Citizen Participation in A Smart City: The Seoul Case
Akıllı Bir Kentte Vatandaş Katılımı: Seul Örneği

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ABSTRACT

The ultimate objective of governments that adopt the smart city approach is to improve the living conditions of citizens. Therefore, the realization of the smart city vision is largely an issue related to citizens. Thus, the increasing success of smart cities that become prominent in the world by effectively ensuring citizen engagement beyond prioritizing the technology use attests to this. This study aims to reveal the role and importance of citizen participation in smart cities within the framework of the example of Seoul Smart City, the capital of South Korea. In this context, the prominent citizen participation practices and features of the Seoul smart city are mentioned. In the study, which was created with the qualitative method, a descriptive method was used in the direction of the literature review, the information about the smart city on the website of Seoul Municipality, and the information from the Digital City plans. According to the results of the study, it has been seen that the Seoul Municipality has succeeded in increasing citizen participation with the mobile applications implemented in Seoul, which facilitate the education of citizens. However, it has been determined that there are still insufficient field study examples showing the level of influence of bottom-up decisions in Seoul.

Key Words: City, Smart City, Engagement, Citizen Engagement, Seoul

Öz

Akıllı kent yaklaşımını benimseyen yönetimlerin nihai hedefi vatandaşların yaşam şartlarını daha kaliteli hale getirmektir. Bu nedenle akıllı kent vizyonunun gerçekleşmesi büyük oranda vatandaşlar ile ilintili bir konudur. Nitekim teknoloji kullanımını öncelemenin ötesinde vatandaş katılımını etkili şekilde sağlayarak dünyada öne çıkan akıllı kentlerin artan başarısı bunun kanıtıdır. Çalışmanın amacı Güney Kore'nin başkenti Seul akıllı kenti örneği çerçevesinde akıllı kentler için vatandaş katılımının rolü ve öneminin ortaya konulmasıdır. Bu kapsamda Seul akıllı kentinin öne çıkan vatandaş katılımı uygulamaları ve özelliklerinden bahsedilmiştir. Nitel yöntemle oluşturulan çalışmada literatür incelemesi ve Seul Belediyesi web sayfasında yer alan akıllı kente ilişkin bilgiler ile Dijital Kent planlarından alınan bilgiler doğrultusunda betimleyici bir yöntem kullanılmıştır. Çalışmanın sonuçlarına göre, Seul'de hayata geçirilen ve özellikle vatandaşların eğitimini kolaylaştıran mobil uygulamalar ile Seul Belediyesinin vatandaş katılımını artırmayı başardığı görülmüştür. Bununla birlikte halen Seul'de aşağıdan yukarıya doğru kararların etkilenme düzeyini gösteren saha çalışması örneklerinin yetersiz olduğu tespit edilmiştir.

Anahtar kelimeler: Kent, Akıllı Kent, Katılım, Vatandaş Katılımı, Seul.

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INTRODUCTION:

Today, various strategies are developed to solve urban problems effectively and rapidly through the use of technological solutions. And smart city practices are the most prominent strategies among them. City administrations have begun to increasingly incorporate smart practices, leading to the determination of citizen-oriented strategies. Because the times when citizens' feedback only about publıc services were received are long gone. In today's digital age, where opportunities such as e-voting have expanded, citizen input in smart cities has begun to be used in building more innovative practices in the city.

Smartphone and mobile apps have rapidly entered into the lives of citizens and institutions providing services to citizens, and therefore, become indispensable and have changed the direction of state-citizenship relations. The data produced through technology has created new bridges and communication channels between the governor-governed, leading to changes in the nature of these services. In addition, the opportunities offered by digitalization have raised expectations for enhancing the functionality of participation mechanisms. This has opened up important opportunities to increase the impact of good governance principles such as accountability, transparency, and openness. These applications, which encourage citizen participation by making data transparent but also facilitating access to data, are being adopted by more and more government departments. Many municipal managements provide rapid solutions to citizen complaints and also review their suggestions using mobile apps.

Today, intensive efforts are being made to transform these practices, which grant cities the 'smart' label thanks to their ability to produce solutions to urban problems, into permanent urban policies. This can only be achieved by ensuring the complete embracement and participation of citizens in using these smart practices. Because only practices that ensure continuous citizen participation truly contribute to solution-oriented approaches for smart cities. So, it would not be wrong to argue that the main element that makes a city smart is the human factor.

Growing interest in the literature on smart cities has started to cover the 'human' factor. "The smart human factor, which is recognized as a component of smart cities, has been the subject of numerous studies". In some studies, this subject has even been analyzed in detail using the term 'smart citizen' (Capdevila & Zarlenga, 2015; Berntzen & Johannessen, 2016; Willems et al., 2017; Örselli et al., 2018; Cardullo & Kitchin, 2019; Gürsoy & Ömürgülşen, 2019; Örselli & Dinçer, 2019; Correia et al., 2021; David & Benson, 2021; Örselli et al., 2022). Furthermore, some studies have examined lifelong learning in smart cities (Sadioğlu & Dinç, 2019) and some studies reported activities carried out in living laboratories to increase citizen participation in smart city projects (Babaoğlu & Memiş, 2019; Memiş & Küçük Bayraktar, 2020; Öztaş Karlı & Açıksöz, 2021). Despite the growing interest during the last eight years in the international literature, there is a gap in the Turkish literature (Seçkiner Bingöl, 2021) on "citizen participation in the context of smart cities".

Governments, public administrators, city governments have made a concerted effort to transform urban areas into more livable places. However, while some cities have achieved significant progress in their goal of becoming smart cities, others are just at the beginning. Examining smart cities with proven success and those recognized as examples of good practices is important for building sustainable cities of the future since such studies can guide cities at the beginning of their smart city journey. Accordingly, this study aims to reveal importance of citizen participation worldwide based on the Seoul smart city example, as well as provide suggestions. Within the scope of the research objectives, answers were sought to the following questions:

- Is the smart city approach citizen-centered or technology-centered?

- What is the role of the human factor among the success factors of smart cities?
- Why citizen participation is important for smart cities?
- How citizen participation should be in smart cities?
- What are the prominent citizen participation apps in Seoul smart city and their key features?

The study focuses on and evaluates how citizen participation is ensured in Seoul, a city known for its success in emphasizing citizen engagement. For this purpose, the smart city term and the path to becoming a smart city are addressed. In the following sections, the best practices of Seoul, which is a pioneer worldwide due to its smart solutions that put citizen participation at the center of the smart city approach, are examined in detail. The reason why Seoul was chosen for the study is because it received the Smart City 2022 award at the World Smart City Awards.

1. The Smart City Concept and the Path to Becoming a Smart City

Smart apps have gained increasing attention recently as they offer solutions to many problems faced by cities. The increasing interest in the smart city concept has followed a parallel path with the development of new technologies. The facilitating function of technology and the solutions it offers led to the emergence of the "smart" adjective of smart cities.

It can be argued that a single universal definition for the smart city approach is not present in the literature. While many definitions of smart city include general statements evolving around technology, some include "data-driven" and some others focus on "citizen-driven" definitions. For example, Terzi and Orakçı (2017: 12), made a technology-centered definition for the smart city concept saying "a city that uses information and communication technologies to make the city's infrastructure components interactive." On the other hand, Sancino and Hudson (2020: 701) defined a smart city as "an umbrella concept to describe the use of technology in cities to improve public services, to increase efficiency, to address societal challenges, and to foster collaboration between citizens and government" highlighting the importance of not only technology but also collaboration with citizens. Similarly, the definition given in the "2020-2023 Turkish National Smart Cities Strategy and Action Plan" (2019: 22) emphasized the importance of collaboration between the shareholders and the feature of smart cities to make a city a more livable place by producing solutions to the problems of the city with this cooperation.

Caragliu (2009) stated a city gains the ability to intelligently manage sustainable economic resources through investments in social capital and information technology, highlighting the factor that makes a city smart is participatory governance. On the other hand, Lombardi et al. (2012) defined smart cities as a system of innovation that consists of several key actors such as governance, economy, and life.

The term 'smart' in the smart city concept mostly refers to the term 'digital'. The main reason for this is that the information technology infrastructure used by the city gives its smart aspect. Put another way, smart cities use technology to increase the life quality of city dwellers and create solutions to the problems of the city. Digitalization of a city's living spaces with the help of technology facilitates the delivery of services to citizens without any limitations related to space, time, or cost. However, the definition of the smart city concept has widened significantly to include more than just technology today. Because, although technology plays an essential role in making cities smart, it is not the sole factor in the success of cities. The components of a smart city are not just about technology. While it is true that technological solutions to urban problems have been provided, it has become clear that more is needed to build a sustainable smart city. In addition to their technological components, cities become smart by hosting smart people (Gürsoy, 2019: 82). Therefore, it is more important to ensure the utilization of technology in a manner that facilitates daily life by raising the

awareness of city residents and ensuring the sustainable management of the city. It is this approach that can enhance urban residents' quality of life.

According to Cohen (2015), the concept of the smart city has evolved through three distinct evolutionary stages, as described below:

- Smart Cities 1.0: This phase is characterized by technology firms leading the development of cities with a strong emphasis on innovation. During this stage, the interaction between the city and its citizens has not yet been a consideration.
- Smart Cities 2.0: In this phase, government leadership takes the forefront in using technology-driven solutions to enhance the quality of life. During this phase, technology remains essential, but it's the city managers and administrators who take an active role rather than technology companies.
- Smart Cities 3.0: In this phase, citizens are placed at the core of efforts to enhance the quality of life. During this stage, there's a recognition of the significance of citizen participation and collaboration with various urban stakeholders, leading to a more interactive approach. In smart cities characterized by this phase (e.g. Vienna), citizens can even participate as investors to ensure their involvement in projects aimed at transforming the city.

As evident from Cohen's definitions, the smart city pratıcs started with a technology partner company and continues with city administrations using technology extensively. On the other hand, in cities trying to become next-generation smart cities, a bottom-up and human-centered approach is embraced, leading to a stage where all city stakeholders are mobilized for the betterment of the city (Mueller 2017). Cohen (2015) believes that an approach that embraces phases 2.0 and 3.0 would be the most suitable approach for the future of smart cities.

The journey of transformation into a smart city is monitored through the "Smart Cities Wheel" approach adopted by the European Union. According to this approach, a smart city consists of six components namely, smart transportation, smart life, smart governance, smart environment, smart economy, and smart public (Laleoğlu, 2021:15).

2. The Concept of Citizen Participation

The rising expectations for transparency and accountability in public administration have compelled the implementation of governance principles and led public administrations to reorganize accordingly. During this transformation, the relations between public institutions and citizens have changed and citizen participation has become more important in decision-making processes. Participation can be defined as "the anticipation of citizens having a voice in policy choices" (Bishop and Davis, 2002). Accordingly, citizen participation refers to "the process through which citizens influence state activities, including decision-making and policy formulation" (Uçar Kocaoğlu, 2017: 41). On the other hand, another definition argues that "citizen participation is the engagement of individuals in the collective resources of the society to which they belong and in the processes by which these resources are utilized" (Dilfiruz, 2022: 66). Citizen participation offers citizens to engage in the decision-making process on matters that affect them and are of interest to them. It provides citizens with the opportunity to contribute to problem-solving. Citizen participation is valuable in terms of tapping into their experiences and knowledge, as they are often the ones with innovative ideas for finding solutions to problems. Additionally, decisions taken by consensus are highly feasible and can be tested. Changes made in response to citizen feedback, complaints, and recommendations are crucial for effective decision-making processes. Feedback from citizens not only improves the efficiency and effectiveness of services but also their quality. The active participation of citizens in the production of public services has a direct impact on both the quality and satisfaction of services. In relation to this, Irvin and Stansbury (2004) stated that citizen participation offers some advantages

including allowing managers to better understand citizen expectations, as well as empowering citizens.

One of the most basic requirements of democracy is the ensure participation. Democracy strengthens by increasing citizen participation in the public policy determination process (Karaca & Yıldız Özsalmanlı, 2022: 121). Participation not only provides responsibility to citizens for monitoring governance activities but also increases their sense of belonging (Michels & Graaf, 2010). Citizens feel more responsible about public matters as they use participation channels. This also heightens the legitimacy of decisions (Michels & Graaf, 2010). Therefore, citizen participation is an instrument for ensuring effective governance.

Citizen participation, now a crucial component of the decision-making process, facilitates a two-way interaction between the public and government entities, allowing citizens to play an active role. Citizen participation relies on mutual interaction and dialogue and increases respect and trust between the state and citizens as it allows information sharing (Sheedy et al., 2008). Governors gain increased authority when supported by citizens who have a greater say in governance.

3. Citizen Participation in Smart Cities

The overall goal of city managements is to increase citizens' quality of life (Erkek & Örselli, 2023: 345). To achieve this goal, it would be useful and important to involve citizens in the creation and execution of urban projects. Many researchers highlighted that citizen participation is the crucial and fundamental element for the success of smart city practices. According to Jahromi et al. (2019: 571), the role and participation of citizens in smart cities are important components of smart city initiatives. Appleton (2020) stated that "citizen input has the power to help define the dynamics of a city." Kusumastuti and Rouli (2021) explained the concept of citizen participation saying, "a new form of urban governance to solve local problems in smart cities."

Michels and Graaf (2010) stated that involving citizens in policy development processes increases the quality of decisions. According to the results of their case study in two Dutch municipalities, policy decisions in Eindhoven are made through a collaborative governance process. Similarly, budgeting discussions in Groningen are held with a participatory approach between citizens and other stakeholders. However, in both municipalities, citizens have not been made decisive actors in the policy-making process.

Simonofski et al (2017) indicated that instruments offered with smart cities enhance citizen participation and citizens using information technology infrastructure make contributions to the city by being involved in the smart city project. Furthermore, they also highlighted that the sole requirement for smart city governments to realize their objectives is to engage citizens –the end users of these practices– in the design process. Consistent with this, Oh (2020) found that one of the reasons why smart cities sometimes fall short of their objectives is their failure to adequately consider the needs of their citizens. Bastos et al. (2022) highlighted the importance of citizens for a city saying, "Citizens are the life force of a city." Moreover, in a recent field study by Bilici (2023), it was found that citizens utilizing smart city technologies should possess technology competence, be engaged in decision-making processes during project development, and the widespread use of the practices can be enhanced through the promotion of such practices to citizens. Choo et al. (2023: 32) determined that to ensure the continuity of citizen participation, their involvement should not remain limited but should be taken into account throughout the entire city planning process. Chang and Smith (2023) highlighted that to ensure citizen participation in smart city planning processes, their interest should be increased.

As numerously highlighted in the literature, the development of a city depends on increasing citizen participation and ensuring harmonious collaboration between administrators and citizens. Based on this fact, many government departments started establishing platforms where citizens can express their opinions, complaints, and recommendations. For example, Civic Bridge, a cloud-based platform developed in San Francisco to enhance citizen engagement in problem-solving, facilitates direct communication between officials and residents, resulting in swift outcomes. And other digital platforms like Civocracy designed to promote citizen participation are used in Amsterdam, Nice, Potsdam, Brussels, Lyon, and many other European cities. These platforms allow authorities to gather input from the public and foster two-way communication between citizens and administrators, providing a channel for citizens to engage in discussions with officials about projects.

Although many studies emphasized the importance of citizen inputs for a city, only a few studies have offered guidance on how to use citizen experiences in the most effective way (Singh et al., 2021: 35). In this regard, Sminofski et al. (2017) also highlighted this subject and pointed out that in addition to involving citizens in smart city design, the way of participation is more important (Simonofski et al., 2017). Arnstein's (1969) famous "Ladder of Citizen Participation" describes the levels of citizen decision-making in eight levels across three groups (Arnstein, 1969: 216):

1. Group: Manipulation and Therapy levels
2. Group: Informing, Consultation, and Placation levels
3. Group: Partnership, Delegation, and Citizen Control levels.

Arnstein (1969: 216) stated that there is no participation in the steps of the first group; instead, they provide citizen education for participation. Participation in the second group levels is defined as symbolic; in this group, citizen opinions are considered only as suggestions but not taken into account. Finally, the steps in the third group provide citizens with a complete opportunity for decision-making, making citizens in this group powerful. Inspired by Arnstein's ladder of citizen participation, many similar studies were carried out. Berntzen and Johannessen (2016: 3-5) proposed the following three categories for citizen participation: the first stage where citizens are merely informed individuals, the second stage where citizens become data sensors, and finally, the third stage where citizens actively participate. Cardullo and Kitchin (2017) added the degree of consumerism to Arnstein's ladder of citizen participation and developed the nine-level "Scaffold of Smart Citizen Participation." On the other hand, Goodman et al. (2020) measured the level of citizen participation in three Canadian cities using the measure called "IAP2 Public Participation Spectrum." They found that despite attempts toward being citizen-oriented, top-down management still persists. Chantry (2023) found that "Cardullo and Kitchin's scaffolding is not effective in explaining the complexity of citizen participation in smart city planning".

Schmidthuber et al. (2019) analyzed the factors motivating citizens to participate and highlighted the difference between participation styles and motivations for participation. Their findings showed that the level of participation varies with intrinsic and extrinsic types of motivation. On the other hand, according to Sweeting et al. (2022), citizen participation in smart cities takes place in a corporate context; therefore, governance institutions that enable citizen participation are important for a smart city.

The smart governance component, in which citizen participation stands out as an important element, plays a crucial role in the sustainability of smart cities. Smart governance provides the opportunity to improve the quality of life of people living in the city (Dal & Özdemir, 2020: 205). Governance is the primary foundation of the smart city approach. Smart city managements should, therefore, ensure the utilization of technology through multi-stakeholder cooperation (Przeybilovicz et al., 2022). Because ensuring city residents' satisfaction requires knowing their expectations. Instead of

considering city residents just as users, consumers, and testers of technology, an approach that promotes citizen participation should be preferred for building future smart cities (Capdevila & Zarlenga, 2015).

Lee et al. (2014), stated that "sustainable smart cities can only be built through a dynamic process in which all actors coordinate their activities and resources using an open innovation toolkit". On the other hand, Meijer and Bolivar (2016: 392) defined smart governance as "new forms of human collaboration enabled by the use of information and communication technologies to achieve better results and more open governance processes."

Today, there are some challenges in involving citizens in the policy-making processes of smart cities (Correia et al., 2021). Efforts to engage the public through public space idea competitions show promise in encouraging participation. Designing urban open spaces and public spaces with citizen participation has become a preferred practice in many cities.

As the human capital of the city, citizens are the primary contributors to building the smart city due to their technological aptitude, adaptability, and interest in lifelong learning (Memiş, 2017: 75). In this regard, smart citizens are the key actors who drive the development of cities and transform them into centers of attraction (Örselli et al., 2018).

To enhance citizen participation through promoting their feedback, it's important to inform them about activities and encourage them to take initiative in finding solutions to problems. Transparency of public services is a key element that can facilitate citizen participation in the decision-making process. Open and reliable data generated in urban transactions increase participation by ensuring transparency (Khan et al., 2020).

In conclusion, the success of the smart city approach depends on involving citizens as an integral part of the process, since they play important roles as users and decision-makers (Örselli & Bayrakcı, 2021: 114). Furthermore, there is a necessity to establish a people-centered approach to ensure that arrangements are made in the best interest of the smart city residents. This requires an understanding that places greater emphasis on the quality of life for the city's residents and prioritizes their progress toward smart citizens. In addition to enhancing the capabilities of citizens, efforts are also required to encourage their voluntary participation. For this purpose, policies promoting citizen participation should be implemented.

4. Methodology of the Study

Seoul was selected as the sample because it received the "Smart City 2022" award at the World Smart City Awards and it is an exemplar of best practices in citizen participation. Accordingly, citizen participation practices in Seoul and data presented in the smart city section of the official website of the Seoul Metropolitan government were examined based on Seoul city plans. The document analysis method was employed. Korea Smart City Brochure, Seoul Smart City Policy documents, and Smart City bulletins are the documents reviewed. Furthermore, to obtain comprehensive information regarding smart practices, other data provided on the official website of the Seoul Metropolitan government were also utilized.

5. Findings

This section presents findings regarding the smart city practices in Seoul, a city renowned for its successful citizen-centered initiatives, which positions the citizens at the core of its smart city development strategy. First, the city of Seoul is introduced and its journey of becoming a smart city is mentioned, followed by findings on its practices involving citizen participation.

5.1. Seoul and Its Journey of Becoming a Smart City

Seoul, the capital of the Republic of Korea, covers an area of 605 sqm and is home to approximately 10 million residents (constituting around 20% of the total Korean population). According to 2020 data, the gross national product (GNP) is 444,545.9 billion Korean Won, with an estimated 153,000 unemployed individuals. Seoul experiences approximately 26.5 million daily traffic and 2.5 billion subway users. The city also has an extensive network of 1,290.4 kilometers of bicycle lanes (Table 1).

Table 1. Main Indicators of Seoul City

Year	Indicator	Value
2020	GNP	444,545.9 billion KRW
2020	Daily traffic volume	26,497,000
2020	Daily Food Waste Production	2,540.7 tons/day
2021	Total length of bicycle lanes	1.290.4 km
2021	Daily Household Waste Generation	10,853.9 tons/day
2022	Subway Users	2,403,878,000
June 2023	Unemployed individuals	153.000

Source: http://opengov.seoul.go.kr/stat, Date of access: 23.07.2023

The history of Seoul dates back to prehistoric times, with settlement in the city beginning in the Neolithic age. Seoul has a rich cultural heritage and has served as the capital of various kingdoms during ancient and medieval times. It endured Japanese colonization from 1910 to 1945 but gained its independence in 1945. However, the Korean War resulted in significant losses to the city. With a population boom after the 1960s, the Seoul Metropolitan Government faced numerous city-specific challenges and primarily focused on infrastructure development. Hosting the Olympics in 1988 and 1990 contributed to the city's progress. An urban development plan was formulated and implemented, resulting in the achievement of high standards, particularly in urban infrastructure. In the 2000s, on the other hand, the number of digital projects increased with the advancements in information technologies. From this date, some major practices implemented by Seoul management are listed below (https://www.seoulsolution.kr/):

- Online public service offering (2000),
- Information Network Villag INVIL (2001)
- Cheonggyecheon Restoration (2004),
- Public transportation reform (2004),
- Seoul waste management system (2005),
- Metro screen door (2006 ~ ongoing),
- 120 Dasan Call Center (2007),
- Eco-Mileage System (2008),
- Smart bus stop (2009),
- Car Sharing in Seoul (Nanum-Car) (2013),
- Night Bus Based on Big Data Technology- OWLBUS (2013),

- A Safer City for Women Project (2013)
- Smart City Plan (2015)
- Global Digital City Action Plan (2020)

U-City, Korea's national development project, was put into force in 2005 for the utilization of technology to make life easier. Seoul aims to be the first in the world to provide free Wi-Fi in all public spaces and establish a special fiber network for smart services. The public network "e-Seoul Net" was established to connect public buildings and municipalities. Additionally, Seoul implemented an open data policy by sharing much data except personal information with citizens and other institutions.

The Korean government first announced a strategic plan to build smart cities in 2019 and launched two pilot smart city projects as part of this five-year plan, which consists of four strategies and 14 tasks. Subsequently, it implemented collaborative management and established regulations to support smart city innovation. Over time, Seoul has emerged as a pioneering city that showcases its success in smart city applications to the world.

Innovations implemented in Seoul include smart transportation, IoT technology, smart street lighting, smart surveillance, smart waste management, smart water management, and smart sewage grid (https://www.aboutsmartcities.com). From these practices, some smart platforms emerged such as the integrated public transport fare system, demand-responsive transport, and bike sharing program. Lee (2018: 4), listed the features of Seoul smart city as follows:

- A good infrastructure serves to empower citizens
- Open government-focused communication, participation, and sharing
- Strong public-private partnership
- Adoption of technologies such as "Internet of Things, Big data and cloud computing" to solve urban issues
- Sharing smart solutions with the world

5.2. Seoul's Practices for Citizen Participation

The Seoul management performed its digital transformation with the belief that a smart city should be managed not only with a technology-oriented approach but also with a human-centered approach. While trying to cope with typical city problems (pollution, traffic, housing, etc.), Seoul has adopted a different management strategy, particularly after 2011. A new governance based directly on the cooperation of the city residents was implemented with the new approach based on increasing citizen participation. Seoul, recognized as the first smart city to use 5G (Örselli & Akbay, 2019), initially established mechanisms to facilitate citizen participation to gather input from its residents and promote civic cooperation. In 2018, an amendment was made to its smart city strategy, introducing a new goal of "a city as a platform" with the aim of democratizing technology and reducing the cost of innovation (Hwang, 2020). Moreover, Seoul has taken numerous steps to foster a governance culture that enhances the city's functionality. The table below shows Seoul's smart city initiatives, focusing on citizen-centered components (Table 2).

Table 2. Seoul's Smart City Practices

Practice	Component
Seoul Innovation Bureau	Within the scope of Bureau activities, various channels have been established to facilitate citizen input and engagement. These channels include physical field offices, as well as online and offline discussion platforms where topics and matters related to the city can be directly discussed. Civic cooperation has been maximized through this Bureau, maximizing civic cooperation, actively involving citizens in the planning of innovative projects, and determining policies related to youth and other aspects of the city's development.
Seoul Digital Foundation	The foundation was established in 2016 with the goal of promoting and facilitating digital innovation in the city. The foundation established and managed the Digital Innovation School, allowing it to carry out various digital training programs to improve the digital literacy of city residents.
Partnership Governance Committee	The committee serves as a citizens' branch where ideas and initiatives proposed by residents are discussed, projects are selected and evaluated.
The Smart Seoul Network (S-NeT)	The smart city telecommunication infrastructure implemented by the Seoul Metropolitan Government not only secures broadband access for its citizens but also offers solutions to various urban problems.
S-DoT (Smart Data of Things	The smart city infrastructure established by the Seoul Metropolitan Government for policy development is based on urban data, data analysis, and the identification of services that align with the preferences and needs of its citizens.
120 Dasan Call Center	Initiated by the Seoul Metropolitan Government in 2007, this system actively collects citizen feedback and complaints through diverse channels (SMS, social media, text, or video communication) to enhance citizen satisfaction.
mVoting	This mobile voting app was established in Seoul in 2013 to facilitate and accelerate receiving citizen opinions. Through this app, both citizens and staff are surveyed to gauge their satisfaction levels and preferences concerning services and activities. Additionally, it serves as a tool for collecting opinions and input, and is even utilized in the planning of meetings. Through the app, some suggestions such as designating a non-smoking area in Khan River Park, free public transportation for citizens aged 65 and above, and restricting the use of cars to prevent air pollution were received (https://participedia.net/case/5554). However, some argue

	that these proposals lack a substantial democratic impact since they cannot be integrated into actual elections.
Smart Report Mobil App	This app enables citizens to report instances of nuisance and illegal activities (such as noise, parking violations, dangerous urban conditions, etc.) as complaints. Citizen complaints received by the 120 Dasan call center are processed and resolved.
IT Technology Governance Group	A group that communicates with citizens, introduces technologies such as metadata and blockchain to practitioners and attempts to identify shortcomings by collecting opinions on this subject.
Liku Training Robot (2020)	These robots offer digital device training to help senior citizens use digital devices more comfortably, thereby enhancing their ability to utilize smart services. The target audience is particularly senior citizens who may not be proficient in using digital devices. The robots feature face recognition and 3D environment recognition. Additionally, the application includes training on profile creation, sending messages, and sharing photos via the mobile messaging system (KakaoTalk).
123 Digital Learning Center (2022)	The centers offer free services designed to encourage citizens to participate in training programs and lifelong learning to enhance their digital competencies.
2022 Digital Capability Strengthening Plan	This plan was established by the Seoul metropolitan municipality to ensure rapid and easy digital transformation as well as to close the digital divide. The objectives of the plan include increasing digital competence through various training programs, aligning training offerings with citizen demand, providing regionally-based training opportunities, and establishing a balance between education and employment. Accordingly; • The "Right beside" principle aims to enhance digital competence through interactive training methods, including digital training buses and robots. • The "Just right (for me)" principle aims to enhance the digital competencies of diverse segments of society, including the elderly, through customized training programs tailored to their specific needs. • The "neighborhood-wide" principle aims to establish digital education environments by creating educational spaces on a regional basis.

In addition to the above-mentioned practices, the Seoul smart city ensured that its citizens act as a part of monitoring and supervision units. Furthermore, innovation competitions, discussion forums, and exhibitions were organized. Seoul has placed great emphasis on transparency as a mechanism to ensure the participation of city residents. The city has utilized the principle of openness to build trust and promote citizen participation. Based on the belief that informed citizens who have a better understanding of their cities and themselves will actively engage in shaping innovative practices for the future, smart solutions are encouraged. Particularly since 2000, in alignment with the transparency policy under the "Government 3.0 Vision" of Korea, initiatives like "www.open.go.kr (public information portal)" and "www.data.go.kr (open data portal)" were launched. The active

engagement of citizens with their cities for their cities is made possible by placing due importance on openness and transparency and by effectively implementing open data policies.

In the "Smart City and Digitalization Master Plan (2021-2025)" developed by the Seoul Metropolitan Government, Seoul's vision was envisaged to take a leading role in shaping the future of digital transformation. The strategies developed within this concept include primarily building an innovative city infrastructure and leading the creation of an inclusive city (https://english.seoul.go.kr/).

In conclusion, utilizing the power of technology, the Seoul Metropolitan Government has developed smart applications and various communication channels that facilitate two-way interaction with citizens. This paved the way for the collaborative development of solutions to urban problems.

CONCLUSIONS AND EVALUATION:

The smart city approach is being embraced by numerous countries worldwide, as it allows the utilization of developing technologies to address urban challenges effectively. However, the sustainability of smart cities has become a more important agenda today. Relying solely on new technologies to enhance the delivery of public services is no longer a sufficient approach. Investments aimed at making smart practices citizen-centric in the implementation of urban policies contribute to the sustainability of smart cities.

The key results obtained from this study on Seoul's practices are listed below:

- The Seoul metropolitan government has allocated physical spaces within the city to foster collaboration. Initiatives like the Seoul Innovation Bureau and the Seoul Digital Foundation facilitate civic collaboration.
- Through broadband networks and free Wi-Fi applications, the Seoul metropolitan government has been striving to ensure the sustainability of citizens' mobile accessibility to services, also promoting the sustainability of smart applications in urban services.
- Seoul metropolitan government aimed to increase citizen's digital competencies to enhance their participation. For this purpose, it launched mobile apps and educational robots. In doing so, the city aimed to mitigate the potential digital divide among citizens and made efforts to ensure that older citizens could access electronic services through elderly-friendly practices.
- It is true that the digital applications used by the Seoul city government make it faster and easier to obtain citizen opinions. In fact, in this way, citizens' opinions on services and activities are also received. However, as seen in the example given in the e-voting application section, the suggestions were not reflected in the public decision-making process, which did not have a full democratic effect.

The Seoul Metropolitan Government has demonstrated that smart city practices are not solely technology-oriented but also include citizen participation. Seoul's efforts to train individuals with the potential to contribute to the city's smart development and its use of technology to enhance citizen participation are the right approaches. However, these efforts alone may not suffice to ensure effective citizen participation. It should be noted that increasing citizen participation to a level where it can influence policy decisions is important. Field studies conducted in Seoul, which reveal the extent of influence of bottom-up decisions, will provide evidence that these efforts are yielding successful practical outcomes. The evolution of electronic apps, like the Seoul mVoting app, toward a process where citizen opinions are comprehensively incorporated into decisions, will serve as a model for future smart cities.

Compliance with Ethical Standard

Conflict of Interests: There is no conflict of interest between the authors or any third party individuals or institutions.

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