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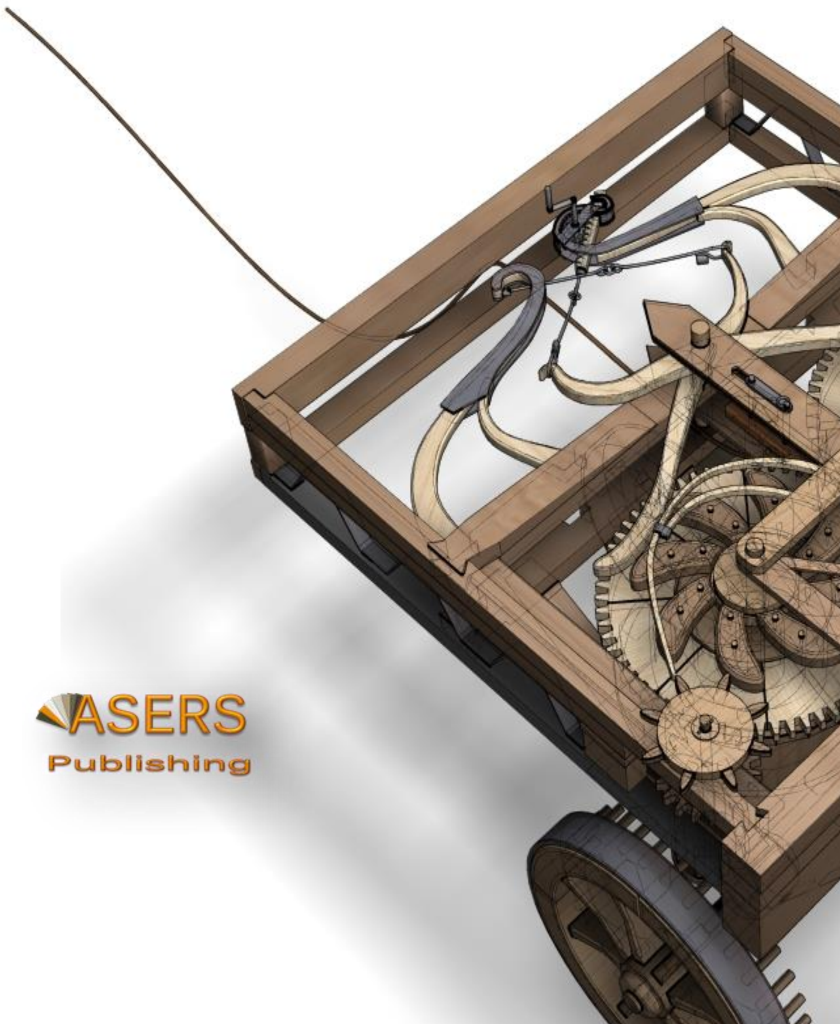

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Table of Contents:

1	**Collective Intelligence and Structural Transformation in the Moroccan Tourism Industry during the COVID-19 Pandemic: A Field Survey in the Marrakech-Safi Region** Wijdane MERIOUMI, Bouchra AIBOUD BENCHEKROUN	1899
2	**Navigating the Fine Line of Sustainable Tourism: A Critical Analysis with Implications for Tourism Planning** Kevin FUCHS	1908
3	**The Contribution of Tourism Industry Cash Flows to Economic Growth "Middle East Evidence"** Mohammad ALADWAN	1915
4	**The Influence of Halal Attractions and Memorable Experiences on Tourists' Destination Choices: An Indonesian Perspective** Muaidy YASIN, Lalu Edy HERMAN	1926
5	**The Complexity of the Legal Framework for Regulating the Activity of Tourist Guides in Kosovo** Armand KRASNIQI, Diamanta SOJEVA, Bekë KUQI	1935
6	**Strategic Planning for Taiwanese Industrial Tourism Parks Themed on Local Characteristic Industries** Hung-I TAI, Li-Wei LIU, Lung-Shih YANG, Chi-Chiang HSIEH	1942
7	**Tourism and COVID-19: Changes in Travel and Behavioral Patterns of Residents of Bosnia and Herzegovina** Amra ČAUŠEVIĆ	1950
8	**Land Areas Management for Development of Tourism Different Types** Aigul SHAIMERDENOVA, Madi NURPEISSOV, Kamshat AKHMETOVA, Valentina GARKUSHINA	1962
9	**Identification of Features for the City Branding: The Case of Shusha City, Azerbaijan as Tourism Destination** Bahman HUSEYNLI	1972
10	**Strategies for Sustainable Rural Tourism Innovation: Evidence from Hanoi, Vietnam** Hoa VU DINH, Tuan NGO ANH, Anh NGUYEN THI NGOC, Chi NGUYEN THI	1984
11	**Non-Price Competitivenes Factors in a Value Chain of a Tourism Product** Mariia GARASYMLIUK, Bohdan DANYLYSHYN, Uliana MARTYNIUK, Viktoriia MAKAROVYCH, Olha POLIVODA, Tetiana NEZVESHCHUK-KOHUT, Nazariy POPADYNETS	1996
12	**State Policy Regulations of Agriculture for Sustainable Development of Rural Tourism** Baglan AIMURZINA, Shakhman YERTARGYN, Aigul NURMAGANBETOVA, Aina NARYNBAYEVA, Gulzhan ABDRAMANOVA, Zhamilya MIZAMBEKOVA	2004
13	**How Smart Are You at Traveling? Adoption of Smart Tourism Technology in Influencing Visiting Tourism Destinations** Lusianus KUSDIBYO, Wahyu RAFDINAL, Eko SUSANTO, Rina SUPRINA,	2015

Summer 2023
Volume XIV
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ASERS Publishing
http://www.asers.eu/asers-publishing
ISSN 2068 – 7729
Journal DOI: https://doi.org/10.14505/jemt

14	**The Effect of the Dollar, Euro, and Sterling Exchange on the Tourism Index in the Turkish Economy** Fariz AHMADOV, Nigar HUSEYNLI, Bahman HUSEYNLI	2029
15	**Putting Cities in the Framework of Sustainable Development; Evolution, Evaluation and Features of SDG 11** Ioannis METAXAS, Theodore METAXAS	2039
16	**The Transformational Role of Entrepreneurial Universities in Fostering Tourism Sector of Kazakhstan: Legal Documentary Analysis** Aigerim BAYANBAYEVA, Dauletkeldi MAKHMADINOV, Nurmukhamed MYRZATAYEV, Gaukhar NIYETALINA, Gulmira NARBAYEVA, Saule SULEIMENOVA, Bakhyt ALTYNBASSOV	2046
17	**Demand for Water Tourism by Rafting in the Upper Northeastern Region 1 of Thailand** Supreeya WAIYAWET, Sakkarin NONTHAPOT	2056
18	**Application of Interactive Media Techniques in Virtual Reality in the Marketing of Tourist Trails in Jordan** Ibrahim ALKURDI, Omar A. ALANANZEH, Ranea Mohammed QADDHAT, Lubna S. HAIJAWI, Sami A. ALHASANAT	2066
19	**Educational Tourism as a Source of Linguistic and Cultural Competence of Foreign Students on the Example of Azerbaijan** Tofik ABDULHASANLI, Gulnara RZAYEVA, Aygun AMIROVA, Zeynab HUSEYNOVA	2077
20	**Audit of the Effectiveness of Inter-Budgetary Relations: The Case of Tourism Industry** Aigul ALIBEKOVA, Gulmira NASYROVA, Aizhan ZHAMIYEVA, Madina TOLYSBAYEVA, Balsheker ALIBEKOVA, Zhanargul ZHUGUNISSOVA	2083
21	**Tourism Development and Local Community Welfare: A Case Study of the Mandalika Special Economic Zone** Sri Budi Cantika YULI, Emilia SEPTIANI, Risky Angga PRAMUJA, SUPIANDI, Mohamad NAJMUDIN	2097
22	**From Concept to Practice: Implementing Sustainable Tourism Development at Anurak Community Lodge in Thailand** Scott SMITH	2107
23	**Tourism Potential and the Assessment of Tourist Destinations as Basis for the Tourism Sustainable Development** Zhassulan SADYKOV, Rimma TAKHTAYEVA, Larissa NUSSUPOVA, Sharipa NURMUKHAMEDOVA, Zhaxylyk AKIMOV	2117
24	**From Decision Making to Practice: Economic Growth on Halal Tourism Policies Based on Sharia Regulation in Lombok, Indonesia** M. SYAMSURRIJAL, Achmad NURMANDI, Hasse JUBBA, Mega HIDAYATI, Zuly QODIR, Irwan ABDULLOH	2127
25	**Empirical Approaches Regarding Interdependency between Technology and Sustainable Tourism** Laura NICOLA-GAVRILĂ	2140
26	**The Impact of the COVID-19 Pandemic on the Tourism Industry of Kazakhstan** Dauren BERDIBEKOV, Olga LASHKAREVA, Aigul MAIDYROVA	2148

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How Smart Are You at Traveling? Adoption of Smart Tourism Technology in Influencing Visiting Tourism Destinations

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Abstract

This study analyses smart tourism technology adoption's role in influencing visiting destinations by providing unity to the technology acceptance model (TAM) mechanism and the model theory of planned behaviour (TPB), using 324 samples of tourists from Indonesia. This study uncovers eight dimensions of innovative tourism technology by applying exploratory factor analysis. A variance-based structural equation model is used to evaluate the model and test hypotheses. This study reveals that the integrated TAM and TPB model can better explain smart tourism technology adoption and visiting tourism destinations. The integrated model is suitable for adopting smart tourism technology, which is the basis for tourist behaviour in tourist destinations. From its finding, this study offers a foundation for formulating an implementation strategy for using appropriate smart tourism technology to attract tourists. By originality, this study describes empirical evidence to promote the values of the smart tourism technology dimensions in enhancing tourist intention to use smart tourism technology and visit tourism destinations.

Keywords: smart tourism technology; TAM; TPB model; intention to use STT; visiting tourism destination.

JEL Classification: Z32; L83; Z33; R11.

Introduction

Sophisticated information and communication technology have been applied in all sectors, including tourism. Technology development in tourism has been initiated since the 2000s (Cai *et al.* 2019). This development has transformed ordinary tourism destinations into "smart" destinations supported by mobile communication, cloud computing, artificial intelligence, and IoTs (Jeong & Shin 2020). Through this technology, the smart system is expected to provide more precise information, support decision-making, and create more tourism experiences for tourists and providers (Susanto *et al.* 2020; Wibisono *et al.* 2023). Moreover, by utilizing smart tourism technology, tourists can be more involved in tour activities such as obtaining, applying, and sharing tourism information (Um & Chung 2021). Thus, by investing in sophisticated ICT (*i.e.*, smart technology) in a tourism destination, destination marketers can encourage active participation, enrich the travel experience and increase the advantages of tourist destinations (Jeong & Shin 2020). The notion of smart tourism is relatively new; only limited study has explored the technology adoption in the tourism industry. Thus, in achieving future success in smart tourism technology, it is necessary to investigate how technology can be adopted and how it influences tourist behavior.

Some scholars have noted technology adoption in the tourism industry, and they believe that further studies exploring the drivers of technology adoption in tourism must be done (Azis *et al.* 2020; Ghaderi *et al.* 2018; Um & Chung 2021). One of the postulations that have been widely used and proven in technology adoption is the technology acceptance model (TAM) (Hua *et al.* 2017; Wang *et al.* 2016; Xia *et al.* 2018). This model explains that the degree of users' acceptance of new technology is driven by users' response to the ease and usefulness of the technology. However, with this complicated technology adoption process, some tourism scholars (Cai *et al.* 2019; Jeong & Shin 2020) recommend continuing a systematic effort to analyze the phenomenon of technology adoption in tourism. Regarding technology associated with tourism, such as smart tourism, some scholars believe that the theory of planned behaviour (TPB) possesses robust predictive utilities for various tourist behavioural intentions (Ghaderi *et al.* 2018). Next, Xie *et al.* (2017) and Chen (2016) have integrated TAM and TPB frameworks, indicating that the integration model assists in seizing the role of technology and comprehending reasons for customer intention. Although the integration model could offer a better prediction of consumer behaviour, surprisingly, no studies examine the integration of those two models in analyzing the adoption of smart tourism technology. A study could help tourism business players to develop technology related strategies to attract tourists.

This study offers a cohesive research model to fill the identified gap in describing smart tourism technology adoption. Specifically, this study: (1) evaluates the dimensions of smart tourism technology and (2) assesses visiting destinations using TAM and TPB. Two reasons underlay the selection of Indonesian tourism destinations for this study. First, it is due to the increase in tourist numbers. In 2021, the number of tourists was 1,557,530, which decreased from the previous year, which was 4,052,923 (BPS, 2022). However, in 2022 from January to August, the number of foreign tourist visits was even higher than in 2021, namely 1,858,866 tourists, which showed a significant increase (BPS, 2022). Second, many types of technology in tourism have been widely used in many developed and developing countries, influencing tourist visiting behaviour (Ghaderi *et al.* 2018; Jeong & Shin 2020; Shafiee *et al.* 2019). Considering that technology in tourism is predicted to grow continuously, identifying the factors causing tourists to visit tourism destinations influenced by technology is paramount in improving the competitive quality of tourism destinations in developing Indonesia.

This paper is arranged into six parts. Starting from the introduction, literature review, and hypotheses developed in the second section. The third section is the research method, discussion and theoretical implications in the fourth section, managerial implications in the next section, and limitations and ideas for future study.

1. Hypothesis Development

1.1 Smart Tourism

Since the beginning of the IoT, tourism has been one of the sectors which frequently changes. One of the popular issues in tourism these days is smart tourism. "Smart" indicates intelligent, digital, integrated, wireless, and/or huge (Um & Chung 2021). The idea of smart tourism initially popped up from smart city development (Başer *et al.* 2019). Smart tourism is a logical evolutionary development from conventional to e-tourism, where technology-based innovation acts as its basis (Shafiee *et al.* 2019). Many tourism destinations have utilized the "smart tourism" concept as it is turned "smarter" through an integrated technology platform, infrastructure, and operation planning (Başer *et al.* 2019; Lamsfus *et al.* 2015). Therefore, smart tourism technology may enable relevant parties to discover, acquire, utilize, and share detailed information while travelling, enhancing tourists' experiences (Um & Chung 2021). With its various advantages, it is important to do an in-depth analysis of smart tourism technology that can improve the competitive capacity of tourism destinations and influence tourists' future behaviour.

Some scholars have defined smart tourism and its dimensions (Ballina *et al.* 2019; Başer *et al.* 2019;

Wang *et al.* 2016). Başer *et al.* (2019) are destination platforms tourists use before, during, and after vacation. Ballina *et al.* (2019) applied the physical concept in explaining technology utilities in smart tourism destinations and noted that smart tourism consists of three important components: smart destination, smart business, and social change. Another study by Wang *et al.* (2016) built up attributes of smart tourism technology by utilizing technology choices by tourists in tourist attractions. With the rapid development of technology, the aforementioned studies suggest the continuing analysis of the validity and reliability of technology dimensions in smart tourism conceptually and empirically. In any case, our comprehension of the dimensions of smart tourism technology is limited, particularly for analyzing tourist evaluation factors towards smart tourism technology. Thus, there is a requirement for advanced exploration and empirically confirming the dimensions of smart tourism technology.

Scholars have analyzed the impact of technology on tourist behaviour (Cai *et al.* 2019; Ghaderi *et al.* 2018). Tourists utilize technology to find tourism facilities to assist them and improve their travel experiences (Astor *et al.* 2022; Ghaderi *et al.* 2018). In practice, tourist recommendations through social networking services can influence tourists' decisions to visit tourist destinations (Pantano *et al.* 2017). Furthermore, tourist recommendations through applications and tour discussion forums can affect tourist decisions in many aspects of their trips, like sharing information, making reservations, or purchasing products (Pantano *et al.* 2017; Um & Chung, 2021). Moreover, Smart tourism technology provides real-time information and enhances tourist travel in its uses (Hunter *et al.* 2015). It is important to comprehend 'new' tourist behaviour and their needs in the smart era (Wang *et al.* 2016), which requires tour providers to fulfil tourists' necessities (Susanto *et al.* 2020). However, the implication of tourist behaviour and smart tourism technology have not been entirely explored. Therefore, the adoption of smart tourism technology cannot be ignored, as it has influenced tourist behaviour that deserves closer scientific attention from practitioners.

1.2 Theory of Planned Behaviour

Previous studies have researched tourist behaviour in destination and attraction selection (Cao *et al.* 2019; Ghaderi *et al.* 2018; Halpenny *et al.* 2018) by applying TPB as their primary conceptual model. TPB (Ajzen 1991) is developed by widening the previous theory, termed the Theory of Reasoned Action (TRA), with a non-volitional dimension (*e.g.*, Perceived behavioural control). In TPB, two volitional variables (subjective norms and attitudes) and one non-intentional variable (perceived behaviour control) affect behavioural intentions (Ajzen 1991). In particular, attitude is a negative or positive opinion towards a behaviour. At the same time, the subjective norm is defined as a social stimulus experienced from references (*e.g.*, friendship, leadership, friends of the same age, and family) to commit or not to commit an action, and perceived behavioural control is an experienced easiness or a difficulty in committing an action (Ajzen 1991). Therefore, this study uses TPB to explain tourists' decision to visit tourist destinations.

Attitudes, subjective norms, and perceived behavioural control, the TPB model's primary constructs, affect behavioural intentions (Cao *et al.* 2019; Ghaderi *et al.* 2018; Wibisono *et al.* 2022). These constructs can lead to actual visitation (Halpenny *et al.* 2018). The attitude refers to how far an individual has an evaluation or assessment toward preferred behaviour or the disadvantaging one (Ajzen 1991). Perceived behaviour control is a person's belief in doing a behaviour they like, while the subjective norm is social support experienced by the person to perform a behaviour in a certain manner (Ajzen 1991). In the smart tourism study, TPB has a notion that tourist behavioural control, attitude, and subjective norms act as the antecedents towards the intention to use technology (Ghaderi *et al.* 2018). Hence, we assume that attitudes influence the intention to use smart tourism technology (STT), perceived behavioural control, and subjective norms of tourists, resulting in the following hypotheses:

H1. Tourist attitude has a significant effect on tourist intention to use STT.

H2. Tourist perceived behaviour control significantly affects tourist intention to use STT.

H3. Tourist subjective norm has a significant effect on tourist intention to use STT.

1.3 Technology Acceptance Model

TAM is applied in analyzing a person's behaviour in utilizing technology. The original TAM (Davis 1989) used perceived usefulness and perceived ease of use to encourage technology utilization behaviour. These constructs bring TAM into an accepted model to explain technology adoption. First, TAM presented a trustable result to forecast user acceptance of many types of technologies in many organizations (Jamshidi & Hussin 2016). Second, this model is established from a robust theory and intense assessment in multiple industries and offers an interesting measurement scale (Jamshidi & Hussin 2016; Rahman *et al.* 2017). Third, scholars have established TAM as a robust framework to comprehend technology acceptance in tourism (Hua *et al.* 2017; Xia *et al.* 2018). In complementing the literature and explaining the implementation of TAM, this study investigates its effect on tourist behaviour using smart tourism technology as a reason for travel decisions.

The original TAM explains technology adoption through perceived usefulness, perceived ease of use, attitudes, and intentions (Davis 1989). This framework supposes that perceived usefulness and ease of use are the principal elements of evaluating information system adoption (Lin *et al.* 2010). Among technology adoption predictors, most previous studies also highlight that the main reasons for technology adoption are perceived usefulness and ease of use (Mulyawan & Rafdinal 2021; Venkatesh 2000). It should be noted that previous tourism studies have explained and confirmed perceived usefulness and perceived ease of use in influencing tourists' attitudes towards the use of technology in the tourism process (Hua *et al.* 2017; Im & Hancer 2017). In a smart tourism technology context, the easier the use and utilization of technology, the more positive their attitudes will be to adopt it. Therefore, the usefulness and ease of use of smart technology in the travel process will affect the attitude of tourists. Thus, the next three hypotheses are proposed:

H4. Perceived usefulness has a significant effect on tourist attitude

H5. Perceived ease of use has a significant effect on tourist attitude

H6. Perceived ease of use has a significant effect on perceived usefulness

1.4 Intention to use STT

TPB is the original theory in predicting behaviour through intention established by attitude, perceived behaviour control, and subjective norm (Ajzen 1991). TAM and TPB propose the factors influencing technology acceptance: behavioural intention and actual behaviour (Chen, 2016; Xia *et al.* 2018). Behavioural intention predicts future behaviour (Dean & Suhartanto, 2019; Kusdibyo 2022), while actual behaviour shows acceptance behaviour (Susanto *et al.* 2020). Ghaderi *et al.* (2018) indicated a correlation between intention and visiting tourism destination behaviour in the study of visiting tourism destinations. If potential travellers have a great enthusiasm for visiting a tourist destination, then their action is to visit that destination (Koo *et al.* 2016). This represents an effect of the intention to use STT on visiting tourism destinations. Thus, it can be hypothesized that:

H7. Intention to use STT has a significant effect on visiting tourism destinations.

1.5 TAM and Smart Tourism Technology

Smart tourism technology is an additional external variable that defines cognitive certainty, affecting perceived usefulness and perceived ease of use (Davis 1989). Kim & Qu (2014) remarked that some external variables were added to the main TAM variables to expand the TAM framework. The previous studies have proved multiple external variables influencing perceived ease of use and perceived usefulness in the tourism industry, in the use of mobile travel applications (Im & Hancer 2017), mobile applications (Xia *et al.* 2018), and share experiences on social media (Hu *et al.* 2019). Smart tourism technology is believed to benefit all relevant parties and influences tourists in every part of travel (Um & Chung 2021). When tourists use smart tourism technology to find destinations, they believe smart technology is highly responsive in distributing information, highly personalized to their options and demands, and dependable and beneficial for their trip (Jeong & Shin 2020). Thus, the hypotheses are:

H8. Smart tourism technology has a significant effect on perceived usefulness.

H9. Smart tourism technology has a significant effect on perceived ease of use.

Some literature has investigated how technology affects intention (Hua *et al.* 2017; Sahli & Legohérel 2015; Venkatesh 2000). The intention is critical to tourists' behaviour influenced by smart technology. The smart system motivates tourists to tour the city better and to improve their experience during the travel process through the direct response from smart tourism technology (Koo *et al.* 2016). Tourist experience with smart tourism technology could be integral to tourists' intention to use the technology (Jeong & Shin 2020). Therefore, the literature confirms the influence of smart tourism technology on the intention to use STT. Thus, the hypothesis for the influence of these two variables is:

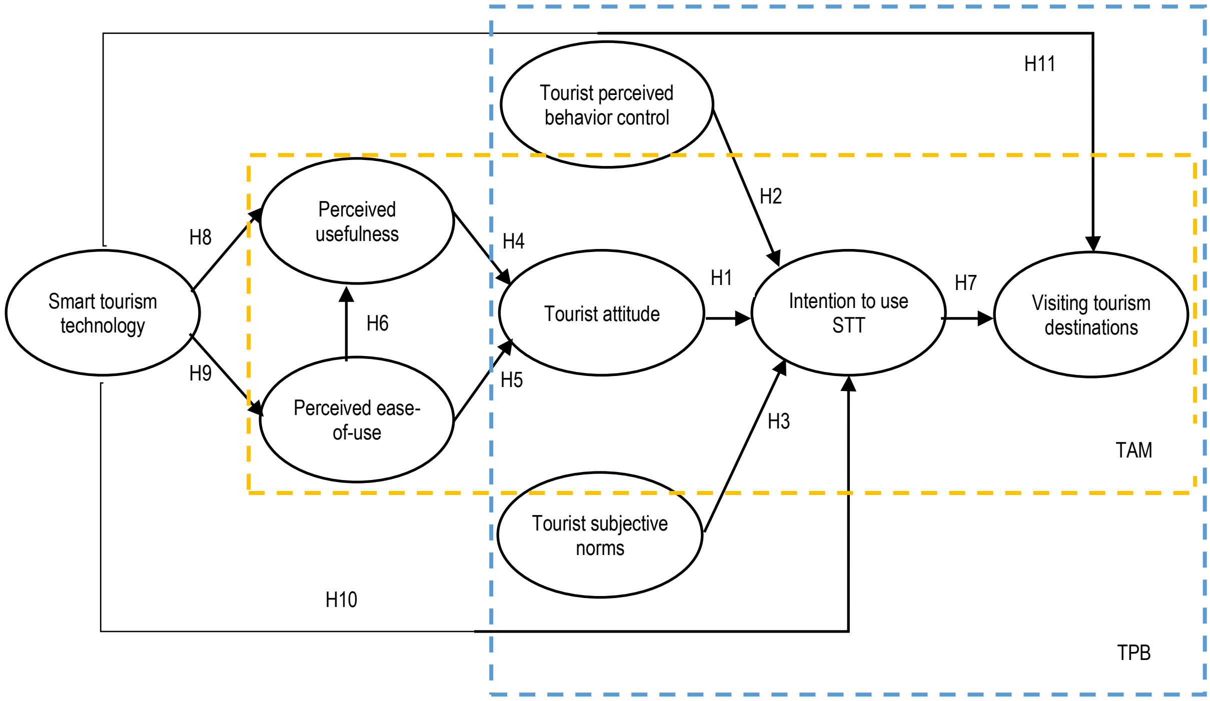
H10. Smart tourism technology has a significant effect on tourist intention to use STT.

The availability of technology in tourism is one of the important reasons why tourists visit tourist destinations (Ghaderi *et al.* 2018). Several contents of smart technology can influence visiting tourism destinations, such as videos, photos, and other content shared on online platforms. They may influence destination selection (Paul *et al.* 2019). Smart tourism technology can influence travel behaviour and enable tourists to acquire unexpected experiences (Koo *et al.* 2016). Moreover, smart tourism technology has influenced tourist behaviour and assisted the tourism industry in expanding effective marketing strategies, attracting tourists to visit, and providing a unique experience to tourism destinations (Jeong & Shin, 2020). Thus, It can be stated that smart tourism technology affects visiting tourism destinations. Therefore, the proposed hypothesis is as follows:

H11. Smart tourism technology has a significant effect on visiting tourism destinations.

Figure 1 illustrates the conclusions from the literature review and hypotheses development. It represents that TPB is a reason for tourists' intention to visit tourism destinations (H1, H2, H3) which influences visiting tourism destinations (H7). Meanwhile, TAM explains the attitude of tourists toward smart tourism technology (H4, H5, H6). The elements of Smart tourism technology determine its ease of use and usefulness (H8, H9) and will determine the intention to adopt (H10) and visit a tourism destination (H11).

Figure 1. Research Model



2. Methodology

Previous research has used the variables analyzed in this research. The operational definition of smart tourism technology was built from several pieces of research, such as technologies used in tourist attractions (Wang *et al.* 2016), devices and platforms used in smart tourism destinations (Başer *et al.* 2019), and technology functions (Ballina *et al.* 2019). Therefore, smart tourism technology is measured by smart assistants, smart tourism management, smart sightseeing, e-commerce, smart safety, smart traffic, smart forecast, and virtual tour. The measurement of TAM constructs was modified from previous studies to examine traveller acceptance of smart facilities (Davis 1989; Rahman *et al.* 2017; Venkatesh 2000). Measurements of TPB constructs and visiting tourism destinations adopt the measurement from previous research on tourists' behavioural intentions in choosing tourist destinations (Ghaderi *et al.* 2018; Halpenny *et al.* 2018). The visiting tourist destination measurement was modified from previous studies regarding actual tourist behaviour (Ghaderi *et al.* 2018; Lin *et al.* 2010). This study emphasized tourist behaviour when visiting a destination in the smart tourism era. All questionnaire items were assessed on a Likert scale using five points, "strongly disagree (1)" to "strongly agree (5)". As the survey instrument was written in Indonesian, the questionnaire was tested on 30 tourists to analyze ambiguity in case, meaning, and other issues. It resulted in a little adjustment for some words in the questionnaires.

The questionnaires were distributed to 340 Indonesian respondents as a sample and obtained 324 usable questionnaires. Data was collected on January 2022 to March 2022. This study applied the purposive sampling technique under the criteria of ever using every attribute of smart tourism technology confirmed with question control in questionnaires. The questionnaire was classified into three parts. First, the respondents stated that they were willing to be involved in this survey. Second, it covered the characteristic of the respondents' social demography and control questions to confirm that the respondent has utilized smart tourism technology. Third, it contained questions regarding the research constructs: smart tourism technology, perceived usefulness, perceived ease of use, tourist attitude, perceived behavioural control, subjective tourist norm, intention to use STT, and visiting tourism destination.

This study uses exploratory factor analysis (EFA) to evaluate the dimensions of smart tourism technology. Next, PLS-SEM evaluates measurement models and structural models (Hair *et al.* 2019). This analysis technique was applied because this study aims to evaluate the constructs' interrelationships and the exogenous construct's predictive capability. In addition, as this research focuses on theory verification and because the data were not distributed properly, evaluating models by SEM-PLS analysis is appropriate (Hair *et al.* 2019).

3. Results

From the activity of distributing questionnaires that have been carried out, the distribution of respondent data is obtained whereby gender 60% are women, and from the aspect of age, the majority of respondent profiles are in the productive age category. Based on income, respondents claimed to have a monthly income of <2 million rupiahs (35%), 2-5 million rupiahs (29%), and >5 million rupiahs (31%). The educational level of the respondents is spread from high school (28%), Diploma/Bachelor (37%), and Postgraduate (35%). Furthermore, based on the type of work, it is known that the majority work as civil servants (44%) and students (31%), and the rest come from work backgrounds as state company employees, business employees, entrepreneurs, and others. Detailed data are presented in Table 1.

Table 1. Respondent characteristics

Variable	Description	Frequency	(%)
Gender	Female	195	60
	Male	129	40
Age	<25	115	35
	25-35	94	29
	36-45	89	27
	>45	26	8
Income/month	<Rp 2 million	120	37
	Rp 2-5 million	105	32
	>Rp 5 million	99	31
Education	High School	90	28
	Diploma/Bachelor	120	37
	Postgraduate	114	35
Occupation	Student	102	31
	Civil servant	141	44
	Business employee	33	10
	State company employee	3	1
	Entrepreneur	15	5
	Others	30	9

3.1 Smart Tourism Technology Dimensions

Table 2 illustrates the 27 items of smart tourism attraction results from eight focus groups. Exploratory factor analysis (EFA) was used to evaluate the dimensions of smart tourism technology by extracting the main component. A varimax rotation with Kaiser normalization was employed, disclosing eight dimensions that explained 73.57% of the variance. First, 'smart assistant' has six items consisting of the official website, free public Wi-Fi, online information, official apps., QR code facility and touch screen facility. Second, 'smart tourism management' consists of five items reflecting smart card, tourist-flow tracking, electronic entrance, crowd handling, and online education information. 'Smart sightseeing' is the third factor consisting of three items reflecting personal-itinerary design, an online recommendation system, and an online map. Fourth, 'e-commerce' includes mobile payment, online vouchers, and online booking. Fifth, 'smart safety' has three items: online-environment tracking, smart emergency-response system, and travel protection. Sixth, 'smart traffic' consists of two items reflecting online transportation scheduling and real-time traffic. Seventh, 'smart forecast,' has three items representing tourist-flow forecast, queuing-time forecast, and weather forecast.

Furthermore, 'virtual tour' has two items representing virtual tourism devices and virtual travel communities. Smart tourism technology is treated as a second-order variable comprising all identified dimensions. Furthermore, Bartlett's test ($p < 0.01$) and the Kaiser-Meyer-Olkin test (0.928) confirmed their sufficiency and reliability in taking the samples used.

Table 2. Exploratory factor analysis (EFA) results.

Indicators/Item	Smart assistant	Smart tourism management	Smart sightseeing	E-commerce	Smart Safety	Smart traffic	Smart forecast	Virtual tourism
Official website	**0,848**	0,589	0,592	0,478	0,601	0,656	0,551	0,630
Free public wi-fi	**0,891**	0,561	0,581	0,463	0,558	0,630	0,607	0,555
Online information	**0,906**	0,615	0,677	0,516	0,511	0,561	0,577	0,554
Official apps.	**0,930**	0,622	0,619	0,507	0,586	0,685	0,638	0,635
QR code facility	**0,897**	0,615	0,634	0,464	0,566	0,625	0,563	0,561
Touch screen facility	**0,737**	0,716	0,668	0,535	0,569	0,519	0,558	0,604
Smart card	0,671	**0,823**	0,662	0,527	0,713	0,611	0,641	0,624
Electronic entrance	0,659	**0,862**	0,653	0,585	0,650	0,568	0,568	0,530
Tourist-flow tracking	0,534	**0,843**	0,604	0,531	0,569	0,463	0,581	0,527
Crowd handling	0,568	**0,868**	0,606	0,492	0,614	0,608	0,630	0,602
Online education information	0,558	**0,808**	0,616	0,522	0,575	0,519	0,592	0,564
Personal-itinerary design	0,616	0,691	**0,912**	0,606	0,526	0,525	0,530	0,472
Online recommendation system	0,706	0,714	**0,954**	0,598	0,574	0,589	0,568	0,567
Online map	0,697	0,688	**0,928**	0,693	0,578	0,555	0,581	0,593
Mobile payment	0,569	0,609	0,652	**0,964**	0,581	0,511	0,536	0,545
Online vouchers	0,544	0,604	0,660	**0,955**	0,562	0,470	0,531	0,550
Online booking	0,508	0,588	0,625	**0,930**	0,528	0,445	0,527	0,522
Online-environment tracking	0,522	0,638	0,514	0,701	**0,858**	0,571	0,617	0,613
Travel protection	0,601	0,704	0,499	0,444	**0,919**	0,667	0,665	0,629
Smart emergency-response system	0,609	0,640	0,586	0,417	**0,882**	0,637	0,648	0,619
Online transportation scheduling	0,679	0,641	0,593	0,449	0,663	**0,929**	0,705	0,592
Real-time traffic	0,629	0,585	0,514	0,480	0,644	**0,924**	0,710	0,599
Tourist-flow forecast	0,597	0,681	0,584	0,541	0,661	0,737	**0,862**	0,671
Queuing-time forecast	0,581	0,649	0,529	0,502	0,658	0,627	**0,929**	0,581
Weather forecast	0,636	0,606	0,509	0,465	0,642	0,694	**0,913**	0,621
Virtual tourism device	0,620	0,620	0,495	0,533	0,627	0,604	0,666	**0,946**
Virtual travel community	0,670	0,668	0,615	0,545	0,701	0,616	0,655	**0,953**

3.2 Measurement Model

The two main steps in the measurement model are convergent validity and discriminant validity. First, this study uses Cronbach's alpha and composite reliability values to evaluate convergent validity, which must be between 0.70 and 0.95 (Hair *et al.* 2019).

Table 3. The result of the measurement model

Construct/item	Loading	Cronbach' alpha	CR	AVE
Smart tourism technology		0.971	0.973	0.570
Smart assistant				
1. Official website	0.754			
2. Free public Wi-fi	0.744			
3. Online information	0.763			
4. Official apps.	0.798			
5. QR code facility	0.758			
6. Touch screen facility	0.746			
Smart tourism management				
1. Smart card	0.793			
2. Electronic entrance	0.781			
3. Tourist-flow tracking	0.716			
4. Crowd handling	0.754			
5. Online education information	0.719			

Construct/item	Loading	Cronbach' alpha	CR	AVE
Smart sightseeing				
1. Personal-itinerary design	0.736			
2. Online recommendation system	0.792			
3. Online map	0.796			
E-commerce				
1. Mobile payment	0.746			
2. Online vouchers	0.732			
3. Online booking	0.701			
Smart Safety				
1. Online-environment tracking	0.747			
2. Travel protection	0.757			
3. Smart emergency-response system	0.742			
Smart traffic				
1. Online transportation scheduling	0.767			
2. Real-time traffic	0.734			
Smart forecast				
1. Tourist-flow forecast	0.777			
2. Queuing time forecast	0.745			
3. Weather forecast	0.744			
Virtual tour				
1. Virtual tourism device	0.744			
2. Virtual travel community	0.792			
Perceived usefulness		0.788	0.864	0.614
1. Help in my every trip	0.831			
2. Flexible	0.847			
3. Saves my time	0.742			
4. Increase my travel experiences	0.706			
Perceived ease-of-use		0.814	0.878	0.644
1. Easy to learn	0.865			
2. An obvious feature	0.753			
3. Easy to use	0.731			
4. Fast learning	0.853			
Tourist attitude		0.837	0.891	0.672
1. The availability of Smart facilities affects my attitude toward	0.881			
travelling	0.839			
2. access to Smart facilities affects my attitude toward travelling	0.769			
3. Smart facilities are necessary for me	0.785			
4. Smart facilities must exist in every tourist destination				
Tourists perceived behaviour control		0.870	0.911	0.718
1. Using smart facilities can share my travel information	0.828			
2. Many people take smart facilities	0.845			
3. To be assured of using smart facilities	0.859			
4. Accessibility of resources, time, and opportunities to utilize smart facilities	0.859			
Tourist subjective norms		0.834	0.900	0.750
1. Colleagues think that I have to use the smart facilities for travelling	0.854			
2. My family encourages me to use smart facilities for travelling	0.853			
3. Close friends think that I have to use the smart facilities for travelling	0.890			
Intention to use STT		0.829	0.898	0.747
1. Choose to use smart facilities on my future trips	0.799			
2. Will use/continue to use smart facilities on my future trips	0.894			
3. Intend to use smart facilities when there is an opportunity	0.895			
Visiting tourism destinations		0.858	0.913	0.778
1. Visiting smart destinations than traditional ones	0.926			
2. Selecting smart destinations for future trips	0.893			
3. Getting more experiences and fun in smart destinations than in traditional ones	0.824			

The results show that Cronbach's alpha and composite reliability are accepted. Furthermore, the average variance extracted value must be above 0.5 to prove that the convergent construct explains the variance of the items (Hair *et al.* 2019).

Table 3 shows the loading factor above 0.708, which means it is accepted; therefore, the indicators reflect the variables and can be included in the research framework. Second, testing discriminant validity. Discriminant validity was validated by the Fornell-Larcker criterion. The discriminant validity results must show that the square root value of the AVE value from each construct has a greater value than the value of the distinct latent constructs (Fornell & Larcker 1981). The square root value of AVE in each construct shows a higher value than the values between other constructs, as revealed in Table 4. Therefore, discriminant validity is accepted.

Table 4. Discriminant validity (Fornell–Larcker criterion)

	1	2	3	4	5	6	7	8
1. Visiting tourism destinations	0.882							
2. Intention to use STT	0.651	0.864						
3. Tourist attitude	0.553	0.482	0.820					
4. Tourists perceived behavioural control	0.467	0.689	0.456	0.848				
5. Tourist subjective norm	0.541	0.663	0.336	0.624	0.866			
6. Perceived usefulness	0.543	0.610	0.711	0.620	0.538	0.784		
7. Perceived ease-of-use	0.521	0.506	0.628	0.579	0.442	0.562	0.803	
8. Smart tourism technology	0.683	0.445	0.351	0.301	0.378	0.374	0.322	0.755

3.3 Structural Model

In analyzing the structural model, model quality assessment depended on its competence to analyze endogenous constructs. Coefficient determination (R^2), the effect size (f^2), cross-validated redundancy (Q^2), and path coefficients are used to evaluate the structure model (Hair *et al.* 2019). The R2 values of 0.75, 0.50, and 0.25 mean substantial, moderate, and weak. The result shows R^2 in the attitude is 0.579, R^2 in the intention to use STT is 0.607, and R^2 in visiting tourism destination is 0.614. It indicates that exogenous constructs influence every mentioned construct in moderate criteria. In addition, exogenous construct significance towards attitude, intention to use STT, and visiting tourism destinations is strengthened by f^2. The constructs have a moderate influence (>0.15) on tourist attitude, which is perceived ease of use (0.184), while the strong influence on attitude is perceived usefulness (0.447). The constructs that have low influence (>0.02) toward intention to use STT (0.052) and tourist attitude (0.042), while moderate influence toward intention to use STT are subjective tourist norm (0.150) and tourist perceived behavioural control (0.195). The constructs which have a high influence (>0.35) on visiting tourism destinations are smart tourism technology (0.502) and intention to use STT (0.391). The Q2 for all dependent constructs have a bigger value than zero, which means they have acceptable predictive power (Hair *et al.* 2019).

TPB explains 44.4% of the visiting tourism destination variance, and TAM explains 45.2% of visiting tourism destination variance. The integration of TAM and TPB models combined with smart tourism technology as a basis to adopt technology can explain the variance of visiting tourism destinations as large as 61.4%. The results show the constructed model of power to influence.

The structure model evaluates the effect of latent variables on other latent variables (Hair *et al.* 2019). Table 5 shows the results of the hypotheses testing. The hypothesis testing revealed that tourist attitudes (β=0.149, t=3.531), tourist perceived behaviour control (β=0.374, t=6.219), and subjective tourist norms (β=0.319, t=5.262) have a significant effect on intentions to use STT which accepts H1, H2, and H3. Perceived usefulness (β=0.522, t=9.764) and perceived ease of use (β=0.335, t=6.531) significantly affect tourist attitudes that support H4 and H5. Furthermore, the perceived ease of use significantly influences perceived usefulness (β=0.492, t=9.775); therefore, H6 is supported. The hypothesis testing results also show that smart tourism technology has a significant influence on perceived usefulness (β=0.216, t=4850), perceived ease of use (β=0.322, t=6.081), and intention to use STT (β=0.159, t=3.223). Thus, hypotheses H8, H9, and H10 are supported. Finally, visiting tourism destinations is significantly influenced by the intention to use STT (β=0.433, t=10.797) and smart tourism technology (β=0.490, t=11.097), supporting hypotheses H7 and H11. Thus, all hypothesized relationships (H1 to H11) are supported.

Table 5. The summary of relationships assessment

Relationships (Hypothesis)	B	T value
Tourist attitude => intention to use STT (H1)	0.149	3.531*
Tourist perceived behavioural control => Intention to use STT (H2)	0.374	6.219**
Tourist subjective norm => Intention to use STT (H3)	0.319	5.262**
Perceived usefulness => Tourist attitude (H4)	0.522	9.764**
Perceived ease-of-use => Tourist attitude (H5)	0.335	6.531**
Perceived ease-of-use => Perceived usefulness (H6)	0.492	9.775**
Intention to use STT => Visiting tourism destination (H7)	0.433	10.797**
Smart tourism technology => Perceived usefulness (H8)	0.216	4.850**
Smart tourism technology => Perceived ease-of-use (H9)	0.322	6.081**
Smart tourism technology => Intention to use STT (H10)	0.159	3.223**
Smart tourism technology => Visiting tourism destination (H11)	0.490	11.097**

Notes: *Significance at (*ρ*=0.05); **Significance at (*ρ*=0.01).

Figure 2. The result of the integrated model

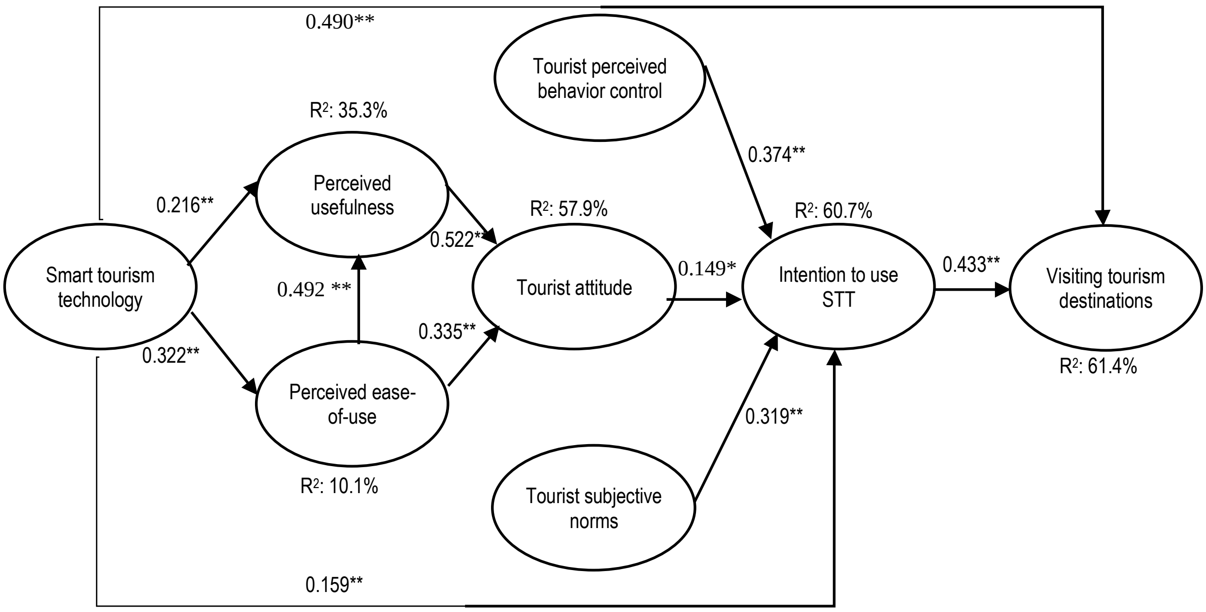


Table 6. The summary of relationships assessment

	Direct effect		Indirect effect		Total effect	
Variables	**β**	**T-value**	**β**	**T-value**	**β**	**T-value**
Tourist attitude => intention to use STT	0.149	3.531*	–	–	0.149	3.531*
Tourist perceived behavioural control => intention to use STT	0.374	6.219**	–	–	0.374	6.219**
Tourist subjective norm => intention to use STT	0.319	5.262**	–	–	0.319	5.262**
Perceived usefulness => Tourist attitude	0.522	9.764**	–	–	0.522	9.764**
Perceived ease-of-use => Tourist attitude	0.335	6.531**	0.257	8.237**	0.592	13.050**
Perceived ease-of-use => Perceived usefulness	0.492	9.775**	–	–	0.492	9.775**
Intention to use STT => Visiting tourism destination	0.433	10.797**	–	–	0.433	10.797**
Smart tourism technology => Perceived usefulness	0.216	4.850**	0.158	4.975**	0.374	8.005**
Smart tourism technology => Perceived ease-of-use	0.322	6.081**	–	–	0.322	6.081**
Smart tourism technology => intention to use STT	0.159	3.223**	0.045	3.030*	0.204	4.602**
Smart tourism technology => Visiting tourism destination	0.490	11.097**	0.088	4.145**	0.579	14.350**

Notes: *Significance at (*ρ*=0.05); **Significance at (*ρ*=0.01).

4. Discussion

This study confirms the advantages of the integrated model in explaining the adoption of smart tourism technology. The R square value shows that this integrated model can explain the variance of visiting tourism destinations higher than TPB and TAM. This result verifies the strength of the integrated model suggested. The integration model of TAM and TPB also strengthens some previous studies (Agag *et al.* 2019; Chen 2016; Xie *et al.* 2017). Theoretically, this study proves that even though TAM and TPB have been applied widely in the tourism sector (Rahman *et al.* 2017; Sahli & Legohérel 2015), integrating both models can improve the predictive power of smart tourism technology adoption. Even though there are already substantial numbers of research related to either TAM or TPB in the tourism industry, there have not been any previous studies showing the compatibility of the integrated model to verify smart tourism technology and transform it into an analysis instrument in visiting tourism destination behaviour. Therefore, this study successfully verifies TAM-TPB integration in smart tourism technology adoption.

This research points out that dimensions of smart tourism technology are reliable and valid measuring tools from tourists' perceptions of smart technology. Smart tourism technology was analyzed using EFA resulting in eight dimensions: smart assistant, smart tourism management, smart sightseeing, e-commerce, smart safety, smart traffic, smart forecast, and virtual tour. Those dimensions are developed from technologies used in tourist attractions (Wang *et al.* 2016), devices and platforms used in smart tourism destinations (Başer *et al.* 2019), and technology functions (Ballina *et al.* 2019). By confirming these eight dimensions, this result complements previous research in developing the dimension of the smart tourism technology variable. The dimensions and research instrument developed by this research can evaluate tourist perception of smart tourism technology and are expected to facilitate further studies concerning smart tourism technology in various tourism destinations, keeping up with the quick pace of research needed to match the equally rapid pace of technological development.

In explaining the TPB model, tourist attitude, perceived behavioural control, and the subjective norm are important factors influencing the intention to use STT and visit tourism destinations. The results show that tourist attitudes perceived behavioural control, and subjective norms significantly and positively affect the intention to use STT and later visiting tourism destination behaviour. This finding strengthens previous studies and confirms the robustness of TPB in predicting tourist intention and behaviour to visit tourism destinations (Cao *et al.* 2019; Ghaderi *et al.* 2018; Halpenny *et al.* 2018). Tourist attitudes explain the evaluation and assessment of smart facilities that support the travel process. Subjective norms explain social stimuli from colleagues, family, and close friends to use smart facilities in travelling. Then, perceived behavioural control explains the personal belief in using smart transport facilities. These three reasons tourists intend to use STT affect their travel behaviour. Moreover, this result proves that TPB contributes to understanding and predicting tourist intention to use STT and behaviour to visit smart tourism destinations as an emerging context in tourism studies.

Regarding technology acceptance, smart tourism technology and TAM are crucial factors in smart tourism technology adoption. This research uncovers that smart tourism technology affects two main constructs of TAM, which aligns with previous studies by Im and Hancer (2017) and Xia *et al.* (2018). Perceived usefulness and perceived ease of use are closely related to technical quality, and the result emphasizes the urgency of technical issues in influencing technology adoption in tourism. Thus, this research broadens the comprehension of tourist perception of the technical factors of smart tourism technology on its influence on perceived usefulness and perceived ease of use. As Venkatesh (2000) proposed, the result also revealed that perceived usefulness and perceived ease of use of technology are two important variables that significantly influence tourist attitudes (Ghaderi *et al.* 2018; Hua *et al.* 2017; Im & Hancer 2017). Tourists in the smart technology era have different technological needs from those in the pre-Internet era. Therefore, it explains that smart tourism technology will be easier to adopt for tourists if the technology employed can be beneficial during the tour journey and easy to use. This study contributes to expanding the literature on technology in tourism by proving its important influence between smart tourism technology and TAM in adopting smart tourism technology.

To conclude, this result points to three significant conclusions. First, this study is one of the few smart tourism studies that design the dimensions of smart tourism technology. This study proves that these dimensions as instruments for measuring tourist perception of smart tourism technology in a destination. Second, the model constructed verifies the explorative power of smart tourism technology adoption. It is proven from R2 values in the integrated models have a higher value than TAM or TPB individually. Third, the results empirically prove that the integration model can explore smart tourism technology adoption. The hypothesis testing results also revealed that TPB is useful for general human behaviour, while TAM is essential to define the technology acceptance behaviour (Rahman *et al.* 2017). Therefore, this integrated model is suitable for explaining smart tourism technology that has become the background of tourist behaviour to visit tourist destinations.

5. Implications

Practically, there are several significant managerial implications. First, smart tourism technology usage is important for forming tourists' perceived behaviour control, subjective norm, and attitude. Various parties, such as the government and destination management organizations, must organize technology development resources by paying close attention to tourist attitudes towards technology use, and the technical service provided must be beneficial during the travel journey (tourist perceived behaviour control). It can create a positive impression on people (tourist subjective norm). To make it a reality, stakeholders are suggested to develop a tour package that employs smart tourism technology so that it is beneficial to ensure that either local or foreign tourists acquire a decent experience during their trip. Local and foreign tourists will leave with the perception that their experience in visiting tourism destinations in Indonesia is what they expected and worth the expense.

Second, it is paramount to examine smart tourism technology that benefits tourists. Smart tourism technology can be both an alternative to and a complement to the traditional strategy of competition and comparative, especially within the competition in the tourism sector. The collaboration among tourists, tourism destination managers, and the government should be giving emotional, psychological, and investment continues to develop smart technology. Besides, a joint effort is required between the Ministry of Tourism and professional organizations in managing technology in Indonesia's tourism by always updating the existing technology facilities and infrastructure. For example, it ensured that the quality of technology and service standards were better and appropriate to meet the minimum standards in other more developed countries and destinations. Technology standards for smart tourism must, in particular, ensure that tourists enjoy a comfortable, safe, and secure environment.

Limitations and Future Research

This research can expand the explanation of smart tourism technology adoption by integrating TAM and TPB, but it still bears several limitations that must be admitted. First, each tourist destination has different attraction characteristics and themes as well as its profile of tourists, which will influence tourist behaviour at every destination. Future studies should differentiate attraction themes and characteristics as their focus so that tourist behaviour can be more fully analyzed. Second, most of the sample distribution is from Java Island, which can limit the generalization of this finding. Future study is expected to complement wider respondent variations in terms of geographical area for acquiring better-finding generalization. Third, assorted ethnic groups and cultures in Indonesia can influence tourists' interest in each area. This can turn into an interesting future study for analyzing the influence of the local destination culture in the smart tourism era.

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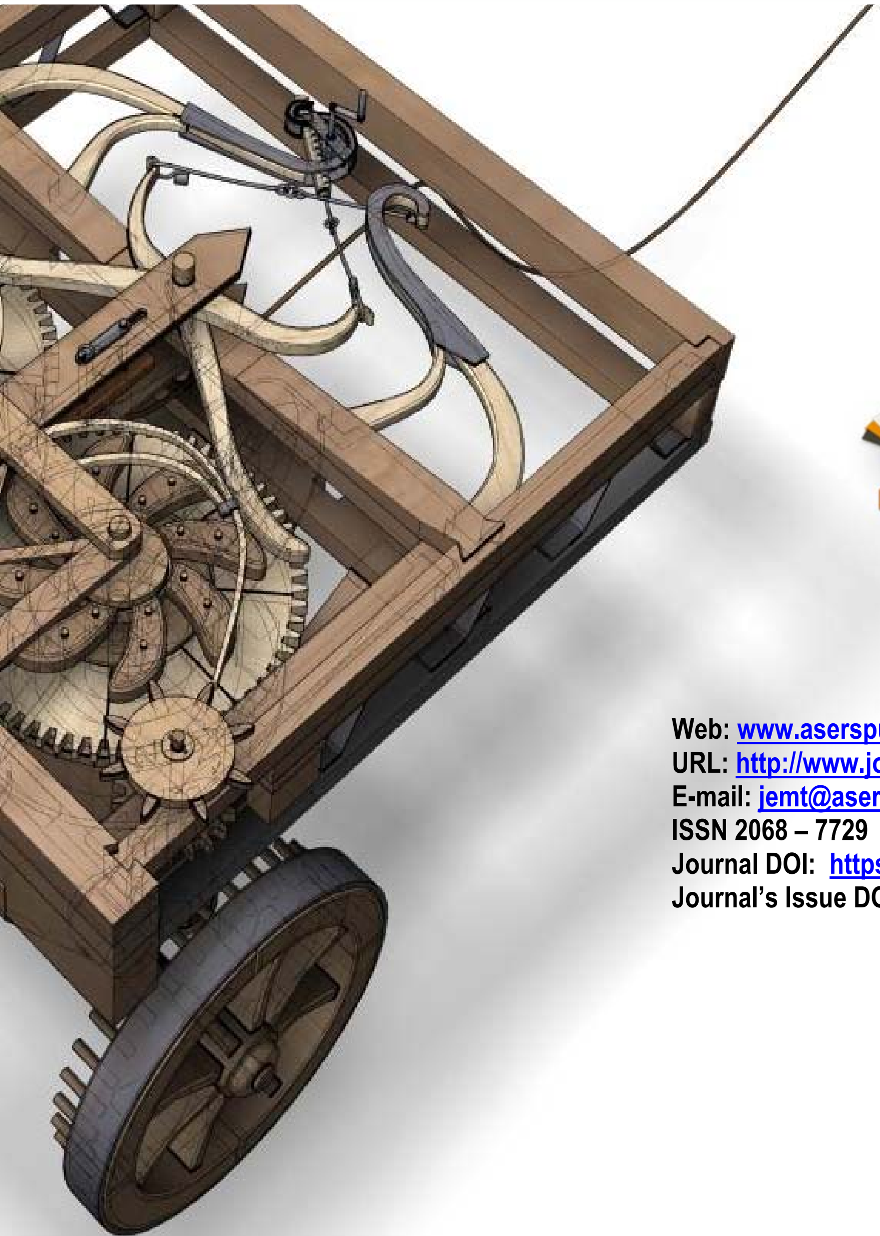

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