# Using augmented reality to improve tourism marketing effectiveness in Egypt: Theoretical Analysis and Conceptualization

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## Abstract

This paper investigates the impact of Web based augmented reality (Web AR) on destination visit intention through the lens of Stimulus organism response (SOR) framework, technology acceptance model (TAM) and flow theory into an integrated theoretical framework. The present research aims to address gaps in literature by providing insights about the relevance of augmented reality to tourism marketing effectiveness. The findings of this paper will shed the light on an alternative idea in destination marketing to inspire destination management organizations wishing to develop a sustainable competitive edge and win within the tourism industry. The results contribute to the Web based augmented reality and tourism marketing literature by providing theoretical guidance

through a framework for the AR tourism experience as well as a reference for destination management organizations.

**Keywords** Tourism marketing, Web AR, Sustainable competitive edge, Technology acceptance theory, Stimulus-Organism-Response theory, flow theory, Destination visit intention.

**الملخص**

تستكشف هذه الدراسة أثر الواقع المعزز القائم على الويب (Web AR) على نية زيارة الوجهات السياحية، وذلك من خلال دمج إطار العمل النظري "المثير–الكائن–الاستجابة (SOR) "مع نموذج تقبّل التكنولوجيا (TAM) ونظرية التدفق، ضمن إطار نظري موحّد ومتكامل. ويهدف هذا البحث إلى معالجة الفجوات المعرفية القائمة في الأدبيات، من خلال تقديم رؤى معمّقة حول الدور المحوري الذي يمكن أن يؤديه الواقع المعزز في تعزيز فعالية التسويق السياحي. وتُبرز النتائج فكرة بديلة في مجال تسويق الوجهات، من شأنها أن تلهم منظمات إدارة الوجهات السياحية الساعية إلى بناء ميزة تنافسية مستدامة وتحقيق التميّز في سوق السياحة. وتسهم هذه الدراسة في إثراء الأدبيات المتعلّقة بالواقع المعزز عبر الويب والتسويق السياحي، من خلال تقديم إطار نظري إرشادي لتجربة الواقع المعزز في السياحة، فضلاً عن كونه مرجعاً عملياً لمنظمات إدارة الوجهات السياحية.

**الكلمات المفتاحية :**التسويق السياحي، الواقع المعزز القائم على الويب، ميزة تنافسية مستدامة، نظرية تقبّل التكنولوجيا، نظرية الحافز-الكائن-الاستجابة، نظرية التدفق، نية زيارة الوجهة السياحية

## 1. Introduction

The emergence of new trends in the marketing environment is driven by ongoing development. World markets

are experiencing constant transformations and changes, and companies must continuously adapt to these new marketing shifts. Intense competition has led companies to attract customers through the use of modern marketing strategies rather than focusing only on the product itself (Zasornova et al., 2021). One of the striking tools for companies to satisfy customers and build a competitive advantage is the adoption of augmented reality technology in the field of marketing. Through the application of augmented reality, new avenues for better product visualization will be unlocked, which enhance the competitiveness of products as well as services (Vilkina, 2020).

Augmented reality is a technology that combines the real world with digital, computer-generated objects that are overlaid into the real world (Cibilić et al., 2021). Hence, technology pioneers have described the phenomenon of supplementing the physical world with the digital world as "phygital" (Mele et al., 2023). Furthermore, the augmented reality has transformed the traditional physical tourism experience to the "phygital" experience where tourists get the chance to immerse themselves and experience the tourism destination before investing in the destination (Tsang et al., 2023). This research will mainly focus on web AR where users can easily access the augmented reality experience without installing applications; this will give companies a greater universal reach and even greater consumer engagement (Khalida and Setiawati, 2020; Zhang, 2023). By

utilizing web AR, destination management organization can guarantee that their digital content will spread worldwide as it is known for its inherent capabilities of accessibility (Du et al., 2022). In this paper, a WebAR experience was designed to fully understand its impact on tourists' destination visit intention.

The ultimate focus of this research is on discussing the issue of tourism marketing and suggesting ways to enhance its effectiveness. Indeed, the impetus of this thesis is to provide some answers to an important question: to what extent does the implementation of augmented reality promote the improvement of the tourism marketing effectiveness? Several industries have dedicated many efforts to introduce augmented reality as a marketing, information and experience channel. Such as makeup, eyewear, clothing, furniture, to allow shoppers to overcome the challenges of online shopping (Du et al., 2022). Yet, most research regarding the relevance and the actual value of augmented reality for the tourism industry is still in its infancy (Cranmer et al., 2020). Since, introducing augmented reality requires high level of investments; it is of a paramount importance to investigate the perceived value of augmented reality prior to making any investment decisions (Cranmer et al., 2020; Tom Dieck and Jung, 2017).

Despite the importance of augmented reality in creating immersive and interactive experience that would benefit the

tourism industry (Gharibi, 2023), the attention that has been given to understand augmented reality marketing and how it can be exploited is very limited and the empirical research in this area is still in the exploratory stage (Hinsch et al., 2020). Accordingly, this paper is thought to make a contribution to fill this gap**.** Lately, studies have reported that immersive technology research, such as virtual reality and augmented reality, usually lacks theoretical foundations that bridges the immersive technology experience and tourists' behavioral intention (Zhu et al., 2023; Yung and Khoo-Lattimore, 2019; Vishwakarma et al., 2020). Vishwakarma et al. (2020) elaborated that only 24% of studies related with the use of immersive technologies in tourism had been supported by theoretical foundation. Additionally, Multiple studies argued that separate theories maybe insufficient to explain tourists' behavior in using immersive technologies (Nguyen et al., 2023).

To bridge this research gap that has risen because of the limitation of theoretical foundations for augmented reality in tourism contexts, this paper integrates the TAM, SOR and Flow theories into an integrated framework to explore the impact of web based augmented reality attributes which are vividness and interactivity on tourists' destination visit intentions through tourists' organism in terms of Perceived ease of use, Perceived usefulness, Perceived certainty, Perceived enjoyment and Perceived immersion. In this way, this paper enriches existing

research on tourism marketing effectiveness within a new and emerging scope of immersive technologies called Web AR by providing a basis for outlining a framework for the Web AR tourism experience. This paper is organized as follows: first, the literature on the immersive characteristics of augmented reality, tourists' organism, tourism marketing effectiveness is reviewed and a conceptual model is constructed; Afterwards, research hypotheses are formulated; then, the method part of this paper is explained. Next, data are analyzed and results are conveyed. Finally, discussion on the findings, contributions and limitations of the research are presented.

## 2. Literature review

### *2.1 Augmented reality*

Many studies have claimed that augmented reality is a powerful and effective marketing tool that not only contributes positively to tourists' experience but also attract their attention and allow their participation (Çalışkan *et al*., 2023; Allal-Chérif, 2022). At its core, augmented reality's main value subsists at the pre-booking phase. Since AR can allow tourists to visualize the destination (Neuburger *et al*., 2018). This stage is referred to as a "dreaming stage" where prospective travelers are fantasizing about their upcoming vacation while searching for different destinations (Akmermer, 2022). In this stage specifically, destination marketing organizations should immediately seize the opportunity and use augmented reality to inspire prospective

travelers through a novel and eye-catching personalized experience. To elaborate more, the tourist starts with the planning of the holiday and try to acquire information about several destination, which is a very crucial step since travelling to a new tourism destination without direct trial can increase tourists' anxiety. Consequently, the inclusion of the perceived certainty (PC) variable to the S-O-R is deemed to be necessary. Therefore, this research expanded the model to understand the ability of AR in increasing tourists' perceived certainty. AR can influence tourists' subjective well-being and give them the sensation of actually going through a destination tour. Accordingly, the adoption of augmented reality in marketing for destinations is becoming essential. AR offers substantial potential in the sale of tourism products (Çalışkan *et al*., 2023). AR technology is acknowledged to be able to enhance the effectiveness of digital marketing (Zasornova *et al*., 2021). Whilst, there is a lack of empirical studies to acquire a deeper understanding of how the use of AR will affect tourists' behavior (Chung and Han, 2015). Thus, measuring the destination visit intention through Web based augmented reality is considered to be valuable. This paper will mainly focus on web AR. Although the web AR is still in its infancy stage especially in tourism industry, yet the results of this paper will provide references for researchers as well as tourism providers.

### *2.2 The relevance of augmented reality to tourism marketing effectiveness*

Tussyadiah et al. (2018) has reported that augmented reality creates for tourists' immersive experience and even transport them to destinations through their cell phones. Making customers have a glimpse of the destination before visiting it, definitely engage them as well as inspire them to book and immediately visit the promoted destination. The critical need to explore the tourism suppliers' perceived value from advanced augmented reality technology as the investment cost in AR can be substantial. Attaining high value is essential in order to justify the high investment cost as well as attaining a return on investment (Smink et al., 2020; Cranmer et al., 2020). Hence, this research attempts to explore the perceived value of using augmented reality and how it enhances the tourism marketing effectiveness.

#### 2.2.1 Marketing value

According to a study conducted by (Cranmer et al., 2020), 15 managers in tourism industry were interviewed in order to understand the augmented reality's perceived value. Concurrently, their valuable insights revealed that the marketing value is the most significant benefit of utilizing augmented reality in the tourism industry. In particular, using augmented reality in marketing, gives tourists not only accurate but also better information about the tourism products than traditional marketing (Cranmer et al., 2020). The researchers of the previous

study suggested that even companies with limited marketing budget should invest in augmented reality due to its great marketing potential in selling holiday packages.

Augmented reality is changing the game in marketing through the multiple benefits it offers, first, augmented reality can better promote tourism products including destinations and tours through an immersive storytelling experience. Second, it allows individuals to participate and become part of the advertising itself, making it easier for companies to sell such intangible products. Third, augmented reality gives individuals the capability of navigating new and unfamiliar destinations rather than only pictures online or even in brochure. Fourth, it has been stated by Cranmer (2017) that implementing augmented reality would greatly impact word of mouth as potential tourists would recommend to others the promoted destination through the augmented reality which will eventually raise the number of visitors. The previous researcher also claimed that the use of augmented reality would definitely enhance the profile of any tourist site and give it an "edge" which again will attract many visitors.

Akmermer (2022) demonstrated that prospective travelers pass through six stages for the decision-making process of any journey namely: inspiration, preparation, booking, pre-travel, on-trip, post-trip. Moreover, the previous researcher described the first stage as a dreaming stage where prospective travelers are

fantasizing about their upcoming vacation while searching for different destinations. In this stage specifically, destination marketing organizations should immediately seize the opportunity and use augmented reality to inspire prospective travelers through a novel and eye-catching personalized experience. In such scenario, augmented reality as a marketing tool plays a persuasive role unlike the traditional marketing (Tussyadiah et al., 2016). Ghandour (2021) confirmed that the adoption of augmented reality technologies is considered an outstanding marketing tool for tourism suppliers.

2.2.2 Economic value

The essential question of "Is investing in augmented reality worth it? Is still unanswered. In tourism industry, according to Cranmer et al. (2020), companies are always concerned with the high investment costs involved in implementing the innovation and whether it is worth investing in it or not. Many companies are hesitant to adopt the augmented reality technology in their marketing due to their uncertainty about the prospective return on investment. However, according to the findings of (Cranmer et al., 2020), despite this fear of implementing this technology, augmented reality is an effective tool for elevating the users' experience.

In detail, the use of augmented reality on a company's website influences the user's evaluation of the website quality in a positive way. Augmented reality can even help the destination

marketing organization achieve greater revenue by providing prospective tourists a more realistic view of the destination. Hence, prospective tourists become satisfied and willing to pay a price premium (Batat, 2021).

Also, Chandra and Kumar (2018) aimed to highlight that companies can mitigate the aggressive competition in the market by incorporating AR in their operations. This clearly show that companies can successfully distinguish themselves from their competitors by catering to their customers in such creative techniques like AR. The previous researchers urged companies to invest in augmented reality as early as possible to gain competitive advantage and "stand out from the crowd".

Accordingly, augmented reality can become a unique selling point for the company that leads to a rapid rise in sales. Tourist suppliers could even sell the expensive vacation options easily by allowing tourists to "visualize" the destination through augmented reality prior visiting it (Cranmer et al., 2020). Ghandour et al (2021) unveiled that many travel providers nowadays have a growing interest in the adoption of digital technological solutions including augmented reality, as these solutions are expected to maximize profits as well as ensure competitive advantages of a company. The adoption of augmented reality represents an economic benefit of growing sales, as companies will be able to attract new target markets;

customers who are interested in innovative offerings (Ghandour et al., 2021).

### *2.3 The technology acceptance model, Stimulus- organism-response model and Flow theory*

This research has considered the technology acceptance model (TAM), Stimulus-organism- response model (S-O-R) and the flow theories as the theoretical foundation. Several studies have used the TAM since it is a practical framework used to show how tourists accept and use a technology in immersive technologies context (Ayeh et al., 2013; Gibson and O'Rawe, 2018; Do et al., 2020; Wei, 2019). Studies have frequently used TAM to inspect behavioral intentions of tourist related to augmented reality, including tourists' impulsive buying behavior (Do et al., 2020), predicting tourists' attitude and usage intention toward AR marketed attractions (Lin and Chen, 2017), and examining the potential of AR in urban heritage tourism (Tom Dieck and Jung, 2018). Since augmented reality is a new technology, most studies between 2012 and 2018 utilized the technology acceptance model to examine its adoption and user acceptance (Jingen Liang and Elliot, 2021). Prior studies show that the TAM is considered suitable tool for examining behavioral intentions of tourists in augmented reality context. To understand tourists' perception regarding the augmented reality and its impact on one's behavioral intention, TAM was operationalized in this research. The two main elements of TAM,

perceived usefulness and perceived ease of use, have been utilized in this research. Scholars have suggested the importance of including hedonic qualities into the original TAM (Wi et al., 2024). the limitation of the TAM is not providing a complete assessment of augmented reality, ignoring its important immersive characteristics that shape user's behavioral intention as well as the absence of the hedonic state of the user. To address both limitations, the present research integrates the original TAM, the stimulus organism response (SOR) model and The Flow theory to develop a new research model for examining the impact of augmented reality attributes on tourists' intention to visit a specific tourism destination.

Flow theory signifies that users experience flow when they are immersed and absorbed in particular activities in which they are not only highly focused and experience enjoyment but also fail to track time (Wi et al., 2024; Huang and Liao, 2017). Huang and Liao mentioned that when people are exposed to interactive technologies, they perceive the passage of time is extremely fast. Multiple studies have utilized the flow theory especially in tourism contexts related to immersive technologies (Nguyen et al., 2023). Moreover, theory-based researches related to immersive technologies revealed that the Flow theory as well as the technology acceptance model are the most used ones in tourism context (Bretos et al., 2023). Accordingly, it is

considered effective to use the two main dimensions of flow theory namely, perceived immersion and perceived enjoyment.

Woodworth introduced the SOR model in 1929 to examine the effect of the environment on individuals' behavior (Attia and Eltobgy, 2024). The SOR model consist of: the stimulus (S) could be marketing tools that marketers use to motivate consumers to purchase and impacts individual's cognitive and affective processes (O) then leads to responses (R) which is referred to as behavioral intention (Chan et al., 2017). This research extends the SOR theory to test the possible influence of perceived certainty on destination visit intention. The addition of perceived certainty is considered to be necessary. Since perceived certainty is appropriate when investigating tourists' behavioral intentions (Tsang et al., 2023). Therefore, by adding the perceived certainty variable, it is aimed to understand how the augmented reality experience overcome tourists' decision insecurity and increase their perceived certainty about a particular destination. The S-O-R paradigm has been extensively used as a solid foundation in augmented reality context (Sengupta and Cao, 2022; Daassi and Debbabi, 2021). Predominantly, this paper chose the S-O-R model for its ability to effectively understand how augmented reality attributes of Web AR (interactivity and vividness), which acts as external stimulators, can influence tourists' organism constituents (perceived usefulness, perceived ease of use, perceived certainty,

perceived enjoyment and perceived immersion) in prospective travelers and eventually their response (destination visit intention).

## 3. Development of the model and the research hypotheses

This research examines two aspects of augmented reality characteristics: interactivity and vividness as stimuli in the SOR paradigm that elicits travelers' destination visit intention as response through the cognitive state, where the original components of TAM are incorporated namely perceived usefulness, perceived ease of use along with the addition of perceived certainty; and affective state, namely perceived enjoyment and perceived immersion of Flow theory as organism.

Interactivity is defined as "the extent to which individuals can take part in modifying the content of a mediated environment in the present time" (Steuer, 1995). Interactivity has three features including (1) the speed of the interaction; where the users' actions can instantaneously make changes in the mediated environment, (2) the range of interactivity; where there are multiple ways to modify the displayed content, and (3) mapping which signifies that "the extent to which ones' actions are connected to actions within the mediated environment (Steuer, 1995).

In the tourism sector, interactivity fosters the perceived ease of use of online destination marketing, which deepen the customer experience (Do et al., 2020). Perceived ease of use

occurs when a user believes that a certain system is easy to use and requires minimal effort (Davis et al., 1989). The interactive components of immersive technologies, such as dragging virtual objects or zooming, allows individuals to gather information with minimum effort (Celik and Uslu, 2022; Nguyen et al., 2023). previous studies stated that there is a significant effect of interactivity on perceived ease of use in not only online shopping but also in various contexts (Tom Dieck *et al*., 2018; Mclean and Wilson, 2019). In this situation, this research proposes the following:

*H1a*: Interactivity of Web AR positively impacts Perceived ease of use

A system is more likely to be used in the future, when it is believed by users that it can actually bring them value (Anifa and Sanaji, 2022). In AR context, the interactive features enhance users' information processing and enhances their knowledge about the displayed product/service (Qin et al., 2021). The interactive features of immersive technologies enable users to not only navigate the virtual environment but also modify it (Griffin et al., 2022). Accordingly, by improving the response time of the visual information, users feel that they actually gained more information than static videos (Celik and Uslu, 2022; Nguyen et al., 2023). In other words, interactivity provides prospect tourists an opportunity to live in the mediated environment that is typical to the real destination before actually travelling to it. Hence, the

Interactivity features of AR technologies determines Perceived usefulness (Mclean and Wilson, 2019). So, this research suggests the following:

*H1b*: Interactivity of Web AR positively impacts Perceived usefulness

The psychological experiences of distrust and uncertainty in tourism context can be defined as perceived uncertainty that can definitely impacts tourist's willingness to travel (Gkoumas, 2019). According to a study done in Australia, immersive technologies became essential tools that tourism suppliers should use in order to reduce prospect tourists' perceived uncertainty when selecting a destination (Yung et al., 2021). Hence, the importance of interactivity features of augmented reality lies in its ability to provide extensive knowledge about the destination to tourists which increases their certainty (Tsang et al., 2023). The main cause of the perceived product uncertainty is the difficulty associated with the evaluation of intangible products promoted online (Bonnin, 2020). Interactivity feature of augmented reality has successfully overcome this issue (Heller et al., 2019). According to a study conducted by (Xia et al., 2024), Interaction has a negative effect on perceived uncertainty in E-commerce contexts. Hence, this research proposed the following:

*H1c*: Interactivity of Web AR positively impacts Perceived certainty

Perceived enjoyment refers to the degree to which using a certain system is perceived as enjoyable for its own right, separate from any performance outcome resulting from using it (Kim et al., 2020). The more the interactive features in computer games, the higher the enjoyment level users experience. In line, users experience enjoyment when exposed to functional elements such as interactivity (Yim et al., 2017). Prior findings insist that interactivity of immersive technologies induces users' perceived enjoyment (Bae et al., 2020; Nguyen et al., 2023). it has been shown that the interactivity of augmented reality provided through mobile applications is expected to provide users with not only entertaining but also playful experience (Mclean and Wilson, 2019). this research hypothesizes that:

*H1d*: Interactivity of Web AR positively impacts Perceived enjoyment

Perceived immersion makes users feel that they are "really here" (Suh and prophet, 2018). Consequently, the interactivity features make users feel immersed and absorbed in the mediated environment by allowing active participation (Qin et al., 2021; Bae et al., 2020; Yim et al., 2017). Such immersive technologies can make users feel immersed into the destination displayed and even increase impulsive desires to actually visit the destination (Lee et al., 2021). The interactivity of AR technologies can impact users' perceived immersion (Yim et al., 2017). Based on such arguments, this research suggests that:

*H1e*: Interactivity of Web AR positively impacts Perceived immersion

Vividness is associated with the overall quality of the product display (Yim et al., 2017). Users' perception of ease of use of technology can be improved, when they better capture all the details of the displayed product (Barhorst et al., 2021). In AR context, vividness, such as clarity and well-defined displays, has a positive effect on users' perceptions of the ease of use of technology (Zhang and Yao, 2023; Mclean and Wilson, 2019; Barhorst et al., 2021; Nguyen et al., 2023). Thereby this research suggests the following hypothesis:

*H2a*: Vividness of Web AR positively impacts Perceived ease of use

Prior studies allude that the greater the vividness on a website, the greater the users' ability to gather information due to the ability to see a well-defined demonstration of a product (Mclean and Wilson, 2019). It has been conceptualized that augmented reality technology assist users by increasing their knowledge in many contexts including consumption context because of the 3-D visualization that provide users with a richer experience. vividness enhances users' perceived usefulness of technology (Argyriou, 2012; Nguyen et al., 2023; Zhang and Yao, 2023; Mclean and Wilson, 2019). These arguments lead to the subsequent hypothesis

*H2b*: Vividness of Web AR positively impacts Perceived usefulness

Vivid product/service display includes more human senses (Xia et al., 2024). Web AR in tourism can provide not only visual senses but also auditory senses. Vividness of displayed product can be provided through multi-sensory channels which can better shape users' experience (Huang and Chung, 2024), therefore increasing product certainty. Vividness can compensate other missing senses to experience tourism in virtual reality contexts (Mou et al., 2024). Additionally, vividness helps in increasing users understanding of product quality in augmented reality context (Hsu et al., 2024), thereby offering a chance for trust building (Xia et al., 2024). Furthermore, augmented reality can effectively reduce uncertainty in online shopping (Barta et al., 2023). Moreover, vividness has a negative impact on perceived uncertainty (Xia et al., 2024). Therefore, this research proposes that:

*H2c*: Vividness of Web AR positively impacts Perceived certainty

Users who experience more vivid 3D images, have a higher level of enjoyment compared with those experiencing 2D images (Yim et al., 2017). Furthermore, within the online environment, when users are exposed to augmented reality with media features that provide them with more vivid visualizations of product/service, they develop a rich and enjoyable experience

(Mclean and Wilson, 2019). In the same vein, vividness of augmented reality technology positively impacts users' enjoyment (Bae et al., 2020; Yim et al., 2017) stated, therefore, this research hypothesis that:

*H2d*: Vividness of Web AR positively impacts Perceived enjoyment.

Vividness of immersive technologies could enhance users' feeling of immersion (Vishwakarma et al., 2020). The vivid nature of immersive technologies provides users with an immersive and impressive experience (Lee, 2020). In line, vividness has a positive impact on immersion in the mediated environment (Bae et al., 2020). The previous research stated that the significant relationship between vividness and immersion occurs because of the vivid and realistic virtual product/service display that appears as a seamless part of the users' physical environment, with this in mind, this research presents the next hypothesis:

*H2e*: Vividness of Web AR positively impacts Perceived immersion

Perceived ease of use and perceived usefulness of immersive technologies influence tourists' intentions to visit (Rasul et al., 2024). The previous study highlights that individuals' perception of immersive technologies as user-friendly fosters a favorable visit intention; also, perceived

usefulness of immersive technologies has a prominent role in impacting prospect tourists' visit intentions. Furthermore, perceived certainty is an important driver of the behavioral intention due to user's high sense of familiarity. When buyers' perceived uncertainty is high due to the absence of detailed information regarding a particular product, this may hinder their future purchase intention (Xia et al., 2024). Moreover, Fun, entertainment or enjoyment experience positive relates to behavioral intention (Wang et al., 2020). Besides, perceived immersion as an affective dimension increases behavioral intention (Sengupta and Cao, 2022; Xie et al., 2022). Likewise, perceived immersion has a significant effect on destination visit intention (Magdi Orabi, 2022). Thus, it is expected that perceived ease of use, Perceived usefulness, Perceived certainty, Perceived enjoyment and Perceived immersion of Web AR will play a vital role in shaping the tourists' behavioral intention. Based on the above discussion, this research is putting forward the following hypotheses:

*H3*: Perceived ease of use positively impacts Destination visit intention

*H4*: Perceived usefulness positively impacts Destination visit intention

*H5*: Perceived certainty positively impacts Destination visit intention

*H6*: Perceived enjoyment positively impacts Destination visit intention

*H7*: Perceived immersion positively impacts Destination visit intention

A conceptual model demonstrating the hypotheses formulated above is depicted in Figure 1

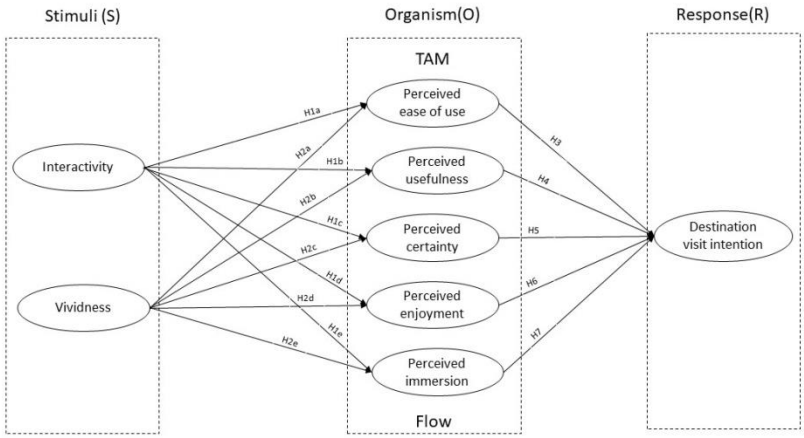


***Figure 1The proposed conceptual model***

## 4. Planned research methodology

This paper adopted a research methodology to investigate the research hypotheses. The following section will explain the essential aspects of this approach.

### *4.1Research design*

In this research, an exploratory sequential mixed methods research design, which is an initial qualitative followed by quantitative, would be chosen to investigate how web based augmented reality attributes enhances tourism marketing effectiveness and influence the tourist' destination visit intention. This is considered the most appropriate methodological approach to empirically test research hypotheses and construct causal relationships. First, qualitative research which consists of in-depth interviews with managers who have knowledge about Augmented reality software development and have provided immersive solutions for tourism sectors. Second, quantitative research, which aims to test the hypotheses, with local as well as international tourists. Respondents go through the Web AR experience of "Safaga" before taking part in the questionnaires.

### *4.2Study site/ Sampling and Plan*

This paper would select Safaga AR experience as the context for this research for multiple reasons. According to one of the most popular diving magazines in the world called DIVE magazine, this British magazine indicated in August, 2024 that Safaga is one of the best places worldwide for scuba diving. Moreover, the number of tourists visiting Egypt is booming and is rapidly increasing. According to Statista, the number of European tourists only who have visited Egypt is around 7.3

million in 2023. Hurghada, red sea alone attracted 1.5 million tourists in the first half of 2023 (Dailynewsegypt, 2024). Furthermore, the sampling unit for the qualitative research would be 5 industry experts. Purposive sampling methods was chosen. Participants, working in immersive software development agencies, who went through the experience of using augmented reality technology in tourism businesses would be chosen based on the knowledge and judgment of the researcher. Second questionnaires would be distributed to a convenient sample of local as well as international tourists using non-probability convenience sampling.

### *4.3Research Variables and Measurement*

This paper would use several indicators to measure the latent variables. Since these latent variables cannot be measured directly, this paper has developed indicators that are believed to represent these variables therefore making the measurement process possible. Indicators will be written as statements and responses will be recorded using a Likert scale with five choices as follows: “1: Strongly Agree”, “2: Agree”, “3: Neutral”, “4: Disagree”, and “5: Strongly Disagree”. All of these variables have been brought from previous literatures and have been adjusted to suit this study. Latent variable such as Interactivity, Perceived ease of use, Perceived certainty, Perceived enjoyment, Perceived immersion and Destination visit intention are measured by four indicators, while Vividness is measured by six

indicators. Finally, Perceived usefulness is measured by 5 indicators

*Table 1 the Proposed model's variables measurement scales*

| Variables | Measurement scales |
|---|---|
| Interactivity | 1. I was in control of my navigation through the Web AR.<br>2. I had some control over the content of the AR that I wanted to see.<br>3. I was in control over the pace (speed) to watch the digital objects.<br>4. The AR technology had the ability to respond to my specific needs quickly and efficiently. |
| Vividness | 1. The visual display through the Web AR technology was clear<br>2. The visual display through Web AR was detailed<br>3. The visual display through Web AR was vague<br>4. The visual display through Web AR was vivid.<br>5. The visual display through Web AR was sharp.<br>6. The visual display through Web AR was well defined. |
| Perceived ease of use | 1. The interaction with the Web AR is clear and understandable.<br>2. The interaction with the Web AR does not require a lot of effort.<br>3. I find Web AR easy to use.<br>4. I find it easy to access the desired information through the Web AR. |
| Perceived usefulness | 1. Through the Web AR, I can more quickly get an impression of Safaga red sea.<br>2. Due to the Web AR, I can easily evaluate the Safaga red sea.<br>3. By using the Web AR, I can better evaluate Safaga red sea. |

| | |
|---|---|
| | 4. I find the Web AR useful to look at Safaga red sea.<br>5. Overall, I find that the Web AR is useful to get an impression of Safaga red sea. |
| Perceived certainty | 1. It is likely that this destination meets my expectations.<br>2. It is likely that I'm satisfied with this destination.<br>3. There is a higher chance that this destination does not disappoint.<br>4. Visiting this destination is probably a good choice. |
| Perceived enjoyment | 1. I had fun using Web AR.<br>2. Using Web AR provided me with a lot of enjoyment.<br>3. I enjoyed using Web AR.<br>4. Using Web AR did not bore me. |
| Perceived immersion | 1. Once into the Web AR, I was unaware of what was happening around me.<br>2. Once into the Web AR, I felt disconnected from outside world.<br>3. I felt that I was actually travelling during my experience of Web AR.<br>4. During Web AR, I feel in another world. |
| Destination visit intention | 1) Based on my Web AR experience, I will visit this destination in the future<br>2) I intend to visit the destination I experienced in Web AR in the near future<br>3) I would not want to visit this destination after this Web AR experience.<br>4) I would recommend the destination I experienced in Web AR to others |

## References

Akmermer, B. (2022). The phygital experiential marketing practices: the conceptual framework and applications for tourism industry. In *Handbook of Research on*

Allal-Chérif, O. (2022). Intelligent cathedrals: Using augmented reality, virtual reality, and artificial intelligence to provide an intense cultural, historical, and religious visitor experience. *Technological Forecasting and Social Change*, *178*, 121604.

Anifa, N. &. S. S., 2022. Augmented reality users: the effect of perceived ease of use, perceived usefulness, and customer experience on repurchase intention. *Journal of Business and Management Review*, 3(3), pp. 252-274.

Argyriou, E., 2012. Consumer intentions to revisit online retailers: a mental imagery account. *Psychology & Marketing*, 29(1), pp. 25-35.

Ayeh, J. K., Au, N., & Law, R. (2013). Predicting the intention to use consumer-generated media for travel planning. *Tourism management*, *35*, 132-143.

Bae, S. J. T. H. M. N. S. M. &. K. O., 2020. The influence of mixed reality on satisfaction and brand loyalty in cultural heritage attractions: A brand equity perspective. *Sustainability*, 12(7), p. 2956.

Barta, S. G. R. &. F. C., 2023. Using augmented reality to reduce cognitive dissonance and increase purchase intention. *Computers in Human Behavior*, Volume 140, p. 107564.

Bonnin, G., 2020. The roles of perceived risk, attractiveness of the online store and familiarity with AR in the influence of AR on patronage intention. *Journal of Retailing and Consumer Services*, Volume 52, p. 101938.

Barhorst, J. B. M. G. S. E. &. M. R., 2021. Blending the real world and the virtual world: Exploring the role of flow in augmented reality experiences. *Journal of Business Research,* Volume 122, pp. 423-436.

Batat, W. (2021). How augmented reality (AR) is transforming the restaurant sector: Investigating the impact of "Le Petit Chef" on customers' dining experiences. *Technological Forecasting and Social Change*, *172*, 121013

Bretos, M. A. I.-S. S. &. O. C., 2023. Applying virtual reality and augmented reality to the tourism experience: a comparative literature review. *Spanish Journal of Marketing-ESIC,* 28(3), pp. 287-309.

Caliskan, G., Yayla, İ., & Pamukçu, H. (2023). The use of augmented reality technologies in tourism businesses from the perspective of UTAUT2. *European Journal of Innovation Management*

Çelik, Z. &. U. A., 2022. Bibliometric Analysis of Flow Theory from Past to Present with Visual Mapping Technique: A Marketing-Sided Approach. *Öneri Dergisi,* 17(57), pp. 243-267.

Chandra, S., & Kumar, K. N. (2018). EXPLORING FACTORS INFLUENCING ORGANIZATIONAL ADOPTION OF AUGMENTED REALITY IN E-COMMERCE: EMPIRICAL ANALYSIS USING TECHNOLOGY-ORGANIZATION-ENVIRONMENT MODEL. *Journal of electronic commerce research*, *19*(3).

Chan, T. K. C. C. M. &. L. Z. W., 2017. The state of online impulse-buying research: A literature analysis. *Information & Management,* 54(2), pp. 204-217.

Chung, N., Han, H., & Joun, Y. (2015). Tourists' intention to visit a destination: The role of augmented reality (AR) application for a heritage site. *Computers in human behavior*, *50*, 588-599

Cibilić, I., Poslončec-Petrić, V., & Tominić, K. (2021, December). Implementing augmented reality in tourism. In *Proceedings of the ICA* (Vol. 4, p. 21). Göttingen, Germany: Copernicus Publications.

Cranmer, E. E., tom Dieck, M. C., & Fountoulaki, P. (2020). Exploring the value of augmented reality for tourism. *Tourism Management Perspectives*, *35*, 100672.

Cranmer, E. E. (2017). Developing an augmented reality business model for cultural heritage tourism: the case of Geevor Museum.

Daassi, M. &. D. S., 2021. Intention to reuse AR-based apps: The combined role of the sense of immersion, product presence and perceived realism. *Information & Management,* 58(4), p. 103453.

Davis, F. D. B. R. P. &. W. P. R., 1989. User acceptance of computer technology: A comparison of two theoretical models. *Management science,* 35(8), pp. 982-1003.

Du, Z., Liu, J., & Wang, T. (2022). Augmented reality marketing: A systematic literature review and an agenda for future inquiry. *Frontiers in psychology*, *13*, 925963.

Eltobgy, A. E., 2024. An Integrated Approach to Stimulate Users' Involvement Behavior and Visiting Intention In Wadi Degla Virtual Museum Using PLS-SEM Data Analysis. *The International Journal of Tourism and Hospitality Studies,* 6(1), pp. 104-125.

Gharibi, N. (2023). *An eye to the future: Defining a framework for the VR tourism experience* (Doctoral dissertation, Open Access Te Herenga Waka-Victoria University of Wellington).

Ghandour, A., Kintonova, A., Demidchik, N., & Sverdlikova, E. (2021). Solving tourism management challenges by means of mobile augmented reality applications. *International Journal of Web-Based Learning and Teaching Technologies (IJWLTT)*, *16*(6), 1-16.

Gibson, A. &. O. M., 2018. Virtual reality as a travel promotional tool: Insights from a consumer travel fair. *Ugmented reality and virtual reality: Empowering human, place and business*, pp. 93-107.

Gkoumas, A., 2019. Evaluating a standard for sustainable tourism through the lenses of local industry. *Heliyon*, 5(11), p. e02707.

Griffin, T. G. D. L. S. H. G. J. &. D. F., 2023. Is VR always better for destination marketing? Comparing different media and styles. *Journal of Vacation Marketing*, 29(1), pp. 119-140.

Heller, J. C. M. d. R. K. M. D. &. K. D. I., 2019. Let me imagine that for you: Transforming the retail frontline through augmenting customer mental imagery ability. *Journal of Retailing*, 95(2), pp. 94-114.

Hinsch, C., Felix, R., Rauschnabel, P.A., 2020. Nostalgia beats the wow-effect: inspiration, awe and meaningful associations in augmented reality marketing. J. Retailing Consum. Serv. 53, 101987.

Hsu, W. C. L. M. H. &. Z. K. W., 2024. From virtual to reality: The power of augmented reality in triggering impulsive purchases. *Journal of Retailing and Consumer Services*, Volume 76, p. 103604.

Huang, T. L., & Liao, S. L. (2017). Creating e-shopping multisensory flow experience through augmented-reality interactive technology. *Internet Research*, *27*(2), 449-475.

Huang, T. L. &. C. H. F., 2024. Impact of delightful somatosensory augmented reality experience on online consumer stickiness intention. *Journal of Research in Interactive Marketing*, 18(1), pp. 6-30.

Jingen Liang, L. &. E. S., 2021. A systematic review of augmented reality tourism research: What is now and what is next?. *Tourism and Hospitality Research*, 21(1), pp. 15-30.

Khalida, R., & Setiawati, S. (2020). Website Technology Trends for Augmented Reality Development. *Jurnal Ilmiah Teknik Elektro Komputer dan Informatika*, *6*(1), 11.

Kim, M. J. L. C. K. &. J. T., 2020. Exploring consumer behavior in virtual reality tourism using an extended stimulus-organism-response model. *Journal of travel research*, 59(1), pp. 69-89.

Lee, S. A. L. M. &. J. M., 2021. The role of virtual reality on information sharing and seeking behaviors. *Journal of Hospitality and Tourism Management*, Volume 46, pp. 215-223

Lee, W. J., 2020. Use of immersive virtual technology in consumer retailing and its effects to consumer. *Journal of Distribution Science*, 18(2), pp. 5-15.

Lin, H. F. &. C. C. H., 2017. Combining the technology acceptance model and uses and gratifications theory to examine the usage behavior of an augmented reality tour-sharing application. *Symmetry*, 9(7), p. 113.

Magdi Orabi, R., 2020. The Influence of Experiential Value of Augmented Reality Technology on Destination Visit Intention: Evidence from A Multi-Mediation Model.. *مجلة كلية السياحة والفنادق. جامعة المنصورة*, 8(8), pp. 117-188.

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

Mele, C., Spena, T. R., Marzullo, M., & Di Bernardo, I. (2023). The phygital transformation: a systematic review and a research agenda. *Italian Journal of Marketing*, *2023*(3), 323-349.

Mou, Y. F. J. D. Z. &. K. I., 2024. Impact of virtual reality immersion on customer experience: moderating effect of cross-sensory compensation and social interaction. *Asia Pacific Journal of Marketing and Logistics*, 36(1), pp. 26-47.

Neuburger, L., Beck, J., & Egger, R. (2018). The 'Phygital'tourist experience: The use of augmented and virtual reality in destination marketing. In *Tourism planning and destination marketing* (pp. 183-202). Emerald Publishing Limited.

Nguyen, T. B. T., Le, T. B. N., & Chau, N. T. (2023). How VR technological features prompt tourists' visiting intention: An integrated approach. *Sustainability*, *15*(6), 4765.

Qin, H. P. D. A. &. P. V., 2021. A virtual market in your pocket: How does mobile augmented reality (MAR) influence consumer decision making?. *Journal of Retailing and Consumer Services,* Volume 58, p. 102337.

Rasul, T. L. W. M. O. P. A. A. F. K. d. O. S. F. &. J. L. W., 2024. Immersive virtual reality experiences: boosting potential visitor engagement and attractiveness of natural world heritage sites. *Asia Pacific Journal of Tourism Research, 29(5), 515-526.*, 29(5), pp. 515-526.

Sengupta, A. &. C. L., 2022. Augmented reality's perceived immersion effect on the customer shopping process: Decision-making quality and privacy concerns. *International Journal of Retail & Distribution Management*, 50(8/9), pp. 1039-1061

Smink, A. R., Van Reijmersdal, E. A., Van Noort, G., & Neijens, P. C. (2020). Shopping in augmented reality: The effects of spatial presence, personalization and intrusiveness on app and brand responses. *Journal of Business Research*, *118*, 474-485.

Steuer, J., 1995. Defining virtual reality: Dimensions determining telepresence. *Communication in the age of virtual reality/Lawrence Erlbaum and Associates,* 33(37-39), p. 1.

Suh, A. &. P. J., 2018. The state of immersive technology research: A literature analysis. *Computers in human behavior,* Volume 86, pp. 77-90.

Tom Dieck, M. C., & Jung, T. H. (2017). Value of augmented reality at cultural heritage sites: A stakeholder approach. *Journal of destination marketing & management*, *6*(2), 110-117.

Tom Dieck, M. C. J. T. H. &. R. P. A., 2018. Determining visitor engagement through augmented reality at science festivals: An experience

economy perspective. *Computers in Human Behavior*, Volume 82, pp. 44-53.

*Tourism rebound in Egypt's Red Sea resort fuels optimism for strong growth - dailynewsegypt*. Available at: https://www.dailynewsegypt.com/2023/08/09/tourism-rebound-in-egypts-red-sea-resort-fuels-optimism-for-strong-growth/ (Accessed: 22 September 2024).

Tsang, S. S., Kuo, C., Hu, T. K., & Wang, W. C. (2023). Exploring impacts of AR on group package tours: Destination image, perceived certainty, and experiential value. *Journal of Vacation Marketing*, *29*(1), 84-102.

Tussyadiah, I. P., Jung, T. H., & Tom Dieck, M. C. (2018). Embodiment of wearable augmented reality technology in tourism experiences. *Journal of Travel research*, *57*(5), 597-611.

Vilkina, M. V., & Klimovets, O. V. (2020). Augmented reality as marketing strategy in the global competition. In *The 21st Century from the Positions of Modern Science: Intellectual, Digital and Innovative Aspects* (pp. 54-60). Springer International Publishing.

Vishwakarma, P., Mukherjee, S., & Datta, B. (2020). Antecedents of adoption of virtual reality in experiencing destination: A study on the Indian consumers. *Tourism Recreation Research*, *45*(1), 42-56.

Wang, X. B. A. H. Z. Q. S. M. N. A. H. &. N. Z., 2020. Gaming avatar can influence sustainable healthy lifestyle: Be like an avatar. *Sustainability*, 12(5), p. 1998.

Wei, W., 2019. Research progress on virtual reality (VR) and augmented reality (AR) in tourism and hospitality: A critical review of publications from 2000 to 2018. *Journal of Hospitality and Tourism Technology*, 10(4), pp. 539-570.

Wi, J. H. C. H. S. P. C. &. K. T., 2024. Understanding Factors Influencing Virtual Reality Acceptance Using a Unified Sor-Tam Approach. *SSRN 4699792*.

Xia, Y. X. C. S. W. &. X. Y. C., 2024. How social and media cues induce live streaming impulse buying? SOR model perspective. Frontiers in Psychology, Volume 15, p. 1379992.

Yim, M. Y. C. C. S. C. &. S. P. L., 2017. Is augmented reality technology an effective tool for e-commerce? An interactivity and vividness perspective. *Journal of interactive marketing*, 39(1), pp. 89-103.

Yung, R., & Khoo-Lattimore, C. (2019). New realities: a systematic literature review on virtual reality and augmented reality in tourism research. *Current issues in tourism*, *22*(17), 2056-2081

Yung, R. K.-L. C. P. G. &. S. E., 2021. Around the world in less than a day: virtual reality, destination image and perceived destination choice risk in family tourism. *Tourism Recreation Research*, 46(1), pp. 3-18.

Zasornova, I., Zakharkevich, O., Zasornov, A., Kuleshova, S., Koshevko, J., & Sharan, T. (2021). Usage of augmented reality technologies in the light industry. *Vlakna a textil (Fibres and Textiles)(28), 3*.

Zhang, G. (2023). Design of virtual reality augmented reality mobile platform and game user behavior monitoring using deep learning. *International Journal of Electrical Engineering & Education*, *60*(2_suppl), 205-221.

Zhang, D. &. Y. H., 2023. Research on Consumers' Intention to Use and Promote Augmented Reality. *In 2023 2nd International Conference on Social Sciences and Humanities and Arts (SSHA 2023)*, July.pp. 1245-1253.

Zhu, C., Wu, D. C. W., Hall, C. M., Fong, L. H. N., Koupaei, S. N., & Lin, F. (2023). Exploring non-immersive virtual reality experiences in tourism: Empirical evidence from a world heritage site. *International Journal of Tourism Research*, *25*(3), 372-383