E-Journal of
Tourism
p-ISSN 2541-0857 # e-ISSN 2407-392X Volume 11, Number 02, September 2024

Visualizing Smart Tourism through Smart Community Drivers and Driven Outcomes

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DOI: https://doi.org/10.24922/eot.v11i2.118460

Article Info

Submitted:
June 10th 2024
Accepted:
September 23rd 2024
Published:
September 30th 2024

Abstract

The definition and description of smart tourism have mainly focused on implementing ICT in tourism activities. Smart tourism's techno-centric approach threatens to marginalize thriving smart communities, hindering the symbiotic relationship crucial for destination success. In conducting the theoretical and literature review of smart tourism, the authors found that cloud computing, the Internet of Things (IoT), and End-user devices have facilitated the process but have not changed the nature of tourism. Unsustainable tourism practices can overwhelm communities. By fostering collaboration that leverages collective intelligence, technology acceptance, and a system-thinking approach, communities can effectively address the challenges of excessive tourism. This collaborative effort lays the groundwork for a truly smart community that transcends technological advancements.

Keywords: collective intelligence; community system thinking; smart community; smart tourism; technology acceptance.

INTRODUCTION

Background

Tourism is a social, cultural, and economic phenomenon which entails the movement of people to countries or places outside their usual environment for personal or business/professional purpose (UNWTO, 2024). As defined by UNWTO (2024), tourism has emphasized the relevant implications of social and cultural aspects and economic benefits from business activities in the tourism industry. For decades, numerous Asian and European countries have launched smart tourism campaigns as part of their tourism development strategies. These campaigns promote their socio-cultural heritage and natural resources to attract more tourists and enhance the tourism sector's contribution to economic growth. These countries are increasingly investing in building or enhancing their infrastructure to support smart tourism strategies, a novel concept in tourism development (Gretzel, Reino, Kopera, & Koo, 2015). This approach leverages technological advancements to assist tourism businesses and activities, catering to the growing number of tech-savvy tourists (Gelter, Lexhagen, & Fuchs, 2021).

The integration of information and communication technology, including social media applications, the Internet of Things, e-commerce platforms, and technological infrastructure, has transformed the form and presentation of services at tourism destinations. This shift has also evolved the traditional tourism ecosystem into smart tourism (Gretzel et al., 2015). According to Gelter et al. (2021), information and communication technology applications and infrastructure are crucial technological drivers for enhancing and developing interactions between tourists and destinations in a smart tourism context. Furthermore, a meta-narrative analysis of the smart tourism destination research portfolio emphasized that the smart tourism concept depends on the level of community engagement with information and communication technology (ICT) to facilitate tourist-stakeholder interactions at destinations. ICT may include cloud computing, the Internet of Things (IoT), end-user devices (such as desktop or laptop computers, smartphones, and tablets), and destination digitalization (Gelter, Lexhagen, & Fuchs, 2021; Buhalis & Moldavska, 2022).

Moreover, extensive research in smart tourism indicates that technology engagement in tourism businesses and activities through ICT significantly enhances tourists' memorable experiences. However, using ICT in smart tourism has revealed security and privacy issues, which are seen as counterproductive impacts of smart applications facilitating tourist interactions with destinations. Tourists are increasingly concerned about providing their personal information to application systems and services offered by agencies at destinations (Suntacha, Banos-Pino, & Del Valle, 2023). In addition to the involvement of information and communication technology in tourism activities among stakeholders, providing access to tourism information and digitalized services at destinations (Suntacha, Banos-Pino, & Del Valle, 2023), another perspective from the theory of planned behavior (TPB) suggests that the emotional connection between tourists and destinations remains crucial for enhancing the quality of tourists' memorable experiences in smart tourism destinations (Nieves-Pavón, López-Mosquera, & Jiménez-Naranjo, 2024).

Zhou, Buhalis, Fan, Ladkin, and Lian (2024) underscore the community's pivotal role in constructing a smart tourism framework. Their study evaluates and develops destination strategies to attract digital nomads, highlighting the community's collective contributions to smart tourism development. Utilizing stakeholder theory, they categorize communities into three types: international, destination, and institutional. Each community, with its unique characteristics and contributions, plays a crucial role in smart destination planning and strategy to meet smart tourists' needs (Zhou et al., 2024). Zhou et al. (2024) emphasize the development of smart tourism planning and strategies through the interplay of various communities, each with its unique characteristics and contributions.

This concept aligns with Bethune et al. (2022), who advocate for interdependence and collaboration among community actors in fostering a smart tourism destination. The integration of these ideas underlines the community's pivotal role in smart tourism planning and strategy, facilitated by community-to-community and actor-to-actor interactions at the destination. Information and communication technology advancement has shaped the tourism ecosystem and has inevitably affected the characteristics of traditional tourism elements such as attraction, accessibility, and amenities (Kim et al., 2022; Suntacha et al., 2023). However, this circumstance is not to undermine traditional elements of tourism and the community capability and critical role, whether through the interaction between one community and another community or interaction between actors within a community to their important contribution to smart tourism development (Gelter et al., 2021; Bethune et al., 2022; Zhou et al., 2024).

LITERATURE REVIEW

Overtourism

Overtourism was not a new phenomenon in the tourism industry development, it has been there since early stage of the tourism industry history (Dodds & Butler, 2019). Furthermore, the fuel for overtourism has to be obviously beyond the control of the tourism industry itself but it rests on the interrelated factors that have changed the attributes of tourism in some ways. The interrelated factors have been recognized by Dodds & Butler (2019), such as increasing number of populations has impacted the number of tourist, economic growth in the certain countries that have increase their financial ability to pay for their travel, the visibility of the tourism destination through the internet and information and communication technology (ICT) has revealed more tourism destinations and simplify the travel arrangement, increasing number of promotion and tourism events that have attracted more tourists, increasing number of transportation mode and cheapest fare that have decreased the total cost of travel relatively.

Although overtourism is occurring in the many popular tourism destinations signed by the increasing number of tourists visit the destination; however, there are still many destinations not yet back to the figure they had before the COVID-19 pandemic called under-tourism and both situation could have affect the sustainable tourism (Mihalic, 2020). The government and tourism agencies at a certain destination have designed and implemented regulations and policies to prevent or to solve the problems triggered by overtourism activities. Due to this overtourism tourism is not taking place in all the tourism destinations but to a most popular destination and hype destination in the social media (Dodds & Butler, 2019), the involvement of community at the destination in developing strategy in response to overtourism activities has become significant (Burbano, Valdivieso, Izuriety, Meredith, & Ferri, 2022).

These interrelated factors eventually are not the factors initiated and controlled by the destination community; however, it requires the community capability to response by taking necessary actions. The community capabilities and contributions to the decision-making process toward the overtourism challenges is significant to provide the suitable regulation and policy and establishing sustainable development strategies (Iqbal, Ramachandran, & Siow, 2022). Previously studied by Chin, Lo, Songan, & Nair (2014), have suggested that the stakeholder role represented by the interaction among group in the community is inevitably influenced the community capability to develop a sustainable strategic decision to overcome problems at the tourism destinations as the unsustainable tourism activities (Mihalic, 2020). The community at the destination has a significant role in establishing sustainable regulations and policies through their involvement in a decision-making process to minimize the negative impact of overtourism activities.

Smart tourism

Researchers have defined tourism from various perspectives for years, enriching their understanding and extending the context from traditional to smart tourism. The smart tourism phenomenon has globally influenced sustainable economic growth by leveraging rich tourism destinations and advancements in information technology (Gelter, Lexhagen, & Fuchs, 2021).

According to Gretzel et al. (2015), smart tourism is an interconnected network of smart tourism businesses, destinations, and technological infrastructure. In this framework, the physical elements of a tourism destination are repackaged, recommunicated, and reconnected to tourists through information-based technology applications and infrastructure. This definition suggests that tourists experience a unique and memorable visit due to smart

interactions and connectivity with the destination's physical elements via applications and Wi-Fi (Gretzel, Reino, Kopera, & Koo, 2015).

Similarly, Li, Hu, Huang, and Duan (2017) define smart tourism from an information services perspective as the interaction between an individual tourist support system and the tourism technology ecosystem, particularly in exchanging information through smart information services. Another notable study on smart tourism by Cerdá-Mansilla, Tussyadiah, Campo, and Rubio (2024), viewed as a broader concept of smart destinations, indicates that each stakeholder in the tourism sector at the destination interprets smart tourism differently, presenting various features. Their literature review categorizes stakeholders at the destination into the industry, local community, tourists, and researchers, suggesting that each group presents distinct features when defining a smart destination.

Cerdá-Mansilla et al. (2024) argue that the local community presents distinct features compared to the industry, tourists, and researchers, although several smart community features overlap among stakeholders. The unique features the local community identifies in defining smart destinations include environment, transport, and measurement standards. This viewpoint suggests that the community has specific concerns about the destination's environment, transport accessibility, and indicators of tourism activities, which other stakeholders do not represent. Nonetheless, accessibility, sustainability, tourists, and technology are features shared by all stakeholders, including the community (Cerdá-Mansilla, Tussyadiah, Campo, & Rubio, 2024).

A literature review on smart tourism suggests that the concept extends beyond merely installing technology applications to digitalize tourism activities at the destination (Dar, 2022). Instead, the smart behaviour of the community in their activities and interactions plays a crucial role in developing fundamental aspects of tourism, creating memorable experiences (Nieves-Pavón et al., 2024). Additionally, developing a smart community relies not only on integrating technology and data in tourism businesses and activities but also on multiple factors that significantly influence destination planning (Ghorbani, Danaei, Zargar, & Hematian, 2020).

Building smart tourism hinges on a foundation of smart communities empowered by real-time data and critical decision-making (Dar, 2022). Active community participation strengthens program success across diverse initiatives – from tourism development to climate action and entrepreneurial ventures. This includes involvement in planning, implementation, and oversight at both collective and individual levels (Reimerson, Priebe, Hallberg-Sramek, de Boon, & Sandström, 2024). Such participation fosters responsible resource use and knowledge acquisition.

In the research field of smart tourism destinations, using the word 'smart' has become a magic word to enhance a research article's look, making it look advanced and contemporary. This phenomenon has led to a deficiency in the theoretical definition and description of smart tourism destinations (Gelter et al., 2021), which could undermine and drive the ambiguity in understanding the role of destination communities in tourism development. Some supportive evidence has been observed. Naldi et al. (2015) posit a strong link between smart communities and individual intelligence fostered by education systems.

This collective intelligence empowers communities to identify problems and find effective solutions. A recent literature review by Jakobsen et al. (2023) identified knowledge gaps in smart community technology applications research. These gaps encompass methodological concerns, research approaches, digital integration, co-evolution and impacts, domain-specific technical insights, and the digital divide's societal implications. Jakobsen et al. (2023) further emphasize the importance of a sociotechnical perspective. They argue

that successful smart technology implementation necessitates considering social and cultural contexts, economic benefits, and community infrastructure as integral components of problem-solving mechanisms.

The current focus on technology in smart tourism often overlooks the crucial role of smart communities. While technology facilitates information flow and interaction, the underlying principles, frameworks, tools, and models fail to fully recognize the importance of community involvement (Asian Development Bank, 2023). A destination's ability to adopt and leverage technological advancements hinges on the community's capacity to embrace them. This empowers them to share information effectively using intelligent applications, improve business efficiency, and cater to the evolving preferences of smart tourists (Liu & Wu, 2023).

The literature highlights four interdependent aspects that form the foundation of a smart community at tourism destination framework:

1. System thinking mechanism: The problem-solving abilities of the community (Senge et al., 1994; Jakobsen et al., 2023).
2. Technology acceptance: The tourism community's ability to adopt and adapt information and communication technologies (ICT) advancement (Gelter et al., 2021; Liu & Wu, 2023).
3. Collective intelligence: The community's collective knowledge and wisdom are vital (Naldi et al., 2015).
4. Physical destinations resources: The destination's core attractions, accessibility, and amenities (Gretzel et al., 2015; Kim et al., 2022).

System Thinking Mechanism

Recently, people in Spain's Canary Islands rallied to protest the government's tourism policy and demand that the government limit the number of tourists who have harmed the environment and the residents' lives regardless of the economic benefit they have experienced for years (BBC News, 2024). This island had more than 13 million visitors in 2023, which is even greater than in 2018 and 2019, years before the COVID-19 pandemic (Statista, 2024). In the other destinations, the tourism authority has taken further action to deal with the problem of over-tourism. The Venice Tourism Authority announced the terms and policy commencing June 1, 2024; they would like to limit the number of tourists in one group to 25 persons. Likewise, it requires an advanced booking to visit and pay an entrance fee of up to €10 per person to enjoy the tourism activities in this destination.

The previous year, they banned large cruises from anchoring and bringing tourists into this city (Whitmore, 2024). The residents of Hallstatt in Austria have encountered similar issues about the excess tourism activities (The News, 2024) and Majorca in Spain (Marshall, 2023), the same awareness and reaction was taken by the local residents to protect and maintain the city sustainability from the harmful impact of over-tourism problem to the destinations. These recent events have demonstrated the community's awareness of the collateral damage of over-tourism activities and reaction to preserve the nature of the destination and residents' convenience and peaceful life regardless of the privilege of economic and social benefits (Whitmore, 2024).

Dar (2022) highlights community awareness as a critical factor in building smart communities. Similarly, de São José et al. (2021) emphasize the synergy fostered by collaborative decision-making within communities, where residents work together to identify and implement solutions to local challenges. This underscores the importance of integrating communities into destination planning. Their role has been increasingly recognized in sustainable tourism development, as evidenced by Dar (2022) and McKenna and Hanrahan (2024). The latter study also reveals a disconnect – while the community

acknowledges tourism's positive economic and social impacts (McKenna & Hanrahan, 2024), they have not been actively involved in decision-making processes. McKenna and Hanrahan (2024) observe a gap between resident concerns and the tourism authority's input during sustainable destination planning. Research suggests that local residents and communities, through their inherent problem-solving mechanisms, can effectively understand and analyze local situations, identify root causes, and develop alternative solutions for sustainable destination planning (Jakobsen et al., 2023) and specialization strategies (Romão, 2020). However, this effectiveness can be hampered by discrepancies between the concerns and input provided by the tourism authority and the community.

According to Senge (2006), the system thinking mechanism as the fifth disciplines that crowning the four disciplines known earlier which is personal mastery, shared vision, mental models, and team learning. This system thinking mechanism within the context of community is the ability to merge all four disciplines to recognize the causal relationship of an event, understand the process, and predict the possible impact of an event or phenomenon that have occurred in their community across time (Senge P. M., 2006). An individual ability, the vision and ideas sharing, mental models, and the ability to learn within a group of individuals could have significant and positive affect to the community system thinking mechanism as the fundamental disciplines to establish smart community structure through the community learning process improvement (Senge P. M., 2006).

The authors assert that problem-solving mechanisms are essential attributes of smart communities. These communities demonstrate their ability to identify problems, conduct causal analysis, find alternative solutions, and implement the right solutions. Smart communities necessitate problem-solving mechanisms. Developing intelligent, sustainable, and inclusive growth in smart communities requires enhancing individual education, which is recognized as a crucial indicator (Naldi et al., 2015). Satisfaction, equity, inclusivity, accessibility, safety, and cultural preservation are acknowledged as social indicators for smart tourism destinations alongside technological dimensions (Hussain et al., 2023).

Furthermore, Hussain et al. (2023) presented a rubric for smart tourism assessment, identifying technological indicators such as online service availability and multiple contactless payment systems. The social and technological dimensions coexist in their rubric, advancing the smart community, yet they function as independent dimensions with specific measurement indicators (Hussain et al., 2023). Constructing a smart community should involve the multidimensional tasks and roles of various stakeholders and the integration of numerous soft and hard infrastructures (Gu et al., 2024). Although information technology is indispensable in shaping smart communities, the principles of socio-technological interactions, where social and technological aspects benefit each other, should adhere to livable, sustainable, efficient, secure, resilient, productive, inclusive, and transparent principles (Gupta et al., 2021; Dar, 2022; Bethune et al., 2022; Nakhaei et al., 2023; Berhanu et al., 2024).

However, the definition of a smart community has evolved to encompass complex tasks and roles, distinguishing it by the presence of problem-solving mechanisms (Jakobsen et al., 2023), community involvement in decision-making processes (McKenna & Hanrahan, 2024), individual education levels (Naldi et al., 2015), social quality indicators (Hussain et al., 2023), multidimensional tasking, supportive soft and hard infrastructure (Gu et al., 2024), stakeholder collaboration (Defe & Matsa, 2024), technology adaptation (Collado-Agudo et al., 2023), and information and communication technology (ICT) (Gelter et al., 2021).

System thinking mechanisms had prepared the community with the ability to work as the early warning system and problem solver to the negative impacts that could threaten the individual well-being and the quality of life or even threaten sustainability of their place as the tourism destination (Burbano, Valdivieso, Izuriety, Meredith, & Ferri, 2022).

Technology Acceptance

The research underscores the importance of technology acceptance for community activities and interaction at tourist destinations. This acceptance fosters positive behavioral changes, influencing community preferences and interests (Dar, 2022). Within the tourism context, technology acceptance can be understood as the community's willingness to engage with technological applications related to tourism activities or businesses at the destination (Dar, 2022). Destination agencies and businesses must improve efficiency to cater to evolving tourist preferences and enhance the visitor experience. This can be achieved by adopting and offering intelligent application systems that give tourists the information they need to create memorable experiences (Liu & Wu, 2023).

A study by Collado-Agudo et al. (2023) examines how tourism businesses at a destination can adopt the smart tourism model by shifting their focus from the TOE (Technology, Organization, Environment) framework to the TAM (Technology Acceptance Model). This shift significantly impacts managerial innovation, enhancing competitiveness and commitment to IT development. Ultimately, this strengthens the smart tourism ecosystem. While technological advancements undeniably facilitate tourism interactions and transactions (Torabi et al., 2023), there is a crucial need for capacity building within the destination community. Equipping residents with the knowledge and skills to utilize available IT applications empowers them to leverage smart technologies and digitize their services, further enriching the smart tourism experience. The existence of technology advancement and the ability to apply this technology in the community daily interaction as other form of an organization, could accelerates and innovate the community learning capability as the fundamental element to construct a smart community (Senge P. M., 2006).

Collective Intelligence

The United Nations Development Program (UNDP, 2024) defines collective intelligence as leveraging technology for collaborative knowledge sharing, interpretation, and problem-solving. While a study (Calof, Søilen, Klavans, Abdulkader, & El Moudni, 2022) suggests a decline in the term "collective intelligence" popularity compared to that of “crowdsourcing," the terms are often still used interchangeably. Notably, collective intelligence finds application in various research fields, with computing science being prominent. Talukder et al. (2023) highlights the value of collective intelligence for communities. It facilitates data sharing and problem-solving among diverse stakeholders, leading to locally driven solutions. A study by Bulchand-Gidumal (2022) employed the Delphi method with experts to identify key dimensions of smart communities in tourism destinations. Three key dimensions linked to collective intelligence emerged: education, tourist integration, and productivity/employment.

Building a smart tourism community hinges on three key dimensions Bulchand-Gidumal (2022) identified: education, tourist integration, and productivity/employment. Educating residents equips them with the knowledge and interpersonal skills needed for collaboration. Fostering a safe and welcoming environment for both tourists and residents is crucial for a thriving tourism destination. Finally, encouraging residents to explore non-tourism business opportunities reduces overreliance on a single industry and promotes economic diversification. The reaction of community in some European

and Asian countries to the overtourism activities in their cities has indicated the existence of the community collective intelligence in understanding the event, realizing the negative impact overtourism, and deciding to take necessary action as the possible solutions to retain their social and economic quality.

Physical Destination Resources

The UNWTO (2024) defines the physical element of a destination as a cornerstone of tourism. This encompasses the countries or places tourists visit, along with the people, culture, and environment that shape their experiences. The quality of interaction between tourists and these elements significantly impacts their satisfaction, memories, and revisit intention (Torres-Moraga et al., 2024). Furthermore, Torres-Moraga et al. (2024) have studied the impact of the physical appearance of destinations, along with social, symbolic, and natural dimensions, as stimuli for destination identification, measured by the emotional connection between tourists and destinations. The physical appearance of a destination influences tourists' perceptions of its environmental concerns and alignment with their self-concepts (Torres-Moraga et al., 2024).

Multiple stakeholders' acquisition of information and communication technology at the tourism destination to improve their efficiency and connection with tourists should not undermine the important role of the destination's physical elements in developing destination planning and strategy (Kim et al., 2022). The destination's identity represents the tourist's total concept, affecting their experience and revisit intention (Torres-Moraga et al., 2024). A smart community can be identified by its ability to maintain and improve social quality (Hussain et al., 2023), preserve hard infrastructure (Gu et al., 2024), and enhance attraction, accessibility, and amenities (Kim et al., 2022) as part of the destination's physical identity. The tourism activities could not be separated from the physical destination resources as the unique attributes of the destination have differentiated one tourism destination from other (Cró & Martins, 2017).

RESULTS AND DISCUSSION

Smart Community - Driven Outcomes Model

The authors propose an integrated conceptual model, the "Smart Community-Driven Outcomes Model," to illustrate the critical role of existing smart destination communities in fostering smart tourism, smart economics, smart collaboration, and smart sustainability. This model depicts a reciprocal relationship between a core smart community and four "smart outcomes": smart tourism, smart economics, smart collaboration, and smart sustainability (Figure 1).

The Smart Community-Driven Outcomes Model is a conceptual framework with three interconnected dimensions grounded in a literature review of smart communities and smart tourism.

a. Core Layer: Smart Destination Community - This layer represents the model's foundation.
b. Middle Layer: Smart Drivers - This layer encompasses the factors that propel the smart community forward.
c. Outer Layer: Smart Outcomes - This layer reflects the positive consequences of the smart community, including smart tourism, smart economics, smart collaboration, and smart sustainability.

Smart Destination Community

Smart destination communities encompass residents, stakeholders, and their surrounding social structures, economics, demographics, culture, and behavior (Nieves-Pavón et al., 2024). These communities are crucial in maintaining sociocultural quality, facilitating tourist interaction, and ensuring resource sustainability (McKenna & Hanrahan, 2024). The core element is people – their skills and knowledge (hard and soft capacities)

alongside available tourism resources. Importantly, these communities also involve active interaction among multiple stakeholders: residents, government agencies, NGOs, and international actors (Zhou et al., 2024; Defe & Matsa, 2024).

Effective destination planning hinges on a smart community. Active stakeholder engagement, leveraging diverse capabilities, establishes a foundation for smart tourism (Zhou et al., 2024). Resident participation forms the bedrock upon which other smart tourism dimensions are constructed (Sigalat-Signes, Calvo-Palomares, Roig-Merino, & García-Adán, 2020). Their collective efforts and stakeholder commitment are crucial for effective problem-solving. Reinforcing this point, Sigalat-Signes et al. (2020), after interviewing several stakeholders at the tourism destination in the city of Gandia, Mediterranean, emphasize a resident-centric approach. They argue that smart tourism development should prioritize residents over technology as the primary driver of solutions. Thus, they emphasize residents as the center of the community more than technologies as problem-solving facilitators.

Figure 1. Smart Community-Driven Outcomes

Smart Community Driver

The second dimension of this model is smart community drivers. The authors have identified several key drivers in this dimension: physical destination resources (Kim et al., 2022), community collective intelligence (Calof et al., 2022), community system thinking (Jakobsen et al., 2023), and technology acceptance (Dar, 2022). These drivers have significantly contributed to the development of smart destination communities. The community at the destination, as the core dimension of this model, requires these drivers to qualify as a smart community. The presence of these drivers enhances the community's ability to identify collective problems and find optimal solutions. This increased decision-making capacity indicates the evolution of the community from a traditional to a smart community (Jakobsen et al., 2023).

These drivers support smart destination community development as both inward and outward forces, sustaining smart community outcomes such as smart tourism, smart economics, smart collaboration, and smart sustainability. Beyond their roles

as inward and outward forces, these drivers can also serve as indicators to assess whether the community's collective performance meets the decision-making mechanism's standards.

Physical Destination Resources

Physical destination resources, encompassing natural assets, social quality (Hussain et al., 2023), soft and hard infrastructure (Gu et al., 2024), attractions, accessibility, and amenities (Kim et al., 2022), form the foundation of a tourist destination. These elements not only define a location's identity but also directly impact visitor experiences. Tourists actively engage with the physical environment, shaping their memories and influencing their decision to revisit (Torres-Moraga et al., 2024). A destination's unique blend of resources fosters memorable experiences, ultimately influencing a tourist's intention to return. This physical destination resources as a fundamental element of tourism activities could have a significant impact on the destination competitiveness and could have been worked as the source of wisdom to the local community as well (Cró & Martins, 2017).

Community Collective Intelligence

Community collective intelligence refers to the problem-solving capability that emerges from an educated citizen as an induvial and active stakeholder interaction (Talukder et al., 2023). This collective intelligence empowers the community to identify shared challenges and collaboratively find optimal solutions, ultimately improving social well-being.

In this model the community collective intelligence functions as a dual force. Internally, it strengthens the core smart community by fostering problem-solving capacity. It will enrich the community capacity through the individual intelligence as the member of the community that have been attained through education and training (Zhou, Buhalis, Fan, Ladkin, & Lian, 2024).

Externally, the community collective intelligence has equal force to positively enforce the initiatives and process of smart community driven outcomes such as smart tourism, smart economic, smart collaboration, and smart sustainability.

Community Technology Acceptance

Technology acceptance reflects the community's perception of technology's usefulness and ease of use in their activities (Davis, 1989). This includes attitudes and how readily people adopt new technologies. Building technology acceptance within the smart destination community requires inclusion programs that equip residents with the knowledge and skills to leverage these advancements (Torabi et al., 2023). When stakeholders embrace technology, it transforms tourism interactions and service delivery at the destination (Collado-Agudo, Herrero-Crespo, & San Martín-Gutiérrez, 2023). Moreover, it empowers innovation in tourism businesses, leading to more efficient practices and enhanced destination competitiveness.

Technology acceptance acts as a dual force in this model. Internally, it strengthens the core smart community by fostering digital literacy and technology use. The increasing number of exposures of the community to the technology advancement could improve the system thinking mechanism to smart community (Senge P. M., 2006). Externally, the community ability to accept and adopt the technology advancement could have positive contributes to the development and enhancement of the smart community driven outcomes like smart tourism, smart economic, smart collaboration, and smart sustainability.

Community System Thinking

System thinking, a core principle of learning organizations (Senge P. M., 2006), refers to the ability to understand complex systems. Individual capacity for system thinking builds on early development and is crucial for collective learning

within groups and societies (Senge et al., 1994). In the context of smart communities, system thinking translates to strong community decision-making mechanisms. It empowers residents to identify and solve problems collaboratively, ultimately improving their quality of life (Jakobsen et al., 2023).

As other smart community drivers, system thinking acts as a dual force. Internally, the community system thinking has strengthened the core of smart community by fostering collaborative problem-solving. System thinking has shown in the community's ability to identify the cause of the problems and find the solutions problems to improve the community well being (Senge P. M., 2006). Externally, the community system thinking has a positive contribution to accelerate the driven outcomes development and enforcement such as smart tourism, smart economic, smart collaboration, and smart sustainability by providing a compounding problem solving mechanism within the community.

Smart Outcomes

The outermost layer of the model represents the positive outcomes driven by the smart destination community: smart tourism, smart economics, smart collaboration, and smart sustainability. These "smart outcomes" result from the community's collective efforts and outward forces. Interestingly, a two-way relationship exists between smart outcomes and smart community drivers. While the community's capabilities propel positive outcomes, the success of these outcomes can, in turn, enrich and strengthen the drivers themselves. For example, a thriving smart tourism industry might incentivize further investment in physical destination resources.

Smart Tourism

Smart tourism development hinges on the foundation of a strong, smart community (Zhou et al., 2024). This community's ability to leverage information technology fosters intelligent interactions between tourists and the destination, a crucial element for effective smart tourism planning (Liu & Wu, 2023).

Information and communication technologies (ICT) and social media advancements constantly reshape smart tourism. These advancements introduce innovative products and service presentations, enriching tourist-destination interactions and enhancing the overall tourist experience (Hussain et al., 2023). Furthermore, integrating technology into smart tourism strategies fosters broader social networking partnerships and facilitates faster information sharing (Park, Lee, Yoo, & Nam, 2016).

Smart Economic

Recent qualitative research by Park & Gordon (2024) on a community economic development project in a rural county of Ontario, Canada, has uncovered the community's roles in building a stronger and more resilient economy. They highlighted the community's willingness to engage in interconnected activities within economic development programs, their capacity to identify new opportunities for revenue-generating business activities, and their initiatives to collaborate with other stakeholders as contributors to economic development. The higher the degree of technology acceptance by the community, the more effective and efficient their business operations will be. Similarly, improving managerial capacity will intensify economic activities at the destination and expand their network coverage (Collado-Agudo, Herrero-Crespo, & San Martín-Gutiérrez, 2023).

Smart Collaboration

Effective collaboration among stakeholders at a destination fosters a win-win situation. It unlocks opportunities for network improvement, risk and resource sharing, ultimately enhancing destination competitiveness (Luongo, Sepe, & Del Gaudio, 2023). This collaborative spirit fuels product and service co-creation, a key

driver of competitive advantage. As highlighted in the Regional Innovation System (RIS) matrix, a strong tourism innovation system thrives on both innovation capacity and resource endowment (Luongo et al., 2023). Reinforcing this notion, Chung, Lee, Ham, and Koo (2021) propose a framework for sustaining smart tourism competitiveness. They identify five key partners who interact at the destination: tourists, residents, the local community, tourism companies, and the government. By leveraging these stakeholders' unique roles and contributions, successful collaboration empowers destinations to innovate and thrive.

Smart Sustainability

Sustainable tourism development hinges on a community's ability to balance the influx of tourists with preserving its physical resources and socio-cultural quality (McKenna & Hanrahan, 2024). Research by Vieira, Alén, Fernandes, and Rodrigues (2024) reinforces this notion, highlighting that community involvement and attachment are crucial for positive cost-benefit outcomes in sustainable tourism destinations.

IMPLICATIONS

This conceptual research offers significant advancements in the understanding of smart tourism. First, it introduces the concept of a smart community as a key driver for achieving positive outcomes in smart tourism, sustainability, collaboration, and economics. This highlights the crucial role of a strong community foundation for successful sustainable development strategy across various dimensions. Second, the research strengthens the theoretical framework of smart tourism by positioning the smart community as the cornerstone for successful strategy development. By placing the community at the center, this framework underscores the importance of resident engagement, collective intelligence, and system thinking in achieving sustainable and successful tourism practices.

Finally, the proposed "Smart Community-Driven Outcomes Model" provides a comprehensive framework for understanding the interconnected nature of smart tourism development. The model identifies key drivers within a smart community, including physical resources, technology acceptance, collective intelligence, and system thinking. Importantly, it also highlights the interdependent outcomes of these drivers, encompassing smart tourism, sustainability, collaboration, and economics. This holistic perspective fosters a nuanced understanding of the complex interplay between community development and positive tourism outcomes to anticipate the unsustainable tourism activities known as overtourism. Building upon these novel insights, this research paves the way for further exploration of the intricate relationship between smart communities and smart tourism. Future research could involve empirical studies testing the proposed model and exploring specific strategies to foster smart community development within tourism destinations.

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