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The Augmented Reality Effect on Destination Satisfaction Towards Revolutionizing Heritage Tourism in Sri Lanka

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ABSTRACT

This study explores the impact of augmented reality (AR) on tourist destination satisfaction (DS) in Sri Lanka's heritage tourism, focusing on historical sites in Polonnaruwa. The research aims to improve the visitor experience and address inadequate funding for site rebuild, focusing on the mediating role of immersive experience and perceived value. Furthermore, the researcher surveyed 256 visitors to cultural and historical destinations as part of a quantitative research approach using IBM SPSS Statistics 25 and Smart PLS 4. The results show that AR and DS are significantly and positively related, with perceived value and immersive experience as mediators. According to the study, historical landmarks should include AR technology, and tourist staff members should get AR training. Moreover, future studies could investigate the long-term impacts of AR on visitors' attitudes, loyalty, and behaviour, as well as the cultural characteristics that influence how AR perceives heritage tourism.

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1. INTRODUCTION

UNESCO has recognized eight locations in Sri Lanka as World Historic Sites due to its extensive cultural and historical past (Sri Lanka - UNESCO World Heritage Convention, n.d.). Also, the national economy will immensely benefit from these sites. Since Sri Lanka is still a developing country, many places need repair. However, the continuing economic crisis makes it difficult for Sri Lanka to get funding as tourists cannot see the whole buildings; seeing the remains might be a middle level of satisfaction (Chung et al., 2018).

Furthermore, contemporary technology enables us to create or develop 3D representations of real and imagined items. To create things in 3D, people often use augmented reality (AR), virtual reality (VR), and mixed reality (MR). Since AR requires a smartphone and no other gear, it is the most practical and cost-effective application (Baik, 2021). AR technology creates a mixed reality environment that may enhance visitor engagement and perception by projecting digital data onto the actual world. Several industries, such as tourism, education, entertainment, and health, have extensively used AR, and it has been shown to improve user engagement, happiness, and learning (Chen et al., 2019).

In addition, since it functioned as Sri Lanka's first major city from the 11th to the 13th century, Polonnaruwa is known as one of the country's parts of the UNESCO World Heritage List. Also, it was the site of Buddhist and Hindu temples and the residence of Sinhalese and Soli kings. In the late 19th century, when the British found Polonnaruwa again, they learned that the Rajarata Wari civilization had been

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demolished and concealed for about 700 years. Also, Polonnaruwa, a historic city, has many monuments (Senevirathne, 1998).

However, there needs to be more research on how AR influences tourists' destination satisfaction (DS) in Sri Lanka's heritage tourism, focusing on historical sites in Polonnaruwa. DS is a crucial metric for evaluating a tourist destination's worth and quality, influencing visitors' desire to return, word-of-mouth, and loyalty (Chen, Zhang, and Qiu, 2013). According to earlier research, AR may improve tourists' sense of place by giving them more information, engagement, and immersion (Neuburger et al., 2018; Koo et al., 2018). Nevertheless, these studies have not examined the unique features and difficulties of Sri Lanka's heritage tourism, concentrating primarily on Western or Asian settings. Furthermore, these studies have not investigated the mediating roles of immersive experience (IE) and perceived value (PV) in the link between DS and AR. According to Brochado, Cristóvão Veríssimo, and de Oliveira (2022), PV is the whole evaluation of the expenses and advantages of a tourist site. In contrast, IE is the level of presence and engagement a visitor feels there. These two elements are crucial to comprehending how AR might benefit and satisfy travellers in various historical and cultural contexts.

Therefore, to fill these gaps, this study addresses the following objectives, and the study's primary goal is to examine "How AR influences Destination Satisfaction in cultural and heritage tourism destinations." Moreover, the sub-research objectives are formulated as follows: "To study how perceived value mediates the relationship between augmented reality and destination satisfaction in cultural and heritage tourism destinations." "To study how the Immersive Experience mediates the relationship between Augmented Reality and Destination Satisfaction in cultural and heritage tourism destinations?" and "To study the relationship between Immersive Experience and Perceived Value."

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So, this study primarily emphasizes how AR influences destination satisfaction. The findings suggest that improving public authorities' perceived worth might boost their appeal to visitors. The hypothesis contends that further research is needed to understand better how AR affects how people perceive and appreciate cultural and historical sites. Additionally, this research contributes to the corpus of understanding by exploring the academic underpinnings of AR technology and how it affects the viewer experience. It also offers details on the most popular topic of AR in travel.

2. LITERATURE REVIEW

2.1. Tourism Satisfaction

Researchers have long debated tourism satisfaction, a common subject in tourism studies. Accordingly, Marinao (2018) researched the elements influencing tourist satisfaction. It focuses on how hedonic, utilitarian, and symbolic values are perceived. Statistics have indicated that hedonic and functional values are the two key factors influencing tourists' satisfaction. Examples given by Shin and Jeong (2021) demonstrate how augmented reality applications may motivate visitors. Positive preferences for AR apps are primarily motivated by hedonic and utilitarian factors.
Chen, Zhang and Qiu (2013) conducted a worldwide literature review regarding the pleasure of visitors throughout the previous ten years. That research indicates several variables to consider when assessing visitor satisfaction at locations, making evaluating a particular travel service provider more challenging. In addition, Rajaratnam et al. (2015) researched local Malaysian tourist attractions to look at how the perceived reliability of websites affects users' behavioural intentions directly and secondarily via effects on contentment. Additionally, research has indicated that the foundation of an incredible location comprises the eight primary elements of hospitality: cleanliness, information, safety, logistics, and the essential guest experience. Also, satisfaction substantially impacts the destination's value as a whole and, in turn, considerably influences behavioural intentions. Also, behavioural intentions are directly and significantly impacted by how well-regarded the Considered environment is. Agyeiwaah et al. (2016) researched to determine if tourist

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satisfaction varied across the hotel and attraction sectors. Surprisingly, the findings highlight the significance of customer satisfaction in travel and tourism and the necessity to meet consumer expectations. Moreover, Japutra (2020) found that location is one of the critical elements affecting visitors' pleasure in their journey. Additionally, visitor attachment behaviour may indicate how engaged and entertained visitors would be.

The insight gained in the tourism satisfaction-themed sub-literature review shows that the main factors affected by tourism satisfaction are hedonic, functional, and utilitarian.

2.2. Augmented Reality

Augmented reality is also a frequent topic in tourism research, and researchers have talked about it for many years. Accordingly, Chen et al. (2019) aims to mimic and apply computer-generated information in the real world. AR technology combines digital information with the natural environment. The two types of knowledge are complementary, improving the real world. Recent years have seen numerous papers and scientific findings on AR from renowned universities, research institutions, and companies. These results demonstrate that augmented reality is an innovative technology for interaction between people and computers and how AR technology will fundamentally alter human life.

One of the several industries to use augmented reality is tourism. By incorporating actual sights captured using cell phone cameras and other technological tools, augmented reality technology might help restore historic locations. There is further information offered in addition to the images. Moreover, artefacts in the real world regularly zoom in using AR technology in archaeological investigations to help archaeologists discover them more precisely.

A paradigm for using mobile devices augmented reality in urban historical tourist attractions was investigated and put out by tom Dieck and Jung (2018). The properties

that mobile augmented reality apps must be able to access may now be understood thanks to this research. Similarly, Trunfio et al. (2022) proposed a novel method of service delivery using VR and AR. This study emphasizes the enjoyment of museum visitors. The research makes numerous recommendations for the museum. 4.0 Academic Conversation.

The research undertaken by Aliprantis and Caridakis (2019) shows the trends in developing augmented reality apps for cultural heritage. The authors may infer that cultural user experience evaluation is now one of the most active areas in Augmented Reality Cultural Heritage applications based on the varied methodologies implemented by many new AR apps.

In order to comprehend how Augmented Reality Applications function in cultural heritage communication, Casella and Coelho (2013) performed research. Researchers who looked at the cultural legacy of mobile augmented reality apps concluded that these apps are now becoming collaborative communication tools for cultural and educational institutions like museums. Moreover, Luna, Rivero, and Vicent (2019) researched to demonstrate that using AR in apps can generate new ways of viewing and learning history, even if society is now aware of the lack of innovative educational design. The present investigation also reveals that museums and organizations dedicated to preserving and interpreting cultural material create most of these practices. Also, Nevola, Coles, and Mosconi (2022) researched the main difficulties of running an AR app for Florence cultural tourism. The findings demonstrate that using AR apps to manage well-established cultural destinations has several significant practical merits.

Moreover, there have been setbacks. In addition to improving tourist encounters, creating AR applications for urban heritage travellers also offers clear conceivable advantages for handling destinations. In research by Marto and Gonçalves (2019) to create, test, and assess a mobile augmented reality app at a historical site, especially

the Roman remains of Conimbriga, 97% of respondents said that using the AR app had increased their engagement.

Augment Reality-themed sub-literature reviews how AR mixes digital data with the outside world. Moreover, it indicates with vital facts how successfully AR combined with a mobile application under the different domains, including tourism. Nevertheless, most of this research has concentrated on Western or Asian settings; they have not examined the particular traits and challenges of heritage tourism in Sri Lanka in connection to AR. These findings justify the need for the proposed research outcomes.

2.3. AR and Destination Satisfaction

In recent years, scholars have spoken about an emerging field in tourism studies: AR and destination satisfaction. Neuburger, Beck and Egger (2018) researched using augmented and virtual reality in destination branding. This study demonstrates how AR may give passengers extra information during the fifth phase of travel, often after reaching their destination. An exciting study's finding shows how AR may improve the overall satisfaction of visitors exploring a place of interest. Moreover, Lacka (2020) also conducted another mesmerizing analysis examining how AR gameplay contributes to trips. Unexpectedly, research results indicate that individuals who engage in an augmented reality game based on a well-known travel website want to visit the location in person.

In order to ascertain if event attendees at a historical site believed the usage of augmented reality enhanced their visit and whether they would prepare to pay extra for the experience, Wakefield, Simons, and John (2019) performed research. According to the research, most users of AR technology find it helpful and think it enhances their experience. The audience that the historical monument or attraction is trying to reach might also consider monetizing the technology.

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Koo et al. (2018) investigated if there is an association between the satisfaction of the game players with where they were going and location-based service (LBS) augmented reality games for smartphones. Furthermore, research suggests that AR phenomena may alter a person's perception of presence in a mixed setting and affect destination satisfaction. Even though researchers have determined that games are an effective educational tool for meeting visitor needs, it is crucial to remember that severe and pervasive games can alter people's lives and habits. It also demonstrates how affective, emotional, and immaterial connections significantly influence the spatial presence that fuses reality and virtuality more than cognitive, objective, or physical factors. Moreover, Chung, Han and Joun (2019) studied AR satisfaction and destination loyalty for a specific region. The findings also suggest that creativity and optimism favour a connection between product perceptions and satisfaction with AR but not the destination loyalty relationship, which is unsatisfied with AR.

Furthermore, Japutra (2020) researched the importance of comprehending different visitor attachment kinds. According to this study, the location is a crucial determinant of how satisfied travellers are with their destinations. The study's findings also indicate that visitors' attachment behaviours may predict visitors' attachment and satisfaction levels to some extent.

According to Lee, Pan and Chung (2018), the perception of the destination influences both the level of delight and the quality of the usefulness; thus, the higher the level of contentment, the higher the assessment of the quality of the usefulness. Additionally, contentment would significantly impact behavioural intention. Also, to find out what drives consumers to utilize augmented reality apps in tourist areas, Shin and Jeong (2021) performed a study. This research demonstrates how incentives for elegance and usefulness fundamentally impact how consumers see augmented reality apps in tourist sites. Only the highly creative group benefits significantly from the self-presentation drive regarding how visitors perceive AR applications.

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The insight gained in the AR and destination satisfaction-themed sub-literature review shows how augmented reality and destination satisfaction are associated with each other. This association is solid and positive. However, the unique qualities and challenges of Sri Lankan heritage tourism regarding AR and destination satisfaction have not been examined in this research, which mainly concentrates on individuals with Western or Asian origins. These findings justify the need for the proposed research outcomes.

2.4. AR and Value Generation

AR and Value Generation are new tourism research topics, and researchers have discussed them recently. The effect of perceived value for tourism when a tourist utilizes augmented reality is the subject of closely linked research by Han, Yoon and Kwon (2021). Initially, the travel website collects data about the AR features offered through a survey. He argues that using AR may be a worthwhile experience. Saudi Arabian researchers are exploring the utilization of virtual interactive BIM (Building Information Modelling) to construct a rich, interactive 3D heritage management model, aiming to bridge a knowledge gap on hybrid structural systems in ancient structures. This research recognizes the increasing potential of virtual tourism (Baik, 2021).

Dick and Jung (2018) researched how stakeholders saw augmented reality's potential to improve museum visits at cultural heritage sites. The survey shows that both national and international perspectives value AR. External stakeholders generally viewed the visitor learning experience, whereas internal stakeholders recognized managerial, strategic, and operational value created through AR. In order to fill the knowledge gap regarding the effect of AR architectural components on how visitors feel at galleries, He, Wu, and Li (2018) examined two characteristics of AR design, information type and environmental upgrades, which influenced how visitors felt at institutions and their willingness to spend more. The results showed that changing

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phrases positively influenced customers' desire to purchase more than dynamic sight signals. Because linguistic information may hinder intuitive impulses and promote top-down thinking, it may impact how individuals perceive beauty and make decisions. Because vibrant graphics enhance the perception of beauty and the virtual environment may function as an individualized trigger to stimulate subconscious thoughts, the effect is apparent, and the possibility that consumers will spend more money increases.

Additionally, Jeong and Kim (2020) discovered that in the sports tourism industry, the joy of participating in sports tourism entirely mitigates the relationship between the perception of value, dedication to the attraction, and the reputation of the destination and adherence. They reiterated the necessity to regard minor and major sporting events as crucial to preserving the appeal of tourism destinations. According to Alimamy and Al-Imamy (2022), there is a relationship between the quality of the AR interaction, the buyer's assessment of its worth, and the mediating impact of the consumer's thinking style. Additionally, the inquiry's results illustrate which AR exhibits memorable traits, including authenticity, presence, and engagement, directly influencing consumer feeling. Additionally, studies have shown that consumer attitudes about augmented reality have a beneficial impact on how much users appreciate the technology. Cranmer, tom Dieck and Fountoulaki (2020) qualitatively explore the elements of AR value unique to the tourist sector. v. This study found that one of the main factors determining the value for the modern tourist industry is the marketing potential of AR, and marketing value emerges as a recently discovered AR value dimension. Additionally, Brochado, Cristóvão Veríssimo and de Oliveira (2022) uncovered that immaculate visitor experiences positively impacted four types of appreciated worth: financial, standard significance, psychological value, and value to society. The intentional proposition produces positive effects on intellectual and community value.

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Regarding the values that shape their behavioural intentions, visitors from various demographic groups exhibit varying patterns. Women are more affected by emotional worth, whereas males are more affected by social worth. Moreover, each component of perceived value uniquely impacts behavioural intentions that arise.

Using experiential attributes and tourists' perceptions of the value of the Chinese language, Jiang (2018) conducted research in Yunnan Province, which served as the research site, to investigate the likelihood of AR adoption before visiting a national park. The research results convey an industry assessment of AR encounters for park visitors and show how socioeconomic and cultural factors influence both augmented reality adoption and expected quality. According to this survey, respondents saw pleasure as a supplemental utilization of learning more.

AR and value generation-themed sub-literature reviews clearly show how augmented reality can generate economic, emotional, and social values. Nevertheless, these studies have not addressed the particularities and challenges of heritage tourism in Sri Lanka concerning AR and value creation, mainly because they have concentrated on Western or Asian settings. Moreover, researchers use these insights to refine the final results of the proposed research.

2.5. AR and Tourism Experience

AR and Tourism experience are new topics in tourism research, and researchers have discussed them recently. Jiang et al. (2022) examined how AR may provide unique landmark viewers experiences. It encourages a younger generation of pleasurable visitor encounters in various Chinese tourism regions.

Another study conducted in 2018 focused on the augmented reality aspect of experience travel in Korea. Additionally, AR has an advantageous effect on how travellers perceive the world (Lee, Pan and Chung, 2018). Another research demonstrates how mobile AR's impact on subjective pleasure increases (Jung et al.,

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2018). Moreover, according to Huang (2021) study, tourists prepare to pay a significant sum for an improved experience that augmented reality may provide instead of just seeing the ruins. Additionally, Nhan, Dung and Vu (2022) researched to provide an empirical structure that describes how immersive mobile augmented reality (MAR) applications might improve users' experiences and feelings.

Additionally, take the initiative and work to be kind in a virtual setting. According to research, immersive MAR applications may be more enjoyable when the user has traits like visual imagination and self-exploration and device attributes like simulated proper control and contextual placement. According to reports, the enhanced experience offered by an immersive MAR application substantially impacts consumer attitudes, beliefs, and actions. Although, Guo et al. (2021) examine the visitor experience in digital museums. Three features of this gathering are their main concerns: ease, escape, and location. According to research, the finest digital interactions include aural and visual clues. Research also shows how multi-sensory signals improve the tourism experience by enhancing those who visit mental wellness and fostering a feeling of intervention.

In their study, Bec, Buhalis and Prentice (2019) examined how AR and VR can preserve history while enhancing the tourist experience. They provided a four-step conceptual model that explains the use of immersive technology to represent historic sites and areas. Moreover, to establish a new "smart tourist" experience that strengthens the IP of Jinan Spring Culture, Zhao (2022) investigates the process of creating cultural content for animation via the use of new technologies. The study also found that VR/AR technology may effectively establish new methods to communicate Jinan's spring culture by creating virtual settings, blending them with the actual world, and smoothly integrating them with both. The theoretical and practical significance of its integration with the cultural sector will also strengthen Jinan Spring Culture's impact and development potential.

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The literature survey for the augmented reality and tourism theme showcases recent implementations of AR in the tourism domain with their value generation and satisfaction. However, this research has not addressed the particular features and challenges of historical tourism in Sri Lanka regarding AR and tourist experiences, mainly because they have concentrated on Western or Asian settings. These findings justify the need for the proposed research outcomes.

2.6. Similar Technical Approaches in Sri Lanka

However, Similar technical approaches in Sri Lanka are familiar in tourism research, and researchers have discussed them in recent years. Accordingly, Jayawardena and Perera (2017) created a framework for developing mixed reality (MR) applications for the Yapahuwa archaeological site. Their job is concerned with mobile apps' technical operation and battery use. It does not mean gauging the traveller's level of enjoyment or sense of worth. Moreover, Galmangoda et al. (2016) researched to put into practice the "HeladivaAR" Android app, which enables users to utilize the cameras on their smartphones to see what Sri Lanka's ancient ruins were like during their heyday. They decided to build internet infrastructure at the royal palace in Polonnaruwa. During real-world testing, the "HeladivaAR" app achieves its primary goal. The AR interface of the Android smartphone app loads a 3D rendering of the computer and displays it alongside the camera video. The information page also provides information on the Royal Palace and a video tour of the ruins. People can enlarge and spin a three-dimensional representation using two fingers in a touchscreen gesture, a consistent 3D interface.

Researchers conducted similar technical approaches in the Sri Lankan tourism domain as part of the last literature review sub-theme. However, the literature survey could be more fruitful concerning the international domain. It only found very little significant research, and all these researchers have focused on technical

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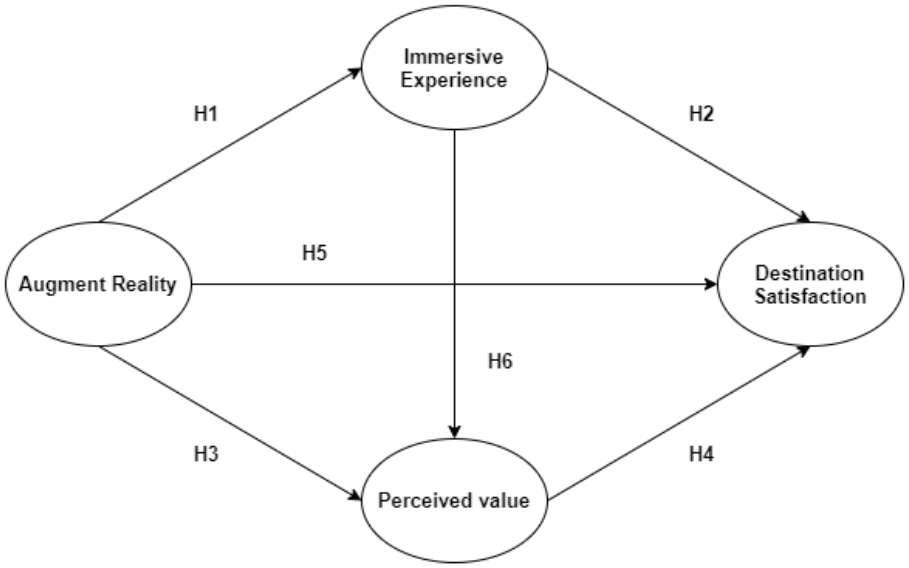
implementations and have yet to try to observe the values and satisfaction levels created.

2.7. Conceptual Framework

Figure 1 Conceptual Framework



2.8. Hypothesis Development

- H1 – There is a relationship between the Augmented Reality impact on the Immersive experience.
- H2 - There is a relationship between the Immersive experience's impact on the Destination Satisfaction
- H3 - There is a relationship between the Augmented Reality impact on the Perceived Value
- H4 - There is a relationship between the Perceived value impact on the Destination Satisfaction
- H5 - There is a relationship between the Augmented Reality impact on the destination satisfaction.

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- H6 - There is a relationship between the Immersive experience's impact on the Perceived Value

3. METHODOLOGY

3.1. Research Design

This research uses quantitative analysis to examine how AR influences visitors' experience of historical and cultural tourism places. The primary data collecting instrument for the research is a structured questionnaire with scales to assess participants on Augmented Reality, Immersive Experience, Perceived Values, and Destination Satisfaction. The AR experiences of the respondents are the study's unit of analysis. This suggests that the researcher is curious about how respondents use and perceive augmented reality (AR) technology at historical and cultural locations and how this influences their assessments of the technology's worth and degree of pleasure. Additionally, the researcher tests facts and evaluates ideas using statistical methods. This study intends to evaluate potential connections and mediating effects between immersive experiences and the perceived value of the AR experience and destination satisfaction, in addition to providing further empirical evidence for the research goals and hypotheses (Creswell, 2017).

3.2. Sampling and Participants

The study's target audience was tourists visiting Sri Lankan historical or cultural sites. The researcher gathered data from 256 tourists, most of whom went to Polonnaruwa's historical and cultural sites, as a sample. The researcher chose convenience sampling as a non-probability sampling method due to its ease of use, speed, and affordability. Convenience sampling enables the researcher to collect data from anybody willing and available to engage in the study without following any specific sample frame or criterion. Convenience sampling does, however, have several drawbacks, such as the possibility of bias, underrepresentation, and inadequate result generalizability. The researcher warns that the study's findings could only partially reflect the opinions and

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experiences of all visitors to Sri Lanka's historical and cultural places (Creswell, 2017; Price, 2013). Additionally, visitors from specific regions designed the sampling structure throughout the data-collecting process, and the sample size was chosen following reasonable time and resource restrictions (Banerjee and Chaudhury, 2010). The researcher may better understand the profile of participants and the potential range of replies by using demographic data gathered via questionnaires, such as participant age, gender, nationality, and other pertinent criteria.

3.3. Instrument Development

Respondents were given a Likert scale of five points for classifying the 26 questions by their level of acceptance or disapproval. The primary goal of Part A was to compile the respondents' demographic information. Part B evaluated the use of augmented reality. Part C looked at the immersive experience, Part D looked at the perceived value, and Part E about the predicted destination's level of satisfaction. Moreover, by responding to questions on a Likert scale linked to the related variable in each segment, respondents may convey their thoughts and emotions (Jebb, Ng and Tay, 2021). This structure made gathering data on tourist experiences and satisfaction at historical and cultural sites easier.

3.4. Data Collection Procedures

In order to investigate how AR usage affects tourists' perceptions of value and happiness with their destination at Sri Lanka's Polonnaruwa cultural and historical sites, the researcher gathered information using a structured questionnaire. The design of the questionnaire, which asked about augmented reality, immersive experiences, perceived values, and destination satisfaction, was influenced by the study's goals. The participants gave multiple-choice questions that allowed them to examine quantitative data. Implementing a standardized questionnaire made data collection more effective, and all relevant factors were considered (Dillman, Smyth and Christian, 2014).

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3.5. Data Analysis Procedures

In this study, Smart PLS 4 and partial least squares structural equation modelling (PLS-SEM) were the primary techniques for quantitative data analysis. PLS-SEM is a multivariate methodology that may evaluate complicated models with latent variables and many indicators, according to Hair, Ringle, and Sarstedt (2011). The researcher used PLS-SEM because it can handle complicated interactions between variables, small sample sizes, and non-normal data (Dash and Paul, 2021). Siswaningsih, Firman, and Khoirunnisa (2017) add that PLS-SEM can also assess the structural model, the measurement model, and the direct and indirect impacts of the variables. The first step in the data analysis method was to examine the measurement model's convergent validity and reliability. To quantify these factors, the researcher employed average variance extracted (AVE), composite reliability (CR), and Cronbach's alpha. Assessing the measurement model's discriminant validity was the second step. The researcher used the heterotrait-monotrait ratio (HTMT) and the Fornell-Larcker criterion to assess these characteristics. The third step was testing the hypothesis and determining the variables' direct impacts. The researcher utilised path coefficient analysis to compute these impacts. Analysing the elements' indirect impacts was the fourth step. A mediation analysis was carried out by the researcher in order to measure these impacts. In addition to PLS-SEM, the researcher employed IBM SPSS Statistics 25 to examine the respondents' demographic data. The demographic data aided the researcher's comprehension of the participant profile and response variability. The researcher followed the guidelines and suggestions of earlier studies to assess and report the results of the data analysis (Creswell, 2017).

3.6. Ethical Considerations

The investigator, who strictly followed ethical guidelines, carefully protected the rights and well-being of the participants throughout the investigation. Each participant consented after being fully informed about the study's objectives; their participation was optional, and the answers were kept private. The study managed

and preserved data following ethical standards to safeguard the participants' privacy. Additionally, the researcher assures the participants that their answers will be kept private and used only for study. Also, researchers took measures to reduce the participants' exposure to hazards, discomfort, and possible harm. The research was conducted with moral integrity, ensuring that the participant's rights and welfare were maximized (American Psychological Association, 2017).

3.7. Limitations

The biggest flaw in the research is its small sample size, which only comprises Polonnaruwa due to funding constraints. Conducting a more thorough study in Sri Lanka was challenging due to high food costs, fuel costs, and data collection challenges. The paper emphasizes the necessity for more investigation into augmented reality and destination satisfaction.

4. RESULTS

4.1. Demographic Factors of Respondents

The investigator drew the following vital conclusions by assessing the demographics of the 256 survey respondents.: 63.3% of the participants were men, while 36.7% were women. The 16–25 age group had the highest response rate, at 48.4%, followed by 26–35 (39.1%), 36–45 (5.9%), 46–55 (4.7%), and those over 56 (2.0%), according to age distribution. Geographically speaking, the Western Province (58.6%) and especially the Colombo District (45.3%) had the highest participation rates. Regarding educational attainment, the highest group (40.6%) holds either an internal or external degree, followed by GCE Advanced level (28.9%) and diploma/vocational training (19.9%). The demographic survey reveals, in short, that there are more men than women, that younger age groups are overrepresented, that there is a concentration of respondents in the western region, and that educational levels differ across the nation.

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4.2. Descriptive Analysis for Variables

In the present study, the researcher did a structured analysis to investigate the correlations between the variables. Initially, descriptive statistics provided a thorough overview and description of a data set. Descriptive statistics contain variables like mean, standard deviation, skewness, and kurtosis. Mean values, which indicate the average scores throughout the data set, are used as indicators of central tendency. The findings' mean interpretation according to the criteria: values between 01 and 2.5 indicate no significant agreement, and values between 2.5 and 3.5 indicate close agreement. Additionally, numbers between 3.5 and 5 indicated a condition of significant agreement (Allen and Seaman, 2007).

Standard deviation values were employed to determine the data set's variance and learn more about the spread or dispersion of the data. Skewness is also considered a measurement of how skewed the data distribution was. The researchers predict that divergence values will range from -2 to 2, indicating acceptable symmetry. Kurtosis, a measure of how flat the data distribution was, was also considered. According to George and Mallery (2010), kurtosis values should lie between -2 and 2, indicating a normal distribution comparable to skewness values. The dataset was rigorously analyzed using these statistical methods with a comprehensive understanding of the associations between variables and outcomes generated using descriptive statistics of fundamental factors.

According to the analyzed data, all the indicators mean values of four variables were more than 3.5, which shows that respondents had a high level of agreement. These findings indicate that the concepts or responses correspond to the facts or inquiries. It also discovered that the standard deviations for each indicator were lower than the corresponding averages, suggesting that the data points were also reasonably evenly spaced around the mean. This finding supports the notion that the dataset displays tolerable variability. Further analysis of the skewness revealed that almost all the

indicator values of four variables varied from -2 to 2, and some even had negative values. These findings suggest that these variables have a normal-shaped and symmetrical distribution. However, Kurtosis shows the distributions have more peaks than usual, with the bulk index values over 2.

4.3. Confirmatory Factor Analysis (CFA)

Utilizing Smart PLS 4, confirmatory factor analysis, or CFA, is used to evaluate the construct's reliability and validity. The researcher uses Cronbach's alpha to evaluate the measurement model's reliability using specific interpretation criteria. According to Siswaningsih, Firman and Khoirunnisa (2017), reliability is appropriate for values more than or equal to 0.7. The average variance extracted (AVE) and composite reliability (CR) were used to evaluate the convergent validity of the measurement model. Although an AVE value of 0.5 or more significant is the recognized standard (Dash and Paul, 2021), Ab Hamid, Sami and Sidek (2017) said CR values between 0.6 and 0.7 are acceptable. The researcher also uses the HTMT and Fornell-Larcker criteria to assess the discriminant validity of the findings. Scores below 0.9, according to Henseler, Ringle and Sarstedt (2015), are acceptable for discriminant validity. The Fornell-Larcker criterion mandates that the value of the square root of the AVE for each construct must be larger than the relationship between the particular construct and the other constructs in the model, according to Tehseen et al. (2017). Additionally, the researcher calculates the results by calculating Cronbach's alpha for the primary variables.

Table 1: Cronbach's Alpha

	Cronbach's Alpha
AR	0.818
DS	0.848
IE	0.73
PV	0.813

According to Table 1 data, all four variables (AR, DS, IE, and PV) had scored over 0.7, suggesting good reliability. The outcome was reached by taking CR and AVE into account for the main factors.

Table 2: Convergent Validity

	Composite Reliability (CR)	**Average Variance Extracted (AVE)**
AR	0.818	0.579
DS	0.85	0.624
IE	0.731	0.553
PV	0.816	0.639

Table 2 shows that each variable had satisfactory convergent validity with values for CR over 0.7 and AVE measurements over 0.5. The researcher also utilized the Heterotrait-Monotrait ratio (HTMT) and Fornell-Larcker criteria to assess discriminating validity.

Table 3: Heterotrait-Monotrait Ratio

	AR	**DS**	**IE**	**PV**
AR				
DS	1.023			
IE	1.049	1.079		
PV	0.987	1.018	1.068	

All HTMT values were more than 0.9, which did not support discriminant validity. Moreover, the Fornell-Larcker criterion also does not support discriminant validity besides HTMT. These findings imply that the variables may evaluate the same underlying idea rather than a different idea.

4.4. Hypothesis Testing

The researchers conducted a path coefficient analysis to test the hypotheses and determine the variables' direct effects. Moreover, this analytical approach revealed the subtle channels and their reciprocal impacts by measuring the strength and significance of the connections between variables. The following diagram shows the path diagrams used by the researcher to test the hypothesis.

Figure 2: Path Diagram

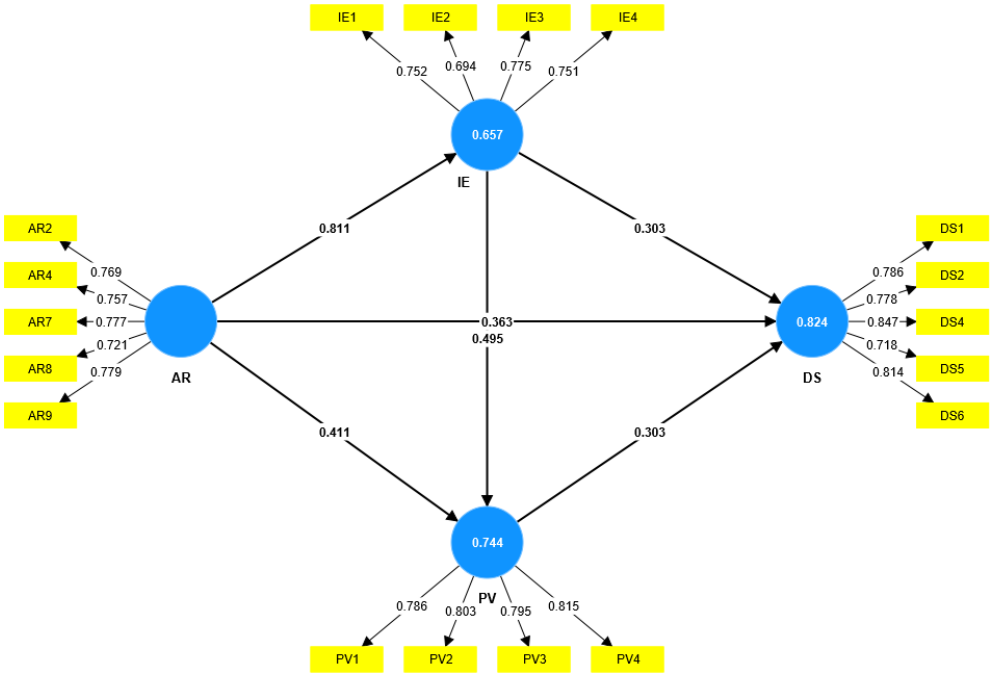

Table 4: Hypothesis Testing

Hypothesis	Path	Path Coefficient	T-Value>2	P-Value	Decision
H1	AR → IE	0.811	23.031	0.000	Accepted
H2	IE → DS	0.303	5.236	0.000	Accepted
H3	AR → PV	0.411	7.044	0.000	Accepted
H4	PV → DS	0.303	4.768	0.000	Accepted
H5	AR → DS	0.363	4.989	0.000	Accepted

H6	IE → PV	0.495	8.064	0.000	Accepted

Table 4 presents the results of the hypothesis test using path coefficient analysis. All path coefficients reveal a positive direct influence between the variables. High t-values imply strong and substantial correlations between variables, whereas a low standard error implies accurate estimations of the path coefficients.

According to Kennedy-Shaffer (2019), the predicted p-values for each hypothesis were all considerably below the 0.05 significance level. Rejecting all null hypotheses leads to the conclusion that there is a statistically meaningful connection between all variables.

These findings suggest connections and causal relationships between the variables investigated. The findings aid in understanding how these variables interact and affect the research.

4.5. Mediation Analysis

The researchers conducted a mediation analysis and examined the direct impacts to explore the unique indirect effects of specific pathways on the outcome variable.

Table 5: Specific Indirect Effect

Path	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics	P values
AR → IE → DS	0.245	0.249	0.049	5.014	0
AR → PV → DS	0.125	0.125	0.032	3.916	0

According to Table 5, two routes with substantial indirect effects emerged from the data, pointing to partial mediation. These findings suggest that the routes' intermediate variables help to explain the correlation between the predictor and the outcome variables.

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5. DISCUSSION

The study's findings advance the knowledge of the connections among augmented reality, destination satisfaction, perceived value, and immersive experiences with Cultural and historical destinations. The results back up earlier studies and provide fascinating data on how AR influences visitors' perceptions of, and overall satisfaction with, historical and cultural sites.

To determine how AR affects tourists' destination satisfaction at cultural and historical locations is the first goal of this research, and the results demonstrate a highly significant connection between augmented reality and how satisfied tourists are with their destination at historical and cultural tourism destinations. This finding indicates that augmented reality significantly enhances visitors' satisfaction with these locations (Guttentag, 2010).

The second objective was to investigate how perceived value affects a traveller's satisfaction with a location in cultural and historical tourist attractions using AR. The study discovered that the association between AR and DS significantly impacts perceived value. Additionally, these results demonstrate how tourists' perceptions of the value they get from an AR experience affect their degrees of satisfaction at historical and cultural places (Tussyadiah and Pesonen, 2016).

The third objective examined how immersive experiences in cultural and historical tourist sites mediate the link between augmented reality and destination satisfaction. The findings demonstrated that immersive tourist experiences in cultural and historical places substantially impact the association between augmented reality and destination satisfaction. These findings suggest that the immersive nature of the AR experience significantly affects visitor satisfaction with the time spent on these websites. (Guttentag, 2010).

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Assessing the link between a fully immersive experience and perceived worth is the fourth goal of this study, and the data analysis shows a vital correlation between an immersive experience and as well as perceived value. Moreover, this finding also suggests that the immersive aspects of the tourist experience benefit the value of visiting cultural and historical sites (Tussyadiah and Pesonen, 2016).

Overall, the findings of this research provide significant knowledge regarding the connections among augmented reality, destination satisfaction, perceived value, and immersive experiences at cultural and historical tourist destinations, and additionally, they support earlier research. These results highlight how crucial augmented reality technologies are to raising visitors' satisfaction levels and perceptions of value.

However, it is crucial to recognize that the study did not establish discriminant validity, which is one of the limitations of the research. This lack of incorporation does not necessarily mean that the assumptions are false. It suggests that future research should address it and that an in-depth examination of hypothesis testing findings is required (O'Leary-Kelly and Vokurka, 1998).

6. CONCLUSION

According to research, AR affects tourists' satisfaction with their travel destinations in places with a solid cultural and historical background. Also, Perceived value and immersive experiences act as key mediating factors. The current research results highlight the potential advantages of adopting augmented reality technology in popular tourist destinations with a strong cultural and historical heritage. Augmented reality can improve visitors' immersive experiences, boosting their engagement and contentment with the site. Destination management must put high perceived value for tourists first, attract packages and promotions, and improve the quality of experiences, facilities, and services if it wants to benefit from this technology. To assist travel service providers in better comprehending and using AR technology, training and seminars should be made available to them. Visitors will have the best

possible experience as a result. Collaboration is essential for developing sustainable tourism practices to safeguard cultural treasures, advance economic development, and reduce detrimental environmental and societal effects. Local communities, commercial enterprises, and governmental organizations should all be tourism stakeholders. Cultural and historical sites may increase visitor experience, protect their assets, and contribute to the widespread success of the tourism sector by combining AR technology with sustainable practices.

Additionally, these findings contribute to the corpus of current information and suggest possible study avenues, such as examining the long-term effects of AR on tourist behaviour and loyalty, investigating the influence of heritage and cultural considerations on travellers and their opinions about AR, and examining variations in visitor estimates based on the tourism industry and cultural origin. Moreover, this study also has a few flaws. First, it is worth noting that hypotheses are valid even without demonstrated discriminant validity. Future studies should carefully analyze the results of further research on this subject. Second, tourist business owners must be more educated and informed about current technology and marketing trends. Third, the research conclusions cannot be generalised due to its small sample size and restricted geographic scope. The need for more studies on AR and tourist satisfaction in Sri Lanka makes it challenging to do a comparative analysis and access pertinent material easily.

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