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Incentivized adoption of smart tourism services: Host community perspective

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ABSTRACT

In developing nations, the success of development programs hinges on addressing stakeholder concerns. The growing popularity of smart tourism initiatives strengthens tourism infrastructure and elevates visitor experiences. Central to this development is the imperative to engage and secure the support of host communities in embracing smart tourism services. Recently, the momentum of incentivized adoption within smart tourism services has become pronounced among host communities. This research delves into the nuanced processes and outcomes of incentive adoption, shedding light on associated challenges. The study was conducted through interviews with host communities in smart cities; the study reveals that incentivized adoption spans diverse operational facets, encompassing digitalization of business, smart infrastructure development, training programs, the establishment of smart tourism centers, community-driven platforms, e-culture transition, and forward/backward linkages. The positive outcomes resulting from incentivized adoption include economic empowerment, community outreach, improved tourism infrastructure, and the enhancement of technical skills. However, challenges persist, ranging from e-safety concerns and e-literacy issues to resource constraints, cultural sensitivities, resistance to change, infrastructural gaps, and limited local involvement. This research contributes to the field by comprehensively understanding the multifaceted dynamics surrounding incentivized adoption in smart tourism, offering valuable insights for policymakers, practitioners, and researchers alike.

Keywords: smart city; smart tourism; incentivized adoption; smart technology; smart services

1. Introduction

In today's rapidly evolving world, the concept of smart cities has gained considerable attention[1–3]. Smart cities are cities that integrate technology and data-driven solutions to improve efficiency, sustainability, and quality of life for their residents[4,5]. These cities leverage information and communication technologies to enhance various aspects of urban life, including transportation, energy management, environmental sustainability, and citizen participation. As smart cities continue to shape urban landscapes, the concept of smart tourism has emerged as an integral component of this transformative approach to city living[6,7]. Smart tourism leverages innovative mobile communication technology and a multidisciplinary concept to enhance the travel experience of tourists and optimize the function of tourism destinations[8]. It focuses on intensive

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information sharing, value co-creation, and the integration of tourism sources with advanced information and communication technologies.

Introducing the concept of smart tourism into the framework of smart cities creates opportunities for both residents and tourists[3]. From the host community, smart tourism presents unique incentives and benefits[9,10]. Smart tourism integrates cutting-edge technologies such as artificial intelligence, the Internet of Things (IoT), and data analytics to enhance the overall visitor experience and optimize destination management[11,12]. While the benefits of smart tourism are evident in terms of improved efficiency and enriched visitor experiences, there exists a critical research gap in understanding the host community's perspective on the incentivized implementation of smart tourism initiatives. The host community is an essential stakeholder in the tourism industry, as their participation and support are crucial for the successful implementation of smart tourism initiatives.

Despite the growing implementation of smart tourism strategies worldwide, little attention has been directed towards comprehensively investigating the attitudes and perceptions of host communities. The interaction between residents and smart tourism technologies remains an underexplored domain[13,14], with limited studies addressing how host communities perceive and respond to the integration of these technologies into their daily lives. Understanding the host community's readiness is crucial for the sustainable development of smart tourism, as their engagement and support are integral to the success and longevity of such initiatives. The research problem addressed in this article lies in investigating the scope for incentivized adoption of smart services in tourism destinations and exploring the consequential outcomes linked to this adoption. Another facet of the research problem lies in identifying the specific challenges, barriers, or concerns that hinder the effective adoption and utilization of new and smart technologies. Furthermore, the research problem delves into the implications of these unexplored issues for the overall success and sustainability of smart technology initiatives.

This research endeavors to bridge the existing gap by delving into the host community perspective on the incentivized implementation of smart tourism. The study aims to unearth the nuanced perceptions, concerns, and expectations of residents living in destinations adopting smart tourism technologies. By shedding light on the host community's viewpoint, the research aims to provide insights to policymakers, destination management organizations, and industry stakeholders regarding the area for incentivized adoption, its outcomes, and the potential challenges and opportunities associated with the implementation of smart tourism initiatives.

The findings of this study will contribute valuable insights to the existing literature, offering a holistic understanding of the socio-cultural implications of smart tourism for host communities. Additionally, the research outcomes will serve as a guide for the development of inclusive and community-oriented smart tourism strategies, fostering a harmonious coexistence between technology-driven advancements and the authentic cultural fabric of destination communities.

2. Review of literature

It is widely acknowledged that tourism is growing at an astounding pace[15,16]. The tourism industry has undergone a significant transformation due to the integration of Information and Communication Technologies (ICT)[6,11,17]. Studies highlight the positive impacts of smart tourism on travelers' experiences, emphasizing the convenience and enjoyment that technological advancements bring[18,19]. Smart tourism technologies have revolutionized various aspects of the travel experience, including accommodation bookings, transportation, destination information, and personalized recommendations[6,14,20,21]. These technologies have not only enhanced efficiency and convenience for tourists but also opened up new opportunities for destination

management organizations to improve their competitiveness[22]. Furthermore, the concept of smart tourism destinations, which is the integration of smart city principles in the tourism industry, has gained traction in recent years[23]. Smart tourism destinations aim to leverage technological advancements and data-driven solutions to enhance the overall visitor experience, optimize resource allocation, and improve sustainable development practices[24,25]. However, while much attention has been given to the benefits and opportunities of smart tourism, there is a need to also consider the perspectives and concerns of host communities.

Host communities play a critical role in the success of smart tourism initiatives[26]. Their involvement and support are crucial for ensuring the seamless integration of smart technologies and maintaining the authenticity and sustainability of the destination. Randhawa and Kumar[27] found that while smart tourism initiatives can bring economic benefits to host communities, there are also potential negative impacts such as increased crowding and over-tourism, loss of local identity and culture, and unequal distribution of benefits. Understanding community awareness is crucial for the successful implementation of new technologies[28,29]. Smart tourism has a significant impact on shaping the community's viewpoint, including perceived benefits and concerns. Understanding these perspectives can facilitate the development of strategies and policies for sustainable adoption and use of smart tourism services by host communities. Therefore, it is essential to explore the host community perspective on the incentivized implementation of smart tourism in smart cities. Several studies highlight the potential benefits that host communities can derive from the adoption of smart tourism services[14,28]. Enhanced economic opportunities, improved infrastructure, and increased cultural exchange are recurring themes in recent works[7,14,26,30]. Understanding the perceived benefits is crucial for designing effective incentive programs. The effectiveness of these strategies is vital for policymakers and stakeholders involved in promoting adoption.

Central to the incentivized adoption process is the crucial role of host communities. Existing literature emphasizes the need to take these communities into confidence, involve them in the decision-making process, and encourage their active participation in smart service adoption[31,32] This aligns with the principles of community-based tourism, emphasizing community empowerment, ownership, and benefit-sharing[33]. In recent years, the concept of incentivized adoption has gained momentum[34–36]. The incentivized adoption of smart services has witnessed a notable surge in recent years, particularly among host communities[28,37]. The literature suggests that incentivization strategies, such as financial rewards, recognition, and support, play a pivotal role in motivating host communities to embrace smart technologies and services[35,36]. The review also underscores the need for a nuanced understanding of the processes and outcomes associated with incentive adoption, contributing to a more comprehensive understanding of its implications.

This study aims to delve into the intricate processes and outcomes associated with incentive adoption, shedding light on the challenges inherent in this transformative process. Understanding how cultural factors and ethical considerations influence the acceptance and success of smart tourism services can enrich the findings and inform more culturally sensitive implementation strategies. Addressing these research gaps can contribute to a more comprehensive understanding of the incentivized adoption of smart tourism services among host communities, facilitating more targeted interventions, policy development, and sustainable implementation strategies.

3. Methodology

3.1. Research design

Qualitative Approach: This study adopts a qualitative research design, influenced by the novelty of the topic as discussed by Lee[38], leading to an exploratory nature of our methodology. Qualitative methodologies

provide the opportunity to gather input from diverse stakeholder perspectives in a more flexible way when contrasted with the rigid structure of quantitative survey techniques[39]. The study employed interviews among host communities situated in smart cities that stand as prominent tourist destinations in India, experiencing a consistent increase in footfall over the past five years. The study used purposive sampling, targeting individuals with diverse backgrounds and varying degrees of engagement with the tourism industry. Additionally, a literature review strategy is employed in conjunction to substantiate the outcomes of the study. This design allows for an in-depth understanding of the process, outcome, and challenges related to the adoption of smart tourism services among host communities from their perspective.

3.2. Sample selection

Purposeful Sampling: The sampling method utilized in this study was a purposive sampling method, where residents from various smart cities (declared by the Government of India) were selected based on their involvement and experience with smart city initiatives. The research focuses on host communities in select smart cities in India, which have witnessed a significant increase in tourism footfall in recent years. In qualitative research, there are no predefined standards or criteria dictating the necessary sample size for achieving data saturation[40]. Achieving data saturation is of paramount importance in qualitative research, contingent upon a sufficient and justifiable sample size[41]. Efforts are made to include diverse participants, considering factors such as demographic variation, socioeconomic status, and cultural backgrounds, which ensure diverse representation. The selection of cities on a PAN India level is justified to ensure the acquisition of comprehensive and representative data for the study.

Data collection

In-depth Interviews: Semi-structured in-depth interviews were conducted with members of host communities (**Table 1**). In total, 21 semi-structured interviews were conducted between October and December 2023, with participants working across 11 locations. Questions covered aspects of awareness and experiences with smart tourism services, the scope and usefulness of incentives, and challenges faced in the adoption process. Multisensory Observation: Along with interviews, multisensory observation techniques will be employed to gain a deeper understanding of the host community's interactions.

Table 1. List of participants (*UG = Undergraduate/*PG = Postgraduate).

Respondent	Age	Gender	Smart cities (tourism destinations)	Participant job role	Educational background	Type of organization
P1	31	Female	Pune	Tour executive	PG	Private
P2	36	Male	Delhi	Car rental	UG	Self employed
P3	40	Male	Trivandrum	Homestay owner	UG	Self employed
P4	30	Male	Bhopal	State tourism board	PG	Government
P5	28	Female	Kochi	Homestay owner	UG	Self employed
P6	32	Female	Trivandrum	Café owner	PG	Self employed
P7	38	Male	Kochi	Handicraft shop	UG	Self employed
P8	35	Male	Coimbatore	Clothing store owner	PG	Self employed
P9	36	Male	Bhubaneshwar	Tour guide	UG	Private
P10	34	Female	Kochi	Tour executive	PG	Private
P11	31	Male	Delhi	Hotel staff	UG	Private

Table 1. (*Continued*).

Respondent	Age	Gender	Smart cities (tourism destinations)	Participant job role	Educational background	Type of organization
P12	30	Male	Bengaluru	Hotel staff	Intermediate	Private
P13	27	Female	Coimbatore	Student	UG	-
P14	30	Male	Bengaluru	Bus conductor	Intermediate	Government
P15	25	Male	Trichy	Hotel receptionist	UG	Private
P16	37	Male	Lucknow	Parking owner	Intermediate	Self employed
P17	33	Female	Delhi	Research scholar	PG	-
P18	44	Male	Hyderabad	Tourism monitors IRCTC	PG	Government
P19	45	Male	Trichy	Online taxi services	UG	Private
P20	32	Male	Hyderabad	Cab driver	Highschool	Private
P21	33	Female	Lucknow	State tourism board	PG	Government

3.3. Data analysis

The qualitative data obtained through interviews was analyzed using NVIVO, a qualitative data analysis software[42]. The software provides users with the ability to undertake multifaceted analyses and articulate findings through the presentation of statistical indices and graphical representations useful for qualitative study. Thematic analysis was employed to identify patterns, themes, and trends within the interview data. This process involved coding segments of data, organizing codes into themes, and deriving meaningful insights. It is called description-focused coding for extracting relevant statements, understanding them, and labeling them to get relevant and precise outcomes. The dependability of the analysis is ensured through the collaborative input of each author, as recommended by Krippendorff[42].

Ethical Considerations: Participants were provided with detailed information about the study, and their informed consent was obtained prior to the interviews. Participant confidentiality was strictly maintained, with data anonymized during analysis and reporting. Findings are reported through a comprehensive narrative, presenting thematic insights, and illustrative quotes from interviews.

4. Analysis and findings

4.1. Area for incentivized adoption

The analysis of data collected from in-depth interviews with host communities in Indian smart cities has revealed several smart tourism services that exhibit potential for incentivized adoption (**Figure 1**). These services, when strategically incentivized, can contribute to the enhancement of the overall tourism experience, economic prosperity, and community well-being. The findings are presented in **Table 2**.

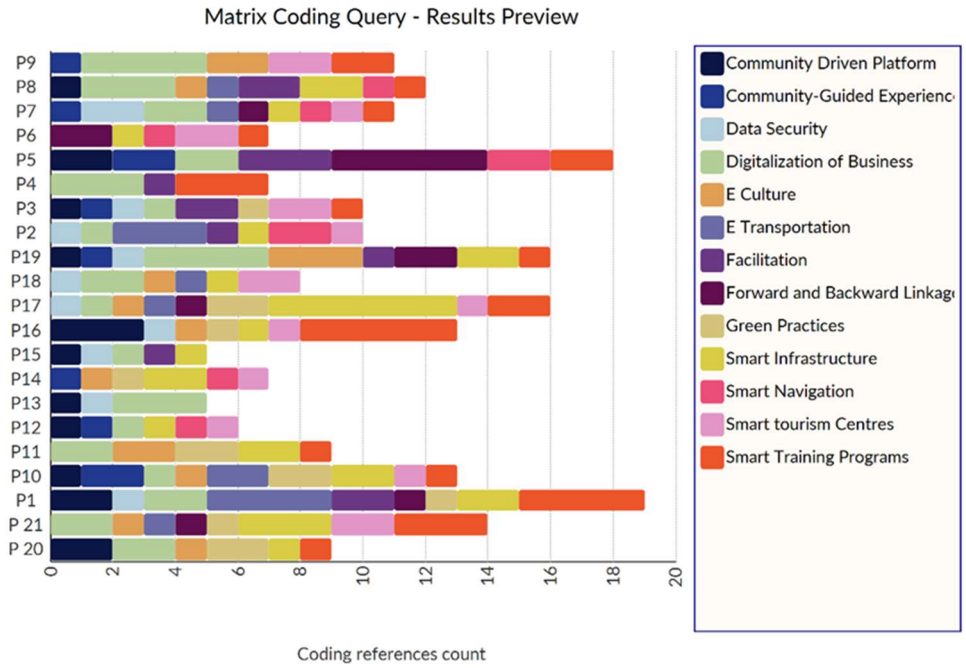

Figure 1. Areas that exhibit potential for incentivized adoption.
Source: Processed using NVivo 14 Plus.

Table 2. Smart tourism services exhibit potential for incentivized adoption.

Name	Description of themes	Files	References
4. Process	Smart tourism operational areas/services that exhibit potential for incentivized adoption	21	226
Digitalization of business	Mobile integration, apps, internet, digital marketing, digital payments	18	37
Smart infrastructure	Smart signal, audio guides, smart	16	29
Smart training programs	Online skill development, digital training, digital skill development, digital literacy, awareness	15	29
Smart tourism centres	Chatbots, AI, digital channels, touchscreen	12	17
Community driven platform	Local amenities, services, hospitality	11	16
E culture	Virtual, online, e-brochure, digital culture	11	15
Data security	Data security/safety, cyber security, data protection	10	11
Green practices	Eco-friendly infrastructure, environmental impact, waste management	9	13
Community-guided experiences	Adaptability, flexibility, responsiveness, authenticity, services	8	10
E transportation	Green, sustainable, E-transport, EV	8	14
Facilitation	Accessibility, transportation links, connectivity, WiFi, internet, smart technology	8	13
Forward and backward linkages	Business growth, collaboration, community partnerships, teamwork	7	13
Smart navigation	Smart maps, apps, GPS	7	9

Source: Author`s compilation (NVivo 14 software).

Digitalization of local business: There was a consensus among communities that financial incentives, training programs, and collaborative platforms can motivate businesses to adopt digital technologies, while marketing support and access to shared infrastructure can amplify their online presence. Providing incentives

to local businesses for integrating with smart tourism platforms that connect them directly with tourists, facilitating seamless transactions, and promoting locally-owned enterprises. It boosts economic activities within the community, encourages entrepreneurship, and fosters a sense of community ownership.

P18 "*... it will attract more tourists and help residents offer more authentic and diversified tourism services at Minimization of Operational Coast. There is no need for many advertisements, direct contact with tourists will help improve interaction*."

P11 *"...collaboration with local authorities, smart tourism services can become more appealing and accessible to residents, encouraging their adoption and regular use*."

Smart infrastructure: Participants expressed that those incentives, such as grants, subsidies, or tax benefits, encourage businesses and communities in smart cities to invest in eco-friendly infrastructure. Recognition and certification programs for establishments implementing green practices are other non-financial incentives that attract them. Offering financial incentives for the implementation of green infrastructure projects, such as smart waste management systems, energy-efficient facilities, and sustainable landscaping, encourages awareness and adoption. Such incentives position the community as environmentally conscious, attract eco-conscious tourists, and contribute to the overall well-being of the community.

Smart training programs: Provide incentives for community members, particularly those involved in the hospitality sector, to undergo training in smart technologies. Participants showed interest in smart hospitality solutions that could streamline accommodation services. Incentivizing the adoption of smart check-in processes, IoT-based amenities, and personalized guest experiences through technology could enhance the overall hospitality sector and contribute to positive perceptions of the destination. This can include workshops on smart check-in processes, the use of IoT devices, and customer service skills.

P1 "*User-friendly interfaces and comprehensive training programs can enhance residents' comfort and proficiency in using these technologies.*"

P5 "*Well, I'm always eager to explore new technologies and services, so I'd definitely be open to trying out smart tourism services! If there's a chance to enhance my knowledge and experiences through training or capacity building programs.*"

Smart tourism centers: Participants expressed a desire for easily accessible and interactive tourist information centers. Grants or subsidies can motivate tourism centers to actively engage host communities in the adoption process. Incentivizing the establishment of smart information kiosks equipped with touchscreens, virtual assistants, and real-time updates could significantly enhance the efficiency of information dissemination and improve the overall tourist experience while facilitating host community linkages[43].

Community-driven platforms: The data underscored a desire for tourism services that actively involve and benefit the local community. Incentivizing the creation of community-driven tourism platforms where local residents can offer unique experiences, services, or accommodations using smart city components can garner benefits for community[44,45]. The implementation of smart tourism services among host communities for their enterprise development can be effectively incentivized by considering the specific needs and aspirations of the community members. Financial incentives, such as discounts, exclusive offers, or revenue-sharing models, can motivate active participation. Recognition and acknowledgment of community contributions, perhaps through a leaderboard or public acknowledgment, serve as non-financial incentives. Designing reward structures and benefits that resonate with the community's values and needs will facilitate the adoption of smart technology in tourism services.

P10 "*Incentives like community rewards or loyalty programs could further facilitate long-term adoption and engagement of smart services*."

E culture: The digitalization of culture refers to the process of incorporating digital technologies and platforms to preserve, showcase, and disseminate cultural heritage, traditions, and expressions. This transformation involves the use of digital tools such as websites, mobile apps, virtual reality, augmented reality, and social media to digitize artifacts, documents, art, performances, and other cultural elements[46]. Participants expressed a keen interest in smart tourism services that offer immersive digital cultural experiences. Incentivizing the creation and utilization of augmented reality (AR) or virtual reality (VR) applications showcasing local cultural heritage, historical landmarks, and traditions could significantly enhance the appeal of such services. Offering financial incentives to community members for actively participating in the development and utilization of mobile applications aimed at preserving and showcasing the local cultural heritage will catalyze smart tourism service adoption by host communities.

P18 "*I can expect to upskill my business capabilities, and I can help tourists with digital platforms showcasing my local products, traditions, landmarks, and cultural experiences in a much more personalized and customized manner*."

Data security: Establishing collaborative partnerships with cybersecurity firms is essential to implementing advanced data protection technologies, ensuring that host communities can cultivate trust and seamlessly integrate into smart tourism services. These partnerships provide crucial support and expertise, enabling communities to adopt robust security measures and safeguard sensitive information, thereby enhancing the overall reliability and credibility of their involvement in the smart tourism sector. Such initiatives build trust among tourists, address privacy concerns, and establish the community as a secure and reliable destination.

P7 "*Assurance of my privacy and security will make me more likely to adopt these services… …...Addressing concerns about data privacy and security by implementing robust measures and transparent policies builds trust and encourages residents to use these services confidently*."

Green practices: Implementing green infrastructure, including eco-friendly transportation systems, green spaces, and sustainable water management, are crucial elements of smart city efficiencies and resilience[47]. For instance, green rooftops can positively impact both the environment and urban livability. The smart grid, energy management system, and innovative waste management systems are other notable green practices that trigger smart city ambience[48]. Improving visitor experiences through the application of digital technologies minimizes environmental impacts to a larger extent. It has been noticed that smart city technologies provide real-time information on sustainable transportation options, eco-friendly accommodations, and environmentally responsible attractions at destinations, mostly through government or other private platforms. The data-driven decision-making optimizes tourism resource management, which in turn promotes environmental conservation[49]. Sustainable practices at built or natural heritage sites could also benefit from the digitalization of services.

Community-guided experiences: It involves creating strategies that empower local communities to actively participate in shaping and sharing their unique cultural offerings. Financial incentives, such as revenue-sharing models or direct compensation for community-guided tours and experiences, can motivate community members to actively engage in the tourism ecosystem. Recognition and acknowledgment of their contributions, perhaps through digital platforms or local events, are other means of non-financial incentives to encourage community members to create and offer unique, personalized experiences to tourists. Incentives could include financial support, marketing assistance, or access to training programs.

E transportation: Smart mobility stands out as the extensively implemented technological facet in contemporary smart city applications[50]. Financial incentives, such as discounts or exclusive offers for using eco-friendly transportation services, can motivate tourists to choose sustainable modes of travel. Loyalty programs tied to green transportation usage can foster an ongoing commitment to eco-conscious services. Implementing incentives for the adoption of eco-friendly transportation services, such as electric vehicles or bike-sharing programs, reduces the environmental footprint of tourism, promotes sustainable practices, addresses environmental concerns, and contributes to a positive community image.

Facilitation: Public facilitation plays a pivotal role in elevating the tourism experience by seamlessly integrating and promoting smart tourism services[51]. This not only enhances the overall experience for tourists but also contributes to the well-being of the community. Implementing features such as interactive maps, digital payment systems for ticket purchases, online booking platforms for transportation and entertainment, interactive customer support, digital museums, and providing public spaces with high-speed WiFi at an incentivized pace serve as foundational elements for the adoption of smart tourism services for both residents and visitors alike. This integration of smart technologies fosters accessibility, convenience, and a more enriched experience for individuals[7,52].

Forward backward linkages: Recognition and promotion of small tourism ventures through digital channels, creating visibility and credibility for establishments on these platforms, is required[53]. Additionally, collaborative partnerships with technology providers and assistance with digital marketing efforts will further incentivize businesses to integrate smart tourism services, which will help them adopt smart platforms. Creating incentives for community members to actively engage in smart tourism initiatives, such as online forums for payment, feedback mechanisms, collaborative decision-making platforms, web adds, or networking services, will attract them to smart technology adoption.

Smart navigation: Gamification elements, like rewards or loyalty programs for using or sharing the information on app, provide an engaging aspect to smart navigation. Incentives may also include personalized recommendations based on user preferences or time-efficient route suggestions. Host communities identified the need for smart navigation and wayfinding applications. Incentivizing the development and adoption of user-friendly mobile apps that guide tourists through city attractions, provide real-time information, and suggest personalized itineraries could streamline the tourist experience and promote local businesses.

By tailoring incentives to align with the unique characteristics and needs of host communities, these smart tourism services can not only enhance the overall tourist experience but also foster sustainable community development. The success of incentivized implementation lies in creating a win-win scenario where both the community and tourists benefit from the adoption of smart tourism initiatives. These findings suggest that a strategic approach to incentivizing smart tourism services, considering the specific needs and preferences of host communities, can foster positive outcomes. Policymakers and stakeholders can tailor incentives to maximize the impact of smart tourism adoption in Indian smart cities.

P9 "*Offering incentives can prompt a change in behavior, encouraging individuals to adapt to new technology or services they might not have considered otherwise.*"

4.2. Outcomes

The incentivized adoption of smart tourism services within host communities has a spectrum of potential outcomes, spanning economic, cultural, and community dimensions (**Figure 2**). The following outcomes (**Table 3**) were identified through the research, highlighting the multifaceted impact of incentivized adoption on host communities:

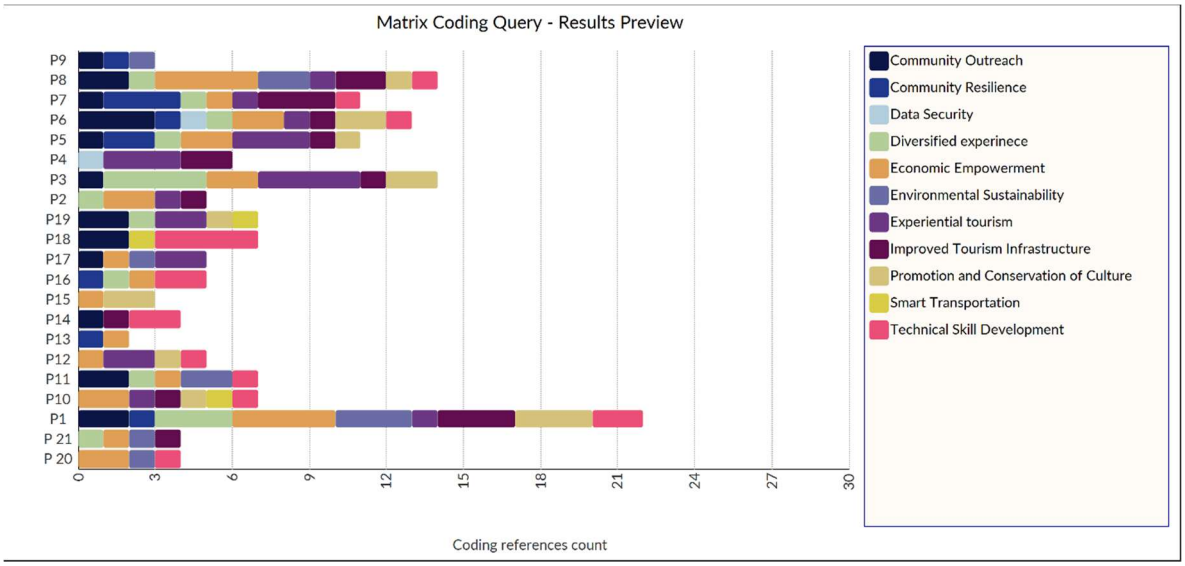

Figure 2. Outcomes from the incentivized adoption of smart tourism services.
Source: Processed using (NVivo 14).

Table 3. Outcomes of the incentivized adoption of smart tourism services.

Name	Description of themes	Files	References
Outcomes	Spectrum of outcomes from incentivized adoption of smart tourism services	21	140
Economic empowerment	Community development, economic growth, local benefits, income, earning	16	28
Experiential tourism	Enhanced experience, positive impressions, visitor satisfaction	12	22
Community outreach	Community involvement, participation, collaboration, involvement, interest	12	20
Diversified experience	Innovation, modernization, creative, customized	11	16
Improved tourism infrastructure	Roads, transportation, airports, accommodation facilities railway station	11	17
Technical skill development	Technological integration, digital adoption, tech-savvy, digital skills	11	17
Promotion and conservation of culture	Cultural conservation, heritage preservation, community identity, traditions	9	14
Community resilience	Community well-being, quality of life, holistic development.	7	10
Environmental sustainability	Responsible/sustainable practices, environmental impact, long-term viability, green initiatives, eco-friendly	7	11
Smart transportation	Smart/E-transportation	3	3
Data security	Data security/safety	2	2

Source: Author's compilation (NVivo 14 software).

Economic empowerment: Incentivized adoption can stimulate economic empowerment within host communities, fostering entrepreneurship, encouraging local business integration, and creating new income streams through smart tourism services. Through incentives such as financial support and marketing assistance, local businesses are encouraged to integrate smart technologies, leading to business growth and increased employment opportunities. The adoption of these services not only enhances the overall tourist experience, attracting more visitors and increasing spending within the community, but also stimulates entrepreneurship and diversifies income streams[1]. The increased economic activities contribute to the financial well-being of community members, enhancing their overall quality of life[54].

Experiential tourism: Community-guided tours, interactive information centers, and innovative hospitality services contribute to positive and memorable experiences for tourists[55]. The adoption of these services creates a seamless and engaging environment, allowing tourists to access tailored information, navigate efficiently, and participate in unique activities. This positive integration of smart tourism services contributes to an enriched overall experience, making the destination more appealing and memorable for travelers[7]. Positive tourist experiences foster word-of-mouth recommendations, repeat visits, and contribute to the positive reputation of the host community as a desirable tourism destination.

P7 "*Adoption of eco-friendly smart tourism services that contribute to sustainability and improve the host's reputation as a responsible business can influence their willingness to adopt*."

P9 "*Utilizing them effectively for travel needs will satisfy customers and help us offer diverse products catering to the demands of various tourists*."

Community outreach: An incentivized approach results in increased community participation in smart tourism initiatives, which creates a more inclusive and participatory tourism ecosystem and fosters a sense of ownership. It has the potential to stimulate local entrepreneurship, foster business integration, and generate new income streams. This, in turn, can significantly contribute to the financial well-being of community members, thereby attracting broader and more active participation within the community.

P15 "*It helps promote tolerance between people as they learn and better understand each other's cultures*."

P20 "*Transparent and effective communication among community members, usage, and spreading good words/benefits of smart tourism services…. become brand ambassadors for smart tourism services*."

Diversified experience: Smart tourism adoption will encourage the diversification of tourism offerings. Community-driven platforms and experiences contribute to a more varied, authentic, and appealing range of attractions for tourists. A diverse tourism portfolio attracts a broader demographic of visitors, increasing the overall resilience of the community's tourism sector.

P3 "*These services could enhance the overall visitor experience through personalized recommendations and seamless navigation, attracting more tourists and stimulating the local economy.*"

Improved tourism infrastructure: Incentives for businesses to adopt smart technologies may lead to the development of advanced communication systems, providing real-time information and personalized experiences for tourists. The influx of funds and increased economic activity driven by smart tourism can further catalyze the creation of modern amenities, including hotels, recreational spaces, and cultural attractions. Ultimately, this incentivized adoption not only propels the community towards technological advancement but also lays the foundation for a more sophisticated and traveler-friendly tourism infrastructure. It can mobilize investments in tourism-related infrastructure, including smart information centers, eco-friendly transportation, and enhanced amenities. This can improve the overall tourism infrastructure of destinations. Upgraded infrastructure contributes to a more seamless and enjoyable tourist experience, attracting a larger and more diverse visitor base.

P7 "*Investments in smart tourism often led to improved infrastructure such as transportation, connectivity, and public spaces, benefiting both residents and visitors.*"

Technical skill development: Training programs and incentives for smart hospitality services will equip individuals with valuable digital skills. The presence and demand for smart tourism components and services will necessitate communities to acquire and cultivate technical skills. This improved technological literacy will

enhance their chances of employability, empower individuals to participate in the digital economy and position the community as adaptable to technological advancements.

> P8 "*Incentivized adoption will facilitate the development of technological skills. It will improve our chances of getting a job or the personal benefit of executing our idea for a start-up, the increase in the standard of living*."

> P16 "…. *Smart technology helps us improve networking and collaboration, technological literacy, and better resource management*."

Promotion and conservation: Through smart technologies, cultural experiences can be curated, marketed, and shared with visitors in innovative ways, attracting attention and increasing awareness[56]. Digital platforms showcasing local traditions, landmarks, and cultural experiences have gained prominence[57]. By integrating technology responsibly, communities can implement measures to preserve and protect cultural assets. This may include the digitization of historical records, artifacts, or traditions, ensuring their longevity and accessibility for future generations. Smart technologies can also assist in implementing sustainable tourism practices that minimize the impact on cultural sites, fostering a balance between tourism promotion and the preservation of cultural identity and heritage[24]. Incentivizing the adoption of smart tourism services, therefore, creates a synergistic approach where the promotion of culture goes hand-in-hand with its conservation. Such implementation can foster a sense of pride among community members, attract culturally inclined tourists, and contribute to the conservation of intangible heritage.

Community resilience: The central outcome following the successful adoption of smart tourism services, highlighted by participants, is the heightened resilience of the community. Economic diversification, sustainable practices, and enhanced community engagement contribute to the community's ability to adapt to changing tourism dynamics. Community resilience ensures the sustainability of tourism initiatives, even in the face of external challenges, fostering long-term community well-being.

> P9 "*The use of innovative technologies in tourism has the power to position our community as a forward-thinking and desirable destination, positively impacting both residents and visitors alike*."

> P17 "*The data collected through smart technologies can inform decision-making for better urban planning and resource allocation, ultimately leading to the overall development and well-being of our community*."

Environmental sustainability: Incentives focused on sustainability could lead to the adoption of eco-friendly practices within host communities. Implementation of smart waste management, green infrastructure, and eco-conscious tourism initiatives has become more prevalent[58]. Cities, leveraging smart technologies, are actively fostering the creation of a sustainable ecosystem that encompasses both social and environmental considerations[24]. Host communities are expected to demonstrate a commitment to environmental responsibility, appealing to environmentally conscious tourists and contributing to the global effort for sustainable tourism.

Smart transportation: Communities highlighted that incentivizing eco-friendly transportation through discounts or special offers via smart card digital transactions could encourage both residents and visitors to choose sustainable modes of travel. Additionally, the integration of smart technologies. has enhanced the efficiency of public transportation systems, provided real-time information, and optimized routes. The overall result is a positive shift towards greener and more efficient transportation solutions, contributing to a more sustainable and advanced urban environment within our host community.

Data security: Incentives emphasizing robust data security measures can build trust among tourists and host communities. Implementation of secure smart tourism services can mitigate concerns about data privacy and security[50]. Enhanced trust fosters positive relationships with tourists, encouraging repeat visits and word-of-mouth recommendations, thereby contributing to sustained tourism growth.

In focusing on these outcomes, it becomes evident that the incentivized adoption of smart tourism services has the potential to bring about positive, sustainable changes that directly benefit host communities.

P12 "*Positive outcomes such as increased business opportunities, positive visitor feedback directly impacting business growth, customer satisfaction, and community engagement would significantly influence a host's willingness to adopt and continue using smart tourism services*."

The outcomes of incentivized adoption extend beyond economic benefits to encompass cultural preservation, community engagement, environmental sustainability, and the overall enhancement of the host community's tourism ecosystem. Recognizing these positive outcomes is essential for informing future strategies, policies, and investments in the dynamic landscape of smart tourism services.

4.3. Challenges

The incentivized adoption of smart tourism services among host communities, while promising, is not without its challenges. The following challenges (**Table 4**) were identified through the research, reflecting the complexities inherent in fostering the adoption of these services:

Table 4. Challenges of the incentivized adoption of smart tourism services.

Name	Description	Files	References
Challenges	Complexities inherent in fostering the smart tourism services adoption	21	109
E safety	Identity theft, data privacy, cybersecurity, data protection, trust in technology	15	20
E literacy	Technological awareness, tech knowledge, technical literacy	14	20
Resource constraints	Financial, technological, human	13	15
Cultural sensitivity	Cultural competence, awareness, cultural shock	12	14
Resistance to change	Readiness, change, hindering the acceptance, adoption	12	13
Infrastructural gaps	Accessibility, smart technology, WiFi, internet	8	9
Limited local involvement	Limited, participation, ownership, involvement	7	10
Mode of engagement	Community initiatives, programs, events	6	7
Incentive dependency	Incentive dependency	1	1

Source: Author`s compilation (NVivo 14 software)

E safety: Communities from major smart cities viewed privacy concerns about smart tourism services as major issues. Heightened concerns about privacy and data security among community members can act as a deterrent. Fear of data breaches or misuse of personal information may erode trust in smart tourism services. The perceived risk of privacy breaches may lead to a reluctance among community members to actively engage with smart technologies, impacting the success of incentivized adoption.

P18 "… *Recent cybercrimes and data security, lack of face-to-face contact between contractors, absence of written evidence/agreement, identity theft, breaching, etc. are major issues that stop us from switching completely to smart services.*"

E-literacy: Disparities in technological literacy within host communities pose a significant challenge[59]. Not all community members may possess the requisite skills to effectively engage with and benefit from smart tourism services, hindering widespread adoption. Limited access to technological resources may lead to exclusion and uneven participation in the benefits of smart tourism initiatives.

> P7 "*There are technological barriers such as difficulty in adopting new technologies, especially among older or less tech-savvy individuals.*" …… "*Not all communities or individuals have equal access to technology or the necessary digital literacy.*"

Resource constraints: The majority of participants expressed the sentiment that budgetary challenges and resource constraints pose significant barriers to the adoption of smart tourism services. Many host communities, especially those in economically disadvantaged areas, face resource constraints[60]. The cost of adopting and integrating smart technologies, such as developing mobile apps or implementing IoT infrastructure, may be prohibitive. Limited resources can impede the community's ability to fully embrace and leverage the potential benefits of smart tourism services.

> P7 "*The cost of implementation is a major challenge in adopting smart tourism services. The initial investment in technology infrastructure, software, and training can be a significant, barrier, especially for small businesses or destinations with limited resources*."

Cultural sensitivity: Community members expressed concerns about cultural changes associated with the introduction of smart services. They fear that the integration of smart services might lead to shifts in cultural norms, values, or social dynamics, raising questions about the preservation of their cultural identity. The introduction of smart tourism services must be culturally sensitive to the specific values and traditions of the host community. Misalignment with cultural norms may result in resistance or rejection[61]. Failure to consider cultural nuances may alienate community members, potentially leading to a negative perception of smart tourism initiatives.

> P9 "*Striking a balance between technological progress and preserving the unique identity and well-being of our community is crucial to effectively address these concerns.*"

Resistance to change: Regardless of the incentives and favorable outcomes, some members believed that a reluctant attitude towards change could hinder the adoption of smart tourism services. Resistance to change, both from community members and local businesses, is a common obstacle hindering the acceptance of smart tourism services[62]. Traditional practices and ingrained norms could be resistant to the introduction of new technologies, leading to slow adoption rates[63]. Slow adoption may impede the realization of the full potential of smart tourism services and limit their overall economic and cultural impact.

> P8 "*Traditional practices and people being resistant to change. It's like, people are so used to doing things the old way, and they're not really ready for all this new tech stuff in tourism*."

Infrastructural gaps: The majority of participants expressed concerns regarding the current infrastructure gaps, which can be observed in **Figure 3**. This includes limitations in transportation, communication, or technological facilities, inadequate connectivity, or limited access to electricity, which pose obstacles to the seamless integration and utilization of smart tourism services. Furthermore, inadequate infrastructure hampers the functionality of technology-dependent services, leading to demotivation among communities to adopt smart tourism services[64].

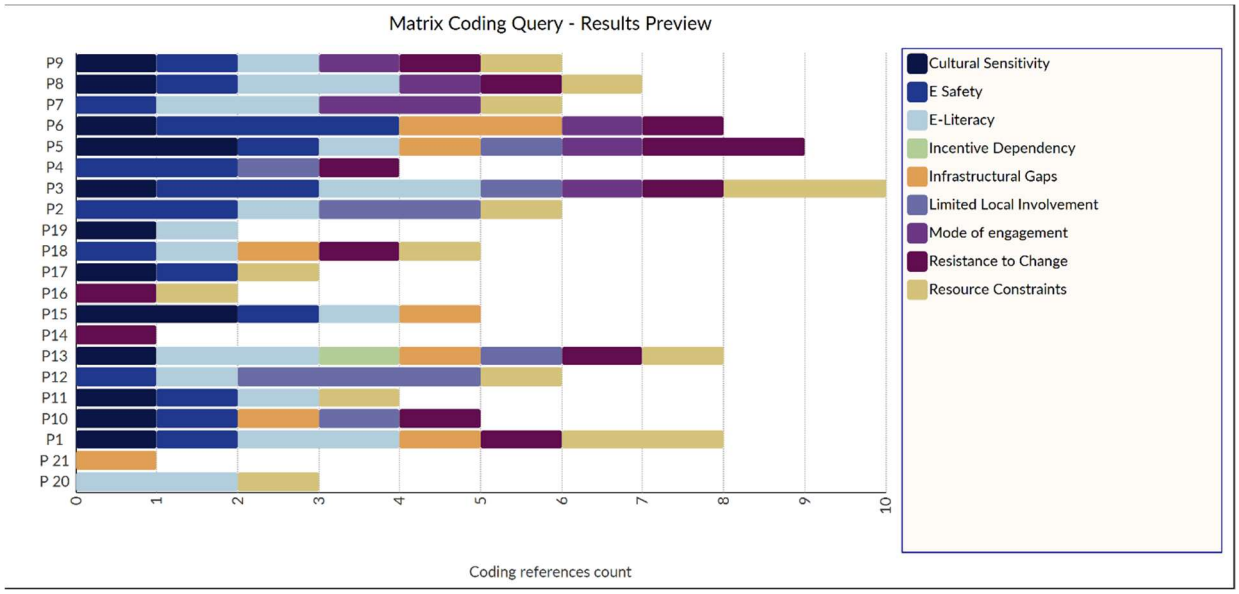

Figure 3. Challenges associated with the incentivized adoption of smart tourism services.
Source: Processed using (NVivo 14).

Limited local involvement: Citizens' preferences for smart city services emphasize a focus on enhancing their quality of life, not the technologies implemented[62]. The adoption of smart tourism services is hindered not because of technological advancement but because of the complicated adoption process and the lack of local relevance. The design of incentive programs may not adequately involve or reflect the needs and aspirations of the local community. Lack of community input in incentive design may result in programs that are less effective and fail to resonate. Incentives that do not align with community priorities may not be attractive, reducing the motivation for active participation in smart tourism services.

> P12 "… *The complexities associated with these services and the absence of locally relevant features/language limit the community's willingness to adopt smart tourism services*."

Mode of engagement: Understanding the preferences and behaviors of the community members and tailoring the engagement strategy and platform accordingly is essential for the successful incentivized adoption of smart tourism services[28]. This involves identifying the most engaging and compelling methods to communicate and encourage participation in the adoption of these services. Selecting the right channels, platforms, messages, and incentives that resonate with the target audience becomes crucial.

> P7 "*Tailoring services to include information relevant to residents, such as local events, hidden gems, community initiatives, and insider tips, can make these services more appealing and useful in their daily lives*." "…*They can participate in pilot programs or trials, providing feedback on usability, relevance, and practicality, which helps refine and improve the initiatives before full-scale implementation*."

Incentive dependency: A participant articulated the viewpoint that stakeholders occasionally exhibit a preference for smart services solely when incentivized, with a tendency to discontinue usage once the incentives are no longer provided. There is a risk that host communities may become overly dependent on incentives, leading to a potential decline in engagement once the incentives are withdrawn. Sustaining long-term community involvement may require a strategic transition from incentive-dependent adoption to intrinsic motivation.

> P13 "*Some stakeholders in our community tend to show interest in smart services primarily when incentives are offered and discontinue to regular operation afterwards*."

Recognizing and addressing these challenges is crucial for designing effective strategies that encourage the incentivized adoption of smart tourism services. Tailoring initiatives to local contexts, fostering community engagement, and implementing sustainable solutions are key considerations in overcoming these obstacles and promoting successful adoption within host communities.

P9 "*A collaborative, participatory, and incentivized role for residents ensures that smart tourism initiatives are not only technologically advanced but also culturally sensitive and community-centric*."

Research conducted earlier in this domain highlighted challenges associated with limited local involvement and the adoption of smart technologies and services[29,65,66]. However, this research specifically focuses on the host community perspective and adds valuable insights to the existing literature. The findings of this research indicate that the design of incentives plays a critical role in the effectiveness and resonance of smart tourism programs within host communities. Moreover, the research reveals that infrastructure gaps, such as inadequate connectivity and limited access to resources, can hinder the successful implementation of smart tourism services. Furthermore, the research findings suggest that there is a risk of over-dependence on incentives by host communities, which may lead to a decline in engagement once the incentives are no longer provided. Previous studies have emphasized the importance of sustained community involvement[31,33,44,45,67]. Specifically, this research contributes to the existing literature by providing a comprehensive understanding of the challenges faced by host communities in the incentivized implementation of smart tourism in smart cities. Additionally, the research findings highlight the importance of considering local contexts in designing and implementing smart tourism initiatives. The study contributes valuable insights into the dynamics of incentivized adoption of smart tourism services, shedding light on the transformative potential and challenges within host communities.

Suggestive measures: In advancing the adoption of smart tourism services in Indian smart cities, a multifaceted approach is recommended. Firstly, incentivize local businesses by introducing financial support programs and training initiatives focused on digital technologies. Encourage the implementation of eco-friendly infrastructure through green incentives and recognition programs, positioning the community as environmentally conscious, fostering smart training programs for the hospitality sector, and offering rewards for technology adoption. Incentivize the establishment of smart tourism centers with grants and encourage interactive features. Promote community-driven platforms through financial rewards and recognition programs, aligning incentives with community values. Support the digitalization of cultural experiences with incentives for augmented reality (AR) or virtual reality (VR) applications, involving community members, and recognizing their contributions.

Secondly, prioritize data security through collaborative partnerships with cybersecurity firms, offering financial support for advanced protection measures. Incentivize green practices by introducing discounts for sustainable transportation and leveraging smart city technologies for real-time information dissemination. Encourage community-guided experiences with financial support and digital recognition platforms. Promote eco-friendly transportation with financial incentives and loyalty programs. Enhance public facilitation through incentives for implementing smart technologies in public spaces. Support forward and backward linkages by providing digital marketing assistance and community engagement platforms. Encourage gamification elements and user-friendly app development for smart navigation, streamlining the tourist experience. This holistic strategy, tailored to each smart city's unique characteristics, aims to maximize the impact of smart tourism adoption.

5. Conclusion

This discourse thoroughly examines the diverse aspects surrounding the incentivized adoption of smart tourism services within host communities. Critical insights into the complex dynamics at play have been revealed through a detailed analysis of key elements such as the process, outcomes, and challenges. The incentivized adoption strategy emerges as a pivotal factor, showcasing its potential to yield positive outcomes such as economic empowerment, enhanced tourism infrastructure, and the preservation and promotion of cultural heritage. Despite its promise, the narrative maintains a nuanced perspective, acknowledging challenges ranging from infrastructural gaps to community members' concerns about cultural shifts. This study significantly contributes to the scholarly discourse on smart tourism, shedding light on the intricacies and implications of integrating innovative technologies into the tourism landscape. The findings provide a solid foundation for further academic exploration and practical considerations, facilitating the development of well-informed strategies that harmonize technological progress with preserving community identity and well-being.

Author contributions

Conceptualization, AV and MS; methodology, AV; software, SM; validation, SM and AV; formal analysis, SM; investigation, AV; resources, SM; data curation, SM; writing—original draft preparation, SM; writing—review and editing, AV and SM; visualization, SM; supervision, MS; project administration, MS. All authors have read and agreed to the published version of the manuscript.

Conflict of interest

The authors declare no conflict of interest.

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