Travel before you actually travel with Augmented Reality – Role of Augmented Reality in future destination

Abstract

The current study of Augmented Reality technology aims to understand consumers' behavioral aspects toward tourism destination intentions in the current situation of a pandemic. Augmented Reality's role has significantly influenced consumers' intentions to travel in the future, yielding fruitful results for academics and managers. The technology readiness index, technology acceptance model, quality, Augmented Reality psychological engagement, attitude, and enjoyment were used to assess consumer behavior. The final data analysis included 484 respondents, who provided insights into the use of Augmented Reality technology. The findings suggest that Augmented Reality aspects influence tourists who want to travel, tour, and realize their desired destination intention in the future. The conceptual framework's overarching theories with Augmented Reality aspects provide relevant findings across the fulcrum of tourism research.

Keywords – Future destination intention, expected enjoyment of destination, augmentation quality, augmented reality psychological engagement, technology readiness index, perceived usefulness

1. Introduction

Tourism organizations incorporate cutting-edge technologies into their services in order to attract customers and increase revenue. (Kim, 2016). The novel technologies provide immersive experiences and entertainment to tourists because of their features and usability (Jiang et al., 2022; Tsai, 2020). In the last two years, worldwide business models change due to pandemics (Bhagavathula et al., 2020). It is expected that tourism will not be the same as it used to be, and it will affect those countries where a significant chunk of their GDP comes from tourism (Gössling et al., 2020; Haywood, 2020). Hence, innovative technologies will help travelers assess future travels, such as augmented reality (Jung et al., 2015; Yovcheva et al., 2013). Augmented reality (AR) can serve many functions, such as providing beforehand information to give a real-life picture about the destination with pleasure and satisfaction (Li & Chen, 2019). AR can help consumers understand the various aspects of a destination, such as culture, history, scenery, food, and people. (Chung et al., 2015; Han et al., 2018). Hence, the AR technology in the tourism perspective can play a vital role for tourists to make future destination intentions (Furata et al., 2012). The mobile phone manufacturers are developing AR apps for tourism with AI tools for the end-user to be enthralled with the AR functions (Alha et al., 2019; Forno, 2018; Tom et al., 2018).

The functions of AR have attracted many industries, and its acceptance is remarkable among business and consumer platforms (Clark et al., 2021; Kirova, 2021). AR can provide an interactive experience in a mediated environment in real-time through its digital object layout (Chung et al., 2018). AR is a booming industry and the future technology for retail, education, medical, and travel (Alha et al., 2019; Boardman et al., 2020; Genç, 2018). COVID-19 clouded the future of tourism and impacted many tourism business models from various countries. (Haywood, 2020; Zhong et al., 2021). It is expected that tourism services around the world will revive again through vaccination and the use of innovative technologies. AR technology has attracted the tourism industry, scholars, and tourists worldwide (Bec et al., 2019; Wei et al., 2019). The current research study aims to understand whether RQ1: Do

consumers believe AR is valuable for future travel decisions? And RQ2: Can AR engage consumers for immersive and pleasurable experiences? These research aims need to be comprehended to have a better view how consumers think of future destination through the use of AR.

The current study seeks to comprehend future destination travel via the AR app. According to one study, the hedonic benefits of AR have a positive influence on consumers. (Stangl et al., 2020). The pleasure of using technology helps in adopting and continuous travel usage (Li & Chen, 2019). In the post-COVID-19 pandemic, the use of AR apps will aid tourist organizations and end-users in future destination decisions. The authors chose the technology readiness index (TRI) and technology acceptance model (TAM) theories after reviewing various scholarly works in the field of AR and tourism. The use of the technology readiness index dimensions optimism and innovativeness will provide guidelines for the benefit of AR apps for future destination intentions (FDI). From the consumer's point of view, TRI offers insights into technology adoption and usage. (Parasuraman & Colby, 2015). TRI has positively impacted the tourism industry with perceived usefulness and ease of use (Cabiddu et al., 2013; Wang et al., 2017). In many research papers, TAM has shown the positive effect of technology usage and adoption in different sectors (Clark et al., 2021; Han & Hyun, 2017; Lu et al., 2015). TRI and TAM relationship may be a strong predictor for AR apps in tourism (Chung et al., 2018). Hence, the current study will focus on TRI and TAM relationships and how AR apps can help decision-making intelligence tourism.

In this study, the TRI and TAM theories are combined to better understand consumer intentions. TRI is widely regarded as the most influential theory in the field of technology usage, influencing users' values and beliefs about perceived usefulness.(Chen & Lin, 2018; Roy et al., 2018). The quality of AR apps can positively affect and engage consumers in adopting the technology. AR apps' quality and psychological engagement can provide crucial insights for future destination travel (Li & Chen, 2019). AR attitudes can positively impact consumers' intentions (Li & Chen, 2019; Wu et al., 2018). Hence, positive emotions can lead to positive results in adoption. Further, enjoyment can also lead to positive outcomes in using technology (Assiouras et al., 2022). Fun is considered a strong predictor for AI and AR technologies in their adoption (Li & Chen, 2019; Pillai et al., 2020). We can assume that attitude and enjoyment will significantly define this study's conceptual framework based on the previous results. The past studies have predicted that AR is of great advantage to organizations and tourists than traditional tourism services (Spielmann & Mantonakis, 2018; Yung & Khoo-Lattimore, 2019). Engagement through AR apps can provide positivity and joy to the end-user.

The current study focuses on how the AR app can assist in improving future destination intentions. As a result, more AR research is needed to determine their impact on consumers' preferences and engagement for future destination intentions. In addition, by taking into account all aspects of AR, the study will provide valuable insights from Chinese consumers. The study is organized as follows: a) literature review, b) methods, c) research analysis, d) discussion, and e) conclusion.

2. Theory and hypothesis development

2.1 Technology readiness index: Optimism and Innovativeness

Technology is convenient for some and can cause inopportuneness for others (Parasuraman & Colby, 2015). Many scholarly works have provided positive insights into consumer behavior from the TRI perspective (Chen & Lin, 2018). TRI concept relates to technology's inclination to help people accomplish goals in their lives (Parasuraman & Colby, 2015). TRI has four dimensions: openness, positivity, distress, and uncertainty associated with new technology usage (Parasuraman, 2000). Consumers with favoritism towards innovation are more likely to adopt the latest technology (Ahmad et al., 2020; Wang et al., 2017). But a percentage of users find new technology stressful and uncertain according to their beliefs and prefer not to adopt it (Fisk et al., 2011). The authors use optimism (OPT) and innovativeness (INN) in the current framework to understand consumer behavior towards future destination travel decisions. The reasons for using the two dimensions are that it will provide the consumer perspective concerning the positive belief and novelty of the technology.

The technology readiness index (TRI) and technology acceptance model (TAM) has been integrated into many studies to understand consumers' behavior (Bharadwaj et al., 2013; Jin, 2013). The reason to integrate the two theories was that TAM explained an individual's belief towards adopting a particular system or platform. In contrast, TRI explains consumer behavior towards adopting a technology (Lama et al., 2020; Lin et al., 2007). Therefore, TRAM studies in previous studies have been investigated in different contexts, such as e-commerce and other social media platforms (Bharadwaj et al., 2013; Jin, 2013). The studies have shown that the dimensions of TRI, i.e., discomfort and insecurity, are unstable in adopting new technologies (Borrero et al., 2014). And other dimensions of TRI optimism and innovativeness are strong predictors for consumer behavior adoption of new technology (Lin et al., 2007; Tsourela & Roumeliotis, 2015). Therefore, the present study will provide the tourists' mental aptitude for future travel through the use of AR app from the TRI framework. We propose the following:

H1: Optimism has a positive influence on the perceived usefulness of AR

H2: Innovativeness has a positive impact on the perceived usefulness of AR

2.2 Augmentation quality

The AR can engage consumers to have a customized output or service. Therefore, the qualitative aspects can play a vital role in AR app usage. Augmentation quality (AQ) is similar to the augmented reality quality concept used by Javornik (2016) in retail. AQ is defined as the output quality that results from interaction with digital contents in the real environment regarding mapping quality, correspondence quality, or information quality (Javornik et al., 2016). We argue that the end-user must stay in some realism for such technology to effect. The quality aspect is related to the information systems success model (ISS) (Freeze et al., 2019; Han & Hyun, 2015). The ISS model assists consumers in understanding the qualitative, system, and service aspects of technology, which leads to satisfaction and continued intention. (DeLone & McLean, 2016; Yeoh & Popovič, 2016). Therefore, the AQ function in ISS's perspective can help us understand consumer behavior.

The digital features of AR technology are critical in providing realism through its usage. AR functions' quality contents are information, digital visual contents, and other materials to enhance the end-user experience (Zhang et al., 2018). The info-graphics always attract the end-user with the high-end quality platform. A tourism study revealed that such visual

appeals enhance consumer experiences in the tourism industry (Hwang & Lee, 2019). The visual elements of high quality in AR can attract tourists to make better decisions for future traveling. AQ operationalization can be an influential variable in comprehending consumers' behavior in AR technology usage (Hilken et al., 2017). Hence, the AQ will enhance the consumers' experience with its qualitative contents in tourism for decision-making. We propose the following:

H3a: Augmentation quality has a positive influence on the perceived usefulness of AR

H3b: Augmentation quality has a positive influence on AR attitude

2.3 AR psychological engagement

Consumer engagement is not a new concept (McLean & Wilson, 2019), but AR psychological engagement (ARPE) is a relatively new concept from the tourism perspective. The current study will employ ARPE to understand the end-user's behavior towards technology usage. The previous studies have shown positive results that unforgettable destination experiences assure positive tourism results (Su et al., 2017; Yolal et al., 2017). Further, pleasurable experiences lead to solid bonding between the end-user and the destination brand's image (Mukherjee et al., 2018). Thus, it can be understood from the previous statements that destination images or pleasurable experiences can engage tourists' psychology in making a better travel destination decision or revisit intention. Previous studies have predicted that technology can engage consumers and provide a satisfying experience (Han et al., 2020; Tarute et al., 2017; Yusuf & Busalim, 2018).

Further, the concept of psychological engagement is linked to the theory of stimulus, organism, and reaction (S-O-R). We can assume that the AQ will enhance the tourist's stimulation, AR (organism component) qualitative contents, and the end-user psychological engagement (human reactions). The figure-1 represents the conceptual framework of the study.

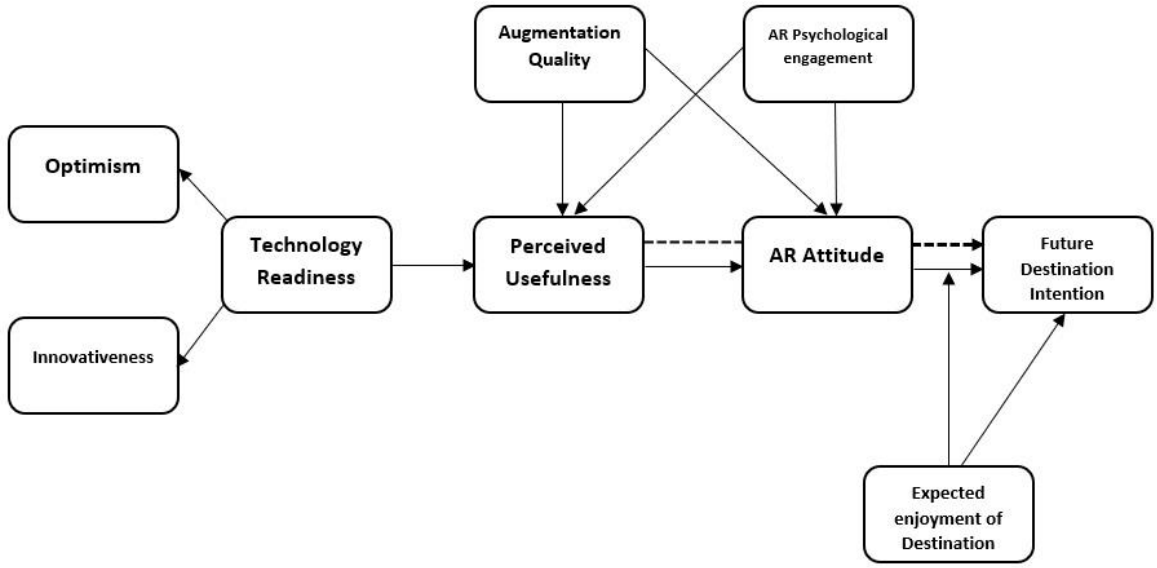


Figure-1 Conceptual framework

Psychological engagement is also a strong predictor for influencing consumers' attitudes (Flowerday & Shell, 2015; Karatepe & Avci, 2017). Previous studies have shown that positive psychological feelings develop with more involvement in ecotourism activities (Siakwah et al., 2020). Following the arguments from previous literature, it is assumed that the new variable ARPE will positively influence the perceived usefulness and attitude in the tourism perspective. Based on this assumption, we propose the following:

H4a: AR psychological engagement has a positive influence on the perceived usefulness of AR

H4b: AR psychological engagement has a positive influence on AR attitude

2.4 Technology acceptance model: Perceived usefulness

The technology acceptance model is a well-known concept that has been applied in many different fields such as online (Bonn et al., 2016; Malik & Rao, 2019), Virtual reality VR or AR (Manis & Choi, 2019), and education (Abdullah et al., 2016). The perceived ease of use and usefulness positively affect individuals' attitudes toward technology usage (Ali et al., 2022; Hyun & Han, 2015; Ivanov et al., 2020). TAM aims to comprehend consumers' adoption of a particular technology system (Tao, Nawaz, Nawaz, Butt, & Ahmad, 2018; B. Wu & Chen, 2017). Hence, AR's perceived usefulness can help develop a positive attitude, as predicted in previous studies (Butt et al., 2021; Koul & Eydgahi, 2018). This research study aims to understand the perceived usefulness (PUSF) of AR in making a better decision for future travel intentions. Hence, we propose the following:

H5: Perceived usefulness of AR positively influences AR attitude

2.5 Perceived expected enjoyment of destination

The pleasurable feelings or motivations are developed while doing somewhat exciting (Gagné et al., 2019). Pleasure, entertainment, enjoyment, or fun can be part of intrinsic motivations (Kim & Drumwright, 2016). Pleasurable experiences lead to positive behavioral intentions and attitudes (Wang et al., 2020). The enjoyment aspect relates to the flow theory. The flow theory predicts that the consumers' emotional behavior is affected when fully immersed in an activity that provides entertainment (Bilgihan et al., 2014; Koufaris, 2002; Wang et al., 2021). Therefore, the destination's perceived expected enjoyment of destination (EEOD) can predict the consumer's positive behavior towards AR apps' usage. The enjoyment factor of an end-user positively relates to the behavioral intention.

In the light of mobile social tourism shopping intention, enjoyment positively influences customers (Hew et al., 2018; Wang et al., 2021). Hence, the current study will predict the effect of pleasure on tourists' decisions. AR technology can influence positive vibes on the end-user in the light of fun. The destination will also have unique attractions, and AR enjoyment can enhance individual interests. The previous studies have predicted joy as a critical factor for providing pleasure and influencing the tourists on revisit intention (Ge & Gretzel, 2018; Lee & Kim, 2018). Hence, we can assume that tourists' expected enjoyment of the destination could positively affect the usage of AR apps and consumer intention's perceived enjoyment. Accordingly, we propose the following hypothesis:

H6a: Perceived expected enjoyment of destination positively influences future destination intention

H6b: Perceived expected enjoyment of destination moderates between AR attitude and future destination intention

2.6 AR attitude

Attitude is a strong predictor in positively influencing consumers' decision-making using new technology (Spielmann & Mantonakis, 2018). The individual's behavioral intention defines attitude. Attitude has shown positive results in consumers' destination decisions in the tourism context (Mendes-Filho et al., 2018). In the current study, the AR attitude (ARAT) from the tourism perspective refers to the tourists' positive feelings regarding future travel. It is assumed that the positive ARAT will influence consumers' decision-making for future traveling. Further, the previous studies show that attitude mediates positively between perceived usefulness and consumer's intention (Chen et al., 2018; Purnawirawan et al., 2012). Hence, the current study can argue that the ARAT will positively mediate AR and future destination intention's perceived usefulness. We propose the following hypothesis:

H7a: AR attitude has a positive influence on future destination intention

H7b: AR attitude mediates between perceived usefulness of AR and future destination intention

3. Methodology

The cross-sectional study format is used for the current research work. For the collection of data simple random sampling technique was used. The respondents were students, job, and business personnel. The data was analyzed through Smart PLS. The reason for choosing the Smart PLS is that this technique can estimate complex relationships, structural paths, indicator variables without imposing distributional assumptions on the data (Hair et al., 2019). And Smart PLS is widely used and accepted by researchers worldwide (Safeer et al., 2021; Sarstedt et al., 2022).

3.1 Instrument Development

The measurement items for the conceptual framework were primarily adapted from prior studies. The dimensions of TRI, i.e., optimism and innovativeness of the users, were adapted from (Chung et al., 2015). AR attitude, perceived usefulness, and future destination intention were adapted from (Chung et al., 2015). Augmentation quality items were adapted from (Rauschnabel et al., 2019). AR psychological engagement is a new variable developed from prior studies (Hollebeek et al., 2019; Quoquab et al., 2020). The measurement items for the destination's perceived expected enjoyment were adapted (Li & Chen, 2019). A survey questionnaire was developed first in English and then translated into Chinese by professionals with experience in both languages. After thorough checks and proofreading, the discrepancies were removed from the questionnaire. The study was conducted with multi-measurement items for each construct to overcome the single item limitations, likely to have a high measurement error rate.

3.2 Data Collection

The study is about understanding the AR technology for future destination intention. The COVID-19 has changed the tourism business entirely due to travel restrictions (Chinazzi et al., 2020). Hence, future traveling will heavily be dependent on technology to make better and more informed travel decisions. The study will highlight how AR can help tourists make better decisions for future destination intentions. We are using a specific AR function of apple maps called "flyover" for this particular purpose. The flyover app contains VR and AR functions that intrigue users to develop a sense of realism of the destination they choose through it. The iPhone users are acquainted with the Apple maps, and this "flyover" mode provides the user with the ability to see the city in the AR and VR format. Consumers can use the touchscreen or physically move along the phone to look around the selected city in the "flyover" mode (Apple, 2021; Forno, 2018). The physical movement concept of the flyover app is just like the Pokémon Go app. The respondents for this particular study are from China. Choosing Chinese consumers is predicted that future traveling is likely to be Chinese. In 2018 collectively, the Chinese had spent more than $258 billion on international travel (Reed, 2019).

More than 228 million iPhone users are in China, and the number is growing (Statista, 2017). We know the current tourism industry is at a halt, but soon it will revive, and AR technology will be the key to helping tourists make future intention destination decisions. An on-site survey was conducted in different universities and markets from users who have iPhones and have had experience or are willing to experience "flyover" mode in the apple maps for the future destination. It was a difficult task, and hence it took one month to collect data. The responses were collected in November 2020. The results were from the city of Dalian, China. A total of 5 local Chinese students with a tourism major and good English were used as field researchers to collect data. Each field researcher was adequately trained to explain Apple's "flyover" mode. The respondents could choose from one of the two countries: Australia and Japan for future destination travel. It is predicted that these two countries will most likely be in the top ten preferred by Chinese tourists (TTR Weekly, 2020). The respondents were introduced to the flyover app and its VR and mainly AR functions essential for the current framework. The respondents were asked to use the app for 10 minutes to feel their chosen destination. We surveyed 497 respondents. Due to inconsistent or partial responses, thirteen questionnaires were eliminated during the data modification process. Finally, 484 sample responses were coded for the data analysis with SMART PLS. The table-1 represents the complete demographic profile.

Table-1 Demographic profile

Characteristics		**Frequency**	**%**
Gender	Male	296	61.16
	Female	188	38.84
Age	15-20	63	13.02
	21-25	141	29.13
	26-30	133	27.48
	31-35	65	13.43
	36-40	51	10.54
	41-45	19	3.93

	Above 45	12	2.48
Education	Undergraduate Degree	322	66.53
	Master Degree	117	24.17
	Ph.D. Degree	45	9.30
Marital Status	Single	196	40.50
	Married	288	59.50
Occupation	Student	117	33.62
	Job	308	88.51
	Business	59	16.95
Monthly income	3000 - 6000 RMB	44	9.09
	6001 - 10000 RMB	160	33.06
	10001 - 15000 RMB	124	25.62
	15001 - 20000 RMB	97	20.04
	Above 20000 RMB	59	12.19

4. Research and data analysis

4.1 Outer Measurement Model

The discriminant validity of constructs was validated through a robust measure developed by Henseler and Sarstedt (2013) called the HTMT ratio based on the Monte Carlo simulation. HTMT ratio is based on inner construct correlation, and the threshold value is 0.90. HTMT correlation values are illustrated in Table-2, and all the values are lower than the standard value of 0.90 and validating the discriminant validity of constructs.

Table-2 Discriminant Validity

(Obtained by Running Algorithm in SmartPLS)

	AQ	ARAT	ARPE	EEOD	FDI	INN	OPT	PUSF	AVE
AQ	0.927[a]	0.295[c]	0.271	0.228	0.345	0.386	0.207	0.269	0.717
ARAT	0.543[b]	0.848	0.341	0.341	0.317	0.362	0.291	0.318	0.650
ARPE	0.521	0.584	0.873	0.338	0.345	0.310	0.216	0.343	0.580
EEOD	0.477	0.584	0.581	0.860	0.324	0.268	0.255	0.359	0.673
FDI	0.587	0.563	0.587	0.569	0.909	0.578	0.366	0.301	0.770
INN	0.621	0.602	0.557	0.518	0.760	0.898	0.392	0.272	0.639
OPT	0.455	0.539	0.465	0.505	0.605	0.626	0.942	0.206	0.764
PUSF	0.519	0.564	0.586	0.599	0.549	0.522	0.454	0.892	0.734
Mean	4.303	4.180	4.159	4.008	4.266	4.329	4.227	4.244	
SD	0.747	0.872	0.873	1.113	0.720	0.783	0.861	0.835	
Cronbach's Alpha	0.901	0.735	0.818	0.769	0.850	0.859	0.923	0.819	

***Note**: AQ (Augmentation quality), ARAT (AR attitude), ARPE (AR psychological engagement), EEOD (expected enjoyment of destination), FDI (Future destination intention), INN (innovativeness), OPT (Optimism) and PUSF (Perceived usefulness)*

[a] Denotes Composite Reliabilities of constructs (Diagonal Highlighted values)

[b] Denotes HTMT Ratio (Correlations) between constructs (Below Diagonal Values)

[c] Denotes Squared Correlations (Above Diagonal Values)

Following Hair et al, (2017) and Henseler et al, (2009), we have evaluated the outer measurement model by assessing the internal consistency discriminant validity and convergent validity. Consistency evaluation is based on reliability tests, whereas convergent

and discriminant validity tests evaluate the validity (Hair et al., 2012). Factor loadings ensure that items of constructs serve the purpose of measuring what is intended to measure (Joe F Hair, Ringle, & Sarstedt, 2011). Table-3 illustrates the results of Cronbach's alpha, average variance extracted, and VIF.

Table-3 Reliability and Validity

Table-III Reliability and Validity		
Constructs and Respective Items	Loadings	VIF
Augmented Quality		
AQ1	0.78	1.81
AQ2	0.85	2.40
AQ3	0.86	2.99
AQ4	0.88	3.32
AQ5	0.87	2.58
AR Attitude		
ARAT1	0.77	1.20
ARAT2	0.84	2.04
ARAT3	0.81	1.99
AR Psychology Engagement		
ARPE1	0.75	1.58
ARPE2	0.79	1.82
ARPE3	0.84	2.05
ARPE4	0.68	1.52
ARPE5	0.74	1.67
Expected Enjoyment of Destination		
EEOD1	0.8	1.20
EEOD2	0.83	2.85
EEOD3	0.83	2.84
Future Destination Intention		
FDI1	0.9	2.47
FDI2	0.87	1.97
FDI3	0.86	2.01
Innovativeness		
INN1	0.79	1.92
INN2	0.83	2.14
INN3	0.79	1.86
INN4	0.81	1.99
INN5	0.78	1.69
Optimism		
OPT1	0.82	2.32
OPT2	0.89	3.37
OPT3	0.9	3.51
OPT4	0.9	3.25
OPT5	0.86	2.72
Perceived Usefulness		
PUSF1	0.85	1.72

PUSF2	0.89	2.14
PUSF3	0.83	1.80

AQ (Augmentation quality), ARAT (AR attitude), ARPE (AR psychological engagement), EEOD (expected enjoyment of destination), FDI (Future destination intention), INN (innovativeness), OPT (Optimism) and PUSF (Perceived usefulness)

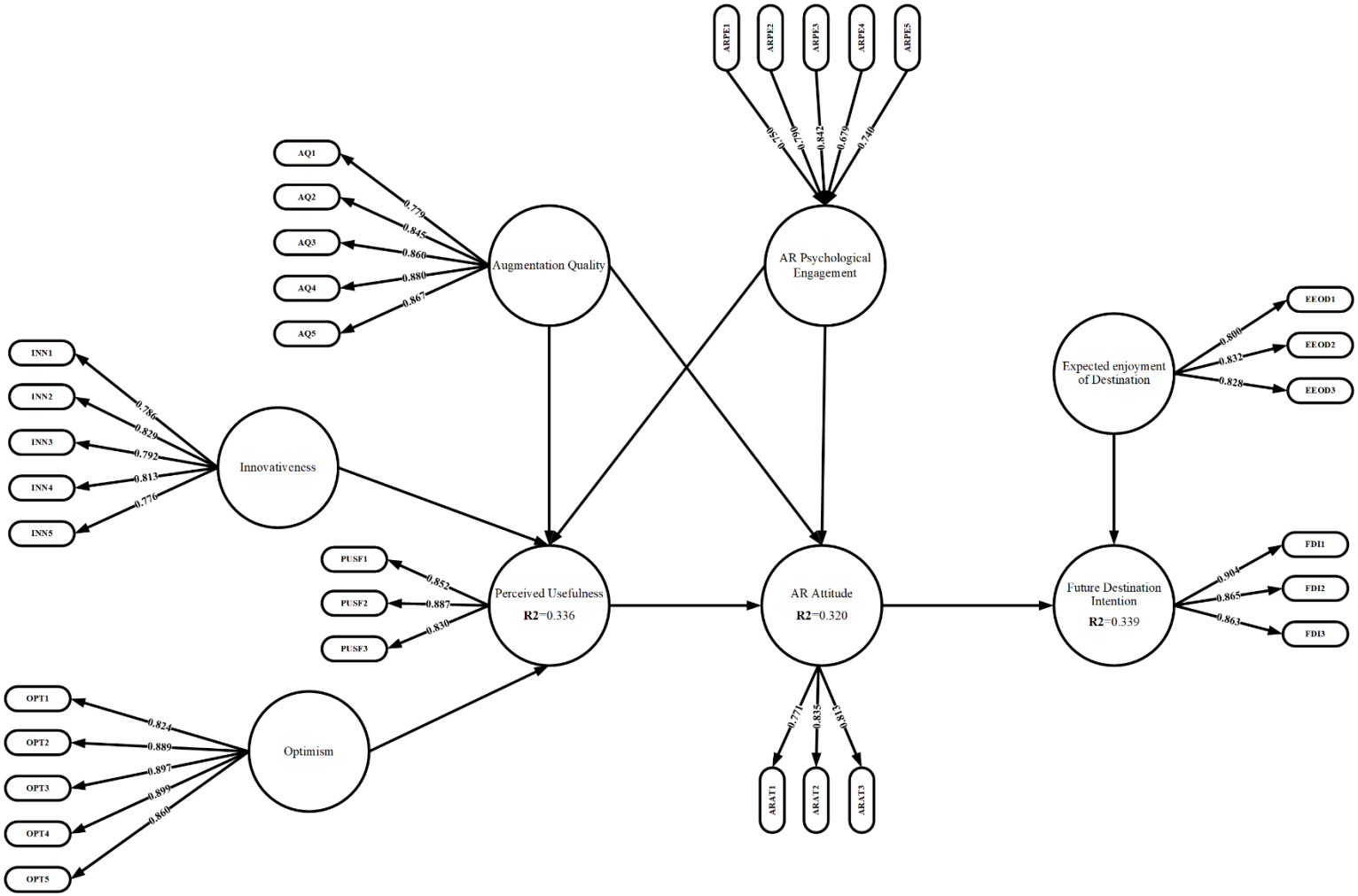


Figure-2 Measurement Model

AQ- Augmented Quality; ARPE- AR Psychological Equipment; EEOD- Expected Enjoyment of Destination

PUSF- Perceived Usefulness; OPT- Optimism; ARAT- AR Attitude; FDI- Future Destination Intention

4.2 Inner Structural Model

After testing and validating the measurement model's reliability and validity, the next is to assess the inner structural model intended to validate the model's hypothesized relationship. The inner structural model is based on path coefficients, the significance of path coefficients, and the goodness of fit index (GOF).

4.2.1 Hypothesis Testing

Table-4 illustrates the regression analysis results and provides insights into the direct relationship between independent and dependent variables. In H1, we proposed a positive and significant relationship between optimism and perceived usefulness (β=0.127, T-Stat=2.142, $p<0.05$); therefore, H1 accepted robustly. Findings also suggested a positive and meaningful relationship between innovativeness and perceived usefulness as depicted by the coefficient and significance values (β=0.127, T-Stat=1.872, $p<0.10$), but this hypothesis is significant at 10% level. H3a also supported the result where we proposed a positive and meaningful relationship between augmentation quality and perceived usefulness, therefore, H3a robustly accepted. This study observed a positive relationship between augmentation quality and augmented reality attitude; results supported H3b. In H4a, we hypothesize that AR psychological engagement positively and significantly affects perceived usefulness; study results supported this hypothesis. According to the results, AR psychological engagement positively impacts AR attitude. This effect is significant as indicated by the T-stat and p-value; therefore, H4b is accepted empirically.

Table-4 Hypothesis Test

	Hypothesis	Coefficient	T Statistics
Direct Effects			
Hypothesis-1	OPT→ PUSF	0.127	2.142**
Hypothesis-2	INN → PUSF	0.127	1.872*
Hypothesis-3a	AQ → PUSF	0.196	3.266***
Hypothesis-3b	AQ → ARAT	0.245	4.066***
Hypothesis-4a	ARPE → PUSF	0.287	4.078***
Hypothesis-4b	ARPE → ARAT	0.242	3.611***
Hypothesis-5	PUSF → ARAT	0.221	3.229***
Hypothesis-6a	EEOD → FDI	0.304	5.529***

Hypothesis-7a	ARAT → FDI	0.235	4.478***	
Moderating Effects				
Hypothesis-6b	EEOD*ARAT → FDI	-0.113	3.416***	
Indirect Effects				
Hypothesis-7b	PUSF → ARAT → FDI	0.052	2.600***	
Variance Explained	**Model Fit (SmartPLS)**	**GoF=√(R2*AVE)**	**All indirect effects**	**β Coefficient**
R2 (PUSF)=0.336	SRMR=0.058		AQ -> PUSF -> ARAT	0.0434**
R2 (ARAT)=0.320	NFI= 0.801	GoF=0.479	ARPE -> PUSF -> ARAT	0.064***
R2 (FDI)=0.339			INN -> PUSF -> ARAT	0.028
Total Effects	**β Coefficient**		OPT -> PUSF -> ARAT	0.028*
Total Effects on Perceived Usefulness			AQ -> ARAT -> FDI	0.058***
OPT	0.127**		ARPE -> ARAT -> FDI	0.057***
INN	0.127*		AQ -> PUSF -> ARAT -> FDI	0.010*
AQ	0.196***		ARPE -> PUSF -> ARAT -> FDI	0.015**
ARPE	0.287***		INN -> PUSF -> ARAT -> FDI	0.007
Total Effects on AR Attitude			PUSF -> ARAT -> FDI	0.052***
AQ	0.288***		OPT -> PUSF -> ARAT -> FDI	0.007
ARPE	0.305****			
PUSF	0.221***			
Total Effects on Future Destination Intention				
ARAT	0.235***			
EEOD	0.304***			

Note:1 *, **, *** denotes significance Level at 10%, 5%, and 1% respectively.

Note:2 AQ (Augmentation quality), ARAT (AR attitude), ARPE (AR psychological engagement), EEOD (expected enjoyment of destination), FDI (Future destination intention), INN (innovativeness), OPT (Optimism), and PUSF (Perceived usefulness)

The positive effect of perceived usefulness on AR attitude has been proposed in H5, and this hypothesis is accepted based on empirical results. Similarly, H6a and H7a are robustly accepted based on empirical results shown in Table-4. In H7b, we proposed that AR attitude plays a mediating role between perceived usefulness and future destination intentions; this hypothesis is also accepted based on quantitative results.

A moderating effect of perceived expected enjoyment of destination has been proposed in H6b, and results provided that the moderating effect has a negative coefficient. Therefore, we have used Jeremy-Dawson two-way interaction graph to explain the moderation. Figure-3 indicates that where the moderator's low values, the independent variable effect on the dependent is also lower. Where the values of the moderator are high, the impact of independent on dependent turns stronger. Therefore, we can claim that a higher EEOD makes the ARAT effect on FDI stronger.

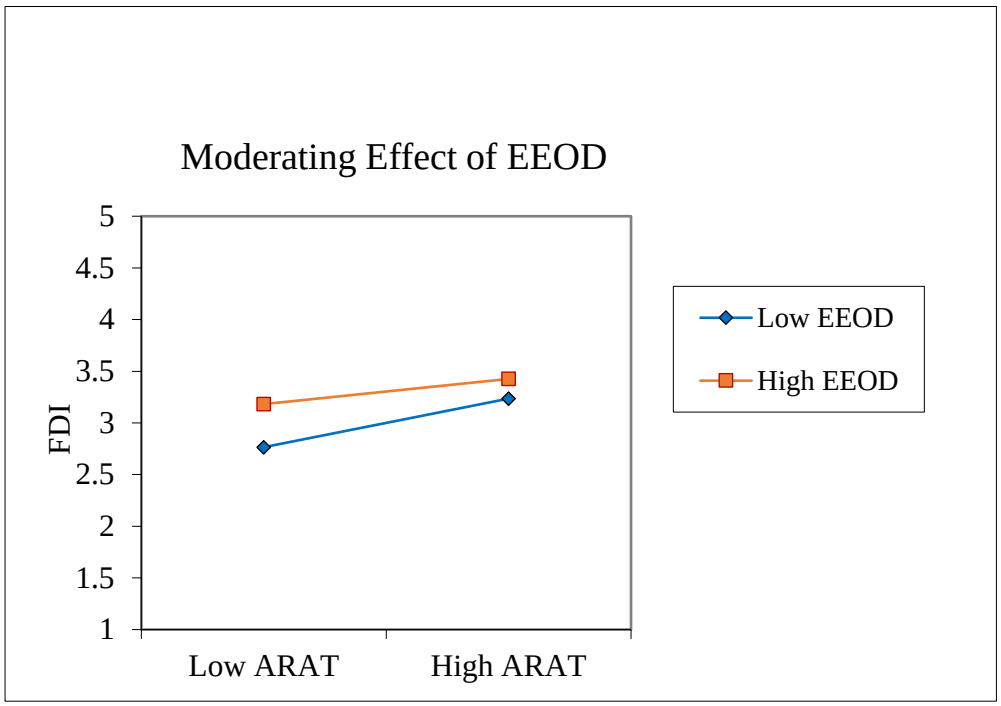


Figure-3 Moderating effect of EEOD

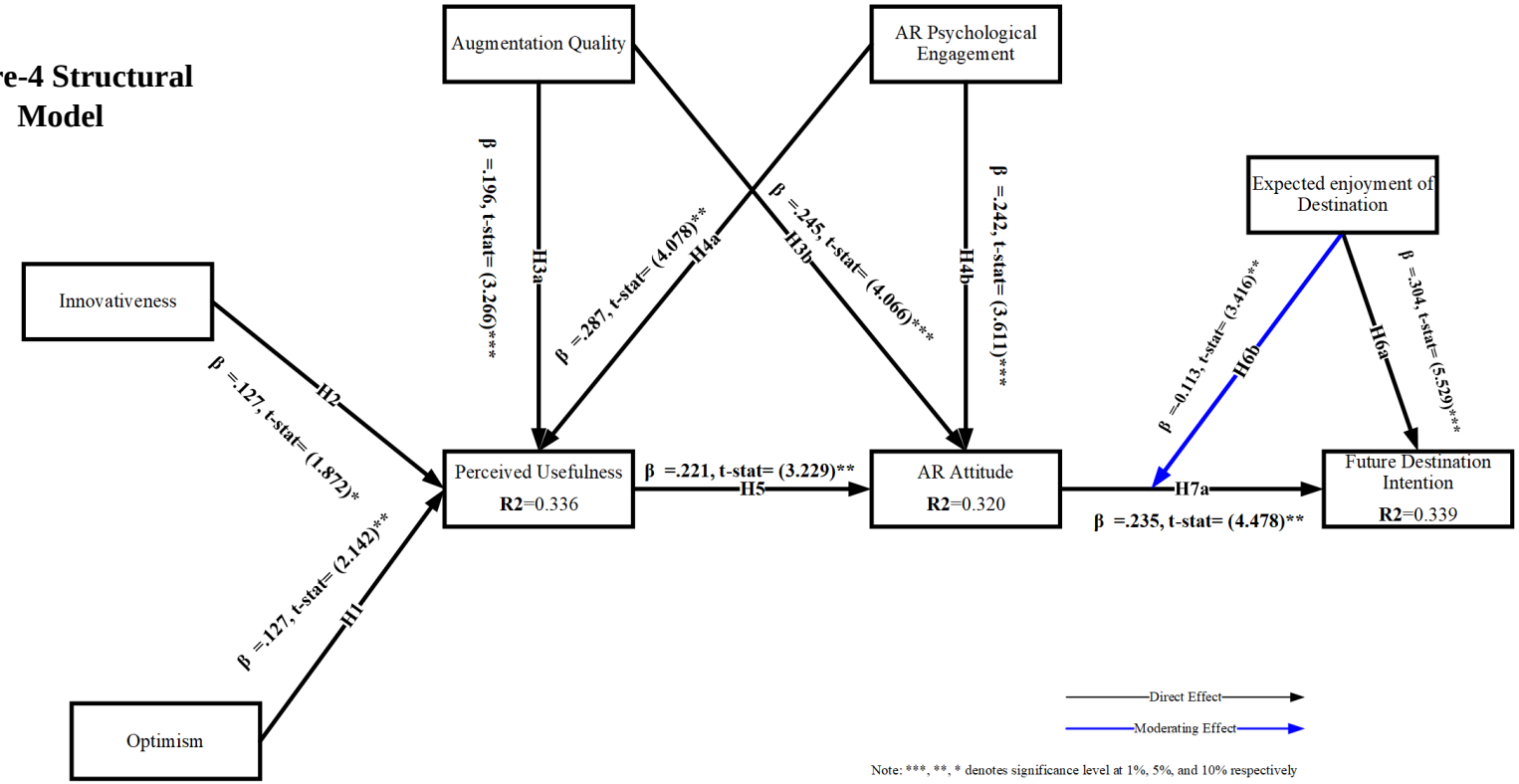
4.3 Goodness-of-Fit Index

The goodness of fit (GOF) index is used to measure the complete model fit to verify that model is sufficiently explaining the data (Tenenhaus, Vinzi, Chatelin, & Lauro, 2005). Equation-1 was used to GOF index, where AVE was measured as (Geometric mean of Average Communalities) and average values of R^2 of all constructs (Tenenhaus et al., 2005). GOF value for this study's model is 0.479, which is considered substantial and indicates a good model fit. The figure-4 represents the structural model details.

Table-5 Goodness of Fit Index

	AVE	R Square	GOF=$\sqrt{R2 * AVE}$
ARAT	0.650	0.320	
FDI	0.770	0.339	**0.479**
PUSF	0.734	0.336	
AQ	0.717		
ARPE	0.580		
EEOD	0.673		
INN	0.639		
OPT	0.764		
Average	**0.691**	**0.332**	

Figure-4 Structural Model



5. Discussion

The current study framework provided valuable insights. The use of augmentation quality and AR psychological engagement proved to be significant predictors of perceived usefulness and AR attitude, and the results are in line with the previous studies (Chung et al., 2015; Li & Chen, 2019). The dimensions of TRI: optimism and innovativeness also proved crucial for the perceived usefulness, in line with previous studies (Chung et al., 2015). Consumer acceptance of new technology, such as AR in tourism, is crucial in the current business environment. Hence, in the current framework, the AR usage helped the end-users psychologically engage with the qualitative contents to make a better future destination decision. The previous studies have prioritized TRI and PUSF as key indicators of adopting or using new technology (Jin, 2013; Lin et al., 2007).

Further, the relationships between augmentation quality and perceived usefulness and AR psychological engagement and perceived usefulness show positive results. Such a finding highlights the critical role of AQ and ARPE in tourists' FDI. In the future, more focus on AQ and ARPE will enhance the PUSF and ARAT in tourism. The perceived usefulness positively influences the AR attitude. The previous studies have highlighted that when consumers find helpful technology, they tend to develop a positive attitude towards it (Bonn et al., 2016). And AR attitude positively affected the FDI of the end-users with the usage of AR technology. Therefore, it is essential to understand consumers' tourism experience and behavior during IT services to determine the tourist outcome (Folgado-Fernández et al., 2017). Another critical component for AR technology usage that can enhance consumers' intrinsic motivation is the destination's expected enjoyment. The findings align with the previous studies (Li & Chen, 2019). The EEOD reflects that AR usage for tourism decisions is crucial for FDI.

5.1 Theoretical contributions

AR technology plays a vital role in businesses, and this novel format influences consumers to have an immersive experience during the buying decision process (Butt et al., 2021). The current research study has shown valuable insights in understanding consumer behavior while using an AR app for future destination intentions. Firstly, the present study highlighted the AR role to the users concerning future destination intentions. The findings provide sustenance towards the conceptual framework with positive effects on future destination intention (Chung et al., 2015; Quoquab et al., 2020). Hence, the study suggests that innovative technologies such as AR must be presented and applied in tourism, especially in COVID-19 times, for businesses to sustain growth. The results contribute to AR literature and in the development of AR theory. Secondly, the study provided personal and cognitive AR usage for future destination intentions. Consumers in China are considered very adaptive to new technology (Chen & Lee, 2017). Hence, cutting-edge technology, such as AR with its qualitative contents, can engage the consumers and develop a positive attitude. The ISS model is primarily used for information technologies and systems. The use of augmentation quality in the current study adds to the ISS literature with positive results.

Thirdly, the usage of innovative technologies experience can be enhanced with the organization's IT infrastructure (Wu et al., 2017). A better IT infrastructure can provide better results for the organization. Therefore, using TRI and TAM dimensions with augmented quality, AR psychological engagement, and AR attitude have provided the base to understand the behavioral intentions towards destination decisions. The findings of the current framework contribute to the TRI and TAM theories from AR's perspective. Fourthly, AR is an innovative tool compared to traditional approaches (Genç, 2018). A destination's expected enjoyment is essential because it is a critical factor in travel intention (Li & Chen, 2019). In the current study, the enjoyment aspect helps determine a better decision regarding future destination intention. The pleasure of using AR technology with its qualitative content and engagement can enhance tourism's end-user experience. Hence, AR technology will provide the tourists with benefits, engagement, and enjoyment. The results of enjoyment contribute to the flow theory from AR's perspective.

5.2 Practical contributions

The findings reflect positive effects on the tourism industry. Firstly, AR usage's technological and behavioral aspects with TRI and TAM dimensions are helpful in tourism. Therefore, tourism application developers, tourism operators, and other tourism organizations should introduce innovative technologies such as AR in tourism. The mentioned stakeholders should also educate the people related to AR because it is growing in tourism. Secondly, this innovative technology's augmentation quality and AR psychological engagement positively affect perceived usefulness and attitude. The concerned organizations should develop helpful AR tools to engage consumers in the tourism industry. Thirdly, a positive attitude towards technology leads to positive choices. The beliefs help strengthen the use of technology such as AR, and the study findings support the importance of attitude towards AR. Therefore, tourists operators, tourism application developers, and destination management organizations must determine tourists' requirements through empirical studies until such innovative technology becomes settled.

Fourthly, the tourism industry managers should focus on providing the enjoyment of destinations through AR usage. The enjoyment factor increases the experience and engages the consumer in using a technology that can lead to loyalty, word of mouth, and customer well-being. Further, the augmentation quality and AR psychological engagement can also enhance the pleasurable experience of the consumers. Hence, AR's enjoyable experience can influence consumers to make positive decisions towards future destination intentions. Fifthly, more AR qualitative content can enhance the consumer experience. The qualitative content can influence usefulness, develop a positive attitude and engage in an enjoyable AR technology experience. Hence, the interactive AR environment can help the managers in the tourism industry to engage the end-users. Lastly, more tourism cities in AR apps should be introduced to increase the circle of tourism destinations, and consumers can experience travel even before traveling. The AR technology in tourism can help tourists make better decisions for traveling.

6. Limitations and future suggestions

Regardless of the fruitful contributions of this study, it has a few limitations. First, the research is focused on two destinations, i.e., Australia and Japan. Hence, the study results should not be generalized for other destinations in the AR perspective. Second, the sample

size is large, but it does not represent the whole population of China. The sample size can be increased to have more valuable findings for future studies. More AR users should be part of such tasks. Thirdly, one urban city in China was part of the sample size. More, metropolitan cities of China can be part of future empirical studies. The framework for future studies can be revised with different theories and the integration of AI-powered tools. Such an idea can further the cognitive and behavioral aspects of the consumers concerning AR usage in tourism. Lastly, other factors with experience, habits, cultural values, destination brand image, and destination information can be considered for future studies.

7. Conclusion

AR technology is considered a breakthrough in the current situation for a tourism experience. Chinese consumers are adaptive in the use of innovative technology. The study framework provided positive results for future destination intention through TRI and TAM dimensions, augmentation quality, AR psychological engagement, AR attitude, and moderating effect of expected enjoyment of destination. The changing business environment requires integrating innovative technologies to have better performance. AR is state-the-art-of-technology that provides an engaging tourism experience even before traveling to the actual destination. The research findings provide evidence that AR positively influences travel decisions. The results contribute to a better understanding of AR usage functionality for tourism, making theoretical and practical contributions.

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