

## Services Innovation for Smart City Destinations: The Case of Bandung City

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### Abstract

**Purpose of the study:** Smart City in the city can be seen through technology, people, and financial systems that support city life. This city also strives by creating the Smart Tourism Destination concept which aims to attract and provide tourist needs by combining ICT, culture, and tourism industry in the city of Bandung

**Design/methodology:** This research is carried out using a descriptive qualitative approach that is useful for testing and developing an understanding of lesser-known phenomena, and is useful for allowing the accumulation of in-depth information about the subject of the study. Data collection uses structured interviews with experts and is obtained through secondary data such as journal articles, reports, organization webpages, and policy documents that are researched to gain a broader perspective on smart city program innovation.

**Findings:** The study shows Bandung effectively utilizes the smart city concept for tourism, highlighting destinations like the Asian-African Museum and Bukit Bintang on the Smart City website and app. However, its technological execution, with 300 flawed applications, remains below expectation.

**Research limitations/Implications:** The research is restricted to a descriptive qualitative approach, which might not provide quantifiable measures of the smart city's success. The research focuses mainly on the tourism aspect of the smart city concept, potentially overlooking other critical facets of the initiative.

**Novelty/Originality of the study:** This study provides a unique insight into the application of the smart city concept specifically for tourism in Bandung, a relatively new endeavour started in 2016. The research bridges the gap between smart city planning and its practical impact on tourism, using Bandung as a case study.

## INTRODUCTION

Smart Tourism is a tourism platform that integrates tourist destinations in Indonesia. Integrating the tourism service ecosystem by providing trip planner services where prospective tourists can easily plan trips according to their preferences and budget. One of the famous areas for tourism development in Indonesia is the city of Bandung. The city of Bandung has been actively carrying out tourism development since the 1950s. Starting from the establishment of the Tourism Indonesia Foundation (YTI) similar to the current tourism agency/department during the Asian – Africa Conferences in 1955 (Anom, et al., 2016). The city of Bandung is located in the West Java region and is the capital of the Province of West Java.

The city of Bandung has also improvised by implementing the Smart City system to facilitate the city of Bandung in providing information (El-Anshori, 2019). Smart City is a concept to improve the quality of life of its citizens. Tourism activities are also related where tourism is one of the foreign exchange earnings of the Indonesian state itself, so there is the concept of Smart Tourism Destination which focuses on the destination itself. Bandung Smart City was formed in 2016 with the formation of Bandung Smart City which helps to be more efficient in all aspects such as knowing the level of congestion, areas with Wi-Fi (city parks), arrangement of public transportation, waste management and tourist areas (Firmansyah et al., 2017). Various aspects are given, so that this part of tourism becomes an interesting thing and is certainly widely used because it will help in determining and knowing whether the location is the same as what is given the information with what is in the Smart City application.

Buhalis and Amaranggana, 2013 stated that Smart Cities and Smart Tourism Destinations can gain competitiveness by applying innovative technologies to enhance the tourism experience. The Smart Tourism Destination (STD) concept adapts the same ideas as Smart City, only STD is specifically applied to tourist destinations. Smart Tourism Destination activities focus on the needs of tourists by implementing and combining Technology, information and communication (ICT) with the culture in the location and the tourism innovation industry, with the hope of promoting quality tourism services, improving aspects of tourism management and can expand the scale of the tourism industry to a wider level (Huang *et al.*, 2017). This research focus on Smart City implementation and with the relationship with smart tourism destination services in the city of Bandung, West Java.

## LITERATURE REVIEW

According to Korachi and Bounabat (2020), the smart city dimension is divided into six dimensions, namely Smart Economy, Smart Government, Smart Environment, Smart Economy, Smart People, Smart, Smart Mobility. Smart Tourism Destination is a continuation of the Smart City concept where the Smart Tourism Destination concept is more directed and focused on improving the quality of tourism destinations by providing information that is in accordance with the tourism destination, Smart Tourism Destination can improve the tourist experience by providing a review. The review will be useful for other tourists in determining the tourism destination they will choose (Xiang *et al.*, 2021). Smart City Destination has supporting characteristics of the concept which consists of several related stakeholders such as tourism organizations, government, local residents / local communities, tourists, and the environment (Eichelberger *et al.*, 2020). According to Law no. 10 of 2009 concerning tourism, a tourist destination is a place that has uniqueness, beauty, and a value, both the diversity of natural wealth, cultural wealth, and man-made tourist attractions that are the destination of a tourist's visit (Atsmara and Kusuma, 2014).

Previous research on Smart City has been carried out both in Indonesia and in other countries. Previous research in smart cities and global urbanization trend and issues around sustainability are the main challenges for cities (Angelidou *et al.*, 2018; Silva *et al.*, 2018; Sanchez-Corcuera *et al.*, 2019). Smart City concept has been developed as a strategy that can be used to cooperate with other cities because systematically this concept has become more complex, starting from an interdependent framework, and increasingly relying on the use of Information and Communication Technology to meet the needs of its citizen (Zubizarreta, *et al.*, 2016). Previous researches also explore the concept of smart cities as a potential urban construction and can overcome the social and ecological sustainability challenges faced by the community (Bibri & Krogstie, 2017; Silva *et al.*, 2018). Moreover, the strengths and limitations of the concept of cities are intelligently identified and structured through the framework for Strategic Sustainable Development (SSD) (Sadeq & Cevik, 2022). Strategic Sustainable Development (SSD) approach is applied and implemented as a method that can maximize the concept of benefits as well as being able to reduce the identified limitations (Shapira *et al.*, 2017). Planning guidelines, which are informed by the SSD approach aims to help smart cities move strategically towards their smart city vision and also move communities towards sustainability (Sadeq & Cevik, 2022).

### Smart City Concept

According to Pereira *et al.*, (2018), the concept of a smart city is all efforts made to develop a government system effectively, efficiently and transparently by using the use of an information technology system. Smart city is a development and development of cities by utilizing an Information and Communication Technology (ICT) system that can be useful for connecting, monitoring and controlling various resources in the city more effectively and efficiently and can be useful for maximizing services to its citizens and supporting sustainable development (Gracias *et al.*, 2023). While ICT is a general term for all kinds of technologies that assist humans in creating, changing, store, communicate or disseminate information (Setyowati *et al.*, 2021). ICT also unites computing (computer science which solve a problem of input data) and high-speed communication high for data, voice and video (Javed *et al.*, 2021).

Moreover, Anthopoulos (2017) explained that smart city is a concept used for a city that is able to use human resources, social capital and modern telecommunications infrastructure in it which is useful for realizing sustainable economic growth and high quality of life in it, with an excellent management of resources through governance based on public participation. Smart City uses a digital technology that can improve people's performance and welfare, can reduce people's costs and consumption resources, and can engage more effectively and actively with its citizens. The keyword "Smart" includes modes of transportation, renewable energy used in cities, health levels, water, waste. The purpose of this smart city concept is to form a safe and comfortable city for its citizens and can strengthen the competitiveness of the city, both in terms of economy, and other things (Angelidou *et al.*, 2018). Another objective of smart city is to support the city in terms of social (security), economy (competitiveness) and environment (comfort). With smart city concept, it is hoped that local governments can encourage the government to innovate and update, especially for information technology-based services. In essence, the smart city concept is a concept that can connect physical infrastructure, social infrastructure and

economic infrastructure by using technology and then integrating all elements in these aspects and making the city more efficient and liveable (Anttiroiko, 2014).

### **Smart City Indicator**

According to Angelakoglou *et al.*, (2019), there are 6 indicators that support the creation of smart city. First, physical Infrastructure (hard infrastructure): land and buildings, transportation and utility and ICT networks. Second, city system divided into activities carried out to manage the city: government, education, transportation, health, energy, security, environment, social, financial, and commercial. Third, soft Infrastructure i.e. people and institutions that manage infrastructure physical, regulatory and social life in urban areas: leadership, governance manage, innovation forum. Fourth, ecosystem including public ecosystem, private business ecosystem, community ecosystem and party ecosystems. Fifth, people or organizations who have a concern, have interests, or getting involved in some urban problems and Sixth, the goal to be achieved from the application of smart cities.

Meanwhile, Milošević (2019) divides smart city into six main indicators: first is smart people, not only refers to a person's educational qualifications but also the quality of social interactions formed, continuous development requires capital, both economic capital, human capital, and capital social. Second is smart environment including technological advances and their use to protect and maintain the city's environment, both safety and natural protection. Third is smart living is a sense of comfort that can be obtained by the community in a city, namely health, housing, accessibility, waste, energy, biodiversity, water, technology, and transportation. This means that humans have a quality of life measurable however the quality of life is dynamic, in the sense that always trying to improve himself. Fourth is smart mobility is the ability of cities to provide broad accessibility for both local people and international people. Smart mobility including transportation and development of city transportation infrastructure. Strengthening of urban infrastructure planning systems, with the availability of transportation and adequate infrastructure and infrastructure will improve the quality of life of the community and increase economic growth and social welfare. Fifth, smart economy in city life refers to a smart industry namely by utilizing the development of information technology and communication in the process of production and distribution of goods and services. On the aspect smart economy, the city must be supported by economic activities that very good and can increase every year. That economic activity itself can run well if urban planning and infrastructure are prepared by the government. Sixth, smart governance (empowerment and participation) related to politics and community participation, citizen services and use of networks new communications such as e-government and e-democracy. The main key word for the success of a governance is managed properly and correctly. Paradigms, systems and processes of governance and urban development according to the rule of law, humanity, justice, democracy, participation, transparency, professionalism, and accountability coupled with a commitment to uphold the values and principles of decentralization, usability, efficiency, clean, responsible and competitive governance.

### **Framework**

In this research the indicators that support the creation of smart city into six indicators, namely: (1) physical infrastructure (2) city system (3) soft infrastructure (4) ecosystem (5) stakeholders (6) goals (Boes *et al.*, 2015). The development of smart city service innovations should be inline with the government's efforts to improve public services, so that community needs are met and the implementation of service innovations can well organized. The facilities and infrastructure for tourism such as accommodation, restaurants, transportation and travel agents. Institutional (ancillary) are the existence of tourism institutions, tourists can feel safe (protection of tourism) and protected. Institutions can be in the form of local government, tourism office, tourism awareness groups and local communities (Suwena *et al.*, 2010). The top-down policy implementation including four variables that determine the success of public policy implementation, namely Communication, Resources, Disposition and Bureaucracy. Blommerde and Lynch (2014) compile a number of capability dimensions that surround service innovation, including ability to develop strategy; capability to formulate various things around the needs of consumers and society that are strategically placed to increase the value of services. Knowledge management ability; regulatory capability and optimization of intellectual potential within the company which is the source for creating various new service innovations according to the wishes of consumers and society. Network capability; organizational capability to expand social networks that can expand marketing and sales. Customer engagement capability; organizational capability to formulate mutually beneficial and reciprocal cooperation with consumers to be able to produce various new innovations in the service sector / service innovation.

### **METHODOLOGY**

This research uses qualitative methods that are useful for testing and developing an understanding of lesser-known phenomena, and are useful for enabling the accumulation of in-depth information about the subject of research. Data collection uses secondary data such as journal articles, reports, organizational web pages, and policy documents studied to get a broader perspective of smart city program innovations. The location that the researchers did was in the city of Bandung, West Java, Indonesia. Nam and Pardo, 2011, argue that in implementing smart cities, it emphasizes three main components, namely technology, humans, and institutions. The assessment of the three categories in the indicators can be seen in the table 1.

**Table 1:** Research Framework

Category	Sub-Category	Explanation
Technology	Hardware	<ul style="list-style-type: none"> <li>• Completeness of network infrastructure</li> <li>• Quality and quantity of hardware</li> <li>• Device security</li> <li>• Devices hardware integration</li> </ul>
	Software	<ul style="list-style-type: none"> <li>• Availability of software application</li> <li>• Ease of Use / User friendly</li> <li>• Customization (settings)</li> <li>• Reliability of database management System</li> <li>• Inter-Software integration (availability and Reliability of protocols)</li> </ul>
Humans	Citizen knowledge of the program (reflecting education)	<ul style="list-style-type: none"> <li>• Socialization carried out by the government</li> <li>• Public understanding of the program</li> <li>• The ability of citizens to take advantage of the program</li> </ul>
	Citizen participation in urban development (creativity & diversity)	<ul style="list-style-type: none"> <li>• Creativity and participation of citizens in building cities</li> <li>• Citizen participation in supporting smart city programs</li> </ul>
Institution	Regulation	<ul style="list-style-type: none"> <li>• Policy master plan</li> <li>• Government commitment in implementing smart city regulations</li> </ul>
	Collaboration between stakeholders	<ul style="list-style-type: none"> <li>• Government collaboration with academic organizations</li> <li>• Government collaboration with the business sector</li> </ul>

Adapted from: Nam and Pardo, (2011)

## FINDINGS / RESULTS

Researchers examined the defining traits of Bandung's smart city initiatives. Drawing from the categories suggested by Nam and Pardo, 2011. The analysis extends beyond just technology, encompassing the roles of people and institutions. This article delves into each of these smart city characteristics in Bandung as elaborated below:

### Technology

In the technological aspect, it explains the hardware and software of implementing smart cities in Indonesia Bandung. Bandung City Government has more than 300 applications. However, in its application, researchers found that data integration in existing applications insufficient. Including a database system that has not been integrated so that it has an impact on Existing data cannot be executed in an integrated manner in real time. As a result, will data be out of sync if there is no synchronization in the database. With protocols between software, so that one application may not necessarily be able to take advantage of the results other applications. This is in line with the statement of the Assistant for Government and People's Welfare the Regional Secretariat of the City of Bandung, that the condition of the City of Bandung has many applications but still not integrated. For example, in the Local Management Information System (SIMDA) application which is owned by the financial, not yet website-based so it is still difficult to integrate. The impact in the planning process still needs to re-enter data for budgeting. the hope that desired is less input when data integration has been carried out. Integration becomes important in the implementation of smart cities considering that smart cities encourage integration all city functions and departments in order to create new insights and synergies.

Regarding the user friendly of applications owned by the Bandung City government in the context of implementing Smart City, it appears that with the existing of these hundreds of applications, clearly provide convenience to the community. The reliability of the application in the city of Bandung is shown in the open data has been released since 2014 (Dinas Komunikasi dan Informatika Kota Bandung, 2023). Online applications and services provide in Data Bandung make it easy to access, saves time and is cost efficient (free). However, not all people of Bandung City are technology literate and able to apply hundreds of existing applications. Therefore, the Bandung City Government needs to socialize the non-technologically literate to sustain providing services for all the society class.

In the hardware aspect, the Bandung City Government has built Bandung Command Centre (BCC). BCC was used in monitoring real time conditions in Bandung City related to infrastructure. It was found that conditions infrastructure that supports smart cities in Bandung is still inadequate, this is because of inadequate budgetary support. Head of Encryption and Informatics application in Bandung city said that “Infrastructure facilities are not yet 100 percent in terms of infrastructure because the budget is still limited. Budget for infrastructure only 5 billion rupiah. Budget support for facilities and infrastructure, especially infrastructure is still limited because budget items are prioritized for other programs and activities. However, with limited budget, the Bandung City Government continues to strive to develop smart city. Included in the hardware security system, the Bandung City Government has a weather sensor. One prototype of the weather sensor has been installed at BCC with the aim of obtaining information for knowing the wind direction, humidity and wind speed that occurs in the city of Bandung.

**Table 2:** Existing Condition of Smart Government Program

Program	Already	Plan ahead
Public Service	a) Mobile Mepelling b) Online tax service	Single sign in
Public Policy	a. BPG (Bandung Planning Galery)	Information services Bandung City government services integrated system
Bureaucracy	a. e-RK (Elektronik Remunerasi kerja) b. Sira (Financial Planning and budgeting)	Apparatus development system and integrated asset management system

Source: Bandung Smart City (2023)

In its development (see table 2), programs that are already running are very helpful for the community in facilitating activities by providing mobile services and paying taxes online. Smart Government in Bandung has been running and making it easier for activities and providing data transparency regarding development planning and the financial system. Therefore, public can monitor when manipulation occurs or can be directly involved in providing advice on planning by providing information in supporting local community activities.

### Smart Branding

Smart branding is part of a smart city that is focused on increasing regional competitiveness by developing elements such as tourism, business and brand image of the Bandung city. According to Smart City Bandung (2022), the existing implementations can be seen in table 3.

**Table 3:** Existing Condition of Smart Branding

Program	Already	Plan Ahead
Tourism	Stunning Bandung	Bandung Tourism Go Internasional
City Development	Tematik Garden	Bandung Technopolis
Business	GAMPIL (Gadget Mobile licence)	Bussines Longue and Invesment Gate

Source: Bandung Smart City (2023)

The city of Bandung has become one of the largest tourism supporters in Indonesia by providing uniqueness in the various tourist destinations offered, as well as the many international events attract domestic and international tourist. City of Bandung also gets new impressions by publishing thematic parks such as film parks, singles parks, conservation parks and many more, making the city of Bandung offer interest to tourists to visit again by renewing the concepts of tourism. The city of Bandung won the branding of Bandung as one of the largest start-up providers in Indonesia after Jakarta (Wahyuni & Noviaristanti, 2022).

## DISCUSSION / ANALYSIS

Smart Tourism Destination is the dynamics of stakeholder connectedness in technology platforms providing information related to tourist activities and easily vice versa. Smart Tourism Destination provides advantages in various sectors namely: (1) technology embedded in the environment, (2) response processes from macro and micro levels, (3) end-user devices in multiple touch points, (4) involved stakeholders use the platform dynamically as a system (Buhalis and Amaranggana, 2013). Bandung as Smart Tourism Destinations, has several top destinations related to the development of Smart Tourism, such as the Asia Africa Museum, Bandung Grand Mosque, Bandung Film Park, Bukit Bintang Park, and Ir. H. Juanda conservation park. These tourist destinations in the tourist tools contained information about destinations, related to locations that are connected directly to the Google maps to see the distance from the location of tourists to tourist destinations. Some of the destinations included in the Smart Tourism Destination has been review by tourist described in table 4.

**Table 4.** Review of destinations in Bandung City

Name of Places	Rating	Reviews
Asia Afrika Museum	5/5	Clean place, Local Guide fluent in English, smart, friendly and informative. The historical place is very interesting and continues to be preserved.
Bandung Grand Mosque	3/5	The architecture is in the middle eastern style so that there is nothing unique. The square that joins the mosque, the yard is 1200 square meters with synthetic grass. There are facilities such as a children's playground, library and wifi.
Bandung Film Park	3/5	Located outdoors under the Pasupati flyover road, the flyover keeps the rain out while watching a movie. It's hard to find a parking space.
Bukit Bintang Park	3/4	The place is very difficult to get to. One-way road, if you meet a car in the opposite direction will be very difficult, the road is very bumpy, and very uphill. The place is just a plateau made for camping, there are several restaurants made by local residents. At night the view is beautiful by looking at the view of the city of Bandung.
Ir.H Djuanda Conservation Park	4/5	A place with good trails, small stalls in the mountains area, interesting tunnels to go through and can see monkeys.

Source: Tripadvisor, (2023)

With the smart tourism application, the local government can ensure the opens access for the tourist destination permits, by discloses data and regulation of the personal data, as a public and private companion. However, it is crucial to control information about each tourist destination. It can be seen from the reviews that many complaints stating that there is a lack of cleanliness in the destinations they visit such as the Bandung Grand Mosque and Bandung film park. Tourism development based on Smart Tourism Destinations, the government as a regulator and facilitator provides facilities for implementing reforms to provide sustainable tourism development in tourist areas in the city of Bandung by providing adequate facilities so that the sustainability of Smart Tourism Destinations can be maintain. Smart tourism destination is design based on the advanced of technology infrastructure by ensuring the sustainable development of tourist areas. Smart tourism destination has facilitating visitor interactions that are integrated with their environment, improving the quality of the travel experience at the destination, and improving the quality of life of local communities (Xiang *et al.*, 2021).

The use of technology in providing a positive impact on local communities has not yet been implemented to get the impression of smart tourism destinations and improve the quality of life of the community with technological developments. The implementation of technology in creating smart tourism destinations and improving the quality of life for local communities presents several challenges that need to be addressed. One of the key challenges is the lack of socialization among local communities regarding the benefits of technology in tourism. Without proper awareness and understanding, communities may not fully utilize available technological resources. To overcome this challenge, regular socialization programs should be conducted to educate and engage the community in the

potential of technology for tourism purposes. These programs should emphasize the positive impact technology can have on enhancing the overall tourism experience and improving the quality of life.

Another challenge is the insufficient infrastructure in many destinations to be considered smart tourism destinations. The existing infrastructure may not meet the required standards for seamless integration of technology and services. To address this issue, governments and stakeholders must prioritize infrastructure development. Improving internet connectivity, establishing data centers, and implementing cloud computing services can enhance data processing and service delivery, thus facilitating the effective utilization of technology in tourism. The implementation of Smart City in realizing Smart Tourism Destinations is one of the important things seen from this digital or technology era so that information is searched through the internet. There is still a lack of socialization to local communities, an environment that is still below the standard to be regarded as a smart tourist destination, a lack of human resources in running a technology to facilitate the sharing of the necessary information or data.

Moreover, it is important to emphasize the need for continuous program maintenance. Once the technology is implemented, it is crucial to ensure its proper functioning and effectiveness over time. Regular monitoring and evaluation should be conducted to identify any shortcomings or areas for improvement. This will help in avoiding both underutilization and overutilization of technology resources. By maintaining and updating the implemented programs, local communities can ensure that they continue to run smoothly and according to their intended purpose. This will also enable them to adapt to emerging technologies and stay up-to-date with the evolving needs of tourists. Additionally, fostering collaboration between tourists and the government is essential for the success of smart tourism destinations. Through platforms and initiatives that facilitate interaction and communication, tourists can contribute to creating content and sharing their experiences. This user-generated content can serve as valuable information for other tourists, helping them make informed decisions and enhancing their overall experience. Furthermore, by actively engaging with tourists and encouraging them to provide feedback, local communities can gain insights into areas that need improvement and tailor their services accordingly.

In conclusion, the implementation of technology in creating smart tourism destinations requires addressing various challenges such as socialization, infrastructure, and human resources. By adopting comprehensive strategies and implementing the recommended recommendations, local communities can overcome these challenges and successfully integrate technology into their tourism initiatives. This will lead to the creation of smart tourism destinations that enhance the overall tourism experience, improve the quality of life for residents, and contribute to the sustainable development of the destination. However, it is important to note that the implementation of technology should not be seen as a standalone solution. It should be integrated into a broader strategy that considers the unique characteristics and needs of each destination. This requires careful planning, collaboration, and ongoing evaluation to ensure that the technology implemented aligns with the goals and objectives of the destination. Furthermore, it is crucial to consider the ethical and privacy implications of implementing technology in smart tourism destinations. Data protection and privacy should be prioritized to ensure the trust and confidence of both residents and tourists. Clear guidelines and regulations should be established to govern the collection, storage, and use of data, while also respecting individual privacy rights. In conclusion, the successful implementation of technology in creating smart tourism destinations relies on a holistic approach that addresses socialization, infrastructure, and human resources. By adopting comprehensive strategies, local communities can overcome these challenges and leverage technology to enhance the tourism experience, foster sustainable development in tourism destinations.

## **CONCLUSION**

Smart tourism is a platform that integrates tourist destinations, offering trip planner services for tourists to easily plan their trips based on their preferences and budget. The Bandung smart city initiative has improved various aspects, including congestion information, Wi-Fi availability in city parks, and public transport arrangements. Smart tourism destinations (STDs) adopt similar concepts as smart cities, focusing on the needs of tourists by combining ICT, culture, and the tourism industry. The study suggests that the government should enhance communication services and disseminate information about the smart city through modern media and technology. It is crucial to strengthen the information technology infrastructure across all smart city indicators, not just in the city center but also in other areas of Bandung. Additionally, the challenges of urbanization and population growth require effective urban planning management aligned with community expectations. Embracing the smart city concept can be a strategy for improving cities services to its community, addressing resource issues, and promoting safety, convenience, efficiency, and sustainability. However, achieving significant changes requires full commitment and support from the government.

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