



Participatory Governance for Smart Cities: Challenges and Perspectives

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Abstract

This study examines the challenges and prospects of participatory governance for smart cities. Using a qualitative method, the study investigates how citizen involvement can be successfully incorporated into urban management. The SWOT analysis and the results highlight the benefits of transparency, strengthened democracy, and improved urban life standards. However, challenges remain, including the digital divide and unequal inclusion of citizens. Barcelona and Singapore illustrate two examples of smart cities that successfully implement participatory governance. The most optimistic perspective is the development of the economy and society.

- ✓ Smart cities, participatory governance, urban management, ICT¹, issued and perspectives, swot analysis.

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¹ ICT : Information and Communication Technologies

1. INTRODUCTION

Cities worldwide are facing numerous challenges, including increasing urbanization, growing demand for resources, environmental issues, and pressure on existing infrastructure. In this context, smart cities are emerging as a promising solution to meet these challenges and create more sustainable, efficient and pleasant urban environments. To better manage resources, Smart cities integrate cutting-edge technologies such as the Internet of Things (IoT)², artificial intelligence (AI) and data analysis to improve resource management, optimize urban services and facilitate decision-making. However, an important concern arises: how to involve citizens in the transformation of cities into smart cities? The answer lies in participative governance, which emphasizes the active involvement of citizens in decision-making processes and the co-creation of their urban environment. Participatory governance recognizes that local citizens are the key players in the city, and that they are intimately familiar with their neighbourhoods, as well as their needs and aspirations. By including them in smart city decisions, it is possible to create solutions that are better adapted to and more accepted by the community.

This article explores the challenges and prospects of participative governance for smart cities. It examines the benefits of this approach, such as improving citizens' quality of life, creating a sense of belonging and commitment, and promoting more transparent and accountable governance. Additionally, it addresses important problems and obstacles that participatory governance encounters, such as social inclusion, the security of private information, and assuring equitable representation of different viewpoints.

² Internet of Things IoT: Connectivity of everyday objects to the Internet, allowing them to communicate with each other and with users to provide enhanced functionality and intelligent automation.

• General Problematic:

In this context, the general problematic of our study is as follows:

What are the challenges and perspectives of participatory governance for smart cities?

To address this issue, the article is structured around several key questions:

1. *What are the main challenges and obstacles to the establishment of participatory governance for smart cities?*
2. *What are the benefits of participatory governance in the context of smart cities?*
3. *How can we ensure equitable inclusion of citizens in participatory smart city governance processes?*

• Hypotheses:

In order to answer these questions, three hypotheses were formulated:

1. *Participatory governance promotes a better match between urban policies and the real needs of citizens.*
2. *Digital technologies can play a key role in promoting citizen participation and collecting data for more effective governance.*
3. *Social inclusion and equitable access to participatory governance processes are essential elements to avoid the marginalization of disadvantaged groups in smart cities.*

• Objective:

This article seeks to provide an in-depth examination of the concerns and perspectives of participatory governance for smart cities by examining these questions, stressing the obstacles to be removed and the opportunities to be taken. Additionally, it will provide useful suggestions for the effective implementation of participatory governance in order to build truly inclusive, accountable, and centred smart cities.

• Method and tools:

The methodology used in this study relies on a qualitative approach based on a literature review conducted by consulting academic databases in the field of smart cities and participatory governance. This process has gathered useful data on the ideas, problems, and viewpoints of participatory governance for smart cities. Case studies of smart cities were examined in addition to the literature review. These case studies were chosen based on their applicability to the study challenge and their relevance. They made it feasible to specifically analyze the ways in which participatory governance is applied in various smart cities throughout the world and to pinpoint both successful strategies and problems. Last but not least, a SWOT analysis was created to identify the (Strengths-Weaknesses-Opportunities-Threats) of participatory governance for smart cities.

2. Conceptual framework

A conceptual framework is offered to clarify the two essential ideas—smart cities and participatory governance—to ensure a better understanding of our research issue.

2.1 Smart cities: a necessary urban evolution

The smart city is a concept of urban development. It is about improving the quality of life of citizens by making the city more adaptive and efficient.

2.1.1 What prompted the idea of smart cities?

The development of smart cities is the consequence of a number of important drivers and inspirations that have changed how cities are planned and run. In fact, rising urbanization has caused a concentration of people in cities, posing problems for quality of life, resource management, mobility, and urban services. In order to address these issues and promote more efficient and sustainable urban growth, smart cities provide answers.

Moreover, environmental problems such as air pollution, excessive energy consumption and inadequate waste management have led to thinking about a new mode of cities that aim to reduce these pressures by adopting sustainable practices, such as

the efficient use of resources, the promotion of renewable energies and the establishment of cleaner transport systems (Eveno, 2018).

2.1.2 Definition of a Smart City:

The idea of a "smart city" attempts to employ digital data and information technology (ICT) to enhance urban living standards, operational effectiveness, environmental sustainability, and public involvement. an urban setting.

A smart city relies on the integration of various systems and infrastructures, such as sensor networks, Internet of Things (IoT), data analytics, artificial intelligence (AI) and advanced communication technologies. These elements make it possible to collect and analyze large amounts of data in real time, allowing more informed decisions to be made and the optimization of urban services. (Breux and Diaz, 2017).

The ultimate goal of smart cities is to create a sustainable, resilient and citizen-centred urban environment by using technology in an integrated and holistic³ manner to improve quality of life, resource management and urban governance.

2.1.3 Characteristics of smart cities

Smart city is a concept encompassing a comprehensive and integrated approach to urban management, emphasizing the use of information and communication technology (ICT) to improve all aspects of urban life. Its features can vary according to the specifics and needs of each city (Derolez, 2017). Some of them are listed below:

- **Digital infrastructure:** A smart city has a highly connected communication infrastructure, allowing fast and reliable communication between the different urban systems and actors.

³ Holistic approach: consider a subject as a whole by taking into account all the interactions and dimensions that compose it.

- **Data management:** Smart cities collect, analyze and use data from various sources (sensors, connected devices, social networks, etc.) to improve decision-making and optimize urban services.
- **Smart mobility:** A smart city integrates intelligent transport systems, such as traffic management, efficient public transport, carpooling solutions and charging infrastructure for electric vehicles, in order to optimize urban mobility and reduce congestion and pollution.
- **Efficient use of resources:** Smart cities adopt sustainable approaches to the management of resources, such as “energy efficiency”⁴, water and waste, using smart technologies for monitoring, conservation and optimization of their use.
- **Citizen participation:** Smart cities encourage the active participation of citizens through digital platforms, mobile applications and online participation tools, in order to gather their opinions, foster transparency and involve them in urban decision-making (Picon, 2016).

2.2 Participatory governance: a pillar of urban democracy

Participatory governance is considered as one of the pillars of urban democracy. The aim is to increase the active participation of citizens in decision-making processes related to the management of urban affairs, thereby promoting more democratic and inclusive decision-making.

2.2.1 Definition of participatory governance

Participatory governance describes decision-making and management processes in which citizens and stakeholders actively participate. The aim is to create an environment where individuals and groups can contribute at the local level to formulate policy, plan projects and solve problems (Nesti, 2020).

⁴ Energy efficiency: Rational and efficient use of fossil energy sources with the aim of preserving them for future generations.

Participatory governance is viewed as a means of enhancing democratic legitimacy, raising the standard of decisions made, and promoting citizen adoption of public policies. It can be used at several levels, including local, national, and international levels, as well as in a variety of fields including politics, the environment, education, health, and so on.

2.2.2 Principles of participatory governance

The foundation of participatory governance is the encouragement of citizen involvement, democratic inclusion, and citizen-government cooperation (Younes, Salah et Touzani, 2016). In fact, the following can be used to summarize these ideas:

- **Inclusion:** Participatory governance aims to involve all relevant interested parties in the decision-making process. It may include citizens, community organizations, business organizations, civil society organizations, academics, and government representatives.
- **Transparency:** Decision-making processes must be open and transparent, providing clear information on the issues, choices made, and anticipated outcomes. Transparency fosters trust and enables individuals to understand the implications of their efforts.
- **Collaboration:** Participatory governance promotes cooperation amongst the parties involved. This can be expressed through conversations, debates, work sessions, and other forms of communication that allow for the exploration of opposing viewpoints, the development of original solutions, and the formation of consensus.
- **Accountability:** Decisions made as part of participatory governance must be accountable and take into account the wants and needs of the entire community. The persons involved must be held accountable for their deeds and commitments.
- **Responsibility:** Decisions made within the framework of participatory governance must be responsible, and take the needs and interests of the entire community into consideration. Each party involved must accept responsibility for their deeds and commitments.

• **Capacity:** Effective participation in participatory governance requires that individuals have the knowledge, skills, and resources necessary. It is necessary to make efforts to increase both individuals' and groups' capacity to participate in the governance process (Younes, Salah, and Touzani, 2016).

2.2.3 Characteristics of participatory governance in a smart city context

In the context of smart cities, participatory governance is characterized by several specific aspects, including:

- *Use of information and communication technologies* through online platforms, mobile applications and social networks to enable citizens to actively participate in decision-making processes, share information and collaborate with other stakeholders.
- *Use technology to collect and analyze data* related to smart city components such as mobility, energy, air quality, etc. In this context, participatory governance aims to involve citizens in data collection, sensitize them to the issue, and encourage them to share their data. Citizens can also participate in the analysis and interpretation of data to support evidence-based decision-making.
- *Multi-stakeholder collaboration* between public, private and civil society actors. Participatory governance of smart cities requires close collaboration. It's about facilitating collaboration between municipalities, tech companies, community organizations, universities, and citizens. This multi-stakeholder collaboration helps bring together the different perspectives, skills and resources needed to develop innovative and sustainable solutions.
- *Ongoing citizen engagement* where citizens are involved throughout the decision-making process, from planning to project implementation and evaluation. This can include working groups, advisory boards, online discussion forums, and other forms of long-term involvement.
- *The transparency of decision-making processes* and the responsibility of the actors involved. Citizens have the right to access relevant information, to understand how

decisions are made and to evaluate the results obtained. Public authorities must report on their actions and the results of the projects implemented. (Meijer and Bolívar, 2016)

3. Challenges and Perspectives of Participatory Governance for Smart Cities

We will now address the second critical component, which is the issues, challenges, and barriers of participatory government in smart cities, after having established the conceptual framework of the two fundamental topics of our research, namely, participatory governance and smart cities. First, and then we'll offer the viewpoints and future orientations of these notions in a subsequent section.

3.1 The challenges of participatory governance for smart cities

The challenges of participatory governance for smart cities are numerous and of great importance in the promotion of sustainable urban development. They can be grouped into three main axes: inclusion, empowerment and collaboration (Périès, 2020).

3.1.1 Civic inclusion and equity

Citizens' inclusion and equity are important issues in the participatory governance of intelligent cities. It is essential to ensure equitable access to technological tools, to encourage involvement from all societal groups, and to ensure that the benefits of projects for intelligent cities are distributed fairly. This makes it possible to design more inclusive cities where each resident has the ability to influence the choices that affect them and shape their daily lives. The following factors help to explain these issues:

- **Digital divide:** The term "digital divide" refers to differences in access to information and communication technology. It is crucial to ensure that all citizens have equitable access to the digital platforms and technological tools used for civic engagement in the context of smart cities. This entails taking steps to level the playing field for Internet access, ensure the availability of public access points, and provide digital skills training to populations that require it.
- **Inclusive participation:** Participatory governance aims to involve all societal sectors in the decision-making process. Making sure that the engagement mechanisms are appropriate for various groups, such as the elderly, the disabled, ethnic minorities,

women, and underrepresented communities, is crucial. This may call for approaches that are tailored to the unique cultural and linguistic characteristics as well as extra work to actively engage these groups and get their viewpoints.

- **Involvement of marginalized communities:** Marginalized communities, such as disadvantaged neighbourhoods, low-income populations, and minority ethnic groups, may be excluded from conventional decision-making processes. Participatory governance provides the chance to hear from these communities and take into account their unique needs. This can be accomplished by setting up communication channels that are appropriate for their circumstances, planning neighborhood meetings and gatherings, and facilitating participation through community representatives or civil society organizations.

- **Equitable resource distribution:** Smart cities aim to maximize the use of urban resources through the collection and real-time analysis of data. However, it is crucial to watch out for an equitable distribution of the benefits of these programs. Participatory governance can help in this regard by including citizens in the selection of urban development priorities, monitoring that the needs of underserved neighbourhoods are taken into account, and advocating for policies that lessen social and spatial disparities.

- **Responsibility and openness**

The fundamental pillars of participatory governance for smart cities are transparency and accountability. In order to build trust and cooperation between citizens and institutions, it is important to promote data transparency, strengthen decision-making processes, and hold urban actors accountable. This results in more informed, equitable, and popularly supported decisions, which helps to create intelligent, more democratic, and more responsible cities. These issues can be developed along the following axes:

3.1.2 Transparency of data and decision-making processes: In intelligent cities, enormous amounts of data are gathered and used for urban planning. In order for the public to understand how decisions are made, what data are used, and how they are

used, transparency entails making these data available to the public (Pokore, 2020). By ensuring a clear understanding of the policies and activities taken, it helps to increase trust between citizens and urban authorities.

- **Strengthening of urban actors' responsibilities:** Participatory governance aims to involve citizens in decision-making processes, but it must also increase the accountability of urban actors. This includes local government agencies, private businesses, and other stakeholders involved in urban management. Responsibility entails holding oneself accountable for their activities in a transparent manner, addressing public concerns, and taking corrective action as necessary. This ensures that decisions are justified and that urban actors are held accountable for their deeds.

- **Trust between citizens and institutions:** Transparency and responsibility help to increase trust between citizens and institutions. When citizens have access to clear information about decisions made, they are more likely to feel included and have faith in the institutions that stand in their place. It encourages better citizen cooperation and more active participation, which is crucial for the success of smart city initiatives.

- **Data protection and privacy protection:** smart cities gather and use a lot of data on their residents, raising concerns about data protection and privacy protection. To ensure that the citizens' personal information is secure, it is essential to put in place reliable data protection mechanisms and to uphold confidentiality standards. The citizens' trust in the projects of intelligent cities will be strengthened if they are informed about how their data is used and have control over how it is used.

3.1.3 Co-creation and collaboration

Collaboration and co-creation are key components of participatory governance for smart cities. They enable knowledge and skill sharing, citizen participation and appropriation, the strengthening of participatory democracy and the legitimacy of decisions, and the promotion of innovation and complicated problem solving. By encouraging these ideas, cities may fully utilize the skills and views of their residents,

fostering a more dynamic, collaborative, and innovative urban environment (Guglielmi, 2015). More eloquently, these elements are presented as follows:

- **Knowledge and skill sharing:** The cooperation between various urban actors, including citizens, businesses, organizations of civil society, and public agencies, enables the exchange of a variety of knowledge and skills. Each party contributes a distinct perspective and area of knowledge, which enhances decision-making and encourages creativity. In order to develop urban solutions and projects that more effectively and long-lastingly address the needs of the community, co-creation requires teamwork.
- **Engagement and appropriation of citizens:** Participating actively in the decision-making process is a requirement of co-creation. Citizens no longer just get benefits from urban policies; they now actively participate as partners in the development and implementation of projects. This encourages their participation in the adoption of urban projects because it makes them feel invested in and accountable for their own environment. Co-creation enables the development of solutions that are more suited to the citizens' actual needs by taking into account their knowledge and life experiences.
- **Participatory democracy and legitimacy:** Collaboration and co-creation strengthen participatory democracy principles. Instead of just casting a ballot during elections, they provide citizens the opportunity to actively participate in decisions that affect them. This helps to better represent the needs and interests of citizens, strengthening the legitimacy of the decisions made. The public authorities may also benefit from more acceptance and growing support from the populace by involving citizens in the creation of urban policies.
- **Innovation and complex problem-solving:** Collaboration and co-creation foster innovation by bringing together a variety of ideas and skills. This facilitates the solving of complicated problems. Modern urban challenges are frequently complicated and interconnected, necessitating new approaches to address them. It is possible to generate more creative ideas and solutions that are tailored to the particular needs of the

community by bringing all interested parties to the table and encouraging co-creation. This encourages the development of intelligent cities that are more resilient, long-lasting, and inclusive.

Co-creation and collaboration encourage a better understanding of citizens' needs and goals, allowing for the development of solutions that are more in line with their expectations (Cunha, Knoepfel, Leresche, Nahrath, 2005).

Urban actors can work together in a variety of ways, including through co-creation studios, collaborative work groups, open public consultations, and participatory digital platforms.

3.2 The perspectives of participatory governance for smart cities

The prospects of participatory governance for smart cities can be analyzed through various dimensions: economic, social, environmental and political. This multidimensional approach allows for capturing multiple potential benefits and ensuring a balanced and sustainable development of smart cities (Souillard, 2020).

3.2.1 The economic prospects of participatory governance for smart cities:

- **Entrepreneurship and innovation:** Active public involvement in smart city efforts can drive innovation and the birth of fresh concepts and new businesses. To create cutting-edge technical solutions, services, and business models that fit the requirements of the community, citizens can contribute their knowledge and creativity. This may stimulate local economic development, attract investment, and create jobs.
- **Local economic development:** Participatory governance can contribute to local economic development by encouraging decision-making based on the real needs of the community. Citizens can play an active role in identifying priorities and development projects, which helps target investments and resources to the most relevant and promising sectors for the local economy. This can promote the city's competitiveness, attract businesses and support the creation of sustainable jobs.
- **Economic efficiency of urban services:** Increasing the economic efficiency of urban services can be achieved through citizen involvement in their development and

management. The final consumers of services including transportation, energy, water, garbage, etc. are the citizens. Their involvement helps to better understand their requirements and preferences, to make the most of the resources at hand, and to deliver more flexible and affordable services. Local governments may be able to cut costs as a result, and resources may be used more sustainably.

- **Attractiveness and competitiveness:** Participatory governance and smart city initiatives can increase a city's attractiveness and competitiveness on the local, regional, and global levels. Effective urban services, cutting-edge technology infrastructure, a high standard of living, and engaged citizens may draw capital, talent, and economic activities. This may improve the city's reputation and appearance as a desirable location for enterprises, citizens, and tourists, which supports economic growth.

3.2.2 Social perspectives of participatory governance for smart cities encompass the following aspects:

- **Strengthening the social fabric:** Citizen participation in smart city initiatives promotes the creation of social ties and strengthens the social fabric. By encouraging interactions between citizens, local authorities and community actors, it promotes mutual trust, solidarity and cooperation. Participatory governance projects can also encourage the active participation of citizens in their community, thus strengthening the sense of belonging and social cohesion (Marcaletti -Riniolo, 2015).

- **Empowering citizens:** Participatory government gives residents the ability to actively participate in choices that affect them and have an impact on the growth of their community. By enabling people to feel like agents of change and acknowledging their involvement as partners in the government of the city, this fosters the empowerment of individuals. By empowering them, residents can become more engaged in their communities, more self-assured, and better able to work together for the common good.

- **Taking into account local needs:** Citizen involvement in smart city programs aids in a better understanding of the requirements, worries, and goals of local communities. Citizens can contribute extensive information of their immediate surroundings, particular requirements, and cultural values. This makes it feasible to create solutions that are specifically tailored to local circumstances and better meet citizen expectations for urban services, quality of life, and sustainable development.
- **Civic education and active participation:** Participatory governance provides opportunities for civic education and active participation of citizens. By participating in decision-making processes, citizens acquire a deeper understanding of urban issues, public policies and governance mechanisms. This promotes the formation of an active, informed and responsible citizenship, able to contribute constructively to the life of the community and to work for the common good (Naji & Deakin, 2017).

3.2.3 Environmental perspectives of participatory governance for smart cities may include the following:

- **Urban sustainability:** Citizen Participation in smart city initiatives helps focus on environmental sustainability. Citizens can contribute to the identification of local environmental challenges, the search for innovative solutions and the promotion of sustainable behaviors. This can include reducing greenhouse gas emissions, conserving energy, managing natural resources efficiently, promoting sustainable mobility and preserving green spaces (Gardiol, 2007).
- **Preservation of ecosystems:** Participatory governance can promote informed and enlightened decision-making regarding the protection of urban ecosystems and natural areas. Citizens can share their local expertise and knowledge of natural resources to promote the preservation of habitats, biodiversity and the restoration of degraded ecosystems. This helps improve air, water and soil quality, as well as supporting the health and well-being of citizens.

- **Efficient use of resources:** Citizen participation can contribute to more efficient use of resources in smart cities. Citizens can contribute ideas to reduce water consumption, promote recycling and waste management, encourage the circular economy and adopt sustainable sourcing practices. This can lead to a decrease in the city's ecological footprint, saving natural resources and reducing the costs associated with their use.
- **Climate change resilience:** Participatory governance can increase cities' ability to withstand the effects of climate change. The identification of climate risks and vulnerabilities, as well as the execution of effective adaption strategies, can be helped by citizens. This can involve promoting environmental-friendly building practices, managing flood hazards, creating urban green spaces, utilizing low-carbon technologies, and increasing public awareness of the need to lower greenhouse gas emissions.
- **Environmental education and awareness:** Participatory governance opens doors for environmental education and awareness. Citizens can participate in educational initiatives, public awareness campaigns, and neighbourhood events that support ecologically responsible behaviour. This encourages education, the adoption of sustainable practices, and a long-term dedication to environmental preservation (Scarwell, Kergomard, Iaganier, 2007).

3.2.4 Political perspectives of participatory governance for smart cities include the following:

- **Strengthening of local democracy:** Participatory governance promotes local democracy by giving citizens the opportunity to actively participate in decision-making processes. This reinforces the legitimacy of the decisions taken by local authorities and ensures a fairer representation of citizens' interests and opinions. By involving citizens in planning and decision-making, participatory governance contributes to transparency, accountability and trust between citizens and political institutions.
- **Greater citizen involvement:** Participatory governance expands political engagement beyond official elections. It enables citizens to actively participate in

decisions that have an impact on them, offering them the chance to contribute to problem resolution, policy development, and result evaluation. This encourages civic participation, increases a person's feeling of community, and gives people a sense of ownership over the development of their city (Coussi, Hénaff, 2021).

• **Social cohesion and inter-community dialogue:** Participatory governance encourages dialogue and collaboration between different communities and interest groups within the city. It promotes mutual understanding, conflict resolution and consensus building. By involving citizens in decisions, participatory governance promotes a diversity of voices and perspectives, which contributes to better social cohesion and more inclusive governance.

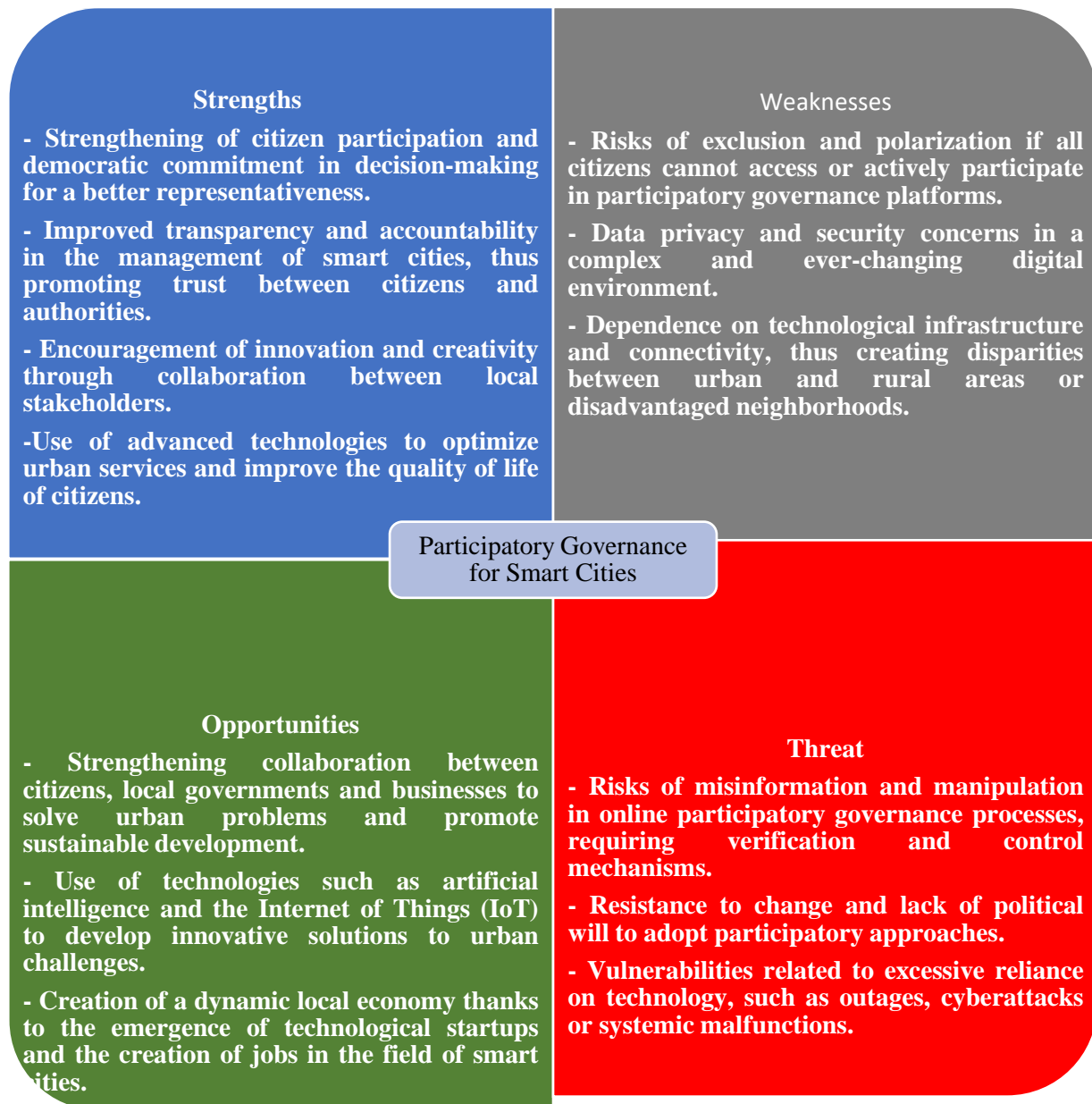
Participatory governance overall offers bright prospects for the development of smart cities. Cities can build more resilient, inclusive, and sustainable urban environments by incorporating citizen input into the design and execution of smart city programs (Courmont, 2015).

It should be recognized, nonetheless, that creating efficient participatory government in smart cities poses difficulties. To guarantee the representativeness of citizen voices, avoid biases and inequities, and promote inclusive involvement of all social groups, it is vital to put in place the proper processes. Additionally, it's crucial to provide open lines of communication, promote public education and knowledge of ICTs, and ensure data security and privacy.

4. SWOT Analysis and Examples of Smart Cities Implementing Participatory Governance

In this part, we will present a SWOT (Strengths-Weaknesses-Opportunities-Threats) analysis of participatory governance for smart cities, then we will look at good practice examples of participatory governance in smart cities around the world.

4.1 SWOT (Strengths-Weaknesses-Opportunities-Threats) analysis of participatory governance for smart cities:



Source: Performed by the author based on part 01 and 02 of this article

4.2 Illustration of good participatory governance practice for smart cities

Across the world, many cities are taking innovative approaches to becoming smart cities, integrating digital solutions and connected infrastructure to solve urban challenges. They also implemented innovative participatory governance initiatives to increase citizen engagement and encourage more inclusive decision-making. These

examples of smart cities implementing participatory governance illustrate how citizens can help shape the future of cities by participating in the urban planning process, co-designing projects and making decisions.

The following table includes examples of good practices of participatory governance in smart cities around the world.

SMART CITIES	COUNTRY	INITIATIVE
Singapore	Singapore	- - Our Singapore Conversation “CSO”: collecting ideas, concerns and aspirations of citizens through a series of consultation dialogues « Smart Nation Co-create » and “Virtual Singapore”: digital platforms for the Co-creation of smart solutions to urban challenges while having access to the urban data necessary for the realization of citizen initiatives.
Barcelona	Spain	- - "Decidim Barcelona": digital platform allowing citizens to propose, participate and vote in decisions (in different sectors: environments, mobility, education, health, etc.) related to the city. “District Boards”: neighborhood councils allowing residents to participate in local management and decisions concerning their own environment.
Tokyo	Japan	- - “Tokyo Civic Participation”: a series of meetings, forums and workshops allowing citizens to express their opinions and influence decision-making in various aspects of urban life.
Copenhagen	Denmark	- - “Copenhagen 2025 Climate Plan”: workshops and consultations with citizens for inclusive decision-making with the aim of making the city of Copenhagen a carbon neutral city by 2025. “Participatory Budget”: program aimed at the participation of citizens by proposing projects and allocating municipal funds for local initiatives, through a vote for their favorite project.
Dubai	Emirates	- - “Dubai Pulse”: online platform allowing citizens to submit their comments, participate in surveys, express their opinions and contribute to decision-making on city issues such as the environment, public services, transport ...

		- “Happiness Agenda”: public consultations, community forums and surveys allowing citizens to share their needs, aspirations and ideas for improving their quality of life.
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Source: Produced by the author based on smart city case studies.

5. RESULTS AND DISCUSSION

Participatory governance in the context of smart cities is a model aimed at actively involving citizens in decision-making and city management. This facilitates more transparent, democratic and inclusive decision-making and gives residents the opportunity to contribute to the development of city policy and voice their needs and concerns.

Through this research we were able to identify the following results:

- Growing urbanization and environmental issues are key factors that have led to rethinking the way cities are designed and managed.
- The use of ICTs, energy efficiency, smart mobility and participatory governance are the pillars of smart cities.
- Participatory governance is based on three core principles: inclusion and equity, accountability, and collaboration and co-creation.
- The digital divide, unequal access to technology, and unequal public involvement are challenges with participatory governance for smart cities. Establishing accessible and user-friendly digital platforms is crucial, as is creating mechanisms for training and raising awareness in order to promote public engagement.
- Participatory governance has bright future potential. It encourages better cohesion and stronger social bonds in urban areas. Through citizen entrepreneurship and creativity, it also helps the economy and society thrive. Utilizing local knowledge and skills might result in more creative solutions for urban challenges, which is another benefit. Furthermore, increased resident satisfaction and improved quality of life in cities might result from public participation.
- Participatory governance in smart cities is subject to a SWOT analysis, which identifies its advantages, disadvantages, opportunities, and threats. Strengths include

better citizen quality of life as well as increased democracy and transparency. The digital gap and citizens' unequal inclusion are weaknesses. Threats might arise from resistance to change and financial difficulties, whereas opportunities can emerge from innovation and sustainability.

- There are numerous instances of smart cities that have implemented participatory governance. However, the nations that are most dedicated to this trend of smart cities are primarily found in Asia and Europe.

6. CONCLUSION

Participatory governance for smart cities is a promising model that can promote transparent, democratic, and inclusive decision-making, achieved by actively engaging citizens in urban management. This approach has numerous advantages, including a higher quality of life, an increase in social cohesion, and the utilization of residents' expertise to address urban problems.

Despite progress made in participatory governance, challenges remain, specifically in the form of the digital divide and unequal inclusion of citizens. In order to fully realize the advantages of participatory governance, it is crucial to establish digital platforms and tools that are accessible to everyone. Additionally, training and awareness programs must be implemented to encourage citizen engagement and participation.

The potential benefits of participatory governance in smart cities are abundant. These benefits include the promotion of urban innovation, the facilitation of sustainable development, and the enhancement of overall resident satisfaction. There exist inspiring examples of smart cities that have already adopted participatory governance, which can serve as instructive models for future initiatives, providing valuable insights and lessons learned.

Research and practice in participatory governance for smart cities are expanding, opening up intriguing possibilities for more equitable and sustainable urban planning. It can make our cities more resilient, collaborative, and responsive by encouraging public engagement.

7. Recommendations:

- Increase accessibility and inclusiveness to ensure that everyone has equal access to the digital tools and platforms utilized for participatory governance.
- Establish mechanisms to train older citizens and those who do not have ICT knowledge in the use of technologies.
- Promote balanced participation and ensure the participation of marginalized groups, disadvantaged communities and underrepresented people.
- Foster transparency and communication and use effective communication tools to inform and engage residents in debates and initiatives.
- Ensure that communication channels are two-way, allowing citizens to give their opinion and ask questions.
- Encourage co-creation and innovation and create co-creation spaces and mechanisms where residents can actively contribute to the planning, design and implementation of urban projects.
- Assess the influence of participatory methods on urban results, resident satisfaction, and decision-making. Utilize these evaluations to enhance participatory government methods and procedures over time.
- Foster partnerships and collaborate with other smart cities and relevant organizations to share best practices, lessons learned and resources.
- Create cooperative networks to improve knowledge and skills in the area of participative governance for smart cities.

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Annex: History of smart cities

The idea of "smart cities" first came into being in the 1990s, when rising urban difficulties and technological advancements forced governments, academics, and businesses to look into novel methods for enhancing city administration. In reality, since these times, the first smart city initiatives have started to take shape, focusing on how ICT may be used to enhance urban services. Specific topics including traffic management, street lighting, and intelligent transportation systems have been the subject of initiatives.

The development of digital technologies then created new potential for smart cities in the 2000s. Real-time data can now be gathered and used to enhance decision-making and operational efficiency thanks to the development of the Internet of Things (IoT), data analytics, and artificial intelligence (AI).

To test and create novel ideas, several cities around the world have started pilot projects and smart city programs. Large-scale smart project implementation has been pioneered by cities like Barcelona, Singapore, Seoul, and Amsterdam, particularly in the fields of mobility, energy, waste management, and governance.

The COVID-19 pandemic has also underlined the significance of smart technologies and strategies for handling emergency circumstances. Infection monitoring, social isolation, service management, and containment strategies have all been supported by smart cities. This time period brought to light the importance of smart systems and digital infrastructure in enhancing urban resilience.

The idea of smart cities has developed through time to now include a more comprehensive and integrated approach to urban administration. Smart cities are no longer just isolated technological solutions; rather, they aim to integrate various aspects of urban life, including transportation, the environment, energy management, urban planning, public safety, health services, and education, as well as the management of water resources, waste, and citizen participation. The objective is to raise citizen quality of life, promote environmental sustainability, increase the effectiveness of urban services, and increase resiliency to urban problems.