Emotional	1- I feel pleased when I get AI-driven recommendations.	Bilal et al. (2024)
	2- I find my shopping experience with AI exciting.	
	3- I feel a sense of connection to brands that use AI recommendations.	
Physical & Sensorial	1- The AI system's design is visually enjoyable.	Bilal et al. (2024)
	2- I find the sensory elements (colors, visuals, sounds) enjoyable when interacting with AI shopping tools.	
	3- AI-based recommendations enhance my shopping experience.	
Social Elements	1- I sometimes share AI-recommended products with my surroundings.	Bilal et al. (2024)
	2- AI-driven shopping tools make me connected with my community	
	3- I prefer to discuss\ share AI recommendations on social media.	
Consumer Engagement on Social Media		
Consumer Engagement in Social Media	1- I find sharing posts of AI-recommended products enjoyable.	Bilal et al. (2024)
	2- I comment on AI-related product posts on social media.	
	3- I sometimes follow brands or influencers that use AI-based recommendations.	
	4- I spend time engaging with AI-created content on social media.	
	5- I feel connected to brands which brands that use AI on social media.	

4. EMPIRICAL STUDY AND FINDINGS

This section presents an analysis of the research hypotheses by adopting a structured approach to analysis. Confirmatory Factor Analysis validates constructs within the research model and provides an idea of the structural relationships among the variables. In testing the hypotheses, the SEM was used, enabling a comprehensive test of the variable associations.

4.1. Confirmatory Factor Analysis

Confirmatory Factor Analysis (CFA) was conducted using AMOS 24 with the Maximum Likelihood (ML) estimation method to validate the measurement model before applying Structural Equation Modeling (SEM). The model fit statistics indicate an overall good fit. The Chi-square/degrees of freedom ratio (CMIN/DF) was 1.089 with a p-value of 0.000, suggesting statistical significance and minimal discrepancy between the observed and estimated covariance matrices. The Goodness of Fit Index (GFI) was 0.898, indicating that the model explains the observed covariance well, while the Adjusted Goodness of Fit Index (AGFI) recorded 0.885, reflecting an acceptable fit despite being slightly below the ideal 0.80 threshold. The Normed Fit Index (NFI) was 0.935, showing an acceptable fit compared to a null model, and the Tucker-Lewis Index (TLI) reached 0.994, confirming strong model performance. Additionally, the Comparative Fit Index (CFI) was 0.994, supporting the model's strong fit. The Root Mean Square Residual (RMR) was 0.050, indicating minimal differences between observed and predicted correlations, while the Root Mean Square Error of Approximation (RMSEA) was 0.015, suggesting a close fit with minimal estimation error. These results confirm the validity and reliability of the measurement model, as detailed in Table 2, which compares these indices against recommended thresholds.

Table 2: Thresholds And Fit Indices For The Measurement Model.

Measure	Results	Threshold
Chi-square/df	1.089	< 2 excellent; < 3 good; < 5 sometimes permissible
P-value	0.000	> 0.05
GFI	.898	> 0.80
AGFI	.885	> 0.80
NFI	.935	> 0.90
TLI	.994	> 0.95
CFI	.994	> 0.90
RMR	.050	< 0.08
RMSEA	.015	< 0.05

Figure 1 illustrates the execution of confirmatory factor analysis, portraying factor loadings through prominent arrows. The arrows signify strong factor loadings, with values exceeding the 0.4 threshold. To delve into the specific numerical values of these factor loadings, readers are directed to Table 3 for a detailed examination.
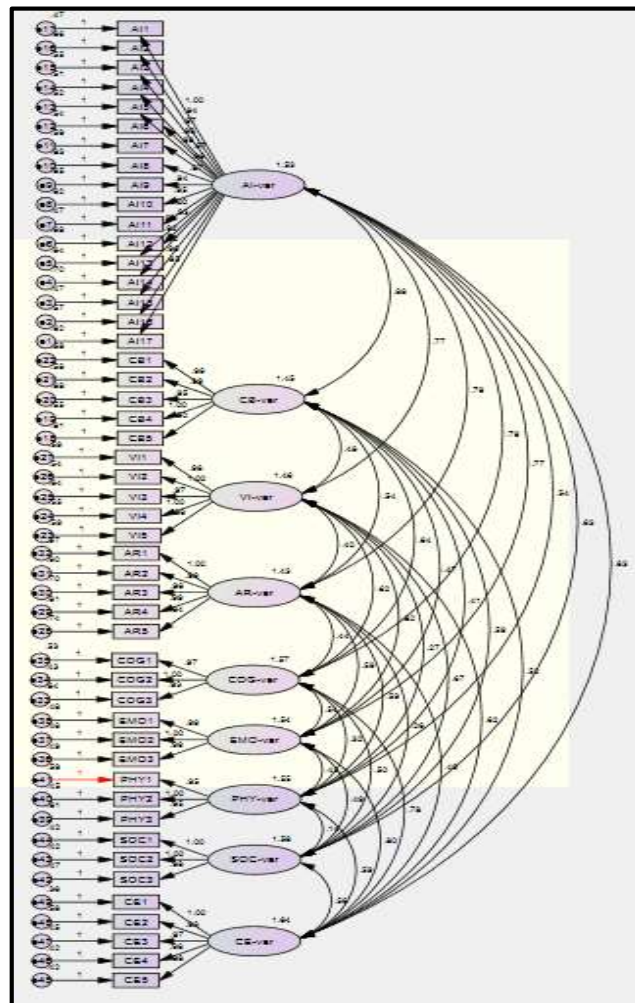
Figure 2: CFA for the Measurement Model

Table 3 presents the factor loadings, showing the strength of item loadings onto their respective variables. In this respect, all factor loadings constantly reach or surpass the critical threshold of 0.40, which further establishes the sound validity of the measured constructs. Furthermore, it is important to note that the p-values associated with each statement are well below the predefined threshold of 0.05, thus strongly supporting the substantive significance of the statements concerning their relationship to the respective constructs.

Table 3: Item Loading after Confirmatory Factor Analysis.

Table 1: Item Loading After Confirmatory Factor Analysis.

			Estimate	S.E.	C.R.	P
AI17	<---	AI	.948	.041	23.000	***
AI16	<---	AI	.964	.041	23.755	***
AI15	<---	AI	.999	.039	25.542	***
AI14	<---	AI	.921	.042	21.766	***
AI13	<---	AI	.942	.041	22.693	***

AI12	<---	AI	.929	.042	22.116	***
AI11	<---	AI	1.000			
AI10	<---	AI	.948	.041	22.986	***
AI9	<---	AI	.938	.042	22.548	***
AI8	<---	AI	.872	.044	19.779	***
AI7	<---	AI	.959	.041	23.488	***
AI6	<---	AI	.974	.040	24.260	***
AI5	<---	AI	.983	.040	24.695	***
AI4	<---	AI	.985	.040	24.799	***
AI3	<---	AI	.974	.040	24.226	***
AI2	<---	AI	.935	.042	22.403	***
AI1	<---	AI	.999	.039	25.537	***
CB5	<---	CB	.903	.049	18.445	***
CB4	<---	CB	1.000			
CB3	<---	CB	.952	.048	19.998	***
CB2	<---	CB	.988	.047	21.236	***
CB1	<---	CB	.987	.047	21.203	***
VI5	<---	VI	.983	.046	21.516	***
VI4	<---	VI	.997	.045	22.068	***
VI3	<---	VI	.966	.046	20.907	***
VI2	<---	VI	1.000			
VI1	<---	VI	.981	.046	21.472	***
AR5	<---	AR	.939	.049	18.976	***
AR4	<---	AR	.987	.048	20.477	***
AR3	<---	AR	.957	.049	19.523	***
AR2	<---	AR	.990	.048	20.570	***
AR1	<---	AR	1.000			
COG3	<---	COG	.931	.045	20.639	***
COG2	<---	COG	1.000			
COG1	<---	COG	.969	.044	21.785	***
EMO3	<---	EMO	.990	.043	22.772	***
EMO2	<---	EMO	1.000			
EMO1	<---	EMO	.994	.043	22.915	***
PHY3	<---	PHY	.947	.047	20.339	***
PHY2	<---	PHY	1.000			
PHY1	<---	PHY	.954	.047	20.502	***
SOC3	<---	SOC	.984	.041	24.034	***
SOC2	<---	SOC	1.000			
SOC1	<---	SOC	1.000	.041	24.611	***
CE5	<---	CE	.980	.035	27.702	***
CE4	<---	CE	.982	.035	27.816	***
CE3	<---	CE	.970	.036	27.018	***
CE2	<---	CE	.930	.038	24.564	***
CE1	<---	CE	1.000			

4.3. Descriptive Analysis

The respondent profile provides valuable insights into the demographics and characteristics of the study participants. Table 4 presents the demographic characteristics of the study participants. It summarizes key information about respondents' gender, age, education level, and marital status. This descriptive data helps provide an overview of the sample composition and supports understanding of the population represented in the study.

Table 2: Respondent Profile.

Item	Frequency (Total sample = 410)	Percent
Gender		
Male	220	53.7
Female	190	46.3
Age		
18-25	132	32.2
26-35	121	29.5
36-45	157	38.3
Education		

High School	58	14.1
Undergraduate	248	60.5
Postgraduate	92	22.4
Other	12	2.9
Social media hours		
< 1 hour/day	35	8.5
1–2 hours/day	154	37.6
3–4 hours/day	125	30.5
5–6 hours/day	61	14.9
7+ hours/day	35	8.5

Table 5 shows the descriptive analysis for the research variables, as the central tendency and dispersion of all the constructs used in the study. It can be seen that all the variables, namely Artificial Intelligence (AI), Chatbots (CB), Virtual Influencers (VI), Augmented Reality (AR), Cognitive Experience (COG), Emotional Experience (EMO), Physical & Sensorial Experience (PHY), Social Elements (SOC), and Consumer Engagement (CE), have mean values ranging from 2.97 to 3.01. It is evident from the results that, in general, the perception of the respondents was neutral to moderately positive about AI-driven social media marketing tools and consumer experiences related to them. The standard deviation for all constructs ranges between 1.28 and 1.36, indicating a moderate level of variability in responses, hence reflecting diverse but balanced opinions of the respondents in the sample. The minimum and maximum values, which range from 1 to 5, also establish the fact that the responses have covered the full spectrum of the Likert scale, hence indicating comprehensive participant engagement. In essence, the descriptive statistics indicate a well-distributed dataset, which is suitable for further inferential analyses like CFA and SEM, thereby ensuring the robustness of the subsequent findings.

Table 5: Descriptive Analysis For The Research Variables.

	Mean	**Std. Deviation**	**Minimum**	**Maximum**
Artificial Intelligence	3.0073	1.28274	1.00	5.00
Chatbots	2.9878	1.29409	1.00	5.00
Virtual Influencers	3.0049	1.27989	1.00	5.00
Augmented Reality	2.9732	1.29008	1.00	5.00
Cognitive Experience	3.0049	1.35595	1.00	5.00
Emotional Experience	2.9829	1.34226	1.00	5.00
Physical & Sensorial Experience	2.9976	1.32033	1.00	5.00
Social Elements	3.0122	1.35681	1.00	5.00
Consumer Engagement	2.9878	1.32028	1.00	5.00

4.4. Testing Research Hypotheses

This section presents an in-depth analysis of the research hypotheses through correlation analysis and path analysis within the structural equation modeling (SEM) framework. Structural Equation Modeling (SEM) analysis was utilized to evaluate the influence of the research variables, as evidenced in Table 9. The SEM results, explained below, provide valuable insights into the relationships between the variables and hypotheses as follows:

H1: Artificial Intelligence (AI) has a significant positive effect on Consumer Experience in social media.

H1-1: Artificial Intelligence (AI) has a significant positive effect on Cognitive Experience.

H1-2: Artificial Intelligence (AI) has a significant positive effect on Emotional Experience.

H1-3: Artificial Intelligence (AI) has a significant positive effect on Physical & Sensorial Experience.

H1-4: Artificial Intelligence (AI) has a significant positive effect on Social Elements of Experience.

H2: Artificial Intelligence (AI) has a significant positive effect on Consumer Engagement on social media.

H3: Artificial Intelligence (AI) has a significant positive effect on Chatbots in social media marketing.

H4: Artificial Intelligence (AI) has a significant positive effect on Virtual Influencers in social media marketing.

H5: Artificial Intelligence (AI) has a significant positive effect on Augmented Reality (AR) in social media marketing.

H6: Chatbots has a significant positive effect on Consumer Experience in social media.

H6-1: Chatbots has a significant positive effect on Cognitive Experience.

H6-2: Chatbots has a significant positive effect on Emotional Experience.

H6-3: Chatbots has a significant positive effect on Physical & Sensorial Experience.

H6-4: Chatbots has a significant positive effect on Social Elements of Experience.

H7: Chatbots has a significant positive effect on Consumer Engagement on Social Media.

H8: Virtual Influencers has a significant positive effect on Consumer Experience in social media.

H8-1: Virtual Influencers has a significant positive effect on Cognitive Experience.

H8-2: Virtual Influencers has a significant positive effect on Emotional Experience.

H8-3: Virtual Influencers has a significant positive effect on Physical & Sensorial Experience.

H8-4: Virtual Influencers has a significant positive effect on Social Elements of Experience.

H9: Virtual Influencers has a significant positive effect on Consumer Engagement on social media.

H10: Augmented Reality has a significant positive effect on Consumer Experience in social media.

H10-1: Augmented Reality has a significant positive effect on Cognitive Experience.

H10-2: Augmented Reality has a significant positive effect on Emotional Experience.

H10-3: Augmented Reality has a significant positive effect on Physical & Sensorial Experience.

H10-4: Augmented Reality has a significant positive effect on Social Elements of Experience.

H11: Augmented Reality has a significant positive effect on Consumer Engagement on social media.

H12: Chatbots mediate the relationship between Artificial Intelligence and Consumer Experience in social media

H13: Chatbots mediate the relationship between Artificial Intelligence and Consumer Engagement on social media

H14: Virtual Influencers mediate the relationship between Artificial Intelligence and Consumer Experience in social media

H15: Virtual Influencers mediate the relationship between Artificial Intelligence and Consumer Engagement on social media

H16: Augmented Reality mediate the relationship between Artificial Intelligence and Consumer Experience in social media

H17: Augmented Reality mediate the relationship between Artificial Intelligence and Consumer Engagement on social media

Regarding the first hypothesis (H1): "Artificial Intelligence (AI) has a significant positive effect on Consumer Experience in Social Media."

This hypothesis consists of four sub-hypotheses, and it could be observed that:

For H1-1, there is a significant positive effect of AI on Cognitive Experience (Estimate = 0.290, $p < 0.001$). For H1-2, there is a significant positive effect of AI on Emotional Experience (Estimate = 0.188, $p = 0.006$). For H1-3, there is an insignificant effect of AI on Physical & Sensorial Experience (Estimate = 0.147, $p = 0.059$). For H1-4, there is a significant positive effect of AI on Social Elements of Experience (Estimate = 0.146, $p = 0.048$). Therefore, H1 is partially supported, as three of the four sub-hypotheses are significant.

Regarding the second hypothesis (H2): "Artificial Intelligence (AI) has a significant positive effect on Consumer Engagement on Social Media."

The results show an insignificant relationship (Estimate = 0.097, $p = 0.194$). Therefore, H2 is not supported.

Regarding the third hypothesis (H3): "Artificial Intelligence (AI) has a significant positive effect on Chatbots in social media marketing."

The results indicate a strong and significant positive effect (Estimate = 0.577, $p < 0.001$).

Therefore, H3 is fully supported.

Regarding the fourth hypothesis (H4): "Artificial Intelligence (AI) has a significant positive effect on Virtual Influencers in social media marketing."

There is a significant positive effect (Estimate = 0.502, $p < 0.001$), indicating that AI positively influences the use of Virtual Influencers. Therefore, H4 is supported.

Regarding the fifth hypothesis (H5): "Artificial Intelligence (AI) has a significant positive effect on Augmented Reality (AR) in social media marketing."

A significant positive effect is found (Estimate = 0.518, $p < 0.001$). Therefore, H5 is supported.

Regarding the sixth hypothesis (H6): "Chatbots have a significant positive effect on Consumer Experience in Social Media."

This hypothesis consists of four sub-hypotheses, and it could be observed that:

For H6-1, there is a significant positive effect of Chatbots on Cognitive Experience (Estimate = 0.194, $p = 0.002$). For H6-2, there is an insignificant effect on Emotional Experience (Estimate = 0.009, $p = 0.881$). For H6-3, there is an insignificant effect on Physical & Sensorial Experience (Estimate = 0.078, $p = 0.241$). For H6-4, there is a significant positive effect on Social Elements (Estimate = 0.242, $p < 0.001$). Therefore, H6 is partially supported, as Chatbots significantly influence Cognitive and Social Experience dimensions.

Regarding the seventh hypothesis (H7): "Chatbots

have a significant positive effect on Consumer Engagement on Social Media."

The results show a significant positive effect (Estimate = 0.149, p = 0.018). Therefore, H7 is supported.

Regarding the eighth hypothesis (H8): "Virtual Influencers have a significant positive effect on Consumer Experience in Social Media."

This hypothesis consists of four sub-hypotheses, and it could be observed that:

For H8-1, there is a significant positive effect on Cognitive Experience (Estimate = 0.213, p < 0.001). For H8-2, there is a significant positive effect on Emotional Experience (Estimate = 0.411, p < 0.001). For H8-3, there is an insignificant effect on Physical & Sensorial Experience (Estimate = 0.003, p = 0.965). For H8-4, there is a significant positive effect on Social Elements (Estimate = 0.332, p < 0.001). Therefore, H8 is partially supported, as Virtual Influencers significantly impact Cognitive, Emotional, and Social Experience.

Regarding the ninth hypothesis (H9): "Virtual Influencers have a significant positive effect on Consumer Engagement on Social Media."

The relationship is significant and positive (Estimate = 0.299, p < 0.001). Therefore, H9 is supported.

Regarding the tenth hypothesis (H10): "Augmented Reality (AR) has a significant positive effect on Consumer Experience in Social Media."

This hypothesis consists of four sub-hypotheses, and it could be observed that:

For H10-1, there is an insignificant effect on Cognitive Experience (Estimate = 0.019, p = 0.742). For H10-2, there is a significant positive effect on Emotional Experience (Estimate = 0.196, p < 0.001). For H10-3, there is a significant positive effect on Physical & Sensorial Experience (Estimate = 0.310, p < 0.001). For H10-4, there is an insignificant effect on Social Elements (Estimate = -0.078, p = 0.193). Therefore, H10 is partially supported, as AR significantly enhances Emotional and Physical &

Sensorial Experience dimensions.

Regarding the eleventh hypothesis (H11): "Augmented Reality (AR) has a significant positive effect on Consumer Engagement on Social Media."

The relationship is significant and positive (Estimate = 0.165, p = 0.007). Therefore, H11 is supported.

Regarding the twelfth and thirteenth hypotheses (H12 and H13): "Chatbots mediate the relationship between Artificial Intelligence and Consumer Experience/Engagement on Social Media."

Given that AI significantly affects Chatbots (p < 0.001), and Chatbots significantly affect both Consumer Experience (p = 0.018) and Engagement (p = 0.018), it can be concluded that Chatbots partially mediate the relationship between AI and both Consumer Experience and Engagement. Therefore, H12 and H13 are partially supported.

Regarding the fourteenth and fifteenth hypotheses (H14 and H15): "Virtual Influencers mediate the relationship between Artificial Intelligence and Consumer Experience/Engagement on Social Media."

Since AI significantly influences Virtual Influencers (p < 0.001), and Virtual Influencers significantly affect both Consumer Experience (p < 0.001) and Engagement (p < 0.001), Virtual Influencers fully mediate the relationship between AI and these two dependent variables. Therefore, H14 and H15 are fully supported.

Regarding the sixteenth and seventeenth hypotheses (H16 and H17): "Augmented Reality mediates the relationship between Artificial Intelligence and Consumer Experience/Engagement on Social Media."

The results show that AI significantly influences AR (p < 0.001), and AR significantly affects both Consumer Experience (p < 0.001) and Engagement (p = 0.007). Therefore, Augmented Reality partially mediates the relationship between AI and the two dependent variables.

Hence, H16 and H17 are partially supported.

Table 6: SEM Analysis for the Research Variables.

			Estimate	S.E.	C.R.	P
CB-var	<---	AI-var	.577	.048	12.082	***
VI-var	<---	AI-var	.502	.048	10.378	***
AR-var	<---	AI-var	.518	.048	10.783	***
COG-var	<---	AI-var	.290	.073	3.957	***
EMO-var	<---	AI-var	.188	.068	2.740	.006
PHY-var	<---	AI-var	.147	.078	1.889	.059
SOC-var	<---	AI-var	.146	.074	1.974	.048
CE-var	<---	AI-var	.097	.074	1.300	.194
COG-var	<---	CB-var	.194	.062	3.127	.002
EMO-var	<---	CB-var	.009	.058	.150	.881
PHY-var	<---	CB-var	.078	.066	1.172	.241
SOC-var	<---	CB-var	.242	.063	3.828	***

CE-var	<---	CB-var	.149	.063	2.361	.018
COG-var	<---	VI-var	.213	.057	3.712	***
EMO-var	<---	VI-var	.411	.056	7.392	***
PHY-var	<---	VI-var	.003	.061	.044	.965
SOC-var	<---	VI-var	.332	.059	5.631	***
CE-var	<---	VI-var	.299	.059	5.055	***
COG-var	<---	AR-var	.019	.059	.330	.742
EMO-var	<---	AR-var	.196	.056	3.494	***
PHY-var	<---	AR-var	.310	.065	4.793	***
SOC-var	<---	AR-var	-.078	.060	-1.302	.193
CE-var	<---	AR-var	.165	.061	2.719	.007

The model fit indices, including CMIN/DF (1.162), GFI (0.891), CFI (0.990), AGFI (0.879), and RMSEA (0.020), all fall within acceptable ranges.

Figure 2 visually represents the SEM model that was employed to analyze the impact of the research model.
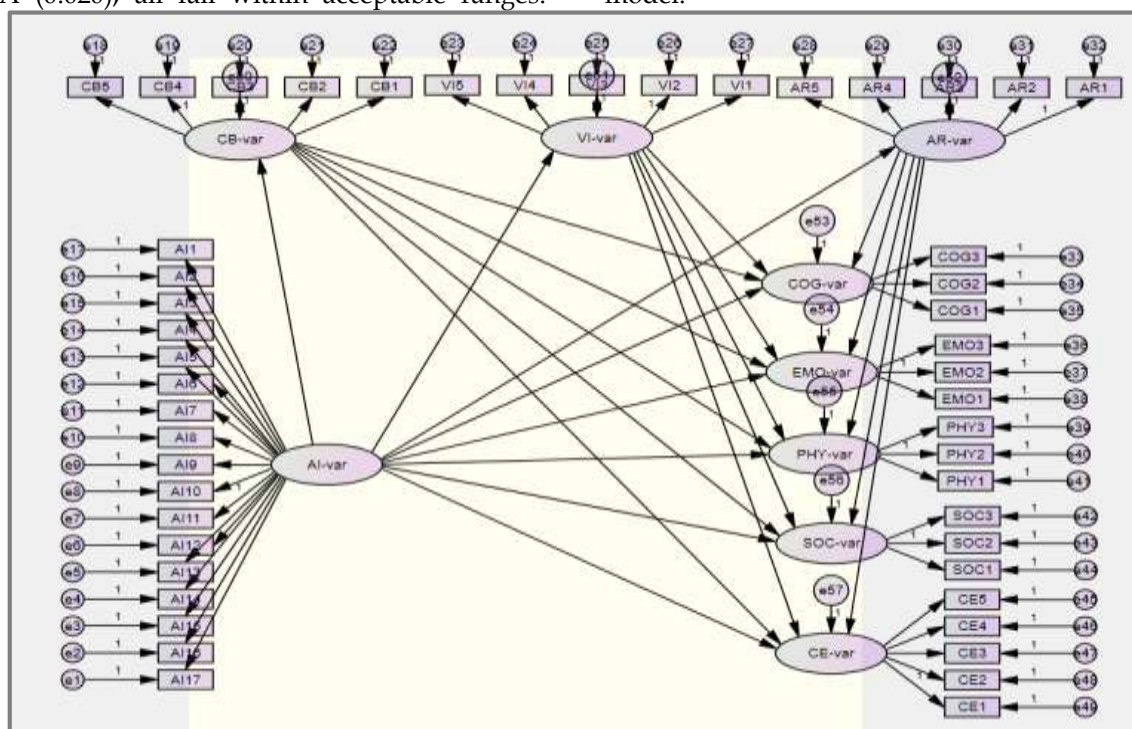

Figure 3: SEM for the Research Variables.

5. RESEARCH FINDINGS AND DISCUSSION

This study examines the impact of AI on Consumer Experience, Engagement on social media Through the Mediating Role of Chatbots, Virtual Influencer, and Augmented Reality The results are explained below and provide valuable insights into the relationships between Artificial Intelligence (AI), Chatbots, Virtual Influencers, Augmented Reality, Consumer Experience, and Consumer Engagement on social media. This research focuses on travelers and social media users aged 18–45 who use digital platforms regularly to plan, explore, or book tourism services. The findings obtained using the Structural Equation Modelling approach offer an all-rounded view of how AI-based technologies shape digital experiences and engagement behaviors of tourists

across social media touchpoints. Therefore, the empirical investigation revealed that:

Empirical results showed that AI has a significant positive influence on various dimensions of consumer experience, such as cognitive, emotional, and social experiences, which reflects the fact that intelligent systems personalize travel recommendations, content, and interactions, enabling decision-making and emotional attachment to tourism brands. In contrast, AI had an insignificant impact on physical and sensorial experiences, which suggests that while AI contributes to information processing and emotional resonance, it does not alone trigger sensory or experiential immersion without enabling interactive technologies such as AR or VR. Additionally, it was determined that the direct effect of AI on consumer engagement was

insignificant, suggesting that customer engagement does not result as a direct consequence of AI use but as a result of the mediating influence of AI-driven tools which enhance interactions and perceptions of users.

The analysis further validated that AI is a significant predictor of the use and performance of Chatbots, Virtual Influencers, and Augmented Reality in social media-based tourism marketing. Among the above mediators, Virtual Influencers had the strongest positive influence, enhancing the cognitive, emotional, and social experiences of tourists along with their overall engagement. This supports the view that AI-powered virtual influencers promote travel destinations by building trust in, excitement about, and inspiration toward travel through relatable and personalized digital storytelling. Chatbots showed partial mediation, influencing the cognitive and social experience and contributing to consumer engagement. This indicates that AI-driven travel assistants help facilitate 24/7 booking support, real-time responses, and customized itinerary planning, thus enhancing service convenience and user satisfaction. Augmented Reality partially mediated the impact of AI, primarily in enhancing emotional and physical-sensorial experiences and was noted for its ability to create immersive destination previews and virtual travel experiences that simulate actual travel exploration and increase emotional bonds to destinations.

Therefore, these findings indicate that the influence of AI on tourist experience and engagement with tourism social media is mainly indirect; it operates through interactive technologies that translate AI's intelligence into experiential value. From these, Virtual Influencers and Chatbots proved to be the strongest mediators in driving engagement and improving online travel experiences, while AR contributed more to the sensory and emotional immersion of tourists. This underlines the importance of integrating various applications of AI in developing holistic and personalized tourism marketing strategies. In sum, the study confirms that AI-powered technologies significantly improve the tourism consumer experience and their engagement with social media platforms if strategically implemented through Chatbots, Virtual Influencers, and AR tools. From the point of view of tourism marketers and destination managers, these findings put forward the possibility to take advantage of AI-empowered social media marketing in order to enhance service personalization, deepen emotional connection, and strengthen traveler engagement at

every touchpoint throughout the decision-making process. Such technologies for travelers in the age range of 18–45 change the way they find, evaluate, and emotionally connect with travel destinations. Future research could extend this study into the moderating effects of variables like trust, destination familiarity, and social media influence, among others, to offer an even deeper understanding of how AI continues to change the digital tourism landscape.

5.1. Research Implications

5.1.1. Academic Implications

This research enriches the growing literature on understanding AI integration into tourism marketing, especially from the perspective of consumer experiences and social media-driven engagement. Theoretically, the study further refines prevailing theories of technology acceptance and experiential marketing by empirically validating Chatbots, Virtual Influencers, and AR as mediators in shaping consumer experiences. This confirms that AI does not determine consumer engagement but functions through interactive and experiential technologies that influence the cognitive, emotional, and social dimensions of experiences.

It further entrenches the importance of multidimensional consumer experience theory within digital contexts, showing that AI-enabled interactions elicit both rational and affective responses from their users. It adds to the literature on AI-mediated communication, pointing at Virtual Influencers as one of the most powerful drivers of engagement and hence contributing to discussions about virtual identity, authenticity, and the formation of consumer-brand relationships in online settings.

By focusing on the age group of travelers between 18–45, this research also offers demographic-specific insights into how younger, digitally literate consumers perceive and respond to AI-based marketing interventions. This enhances the academic understanding of AI adoption and consumer experience within tourism, offering a foundation for future models exploring variables such as trust, authenticity, and perceived enjoyment in AI-driven marketing.

5.1.2. Practical Implications

Managerially, the findings contribute significantly to tourism marketers, DMOs, and travel service providers in a quest to effectively use AI technologies for improving their social media marketing performance. Results spotlight that AI in itself is not a driver of engagement; rather, its

effectiveness lies in the operationalization of AI through interacting tools and personalized experiences.

Therefore, tourism businesses should focus on integrating AI-powered Chatbots to facilitate smoother booking processes, offer 24/7 travel support, and increase responsiveness in customer service to ensure a more efficient and satisfying pre-trip experience. Given the strong mediating role of Virtual Influencers, it would be worth investing in AI-generated or hybrid virtual influencers that could tell authentic, visually attractive, and emotionally appealing stories to inspire travel intention. Moreover, AR and VR previews will significantly enhance emotional and sensory engagement by offering immersive destination experiences before travel, thus increasing both interest and intention to visit. This indicates that this study suggests the pursuit of personalization through data-driven means, in which AI algorithms analyze user preference, travel history, and social media behavior to provide tailored content and recommendations. Marketers should also ensure that AI-powered interactions are transparent, ethical, and mindful of privacy in order to instill confidence in digitally savvy consumers.

5.2. Research Recommendations and Limitations

The empirical investigation performed by the researcher through the current study offered a set of recommendations that are summarized as follows:

Integrate chatbots, virtual influencers, and AR to enhance the adoption of AI-based applications in tourism marketing. This will offer a more personalized and immersive customer experience on social media platforms.

Tourism companies should fully support the use of AI for consumer engagement, more so through chatbots for booking and service support, to ensure round-the-clock connectivity with instant responses and personalized travel recommendations.

Given that virtual influencers have been proven to emotionally engage audiences and influence involvement and destination choice, let's use them as brand ambassadors for travel destinations and tourism services.

By allowing potential tourists to visually experience locations, attractions, or lodging before making a reservation, AR/VR previews can increase

emotional attachment and travel intention.

Design social media marketing campaigns targeting younger tourists, aged between 18-45 years, who are more open towards digital interaction and AI-driven content. Ensure the advertisements cater to the tastes of that group regarding authenticity, personalization, and interactivity.

Improve data analytics and AI personalization models to understand the behaviors, interests, and online interactions of travelers better. This would result in more accurate and pertinent information distribution.

Extend research to cross-cultural contexts, comparing how travelers from different regions perceive and respond to AI-driven tourism marketing tools in order to enhance the generalizability of the findings.

Future research should investigate other mediating or moderating variables, like trust, perceived enjoyment, or digital literacy, which could provide further explanation for the mechanisms through which AI influences consumer experience and engagement.

This study encompasses a set of limitations that needs to be acknowledged. The study was based on data provided by 410 respondents aged 18 to 45 years, focusing only on AI-driven social media marketing within the tourism sector. Although this brings valuable insight into the digital profile of active travelers, it does not entirely represent those older or less technologically savvy consumers whose interactions with AI technologies could be fundamentally different. In addition, a cross-sectional approach was adopted for this study, which limits the ability to establish any long-term causal correlations between AI-powered offerings and consumer behavior.

This investigation also had a constraint in its reliance on self-reported measures, which may include response bias or subjective interpretation. The study limits itself to three mediators: Chatbots, Virtual Influencers, and Augmented Reality. Other applications, equally developing and part of AI, such as predictive analytics, sentiment analysis, or immersive VR experiences, were excluded from this study. Such limitations may be overcome in the future by using longitudinal data, cross-country samples, and mixed-method techniques to gain deeper insights into the evolving role of AI in reshaping consumer involvement and experience within the global tourist environment.

REFERENCES

Agapito, D., Pinto, P. and Mendes, J., 2017. Tourists' memories, sensory impressions and loyalty: In loco and post-visit study in Southwest Portugal. Tourism Management, 58, pp.108-118.

Arena, F., Collotta, M., Pau, G., and Termine, F., 2022. An Overview of Augmented Reality. Comput., 11, pp. 28. https://doi.org/10.3390/computers11020028.

Chatbot | definition of chatbot in English by Lexico Dictionaries. (2019). Lexico Dictionaries | Englis

Cho, Y., 2025. Virtual Influencers as Brand Endorsers: Developing and Validating a Multidimensional Evaluation Scale. Journal of Theoretical and Applied Electronic Commerce Research. https://doi.org/10.3390/jtaer20020090.

Chui, M., Manyika, J., Miremadi, M., Henke, N., Chung, R., Nel, P. and Malhotra, S., 2018. Notes from the AI frontier: Applications and value of deep learning. McKinsey global institute discussion paper, April.

Crawford, K. and Calo, R., 2016. There is a blind spot in AI research. Nature, 538(7625), pp.311-313.

Deska, J.C., Lloyd, E.P. and Hugenberg, K., 2018. Facing humanness: Facial width-to-height ratio predicts ascriptions of humanity. Journal of personality and social psychology, 114(1), p.75.

Dwivedi, Y.K., Ismagilova, E., Hughes, D.L., Carlson, J., Filieri, R., Jacobson, J., Jain, V., Karjaluoto, H., Kefi, H., Krishen, A.S. and Kumar, V., 2021. Setting the future of digital and social media marketing research: Perspectives and research propositions. International journal of information management, 59, p.102168.

Gentile, C., Spiller, N. and Noci, G., 2007. How to sustain the customer experience:: An overview of experience components that co-create value with the customer. European management journal, 25(5), pp.395-410.

Gerlich, M., 2023. The power of virtual influencers: Impact on consumer behaviour and attitudes in the age of AI. Administrative Sciences, 13(8), p.178.

Go, E. and Sundar, S.S., 2019. Humanizing chatbots: The effects of visual, identity and conversational cues on humanness perceptions. Computers in human behavior, 97, pp.304-316.

Grzybowski, A., Pawlikowska–Łagód, K. and Lambert, W.C., 2024. A history of artificial intelligence. Clinics in dermatology, 42(3), pp.221-229.

Haenlein, M. and Kaplan, A., 2019. A brief history of artificial intelligence: On the past, present, and future of artificial intelligence. California management review, 61(4), pp.5-14.

Hicks, A., Comp, S., Horovitz, J., Hovarter, M., Miki, M. and Bevan, J.L., 2012. Why people use Yelp. com: An exploration of uses and gratifications. Computers in human behavior, 28(6), pp.2274-2279.

Hsiao, K.L. and Chen, C.C., 2016. What drives in-app purchase intention for mobile games? An examination of perceived values and loyalty. Electronic commerce research and applications, 16, pp.18-29.

Kandampully, J., Zhang, T. and Jaakkola, E., 2018. Customer experience management in hospitality: A literature synthesis, new understanding and research agenda. International Journal of Contemporary Hospitality Management, 30(1), pp.21-56.

Khanna, A., Pandey, B., Vashishta, K., Kalia, K., Pradeepkumar, B. and Das, T., 2015. A study of today's AI through chatbots and rediscovery of machine intelligence. International Journal of u-and e-Service, Science and Technology, 8(7), pp.277-284.

Lemon, K.N. and Verhoef, P.C., 2016. Understanding customer experience throughout the customer journey. Journal of marketing, 80(6), pp.69-96.

Lu, C.C., Wu, L. and Hsiao, W.H., 2019. Developing customer product loyalty through mobile advertising: Affective and cognitive perspectives. International Journal of Information Management, 47, pp.101-111.

Mahardini, D.F., Kasenda, I., Afgani, M.W. and Isnaini, M., 2024. Quantitative Research Philosophy in Research Methodology. JUPE: Jurnal Pendidikan Mandala, 9(4), p.1135.

McLean, G. and Wilson, A., 2019. Shopping in the digital world: Examining customer engagement through augmented reality mobile applications. Computers in human behavior, 101, pp.210-224.

Pamungkas, E.W., 2019. Emotionally-aware chatbots: A survey. arXiv preprint arXiv:1906.09774.

Potdar, V., Joshi, S., Harish, R., Baskerville, R. and Wongthongtham, P., 2018. A process model for identifying online customer engagement patterns on Facebook brand pages. Information Technology & People, 31(2), pp.595-614.

Rioux, L., Scrima, F. and Werner, C.M., 2017. Space appropriation and place attachment: University students create places. Journal of Environmental Psychology, 50, pp.60-68.

Saranya, A. and Subhashini, R., 2023. A systematic review of Explainable Artificial Intelligence models and applications: Recent developments and future trends. Decision analytics journal, 7, p.100230.

Shrivastava, A., 2024. Artificial Intelligence (AI): Evolution, Methodologies, and Applications. International Journal for Research in Applied Science and Engineering Technology. https://doi.org/10.22214/ijraset.2024.61241.

Shum, H.Y., He, X.D. and Li, D., 2018. From Eliza to XiaoIce: challenges and opportunities with social chatbots.

Frontiers of Information Technology & Electronic Engineering, 19(1), pp.10-26.

Suman, A., 2014. Developing conceptual frameworks: Evolution and architecture. From Knowledge Abstracfion to Management, 2014, pp.87-108.

Wang, P., Huang, Q. and Davison, R.M., 2021. How do digital influencers affect social commerce intention? The roles of social power and satisfaction. Information Technology & People, 34(3), pp.1065-1086.

Xie, C., Wang, Y. and Cheng, Y., 2024. Does artificial intelligence satisfy you? A meta-analysis of user gratification and user satisfaction with AI-powered chatbots. International Journal of Human–Computer Interaction, 40(3), pp.613-623.

Xu, Y., Wang, Q., An, Z., Wang, F., Zhang, L., Wu, Y., Dong, F., Qiu, C., Liu, X., Qiu, J., Hua, K., Su, W., Xu, H., Han, Y., Cao, X., Liu, E., Fu, C., Yin, Z., Liu, M., Roepman, R., Dietmann, S., Virta, M., Kengara, F., Huang, C., Zhang, Z., Zhang, L., Zhao, T., Dai, J., Yang, J., Lan, L., Luo, M., Huang, T., Liu, Z., Qian, S., An, T., Liu, X., Zhang, B., He, X., Cong, S., Liu, X., Zhang, W., Wang, F., Lu, C., Cai, Z., Lewis, J., Tiedje, J., & Zhang, J., 2021. Artificial intelligence: A powerful paradigm for scientific research. The Innovation, 2. https://doi.org/10.1016/j.xinn.2021.100179.

Zhang, Y., Lau, R., Xu, J., Rao, Y., & Li, Y., 2024. Business chatbots with deep learning technologies: state-of-the-art, taxonomies, and future research directions. Artif. Intell. Rev., 57, pp. 113. https://doi.org/10.1007/s10462-024-10744-z.

Zhu, X., Regan, D. and Sun, B., 2022. Does exploring the characteristics of emergency supplies really matter for disaster response operations?. Natural hazards, 110(1), pp.175-189.