

研究論文**A Review of the Literature on Smart Tourism:
A Locational Research Perspective**

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Abstract :

As a new concept, smart tourism has received significant attention in the past decade. By reviewing 136 articles published in mainstream journals in the field of tourism from 2013 to 2022, this study discusses the major themes of smart tourism research of interest to researchers in their regions from the perspectives of Asia-Pacific, Europe, and North America. The results show that researchers in the Asia-Pacific region place smart technology-driven as the center of smart tourism research. In contrast, researchers in the European region discuss smart tourism through a destination research lens. The North American region, where smart tourism originated, researchers have studied the topic particularly from a tourist experience perspective. The article concludes with a discussion of the gaps in existing research in these regions, directions for future research, and contributions to regions in which smart tourism development is just beginning (e.g., Japan). This study is one of the few reviews of research related to smart tourism from a regional researcher's perspective, which fills a gap in past literature reviews of smart tourism, helps researchers better understand the whole picture of smart tourism, establishes a theoretical contact of smart tourism research, and contributes to academia and the industry.

I. Introduction

As a concept that has emerged in the last decade, smart tourism is increasingly popular in travel and people's daily lives. Smart tourism is a social phenomenon that uses technologies such as the internet, cloud computing, the Internet of Things (IoT), and information processing to integrate tourism infrastructure (Gretzel et al., 2015b). Its goal is to provide not only fast, convenient, inexpensive, and smart services to tourists but also efficient, effective, productive, and innovative tourism products for businesses (Koo et al., 2017). Countries worldwide also practice smart tourism development as a director of their national development strategies. In Asia, for example, China and South Korea have designated smart tourism as a national strategy with a top-down development model and have vigorously developed technological infrastructure to advance the process of smart tourism (Hwang et al., 2015; Li et al., 2017; Wang et al., 2013). Japan is also gradually placing the development of smart tourism on its agenda, with the unique concept of Society 5.0, which aims to use smart technology to improve the current living environment

and develop tourism (Cabinet Office, 2022). In European countries such as Spain, the Netherlands, and Finland, bottom-up development strategies dominate, and innovation activities in smart tourism are carried out in living labs (Boes et al., 2015; Segittur, 2015).

As research on smart tourism has grown, scholars have conducted various literature reviews. For example, Ye et al. (2020) sorted 124 articles related to smart tourism published in the past five years, performing keyword change display and country co-occurrence analysis. Kontogianni and Alepis (2020) provided a systematic account of 51 papers published in 2013–2019, categorizing them into themes, including recommender systems, social media, IoT, user experience, real-time, user modeling, augmented reality, big data, cultural heritage, and privacy-preserving in 11 areas. Using a combination of qualitative and quantitative research, Mehraliyev et al. (2020) reviewed 86 articles published until 2018 and described the knowledge areas in smart tourism research. Choi et al. (2019) conducted a systematic quantitative evaluation of 96 articles published between 1995 and 2017 and analyzed them using

an evaluation and correlation review approach. Although these reviews have been essential in developing smart tourism research, there remains a lack of research on the classification of smart tourism in different geographical regions.

Smart tourism as a global activity (Gretzel et al., 2015a) is vital for developing tourism worldwide. To develop smart tourism strategies that suit particular areas, it is useful to examine the current status of smart tourism development not only from a global, macro perspective but also from a region-specific micro perspective. However, few studies have theoretically described the development and current state of smart tourism research in terms of geographical distinctions. Second, although past studies have shed light on the development of smart tourism in various countries (Boes et al., 2015; Wang et al., 2013), little is known about the main research directions in different countries. Third, while past literature reviews have used co-occurrence analysis of international cooperation related to smart tourism from the perspective of quantitative analysis (Choi et al., 2019), research perspective to analyze similarities and differences in the development of smart tourism research between different geographies is still lacking.

This study reviews and analyzes the research on smart tourism published in journals until 2022, by adopting a systematic review method for the data analysis process. The importance of reviews lies in the recognition that “most research can only be understood in context – and a key part of that context consists of the results of other studies” (Petticrew & Roberts, 2006, p. 3). Weed (2006) observes that reviews of the literature allow researchers to “filter out research that contributes little (clearing the brickyard), moderate variable findings of similar research (sorting out the bricks), and build edifices of previously undiscovered public knowledge” (p. 261). Specifically, this study analyzes the frequency and co-occurrence of the selected papers and, based on the results, discusses the current statuses and research directions of scholars in smart tourism research in different regions. It examines smart tourism research by scholars from various geographic areas to identify the focus of current research and provide insights to promote the diversity of future research.

II. Methodology

1. Data Collection

A systematic review was conducted for this research. Data were collected with reference to Ye et al. (2020) and Mehraliyev et al. (2020) using one database, Web of Science (WOS), to obtain articles in the relevant fields. To do so,

the author referred to the pool of keywords generated by Mehraliyev et al. (2020) with conditional qualification. First, the word “smart” was combined with basic words representing the fields of tourism (e.g., tourism, tourists, travel) and hospitality (e.g., hospitality, hotel, and restaurant) to form the terms “smart tourism,” “smart tourist,” and “smart hotel.” In the actual search, the author used the advanced search mode of WOS and limited the field identification to title, abstract, and author keywords to ensure that the collected literature was related to smart tourism. The specific search fields can be found in the appendix. In the preliminary search, WOS located for 550 articles.

2. Data Selection

To analyze the selected literature more precisely, the author qualified the searched literature in several ways. First, only papers written in English were selected. Second, no starting point was set for time, and articles published before 2022 (inclusive) were included. Third, the author referred to the selection recommendations of Ye et al. (2020) for papers published in Social Science Citation Index (SSCI) and limited the selected literature to papers published in journals in the JIF Quartile’s Q1 and Q2 divisions by referring to Journal citation report rankings in the fields of hospitality, leisure, sport and tourism to comprehensively encompass relevant research. The selected journals are all SSCI journals. The SSCI database were chosen because they are recognized standards for measuring the international influence of academic disciplines and journals, covering a variety of social science journals (Sun et al., 2017; Li et al., 2022). In contrast, due to language barriers, Emerging Sources Citation Index (ESCI) journals are published particularly in English-speaking countries and lack comprehensive coverage of disciplines (Huang et al., 2017). In addition, although many papers on smart tourism have been published in ESCI journals, SSCI journals, especially those in the Q1 and Q2 divisions, have high recognition and citation rates. Therefore, only SSCI journals were included in the discussion in this study.

Specifically, the first step of this study was to conduct an advanced search for the search terms (see Appendix) in the WOS platforms. The second step was to restrict the search results by checking the full text of articles published in open-access journals, excluding conference proceedings and editorial materials. The third step was to further restrict the search results by referring to the list of JIF Quartile’s Q1 and Q2 journals in the tourism, leisure, and hospitality management classifications provided by Journal citation report and manually

checking the corresponding journals to obtain the final results. 136 articles were included in the analysis.

3. Data Analysis

Data analysis of the selected papers was conducted using VOSviewer software and OCCO12.6 software. Developed by Leiden University in the Netherlands, VOSviewer can create various graphs for different disciplines based on an algorithm of co-citation, co-authorship, and coupling with bibliographic references (Van Eck & Waltman, 2010). It has been widely used in bibliometric mapping (Williams, 2020) to construct networks to reveal collaboration and research trends. In their smart tourism literature review, Ye et al. (2020) analyzed the country co-occurrence as well as keyword co-occurrence of literature related to smart tourism using VOSviewer software. In this study, country co-occurrence analysis was performed using VOSviewer.

OCCO12.6 was used to perform frequency analysis, including the year of publication, journal publications of related papers, the research keywords frequency, and the country of publication. The OCCO software, developed by the Chinese academic group Xueshudiandi, allows for multiple

types of data frequencies as well as co-occurrence analysis (Xueshudiandi, 2020). Pu et al. (2021) used OCCO software to perform co-occurrence and frequency analysis of articles related to the sharing economy and sustainability research fields.

III. Findings

1. General Topic

(1) Number of Journal Articles Published

As shown in Table 1, this research analyzed 136 papers published in 19 international journals in the JIF Quartile's Q1 and Q2 divisions of the tourism, leisure, and hospitality management discipline (Impact factor data as of 2021). Among the journals, *Current Issues in Tourism* published the most articles (16 articles) related to smart tourism, followed by the *Tourism Review* and *Asia Pacific Journal of Tourism Research* and *Journal of Hospitality and Tourism Technology*, which published 14 articles. In terms of the number of published articles, journals in the Q1 division published 65 articles, while journals in the Q2 division published 71 articles.

Table 1 Number of journal publications of the analyzed paper

Journal	Number	Impact Factor
Current Issues in Tourism (Q2)	16	7.578
Asia Pacific Journal of Tourism Research (Q2)	14	4.074
Journal of Hospitality and Tourism Technology (Q2)	14	5.576
Tourism Review (Q1)	14	7.689
Journal of Destination Marketing and Management (Q2)	13	7.158
International Journal of Contemporary Hospitality Management (Q1)	9	9.321
Annals of Tourism Research (Q1)	7	12.853
Information Technology and Tourism (Q2)	6	6.093
Tourism Management (Q1)	6	12.879
Tourism Management Perspectives (Q1)	6	7.608
Journal of Hospitality and Tourism Management (Q1)	5	7.629
International Journal of Hospitality Management (Q1)	4	10.427
Journal of Sustainable Tourism (Q1)	4	9.470
Journal of Travel and Tourism Marketing (Q1)	4	8.178
International Journal of Tourism Research (Q2)	3	4.737
Journal of Hospitality and Tourism Research (Q2)	3	4.317
Journal of Hospitality Marketing and Management (Q1)	3	9.821
Journal of Travel Research (Q1)	3	8.933
Tourism Economics (Q2)	2	4.582

(2). Distribution of Research Regions and Collaboration of Countries/Regions

Researchers related to smart tourism are located in 37 countries around the world. Table 2 shows the number of papers published by researchers in each country and region. Where a paper is co-authored by researchers from more than one country/region, each country/region is counted as one. For example, if a paper is co-authored by a U.S. and Chinese researcher, then the paper counts as published by both an Asia-Pacific researcher and a North American researcher. China had the highest number of publications (36 articles), followed by the United States and the United Kingdom, with 27 and 26 papers, respectively.

Co-authorship country analysis using VOSviewer was conducted to explore the collaboration of different countries. In Figure 1, each node represents the country/region where an author is located. The font size of the country represents the frequency of collaboration with other countries; the larger the font, the more frequently that author's country collaborates with other countries. The thickness of the line between two nodes represents the intensity of collaboration between them. Researchers from China, the United States, and the United Kingdom collaborate most frequently with researchers from other countries and also represent the main body of research in Asia-Pacific, North America, and Europe, respectively. The reason for this result can be considered as the impact of globalization on the development of smart tourism. Although the development of smart tourism varies from country to country, sharing ideas, intelligence, and good practices on a global scale has become standard among researchers. With the

emergence of more globalized research networks and centers, it can be expected that collaboration between researchers from different countries will only become more common. Therefore, it is important to do a co-occurrence analysis of authors between different countries.

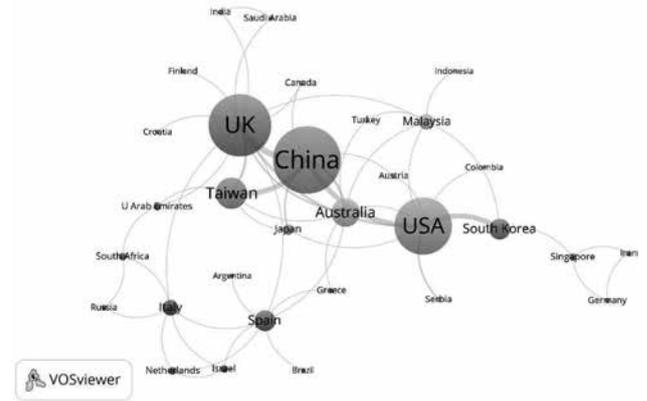


Fig.1 Country cooperation co-occurrence relationship map

2. Asia-Pacific Region

Figure 2 shows the number of publications per year for smart tourism research by researchers in the Asia-Pacific region. During the 10-year period from 2013 to 2022, researchers from Asia-Pacific countries published 77 articles, with China having the most at 36, followed by South Korea at 16. The first paper was “China’s ‘smart tourism destination’ initiative: A taste of the service-dominant logic” in the *Journal of Destination Marketing and Management* in 2013, and the number climbed gradually in the following years, reaching a peak of 23 articles in 2022.

Table 2 Number of articles published by country/region

Country/Region	Count	Country/Region	Count	Country/Region	Count
China (including Hong Kong, Macau)	36	U Arab Emirates	3	Finland	1
USA	27	Austria	2	Germany	1
UK	26	Indonesia	2	Greece	1
Spain	18	Singapore	2	India	1
South Korea	16	Slovakia	2	Israel	1
Australia	11	South Africa	2	Netherlands	1
Taiwan	11	Sweden	2	New Zealand	1
Italy	7	Switzerland	2	Oman	1
Malaysia	5	Turkey	2	Russia	1
Serbia	5	Argentina	1	Saudi Arabia	1
Croatia	3	Brazil	1	Slovenia	1
Iran	3	Canada	1		
Japan	3	Colombia	1		

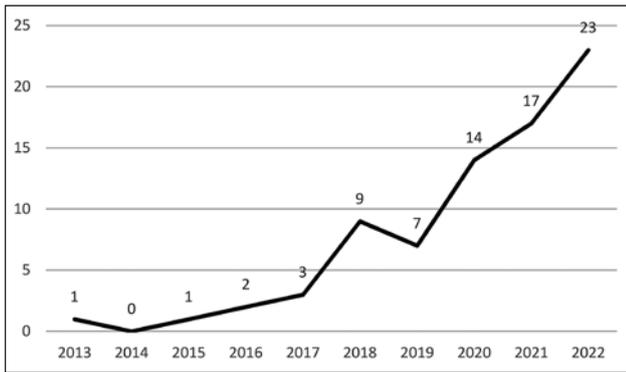


Figure.2 Number of articles published per year by researchers in the Asia Pacific region

Table 3 shows the frequency of keywords in articles published by researchers in countries in the Asia-Pacific region. Keywords can provide features, concepts, and themes of the articles, making data analysis easier and efficiently providing a deeper understanding of the articles (Siddiqi & Sharan, 2015). A total of 290 keywords were summarized through frequency analysis of keywords, and the top 10 keywords in terms of occurrence frequency were extracted in Table 3. The results show that “smart tourism” is the most frequently used keyword, followed by “smart tourism technology,” “artificial intelligence,” “smart hotel,” “big data,” “ICT,” and so on. This indicates that smart tourism researcher in Asia-Pacific countries focuses particularly on technology development and data analysis. In particular, “artificial intelligence” is the latest keyword in recent years, which may have a significant impact on the future development of smart tourism.

Table 3 Asia Pacific Region Researchers Keyword Frequency

Keyword	Count	Weighted Percentage (%)
Smart Tourism	30	10.3%
Smart Tourism Technology	5	1.7%
Smart Hospitality	5	1.7%
Artificial Intelligence	4	1.4%
Smart Hotel	4	1.4%
Social Media	4	1.4%
Tourist	3	1.0%
Big Data	3	1.0%
Smart Tourism Technologies	3	1.0%
ICT	3	1.0%

3. European Region

Figure 3 shows the number of papers published per year for smart tourism research by researchers in European region countries. During the eight-year period from 2015 to 2022,

63 articles were published, with the highest number being in the United Kingdom (26), followed by Spain (18). It is worth mentioning that Spain is not the country with the highest output of smart tourism-related papers. However, the results of its representative researchers have been crucial to smart tourism development. These results include the definition of smart tourism (Gretzel et al., 2015a), the development model of smart tourism destinations (Segittur, 2015), and studies related to smart tourism ecosystems (Gretzel et al., 2015b).

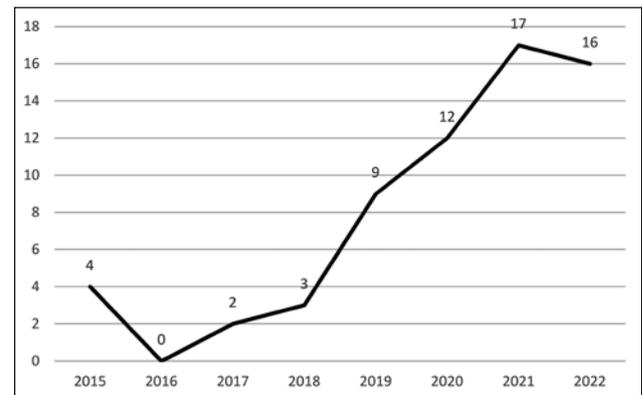


Figure.3 Number of articles published per year by researchers in the European region

Table 4 demonstrates the keyword frequencies of articles published by researchers in European region countries. By analyzing keyword frequency, 270 keywords were summarized, and the top 10 were extracted from Table 3. The results show that “smart tourism” is the most frequently used keyword, followed by “smart tourism destinations,” “smart destinations,” “destination management,” “innovation,” and so on, indicating that the researchers focus on research in European countries is on smart destinations and destination management.

Table 4 European Region Researchers Keyword Frequency

Keyword	Count	Weighted Percentage (%)
Smart Tourism	26	9.6%
Smart Destinations	7	2.6%
Smart Tourism Destinations	7	2.6%
Destination Management	6	2.2%
Smart Destination	6	2.2%
Smart Tourism Destination	5	1.9%
ICT	5	1.9%
Hospitality	4	1.5%
Innovation	4	1.5%
Smart Cities	3	1.1%

4. North American Region

Figure 4 shows the number of papers published per year on smart tourism research by researchers in North America. During the ten-year period from 2013 to 2022, 29 articles were published in the United States as the main body of research in this region. Canadian researchers have published a paper. No articles were published in this region in 2014 and 2015. The highest number (11) of articles was published in 2021. Compared to the Asia-Pacific and European regions researchers, the growth trend of articles published by researchers in North America is more moderate, with a surge in 2021 and a slowdown in 2022.

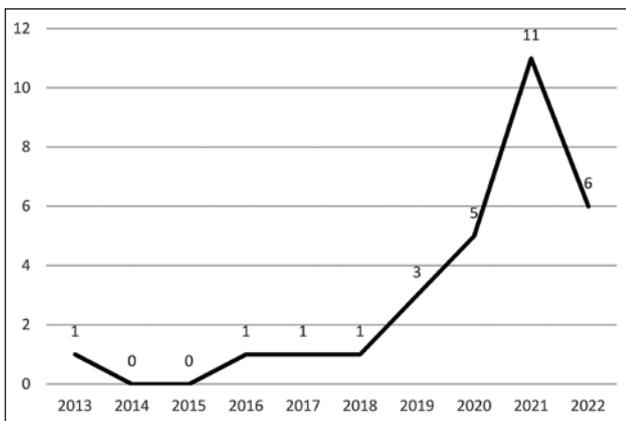


Figure.4 Number of articles published per year by researchers in the North American region

Table 5 shows the keyword frequencies of articles published by researchers in North American countries. Through an analysis of keyword frequency, 150 keywords were summarized, and the top 10 were extracted from Table 5. The results show that “smart tourism” is the most frequently used keyword, as in the Asia-Pacific and European regions. This is followed by “experience design,” “tourism experience,” “social media,” and “tourism design.” The findings suggest that researcher in North American countries focuses on tourism experience design and how to enhance tourists’ smart tourism experience.

Table 5 North America region Researchers Keyword Frequency

Keyword	Count	Weighted Percentage (%)
Smart Tourism	15	10.0%
Experience Design	4	2.7%
Tourism Experience	4	2.7%
Social Media	3	2.0%

Exercise Travel	3	2.0%
Tourism Design	3	2.0%
Smart Tourism Technology	2	1.3%
Gamification	2	1.3%
Smart Destination	2	1.3%
Tourist	2	1.3%

IV. Discussion

1. Smart Tourism Research in the Asia-Pacific Region: A Technology-Driven Focus

The Asia-Pacific region was the first to put the concept of smart tourism into practice, with China and South Korea developing smart tourism earlier than other Asia-Pacific countries. In 2010, the China National Tourism Administration (CNTA) pioneered a nationwide smart tourism program and, the following year, formulated a smart tourism plan as a national development strategy (Shao, 2011). In 2014, the CNTA adopted smart tourism as an annual tourism development theme, bringing tourism into a new development phase (Li et al., 2017). The Korean government pioneered smart tourism development in collaboration with the Korea Tourism Organization (KTO), starting with web production, social media promotion, and smartphone application development (Koo et al., 2013). In Asia-Pacific countries, smart tourism development clearly follows a government-led, top-down development model (Wang et al., 2021). The advantage of this model is that it can integrate resources centrally, clarify the development direction, and speed up development. However, this top-down development model also has disadvantages. Ye et al. (2020) point out that although there is growing emphasis on smart tourism in mainland China, high-quality academic research has not kept pace with the actual development. The current study argues this phenomenon has occurred precisely due to overreliance on the top-down development model, which places development resources and power in the government’s hands, while the market does not have access to resources, leading, in turn, to no means for further development. In the future, this major bottleneck in intelligent tourism development in the Asia-Pacific region, caused by the relationship between the market and government, will need to be resolved.

Regarding research themes, technology-driven smart tourism development accounted for the majority of articles related to smart tourism development. Wang et al. (2013) found three main bases for developing smart tourism destinations: cloud services, IoT, and end-user internet service systems. After Wang et al. (2013) laid the theoretical foundation for smart tourism study, Li et al. (2017) elaborated on the concept

of smart tourism from the perspective of tourism information services, arguing that the concept's essential connotation is original communication technology combined with the new generation of information and communication technology to upgrade tourism from a traditional to modern service industry. Smart tourism emphasizes the application of smart technology, and researchers in the Asia-Pacific region have successively applied smart technology to tourism-related industries in smart museums (Zhang & Rahman, 2022; Yang & Zhang, 2022), smart hotels (Wu & Cheng, 2018; Kim & Han, 2020), smart recommendation systems (Zheng et al., 2020), and smart restaurants (Wu & Cheng, 2018). Researchers in the Asia-Pacific region were also relatively early in introducing artificial intelligence to smart tourism research. Wang et al. (2020) developed an artificial intelligence framework to replace human recognition of web images generated by tourists. Buhalis and Moldavska (2022) examined the use of voice assistants (VA) in the current hotel environment and its future impact through semi-structured in-depth interviews with technology providers and hotel guests. Scholars in the Asia-Pacific region have also focused on the impact of smart technology on visitor experience and destination management. Lee et al. (2018) proposed an integrated model to measure the impact of smart tourism technology and destination values on tourists' happiness. They noted that when evaluating the happiness gained, tourists value what they perceive of the destination tourism experience more than what they perceive of the smart tourism technology service experience. Discussing the relationship between the application of smart technology and destination management, Johnson (2022) argued that tourism destinations should not blindly develop smart technology but consider whether to use smart technology to promote tourism destination development depending on the actual situation.

While advances in smart technology have greatly facilitated smart tourism development, many problems remain associated with it. One problem is the invasion of privacy by smart technology. Gretzel et al. (2015) emphasize that smart technologies, while useful for tourists, can also put tourists' privacy at risk. The development of smart tourism is based on tourists voluntarily sharing their personal information and travel experiences, thus creating data to support the development of smart tourism (Femenia-Serra et al., 2019). The vast majority of smart technologies currently require tourists to provide personal details (e.g., public WIFI requires an email address, and bicycle sharing requires QR code scanning to provide a name and phone number), which undoubtedly creates a channel for the leakage of tourists' personal data. Another

problem is extreme dependence on technology. While smart technology benefits tourists, it has a significant negative impact on the travel experience of those who do not have smartphones or access to smart facilities (Minghetti & Buhalis, 2010). Therefore, the author of the current study believes that privacy issues and technology dependency due to the application of smart tourism technologies will be important issues in future smart tourism development.

2. Smart Tourism Research in the European Region: A Destination-Centric Approach

In Europe, the concept of smart tourism was originally introduced by Buhalis and Amaanggana (2013) in their discussion of smart tourism destinations. They considered smart tourism destinations a special case of smart cities that use the technological infrastructure of smart cities and aim to promote efficient and sustainable development, not only improving residents' quality of life but also enhancing the tourist experience. Jovicic (2019) reviewed the evolution of the concept of destinations, dividing tourism destinations into classical-traditional destinations, destinations with a systematic approach, and smart tourism destinations. He observed that the digital revolution has led to the emergence of smart destinations, a concept in which all stakeholders have access to knowledge and information that facilitates their continuous innovation of their performance and activities. Compared to the Asia-Pacific region, the European region has had a more focused understanding of smart tourism from a destination development perspective, with scholars arguing that technological advances alone are not sufficient for smart tourism destinations to develop but that, more importantly, human capital leads to social capital, which in turn generates innovative activities for destination progress (Boes et al., 2015). Gretzel et al. (2015a, 2015b) have also discussed the foundations, challenges, and development opportunities of smart tourism development and elaborated on the concept of smart tourism. Gretzel et al. (2015b) define smart tourism as:

[...] tourism supported by integrated efforts at a destination to collect and aggregate/harness data derived from physical infrastructure, social connections, government/organizational sources and human bodies/minds in combination with the use of advanced technologies to transform that data into on-site experiences and business value-propositions with a clear focus on efficiency, sustainability and experience enrichment. (p. 181)

This definition highlights that smart tourism is based on the collection, exchange, and processing of various types of data, which are then combined with advanced technologies to ultimately transform into a live experience and value proposition. Smart technology is only a channel for the development of smart tourism and not the main body. Based on this definition, Gretzel et al. (2015b) divided smart tourism into three parts: smart experience, smart destination, and smart business ecosystem. In the same year, Gretzel et al. (2015c) introduced the concept of a smart tourism ecosystem, stating that what constitutes an ecosystem is not individual technological advances but the interconnection, synchronization, and synergistic use of different technologies.

Based on the analysis of the research keywords above, the research themes of interest to researchers in the European region are focused on smart tourism destinations and destination management. Boes et al. (2015) carried out a case study of three smart tourism destinations: Barcelona, Helsinki, and Amsterdam. They observed that smart tourism destination development needs to focus on the influence of four elements (soft intelligence): innovation, social capital, human capital, and leadership, in addition to the support of smart technology (hard intelligence). Through an empirical analysis of Antalya, a smart tourism city in Turkey, Baser et al. (2019) found that smart tourism destination development requires unified coordination and scheduling by a group of smart tourism offices consisting of experts, such as tourism practitioners, universities, and government, and necessary information to help tourists throughout the tourism process (before, during, and after the trip). They also believe that public-private partnerships (PPP) are essential to the development. Researchers in the European region have also extensively investigated concepts derived from smart tourism. Femenia-Serra et al. (2019) discussed what constitutes smart tourists, arguing for the following three characteristics: 1) data sharing with stakeholders; 2) experience acquisition using smart technologies; and 3) interaction and value co-creation of experiences through smart technologies. Gretzel and Koo (2021) integrated the concept of smart tourism with smart cities, proposed the concept of smart tourism cities, and compared it with existing smart cities and smart destinations. The above studies not only expand the research content of smart tourism but also provide diverse directions for future research.

In the research on smart tourism destinations, the issue of the relationship between tourists and residents is worth discussing. Distinct from smart cities, smart tourism destinations focus more on tourists than residents, and smart

tourism destinations are established on the basis of smart cities, thus inevitably generating conflicts between tourists and residents by overexploiting the destinations' resources. Santos-Júnior et al. (2020) have proposed a model to explain the relationship between smart tourism destinations and residents, and Gretzel and Koo (2021) suggest a concept of smart tourism cities that helps residents and smart tourism destinations integrate. However, in the European region, residents still have a strong voice in the process of smart tourism development due to the bottom-up development characteristics of smart tourism destinations (Boes et al., 2015). The advantage of this is that the government creates policies that are better adapted to the lives of the residents, but with that comes a lot of time and effort that the government has to spend on coordination when the interests of tourists and residents conflict. Therefore, this author believes that solving the relationship between tourists and residents at smart tourism destinations will be one of the main research directions for researchers in Europe region in the future.

3. Smart Tourism Research in North America region: Smart tourism origins and tourists' experience-centric

Most smart tourism research in North America is concentrated in the United States, and there seem to be far fewer smart tourism studies in North America than in the European and Asia-Pacific regions. It is worth recalling, however, that the concept of smart cities originated in the United States, with Chen-Ritzo et al. (2009) making the first reference to the term in their study of an "instrumented planet." Initially, smart city research focused on technological development and was referred to as Smart City 1.0 (Woetzel et al., 2018). As the theoretical foundation of smart cities has improved, researchers have developed the concept of Smart Cities 2.0, with a focus on people-centered and multi-sectoral joint development to improve residents' quality of life (Giffinger & Pichler-Milanović, 2007). Harrison et al. (2010) classified the dimensions of smart cities based on information and communications technology: instrumented, interconnected, and intelligent. At the same time, they emphasized that this model is incomplete because it ignores human or manager decisions based on information provided by the ICT infrastructure. In other words, the core concept of smart cities is considered to be technological and institutional innovation driven by human capital, which is influenced by ICT technologies and is a critical objective of smart cities (Boes et al., 2015), aiming to promote sustainable development

and improve their inhabitants' quality of life.

The analysis of thematic keywords showed that smart tourism research themes of researchers in North America have focused on how to enhance the tourist experience. Femenia-Serra et al. (2019) underlined that tourists and visitor experience are the core structure of tourism research, and enhancing this experience is a fundamental goal of tourism research. Buhalis and Amaranggana (2015) stated that a main objective of smart destinations is to enhance the visitor experience through highly personalized services and products and dynamic joint value co-creation. Thus, the ultimate goal of research on both smart technologies and destination management exploration is to create a better experience for tourists. Jeong and Shin (2020) examined the impact of smart tourism technologies on enhancing the overall experience and satisfaction of tourists and noted that in the future, most tourists would use at least two or more smart technologies to improve their experience and that destination marketers need to ensure three key attributes when utilizing smart tourism technologies—interactivity, personalization, and informativeness. Zhang et al. (2019) provided insights into the content of the 2nd China-US Tourism Research Summit 2017, arguing that technology, people (residents and tourists), and organization are essential components in building the tourist experience throughout the destination visit (pre-tour, during, and post-tour).

In North America, the themes that researchers have focused on do not clearly stand out. Although the analysis of keywords suggests that they focus on how to enhance the visitor experience, this focus is the theme of most other tourism research. The author believes that there are two reasons for this result. First, due to geographical constraints, most smart tourism researchers in North America are concentrated in one country, the United States, and the number of accessible papers is much lower than in other regions. Most of these studies are coauthored with scholars in other regions and therefore do not focus on topics specific to researchers in the North America region. Second, the attention to the theme of enhancing the tourism experience is largely due to the fact that research in this region takes a tourist's perspective rather than the technology-driven perspective of the Asia-Pacific region and the smart tourism destination perspective of the European region. Stankov and Gretzel (2020) emphasize that human-centered design should be used as the basis for smart tourism development rather than concentrating too much on innovation and the convenience of technology. The ultimate goal of both the advancement of smart technology and the management of smart tourism destinations is to enhance tourists' experiences

and bring them better tourism services. Therefore, the author believes that the relationship between tourists and smart tourism, as well as the position and role of tourists in the development process of smart tourism, will be widely discussed in the future.

V. Conclusions and Implications

Through a systematic review, this study summarizes and discusses 136 published articles on smart tourism and identifies the direction of smart tourism research in different regions. In doing so, it fills a gap in past literature review studies on smart tourism, provides a different way of understanding the development of smart tourism research.

This study indicates that a review of the research themes of researchers in three major smart tourism research regions can help researchers gain a fuller picture of smart tourism and establish a better theoretical foundation for smart tourism research. From an Asia-Pacific perspective, research themes of researchers in smart tourism focus on technology-driven topics. In addition to cloud services, IoT, and end-user internet service systems already used in destinations, researchers are increasingly applying artificial intelligence to smart tourism. The author believes that national policies largely influence the emergence of this theme in the Asia-Pacific region. Unlike in the European region, most Asian countries have a top-down strategy for smart tourism development (Wang et al., 2021), meaning that the state leads the development of related projects. This has led to the acceleration and expansion of the development scale as prioritizing the development of smart tourism and smart technology-driven tourism is one of the fastest ways to enhance tourism and increase economic benefits (Li et al., 2017). And the author believes that in future research on smart tourism, the relationship between government and market will become the focus of research. From the perspective of the researchers in European region, most research related to smart tourism development takes a destination-centric view. This is in contrast to the Asia-Pacific region, where most cities use a bottom-up (Boes et al., 2015) model through Living Labs or PPPs to develop smart tourism from a more microscopic perspective. The destination-centric research can be more straightforward and in-depth in solving the practical problems encountered in the current smart tourism development process, making it better suited to the current situation in the European region. Researcher in North America, however, has focused on enhancing tourists' experiences. This result suggests that research in North America has combined, to some extent, findings on the tourism experience from the Asia-Pacific and

European regions. At the same time, North America pioneered the concept of smart cities to improve city dwellers' quality of life. As smart tourism is derived from smart cities, this region will also focus on enhancing the tourist experience.

Although smart tourism research has made great strides in various regions, shortcomings remain. In the Asia-Pacific region, for example, although technological advances have contributed significantly to smart tourism development, the quality of tourism services and destination management is still low. Despite scholars calling attention to this aspect (Shao et al., 2017) in recent years, the issue persists. By contrast, in Europe and North America, while there is sufficient focus on destination management and visitor experience improvement, the use of state-of-the-art technology is stagnant. For example, in many European regions, smart technologies are only used in public wifi, QR codes, or traffic alerts (Gretzel & Koo, 2021) and not in other areas (e.g., mobile payments, smart management, smart travel). Therefore, to develop smart tourism more comprehensively, future research on smart tourism should take into consideration different regional research themes to supplement the deficiencies of smart tourism research in specific regions.

Another contribution of this study is to provide new perspectives and ideas for researchers who are in regions where smart tourism development is in its infancy or who are just starting to conduct research on smart tourism. Japan, for example, is a highly popular tourist destination and an important part of the world tourism market, with 31.88 million international visitors and 40813.5 billion yen in international tourist spending in 2019 (JTA, 2019). Unfortunately, however, research and actual development related to smart tourism in Japan have not kept pace with the world and are still in their embryonic stages (Sano, 2021). The results of this study will provide theoretical support for the future growth of less-developed regions, like Japan, in smart tourism, open up new perspectives, and suggest ways of combining each region's own research characteristics with those of other regions so that smart tourism development can make a strong start and be sustained.

As with all studies, this study has limitations. The first limitation is that its scope was restricted to articles related to the field of tourism and did not involve articles from other disciplines. In addition, the data selection was limited to SSCI articles with papers published in Journal citation report's Q1 and Q2 divisions journals and did not involve articles published in other journals. Although these journals represent the trend of smart tourism research, they can only be summarized as

mainstream research opinions. The second limitation is that although the content of this study discusses the themes of smart tourism research in different regions, it fails to discuss in depth the reasons for the formation of the themes. Future research can expand the scope of the study from this perspective and more deeply explore the research related to smart tourism in different regions to obtain newer research results.

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- Appendix : The specific search fields
Web of science:
TI = (“smart tourism” OR “smart hospitality” OR “smart restaurant” OR

“smart restaurants” OR “smart hotel” OR “smart hotels” OR “smart destination” OR “smart destinations” OR “smart travel” OR “smart traveler” OR “smart travelers” OR “smart tourist” OR “smart tourists”) or
AB = (“smart tourism” OR “smart hospitality” OR “smart restaurant” OR “smart restaurants” OR “smart hotel” OR “smart hotels” OR “smart destination” OR “smart destinations” OR “smart travel” OR “smart traveler” OR “smart travelers” OR “smart tourist” OR “smart tourists”) or
AK = (“smart tourism” OR “smart hospitality” OR “smart restaurant” OR “smart restaurants” OR “smart hotel” OR “smart hotels” OR “smart destination” OR “smart destinations” OR “smart travel” OR “smart traveler” OR “smart travelers” OR “smart tourist” OR “smart tourists”)

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