Actual Practices of Citizen Participation in Smart Cities

Deepak KUMAR,
Asian Development Research Institute, Patna, India
deepak.kumar@adriindia.org

Abstract
This article attempts to explore the actual citizen participation practices. Scholarly articles on smart cities have investigated different aspects of the smart city paradigm. Despite increased scholarships on smart cities examining the citizen-centric claim, the praxis of citizen participation has not received much attention. Therefore, the aim of this article is to explore and understand the 'actual practices' of citizen participation in smart cities and how can an inclusive and equitable citizen participation can be ensured. Based on an in-depth review and analysis of secondary data, this article argues that enabling "active" involvement of citizenry through a rights-based approach can make citizen participation a worthwhile endeavor in the development process, which is equitable, inclusive and sustainable.

Keywords: smart cities, citizen participation, citizen engagement, NVivo.

1. Introduction
Globally, immense focus has been laid on creating world-class cities with the integration of data and technology. These world-class cities are commonly termed as 'smart cities.' In the global north and south, the literature on smart cities has found much attention as a way to address challenges of urbanization and rising population. One of the aspects that came as a result of the criticism of the tech-led cities is to ensure citizen-centric development of cities in order to make development truly a bottom-up approach [1]. Hence the citizen participation has been gaining in much popularity. Citizen involvement has been the key focus in the development of the smart cities in several regions of the world [2]. For example, in India, under the Smart Cities Mission, citizen participation has found immense importance for a bottom-up approach in urban governance. Smart City projects in Japan laid focus on citizen participation as one of the criteria for developing cities [3]. However, it has been subjected to criticism from several quarters on the ground that the citizen participation is largely paternalistic and tokenistic in nature [4, 5]. Citizen engagement remains a rhetoric for implementation of projects in the name of wider citizen interests entrenching neo-liberalism [6]. The participation is very ambivalent and opaque [4].

In this backdrop, there is a need to explore actual practices of citizen participation, and understand what lessons can be learnt from such practices. The subsequent sections present research objectives and questions, methodology, findings, and finally conclude with reflections.

2. Research objectives and questions
The aim of the article is to explore actual citizen participation practices to identify equitable and inclusive approaches for urban development, what are the gaps and challenges and the way forward. With this aim, the article attempts to investigate the research questions of what are the different practices of citizen participation in smart cities? And how to achieve active civic participation in smart cities?

3. Research methodology

The article is based on the qualitative review of secondary data sources. Two popular search engines Google Scholar and JSTOR were scanned for the identification of research articles. The period of the articles selected on these platforms was from 2015 to 2023. A total of 1,444 and 17,600 articles were found on JSTOR and Google Scholar, respectively. The inclusion criteria for selection of articles are based on identification of articles on smart cities having reference to either "citizen engagement" or "smart citizen" or "citizen participation" as keywords. These are all open access journals, book chapters and review articles. Of the total articles on JSTOR, eight articles were found relevant after a quick scan of the title and abstract of each one of them; with respect to Google Scholar, 35 articles were found relevant after the initial scan. Following the first review of the full texts of articles on JSTOR and Google Scholar, zero and 15 articles were found relevant from the point of view of actual practices of citizen participation, respectively; in the second round of the reading, 11 articles from Google Scholar was found most relevant and analyzed here.

For the qualitative analysis, NVivo software tool has been used. The software has been used for thematic coding and analysis. It is quite a suitable tool for the identification of thematic areas of focus and analysis. Prior to coding, a code book was created to identify different citizen participation practices and involvement of citizenry in smart cities. It allowed in the visualization of the findings and analysis.

4. Research Findings

This section presents the findings from the secondary data analysis.

4.1. ICT and smart citizenship

The word cloud here shows significant emphasis laid on "smart" notion of citizen participation with the integration of technology in the reviewed articles.

Fig. 1. A word cloud of the reviewed articles
Source: Prepared by the author using NVivo

The literature on smart cities has well established the linkages between the digital technology, governance and citizen participation [7]. However, merely having a robust ICT and digital infrastructure would not lead to active civic engagement for the want of local governance structure and awareness on policies. Besides, understanding of socio-economic variables and needs of the citizenry is warranted for active civic engagement in urban governance. Analysis of 100 smart cities, being developed under the India's ambitious urban transformation mission (Smart Cities Mission) of developing smart cities, has highlighted the limitation of citizen participation in development of smart cities [7]. Citizen participation via myGov.in portal, a propriety-based technology developed to seek suggestions from citizens, ignored the local governance which is required for understanding citizens needs and aspirations and making tailor-made policies. Low participation of citizenry in smart cities in India is the result of top-down approach towards participation and lacking local level engagement in majorities of the cities as well with cities having high penetration of technology. Availability of technology itself does not necessarily guarantee and induce citizens' self-participation in the matters of civic affairs.

What is required, therefore, is better awareness and localized platforms for civic engagements in the development of smart cities.

Use of ICT and social media to inform and engage citizenry has been seen widely as an effective medium towards dialogic communication in smart cities [8]. The social media tools have been used by municipalities in engaging with the citizenry. The tools have been stated to be effective in engaging citizens for the development of smart cities. A case study of Twitter data analysis of Italian municipalities of most active and densely populated parts has showed a negative correlation [8]. These municipalities often used Twitter to inform citizenry about public works being undertaken and steps related to transport services, among other information. Relying on social media listening method, the analysis of the Twitter data of 28 Italian Municipalities has showed that citizen engagement is found more active in case of smaller municipalities as compared to the larger ones with dense population. This reflects better and cohesive civic engagement in less populated areas.

4.2. Behavioral change

The citizen participation in Japanese "Smart Communities", a smart cities project started in 2010 in Japan, mainly focusing on energy issues, is limited to consent and co-production and not involvement of citizens in governance of cities [3]. The strategy is more of a disciplinary in nature to change behavior of the citizenry with very little inputs is expected from them.

A case study of smart community in Kitakyushu, has showcased that citizen participation for an energy project through citizen briefing and feedback meetings is aimed at seeking cooperation of the citizens in getting their energy consumption data. The citizen participation is not aimed at making citizens involved in the governance of the project.

Rather, citizens are being pushed to become "prosumers" (co-producing and distributing energy production services) for boosting industrial activities in Japan. The use of ICT, in this respect, in Japanese smart communities, is therefore, not to improve citizen

participation in policy decision-making but being a co-producer and consumer of energy services.

Using the Arnstein's ladder of citizen participation (co-creation, tokenism and non-participation) in smart cities, it has been shown that smart cities projects in London fails to provide any controlling or delegated power to the citizenry. Overall, the projects lack either of the three criteria for smart city project project [9]. These are active citizen participation knowing the goals of the participation and being aware of that, binding nature of the inputs gathered from citizens on the decision-making process, and democratic character of the participation. One of the projects, Talk London, highlights participation of same group of representatives, interest groups and highly engaged citizenry, lacking a democratic justification.

Investigating the research question of which context factor impacts the strategies for citizen participation in smart cities, case studies in two Belgian and Swedish cities have some promising results [10]. The case studies have identified five context factors which is found to be effective when applied in context-dependent situations. These are: "smart city consideration, drivers for participation, degree for centralization, legal requirements and characteristics of the citizens." These context factors worked differently and encountered different challenges owning to varying situations in terms of participation of different stakeholders. When applied to a different city Brussels, these context factors were found relevant with respect to citizen participation strategies.

The case of smart cities initiatives in Atlanta has showcased that material and discursive construction of the notion of smart citizens do not capture the realities of how citizens are discussed and engaged in the development of policies for smart cities. [11] Deliberative meetings to explore challenges and opportunities for developing smart cities often see absence of people on whose behalf decisions are being taken for development of cities. It also showcased continued presence of same set of people and experts in such deliberative meetings. Using a heuristic understanding of "general" citizens and "absent" citizens, it has been showcased how the lines of inclusion and exclusion are drawn for the citizenry in the making of the smart city. It has been highlighted that the actual smart citizens not even exist, and the way smart citizens are discussed and enrolled are very ambivalent.

Cases from Norway and Belgium have identified three similar categories which can aid in the engagement of the citizens towards the transformation of cities into smart cities [12, 13]These identified categories are: Use of ICT infrastructure and technology in generating data for policy formulation, citizens experiences and competence in co-creating smart city projects, and democratic process in citizen participation in smart cities. Towards, this end a right mix of propriety technology and social media is warranted for citizen involvement.

The propriety technology that are owned and controlled by the government machinery ensures greater control, while social media platform provides avenues for greater involvement of citizenry which can strengthen citizen engagement. However, both have merits and demerits as shown below:

Table 1. Opportunities and challenges of proprietary channels and social media platforms

	Proprietary platforms	Social media
Opportunities	Possibility for tailoring to purpose, such as voting and discussion systems	Can be more inclusive than proprietary systems, attracts regular users
	Systems have been developed for several areas: collaborative writing, geographic information systems, participatory budgeting and urban planning tools for implementation of citizen feedback in the decision-making process	Numerous examples showing different ways of using social media
		Can utilize crowdsourcing, co-creation through collaborative systems and location-based data from smartphones etc.
	Voting advice applications helpful for decision-making	Aggregation of data from blogosphere and other social media can provide valuable information
	Can facilitate inclusion of citizens and grassroots movements	
Challenges	Often general-purpose systems are used in specific contexts. Not always the best match for the purpose	Politicians have limited time and resources to follow up their social media presence
	Some of these systems remain at a conceptual level and are not tested beyond a single case or project	Few studies go beyond describing a single case. Need for reviews and guidelines
	Security issues can be a challenge, especially for voting systems	Requires at least some proprietary software for analysis
	Mostly engages those who already are politically active	Information overload, while still not covering every viewpoint, danger that analysts can overlook the fact that these are not necessarily representing general public opinion

Source: Berntzen & Johannessen, 2016

4.3. Active involvement of citizenry

Using the Scott's framework of normative, regulative and cultural-cognitive elements of an institution, a case study of Mexico City for smart city governance has captured the role of institutions in the development of smart cities [2]. A meaningful citizen participation would require embeddedness of smart city initiatives in the institutional context and align with the larger goal of the institutions. Lack of such institutional transformation can frustrate the citizen participation and the smart city initiatives. It is argued that the rigid institutional structure and organizational practices at times undermine citizen participation. Therefore, ensuring citizen participation is not easy as it sounds when it is examined from the institutional context which plays a crucial role in facilitating civic engagement.

An Amsterdam Smart City project, Smart Kit Project, to measure level of air pollution by local residents to monitor the quality of air has highlighted the existence of both republican and cybernetic notions of citizenship in smart city governance [14]. The republican notion

of citizenship refers to active civic participation by the citizenry in the affairs of city governance by owning responsibilities and making authorities accountable towards day-to-day governance. Whereas, the notion of cybernetic citizenship refers to immersion of the citizenry in information network and creating data aiding in the decision-making process.

In the Amsterdam project, instances have been found where the ICT tool at the disposal of the citizenry allowed them to raise concerns of rising air pollution due to commercial boating and industrial pollution. The Smart Kit Project has been seen as a tool of empowerment, making citizens actively engage in the smart city development. The kit, though not very effective in measuring the level of air pollution, seen as an effective medium of civic engagement. It allowed citizens feel a sense of belonging and civic intimacy by being engaged in creating data on pollution and use them as a tool of daily negotiation in urban life for quality of living.

Citizens' sense of gain refers to citizens' sense of obtaining and feeling of belongingness based on satisfaction achieved at the material and spiritual levels. Material gains represent citizens' feeling based on obtaining material objectives like education, access to better civic facilities, adequate housing, healthcare, transportation and safety and security. The spiritual gains represent mental well-being, and overall feeling as a result of socio-economic development, like justice and fairness, social value, realization of self-worth and social status. Using the theoretical framework of citizens' sense of gain, 17 influencing factors and 15 strategies to enhance citizens' material and spiritual gains in smart cities have been identified [1]. These strategies are identified based on the SWOT analysis of data collected from citizens in Nanjing Smart City in China. For a shift from technology-based smart cities to citizen-centered smart cities development, it is argued to focus on the citizens' need, prioritizing these needs, and have better clarity on the part of the local governments to enhance citizens' perception and feelings towards such gains. This requires a semblance between top-down implementation of policies and bottom-up understanding of the needs of the citizenry.

Based on the strategies identified for enhancing citizens' perception of gains four policy implications have been identified. These are: encouraging citizen participation by strengthening the publicity of smart cities, better clarity on the part of the local government implementing policies, prioritizing the needs of the citizenry, and promoting development which is environment-friendly, age-friendly and vulnerable-friendly. The following table lists factors, criteria and enhancing strategies for citizens' sense of material and spiritual gains:

Table 2. Influencing factors, SWOT criteria and enhancing strategies for citizens' sense of gain in smart cites

Influencing Factors	Public education, Healthcare, Transportation, Environmental governance, Guarantee of social services, Aging services, Income level, Price level, e-governance, Political participation, Public safety, Food safety, Privacy and data security, Realization of self-worth, Socio-economic status, Cultural factors, and Justice and fairness

SWOT criteria based on data collected from citizens in Nanjing Smart City	Strengths: Improve citizens' material quality of life Provide a complete guarantee for citizens Provide public safety protection for citizens Provide a comfortable natural environment for citizens Improve the convenience of citizens' life Opportunities: Citizens' increasing consumption level Citizens' high governmental institutional trust Citizens' ever-growing needs for a better life Citizens' high acceptance of the local government's development planning Citizens' positive response to the national policy of benefitting the people Weaknesses: Non-comprehensive legal system Low urban resilience Insufficient consideration of citizens' needs A regional imbalance in development Citizens' low awareness of the connotation of the smart city Threats: Citizens' low willingness to participate in the development process Citizens' low sense of belonging A high threshold for vulnerable groups to use public service Citizens' personal information data at risk
CSG enhancing strategies	Divide smart infrastructure into different categories according to the hierarchy needs of citizens and promote the synergy development of smart infrastructure within and among different categories Create a convenient and safe consumption environment and promote citizens' online e-commerce and offline smart services consumption Clarify the role of local governments and departments in enhancing the CSG process for smart cities in terms of bottom-up analysis of local citizens' needs and top-down implementation of national policies Apply Internet and Internet of Things technologies to natural environment monitoring and promote the development of environmental-friendly smart cities Strengthen the publicity of smart city development and establish citizen participation paradigms that meet citizens' participation interests and behaviors based on the functions of different departments

	Promote the age-friendly construction of smart cities Promote the integration of smart city development and regional cultural characteristics
	Optimization of personal data protection for citizens in the smart systems and using blockchain technology to establish a multi-channel password lock mechanism for citizen information access
	Improve urban resilience, and improve the synergy of smart systems and smart infrastructure in all phases of disasters to protect the lives and property of citizens
	Conduct surveys of citizens' needs, analyse the priority needs of various groups of citizens
	Improve the supervision of smart city development and establish a multi-sectoral citizen feedback mechanism that allows citizens to participate in the supervision of smart city development
	Improve the data synergy mechanism of smart city development and promote balanced development
	Improve the legal system for the protection of citizens' personal information data
	Establish a feedback mechanism for citizens on the benefits of smart cities and make citizens share the dividends of development
	Reduce the difficulty of using smart city public service

Source: Compiled by the researcher from Li et al., 2023

5. Reflections

The actual practices of citizen participation can be examined by understanding the discursive and material notions of citizenship engendered by smart city projects.

Discursive and material notions of smart citizenship refer to two different perspectives on the concept of citizenship in the context of smart cities and technology. These perspectives encompass both the discourses, or the way we talk about and understand smart citizenship, and the material aspects, which involve the tangible technologies and infrastructures that shape the experiences of citizens in smart cities.

Discursive notions involve the language, rhetoric, and narratives surrounding smart citizenship. How people talk about and perceive the role of technology in citizenship is crucial. Discussions may focus on concepts like digital inclusion, data privacy, civic engagement through digital platforms, and the impact of technology on social relations.

Discourses also include discussions around the policies and governance structures that shape smart citizenship. This involves debates on issues such as data ownership, surveillance, and the balance between technological innovation and individual rights. Discursive notions of smart citizenship also touch upon questions of identity and community in a digital age. It involves considering how technology affects our sense of belonging, participation, and the formation of communities in virtual spaces.

Material notions of smart citizenship focus on the tangible aspects of technology in urban environments. This includes the physical infrastructure that enables smart cities, such as sensor networks, data centers, and communication networks. The availability and accessibility of technology play a significant role in shaping citizens' experiences. Both discursive and material notions are intertwined, influencing and shaping each other. How we talk about smart citizenship informs the policies and technologies implemented, while the material infrastructure and services contribute to the lived experiences of citizens and shape the discourse around the role of technology in civic life.

Balancing these aspects is essential for the development of inclusive and responsible smart cities. Besides, balancing the rights and duties of citizens in smart cities is essential for creating inclusive, responsive, and sustainable urban environments. It requires ongoing dialogue, education, and collaboration between citizens, government entities, and other stakeholders involved in shaping the smart city landscape.

In the context of citizen participation in smart cities, the duty and rights aspects take on a specific dimension influenced by technology, data, and urban innovation. In smart cities, citizens have the right to control and protect their personal data. They should be informed about how their data is collected, used, and stored, and they have the right to expect robust security measures to safeguard their information. Citizens have the right to actively participate in the decision-making processes related to smart city initiatives. This may involve input on urban planning, technology implementation, and the policies governing smart city projects.

The achievement of citizen-centric smart cities necessitates robust citizen engagement, where the alignment of official discourse on citizen participation with actual practices becomes imperative. To strengthen this alignment, strategies should be employed to identify context-specific factors and acknowledge citizens' sense of both material and spiritual dimensions.

In the realm of sustainable development, the inseparability of rights and duties is underscored as a fundamental principle. Balancing individual rights with civic duties is essential to cultivate a sense of responsibility among citizens, thereby contributing to the long-term sustainability of smart cities. Crucially, recognizing citizens as key stakeholders is pivotal for achieving inclusive development. Only by integrating citizens as central contributors can smart cities truly realize their potential.

The Amsterdam Smart City Project stands out as an exemplar, offering valuable insights and lessons for other smart city initiatives. Empowering citizens with tools at their disposal

is a key facet of fostering active civic participation. These tools, ranging from digital platforms for communication to participatory decision-making processes, play a vital role in making citizens feel a profound sense of belonging to the developmental processes around them.

The vision of citizen-centric smart cities thrives on a comprehensive and inclusive approach that considers both the tangible and intangible aspects of citizen well-being. Aligning rhetoric with action, recognizing citizens as key contributors, and drawing inspiration from successful projects like the Amsterdam Smart City initiative are pivotal steps toward realizing the full potential of smart and sustainable urban development.

This article delves into the aspects of citizen participation in smart cities, drawing insights from secondary data. While the discussion is somewhat limited in its scope, acknowledging the need for a more comprehensive examination of actual practices, it underscores the pivotal role of smart solutions in actively engaging citizens and fostering a sense of belonging in civic affairs. Recognizing the potential effectiveness of these technologies, the article advocates for further research to provide empirical evidence on citizen engagement practices in smart cities. Additionally, it emphasizes the importance of understanding the enablers and barriers that impact the development of smart cities, contributing to a more nuanced and informed approach to sustainable urban development.

References

[1] D. Li, W. Wang, G. Huang, S. Zhou, S. Shu and H. Feng, "How to Enhance Citizens Sense of Gain in Smart Cities? A SWOT-AHP-TOWS Approach" vol. 165, no. 3, p. 787–820, 2023.

[2] D. Sweeting, J. De Alba-Ulloa, M. Pansera and A. Marsh, "Easier said than done? Involving citizens in the smart city" *Environ. Plan. C Polit. Space,* vol. 40, no. 6, p. 1365–1381, 2022.

[3] B. Granier and H. Kudo, "How are citizens involved in smart cities? Analysing citizen participation in Japanese ``Smart Communities" *Inf. Polity,* vol. 21, no. 1, p. 61–76, 2016.

[4] "Habitat International Coalition" *Ed. India's smart cities mission: smart for whom? cities for whom?,* 2018.

[5] I. Basu, "Elite discourse coalitions and the governance of 'smart spaces': Politics, power and privilege in India's Smart Cities Mission", *Polit. Geogr.,* vol. 68, p. 77–85, January 2019.

[6] H. Burte, "The 'Smart City' Card" *Econ. Polit. Wkly,* vol. 49, no. 46, pp. 22-25, 2014.

[7] S. Praharaj, J. H. Han and S. Hawken, "Innovative Civic Engagement and Digital Urban Infrastructure: Lessons from 100 Smart Cities Mission in India" *Procedia Eng,* vol. 180, p. 1423–1432, 2017.

[8] S. Blasi, E. Gobbo and S. R. Sedita, "Smart cities and citizen engagement: Evidence from Twitter data analysis on Italian municipalities" *J. Urban Manag,* vol. 11, no. 2, p. 153–165, June 202.

[9] J. Willems, J. Van Den Bergh and S. Viaene, "Smart City Projects and Citizen Participation: The Case of London" *in Public Sector Management in a Globalized World, R. Andeßner, D. Greiling, and R. Vogel, Eds., Wiesbaden: Springer Fachmedien Wiesbaden,* p. 249–266, 2017.

[10] A. Simonofski, T. Vallé, E. Serral and Y. Wautelet, "Investigating context factors in citizen participation strategies: A comparative analysis of Swedish and Belgian smart cities" *Int. J. Inf. Manag,* vol. 56, p. 102011, February 2021.

[11] T. Shelton and T. Lodato, "Actually existing smart citizens: Expertise and (non)participation in the making of the smart city" *City,* vol. 23, no. 1, pp. 35-52, January 2019.

[12] L. Berntzen and M. R. Johannessen, "The Role of Citizen Participation in Municipal Smart City Projects: Lessons Learned from Norway" *in Smarter as the New Urban Agenda,* vol. 11, p. 299–314, 2016.

[13] A. Simonofski, E. S. Asensio, J. De Smedt and M. Snoeck, "Citizen Participation in Smart Cities: Evaluation Framework Proposal" *Conference on Business Informatics,* p. 227–236, July 2017.

[14] D. Zandbergen and J. Uitermark, "In search of the Smart Citizen: Republican and cybernetic citizenship in the smart city" *Urban Stud,* vol. 57, no. 8, p. 1733–1748, June 2020.