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XIV CONGRESSO BRASILEIRO DE ENGENHARIA DE PRODUÇÃO

I CIGELUBRA

Congresso Internacional de Gestão e Engenharia Luso-Brasileiro

04 a 06 de dezembro de 2024

Energias Limpas nas Engenharias

The Role of the Institutional Context in Smart Governance: A Systematic Literature Review

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Abstract: Accelerated urban growth and increasing demand for resources have created significant challenges for the sustainability of cities. Smart governance, supported by public-private partnerships (PPPs) and information and communication technologies (ICTs), offers promising solutions. However, the success of these initiatives depends on the institutional context in which they are implemented, which can affect their effectiveness. This study investigates how institutional contexts influence smart governance, emphasizing the application of PPPs and ICTs. The methodology adopted was a systematic literature review using the methodology Methodi Ordinatio, selecting 57 articles from the database Scopus. The results indicate that the institutional context is a determining factor in the success of smart governance, highlighting the importance of policies adapted to local particularities to ensure effective management of smart cities.

Keywords: Smart Governance, Institutional Context, Public-Private Partnerships, Information and Communication Technologies, Smart Cities.

O Papel do Contexto Institucional na Governança Inteligente: Uma Revisão Sistemática da Literatura

Resumo: O crescimento urbano acelerado e a crescente demanda por recursos têm gerado desafios significativos para a sustentabilidade das cidades. A governança inteligente, apoiada por parcerias público-privadas (PPPs) e tecnologias da informação e comunicação (ICTs), oferece soluções promissoras. No entanto, o sucesso dessas iniciativas depende do contexto institucional em que são implementadas, o que pode afetar sua eficácia. Este estudo tem como objetivo investigar como os contextos institucionais influenciam a governança inteligente, com ênfase na aplicação de PPPs e ICTs. A metodologia adotada foi a revisão sistemática da literatura, utilizando a metodologia Methodi Ordinatio, resultando na seleção de 57 artigos da base Scopus. Os resultados indicam que o contexto institucional é determinante para o sucesso da governança inteligente, ressaltando a importância de políticas adaptadas às particularidades locais para garantir a eficácia na gestão das cidades inteligentes.

Palavras-chave: Governança Inteligente, Contexto Institucional, Parcerias Público-Privadas, Tecnologias da Informação e Comunicação, Cidades Inteligentes.

1. Introduction

Global population growth, especially in developing countries, has accelerated significantly in recent decades (BANK, 2022). Consequently, urban centers are expanding rapidly, accompanied by a proportional increase in resource demands, exacerbating the challenges related to these large cities' economic, social, and environmental sustainability (BARYKIN *et al.*, 2023). Rural exodus intensifies these problems, contributing to pollution, poor sanitation, inefficient transportation, social inequality, and a lack of accessibility and inclusion (OYEWO *et al.*, 2024).

With this complexity, technological solutions are essential to tackle the main urban challenges or mitigate the negative impacts of unsustainable urbanization (MOKTADIR; REN, 2023). In this sense, the concept of Smart Cities is emerging as a strategic response, integrating operational efficiency, environmental sustainability, quality of life, economic innovation, public safety, and connectivity (SIERDOVSKI *et al.*, 2022).

Two central approaches stand out in this debate: public-private partnerships (PPPs) and information and communication technologies (ICTs). Both are key to implementing innovative solutions in urban environments, contributing to more efficient financial, operational, and human resources management, mitigating risks, and improving public services (BANERJEE; PETERSEN, 2024).

In the field of PPPs, current literature explores inter-institutional collaboration, highlighting the need for metrics to measure the effectiveness of these partnerships and guidelines for the practical application of the results obtained (NELISCHER, 2023). In addition, risk assessment is a central element, particularly in investment decision-making in PPPs (NGUYEN *et al.*, 2023). As for ICTs, research prioritizes the development of approaches to reduce energy consumption (KRAMERS *et al.*, 2014), mapping the benefits of ICT densities (BENEVOLO *et al.*, 2016) and assessing the impacts generated by the implementation of these technologies in the context of smart cities (YEH, 2017).

Although these areas of study are well established, significant gaps still need to be identified in understanding how the institutional context affects smart governance. The few studies available need to offer a comprehensive view of how the institutional environment directly influences the configuration and effectiveness of governance in smart cities. Understanding this issue is crucial in assessing how different institutional contexts impact governance management, allowing for more efficient planning adapted to local characteristics.

Based on this premise, this article seeks to answer the following research question: How do institutional contexts shape smart governance in cities, especially in implementing public-private partnerships (PPPs) and information and communication technologies (ICTs)? The aim is to map governance models and analyze their influence on the application of these solutions in the context of smart cities.

To achieve this goal, a systematic literature review was conducted using the multi-criteria methodology, *Methodi Ordinatio*, which classifies and selects articles based on criteria such as impact factor (IF), number of citations (Ci), and year of publication (PAGANI *et al.*, 2015, 2017; CAMPOS *et al.*, 2018). Applying this methodology resulted in the selection of 57 studies from the Scopus, ensuring an in-depth and careful analysis of the most relevant and influential articles related to the topic.

The structure of this article is organized as follows: After the introduction, section 2 presents the theoretical framework of smart governance and institutional contexts. Section 3 describes the research methodology adopted, emphasizing the use of *Methodi Ordinatio*. Section 4 presents and discusses the results of the analysis of the selected studies. Finally, section 5 concludes, highlighting the main contributions of the work and suggesting avenues for future research.

2. Literature Review

2.1 Smart Governance

Smart governance encompasses several dimensions, such as public participation, providing services to the population, and the administration's performance (ALDEGHEISHEM, 2024). Hong and Lee (2023) define smart governance as a system of conceptual innovation that integrates information, communication, and intelligence technology with the concept of co-creation, aiming to guarantee the participation of various stakeholders in the formulation and execution of policies, overcoming the limitations of traditional governance.

Smart governance guides the management and operations of smart city activities. It aims to efficiently implement smart city policies using new technologies (ALDEGHEISHEM, 2024).

In this style of governance, new forms of human collaboration are created through ICTs, aiming to achieve better results and more transparent governance processes (TOMOR *et al.*, 2021). However, this governance does not apply similarly to all government scenarios.

2.2 Institutional Context of Governance

The institutional context of governance regulates how society is managed; that is, it determines how power is established, and within smart cities, there are different configurations of smart governance that vary in different urban settings (TOMOR *et al.*, 2021). According to Meijer and Bolívar (2016), administrative cultures and the political environment in cities are factors that have an impact on smart governance choices and styles.

Smart city governance processes are more complex for developing countries still on their way to meeting the basic needs of all citizens (TAN; TAEIHAGH, 2020). Therefore, according to the authors, the desired results in smart governance will be influenced by the institutional context in which the society finds itself.

3. Methodology

This study investigates how institutional contexts shape the configuration and effectiveness of smart governance in cities, emphasizing the implementation of public-private partnerships (PPPs) and information and communication technologies (ICTs). To achieve this goal, a systematic literature review was carried out using the multi-criteria Methodi Ordinatio methodology, which allows the selection and classification of articles based on factors such as impact factor (IF), number of citations (Ci), and year of publication (PAGANI *et al.*, 2015, 2017; CAMPOS *et al.*, 2018).

The methodology was divided into nine steps, as described below:

Stage 1. Definition of research intent: The central aim of this study is to map the different models of smart governance and analyze how institutional contexts influence the application of PPPs and ICTs in smart cities.

Stage 2. Preliminary search in databases: A preliminary search was carried out in the Scopus database using keywords associated with governance in smart cities.

Stage 3. Defining and combining keywords: The keywords were selected and combined to capture relevant studies. A combination of Boolean operators was used to maximize the scope and precision of the search. The combination of terms used was: ("smart city" OR "smart cities") AND ("governance") AND ("public-private partnerships" OR "PPP" OR "information and communication technologies" OR "ICT").

Step 4. Searching the Scopus database: The initial search in all fields resulted in 11,186 articles. Specific filters were then applied for "Title, Abstract, and Keywords," which reduced the number of studies to 621. To ensure the relevance and timeliness of the studies, only

research articles published in the last decade and written exclusively in English were selected, resulting in a final set of 249 articles.

Stage 5. Filtering procedures: Strict filtering criteria were applied, removing 7 articles without sufficient information (such as year, author, or title), 3 duplicate articles, and 124 articles outside the scope of the research, resulting in a portfolio of 115 articles.

Step 6. Identification of variables: The variables used to classify the articles included the impact factor (IF), the number of citations (Ci), and the year of publication. This information was extracted from the Scopus database and supplemented by data from Google Scholar.

Step 7. Classification of articles using InOrdinatio: The articles were classified using the InOrdinatio equation (Equation 1), with α set at 10 due to the importance of the year factor for the research. Articles with an InOrdinatio of 100.00 or more were selected, resulting in a final portfolio of 57 articles.

$$InOrdinatio = \left(\frac{IF}{1000} \right) + \alpha * [10 - (ResearchYear - PublishYear)] + \left(\sum C_i \right) \quad (1)$$

Step 8. Search for full articles: The 57 selected articles were obtained in full versions, enabling a detailed analysis.

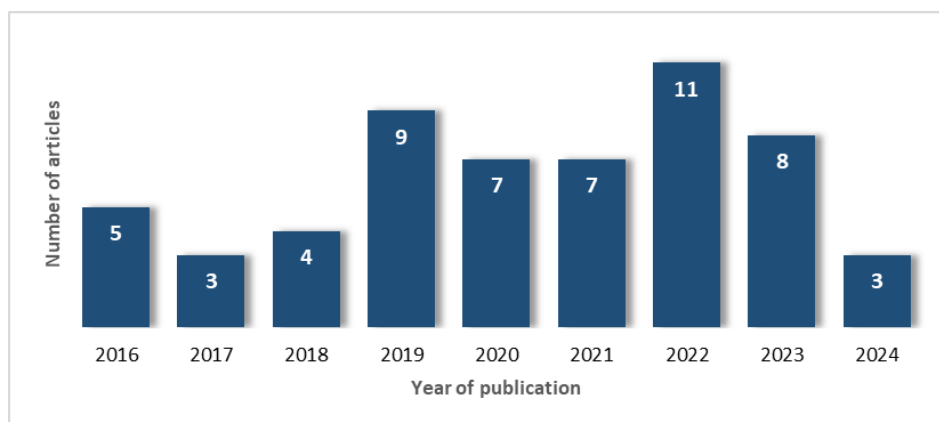
Stage 9. Final reading and systematic analysis of the articles: The final stage involved a thorough reading and systematic analysis of the selected articles, using tools such as Excel, Mendeley, and VOSviewer to identify patterns, contributions, and gaps in studies on governance in the context of smart cities.

4. Results and Discussion

4.1 Analysis of Results

An analysis of the number of publications over the years reflects the growing interest in smart governance and its impact on implementing PPPs and ICTs in smart cities. According to the data presented in Figure 1, the period from 2016 to 2024 shows a growing trend in the number of studies, with a notable increase from 2019 onwards, the year in which 9 articles were published, corresponding to 15.8% of the total. This growth suggests a consolidation of the topic in scientific literature, especially in 2022, which stood out with the highest number of publications (11 articles, or 19.3% of the total).

Figure 1 – Number of publications per year



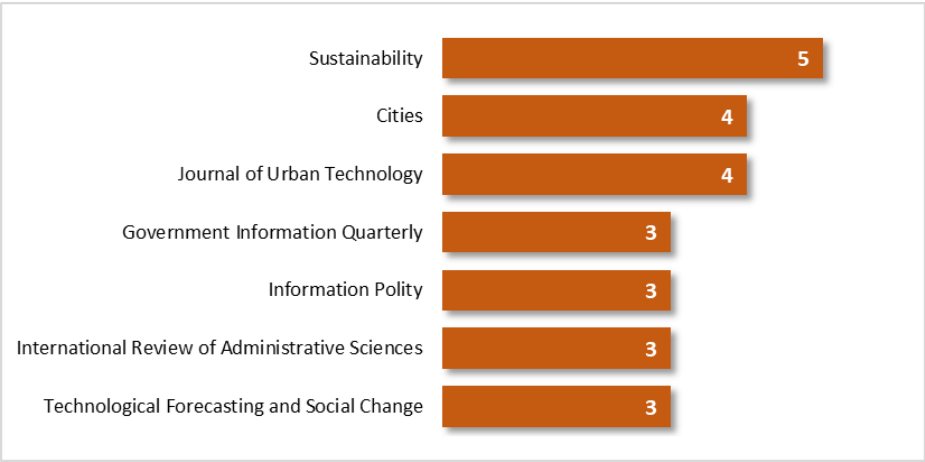
Source: Authors (2024)

This continuous evolution, culminating in a peak in 2022, suggests that the topic is gaining traction in academic debates, attracting more and more research attention. The slight drop in 2023 and the reduction observed by 2024, with only 5.3% of publications, can be attributed to the fact that new studies are still under development or awaiting publication. Thus, the current scenario indicates that, despite the temporary reduction, the theme continues to expand and is relevant in academic literature.

The journal's distribution of articles reveals the main publication outlets on smart city governance. In all, 38 different journals were identified that contributed to the publications analyzed, demonstrating the vast diversity of academic interest in the topic. Among these journals, Sustainability (impact factor 3.3) stands out as the main one, with 5 articles, followed by Cities (impact factor 6.0) and Journal of Urban Technology (impact factor 4.6), both with 4 publications each. Together, these three journals concentrate a significant portion of the publications, reflecting the relevance of themes related to sustainability, urbanism, and technological innovation in the context of smart cities.

Other notable journals include Government Information Quarterly (impact factor 7.8), Information Polity (impact factor 1.3), and International Review of Administrative Sciences (impact factor 2.7), each with 3 publications, reinforcing the growing interest in digital governance and efficient public administration. The presence of journals such as Technological Forecasting and Social Change (impact factor 12.9), also with 3 publications, reinforces the importance of a predictive and technological approach in the debate on the future of smart cities. This concentration in high-impact journals, highlighted in Figure 2, shows the academic validation of the topic and reinforces the relevance of discussions published in high-quality sources.

Figure 2 – Distribution of articles among the main journals



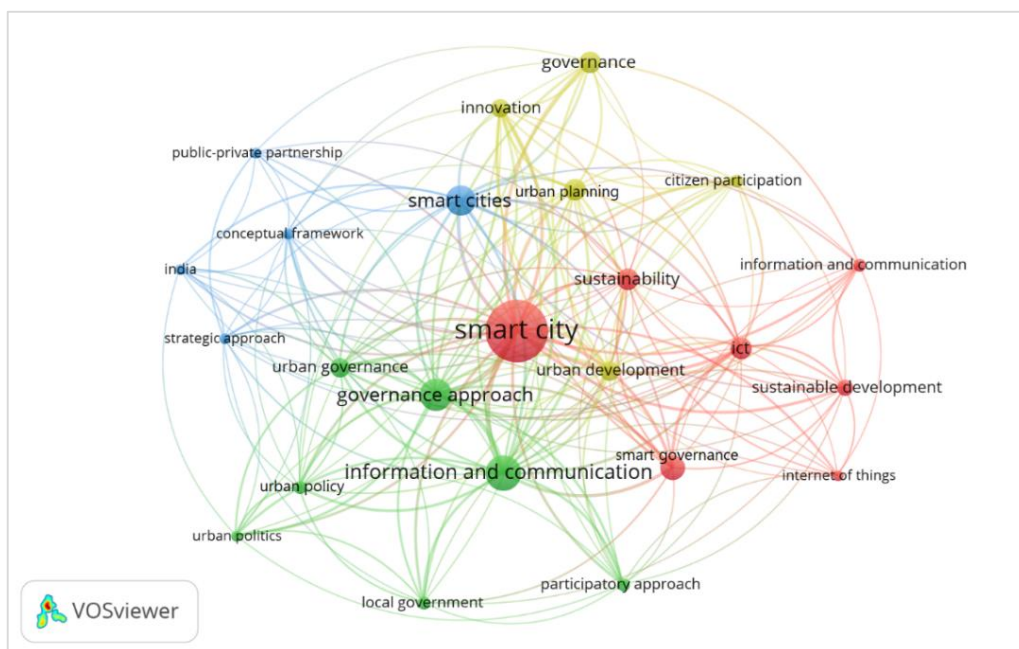
Source: Authors (2024)

An analysis of the most cited articles reveals the relevance and influence of specific studies in smart governance and the role of public-private partnerships (PPPs) and information and communication technologies (ICTs) in smart cities. The most influential article in the portfolio is by Meijer and Bolívar (2016), entitled "Governing the smart city: a review of the literature on smart urban governance," with an impressive 1,881 citations. This study, published in the International Review of Administrative Sciences, has established itself as a fundamental reference by clarifying the fragmented debate on smart urban governance. Another highlight is the article by Allam and Newman (2018), "Redefining the smart city: Culture, metabolism and governance," published in Smart Cities, which has accumulated 551 citations and proposes a new approach to the concept of smart cities by integrating cultural and historical aspects.

In addition, the article by Ahad *et al.* (2020), "Enabling technologies and sustainable smart cities," published in *Sustainable Cities and Society*, achieved 494 citations, standing out for its comprehensive discussion of the role of enabling technologies in smart cities. Another influential study is Angelidou's (2017) "The Role of Smart City Characteristics in the Plans of Fifteen Cities," published in the *Journal of Urban Technology*, with 463 citations, which examines the characteristics of smart cities in different urban contexts. Finally, the article by Trencher (2019), "Towards the smart city 2.0: Empirical evidence of using smartness as a tool for tackling social challenges," published in *Technological Forecasting and Social Change*, with 313 citations, highlights the use of smart technologies to tackle social challenges. These articles lead the portfolio in citations and play a key role in advancing the contemporary understanding of smart city governance.

Keyword analysis, conducted using VOSviewer software, reveals the main thematic areas that dominate research on governance in the context of smart cities. The terms were organized into four distinct clusters, as illustrated in Figure 3, each representing a set of interconnected keywords that reflect the approaches most discussed in current literature.

Figure 3 – Final Portfolio Keywords



Source: Authors (2024)

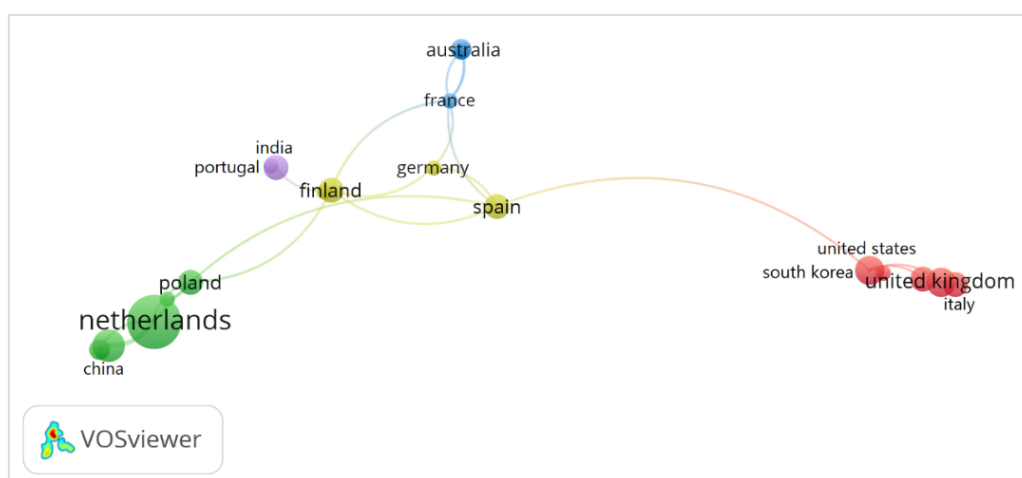
The Red Cluster is the most expressive, with "smart city" standing out as the central keyword with 45 occurrences, alongside terms such as "smart governance" (12 occurrences) and "sustainability" (10 occurrences). This cluster focuses on the intersection between information and communication technology (ICT), smart governance, and sustainable development, suggesting that adopting digital technologies is directly linked to the search for more sustainable urban solutions. In the Green Cluster, the focus is on urban governance and the participatory approach. Keywords such as "information and communication technology" (20 occurrences), "governance approach" (18 occurrences), and "urban governance" (9 occurrences) indicate that ICTs play a central role in the formulation of urban policies and citizen participation.

The Blue Cluster explores public-private partnerships and conceptual frameworks, with "smart cities" appearing 16 times, followed by terms such as "public-private partnership" (4 occurrences) and "conceptual framework" (4 occurrences), highlighting the importance of

partnerships in the development of smart cities. The Yellow Cluster focuses on innovation and urban planning, highlighting terms such as "governance" (10 occurrences) and "urban planning" (10 occurrences), which reinforce the need for innovative strategies to meet the challenges of sustainable urban development.

The analysis of international collaborations with VOSviewer reveals a dense and significant cooperation network between countries in brilliant governance research, as illustrated in Figure 4. The Netherlands and the United Kingdom stand out as the primary collaboration hubs. The Netherlands cluster displays strong connections with countries such as Poland and China, consolidating its leading position in global co-authorships. The United Kingdom collaborates extensively with the United States, Italy, and South Korea, forming a highly influential scientific cooperation network. These two countries, with their extensive networks of partnerships, play a central role in advancing research into smart governance, reflecting their growing impact on the international academic scene.

Figure 4 – Collaboration network of countries



Source: Authors (2024)

4.2. Discussion

4.2.1. The Role of the Institutional Context in Intelligent Governance

Smart governance goes beyond the simple incorporation of digital technologies and is profoundly shaped by the institutional context of each city. Voorwinden (2021) points out that smart governance must be understood within existing institutional structures, which implies a direct interaction between regulatory frameworks, cultural norms, and local forms of governance. For example, Allam and Newman's (2018) study of cities such as Barcelona and Amsterdam reveals how these localities have integrated smart technologies in a way that is adapted to their socio-cultural particularities, which has allowed them to be more effective in implementing technological solutions tailored to local needs.

The influence of the institutional context also manifests itself in the ability of cities to adapt and be flexible when adopting smart governance solutions. Dameri and Benevolo (2016) argue that the absence of a unified smart governance standard results in significant variations between different cities, which requires each locality to develop specific governance structures based on its circumstances. One example is the city of Singapore, which, according to Jiang *et al.* (2022), has adjusted its governance strategies to incorporate citizen participation practices, promoting more inclusive smart governance.

Another critical aspect of the institutional context is the ability to involve citizens in the governance process. According to Del-Real *et al.* (2021), e-governance platforms facilitate

citizens' active participation in political decisions in cities such as Chattanooga in the United States, reflecting a local culture that values community engagement. In contrast, cities with a less participatory political culture face more significant challenges in implementing collaborative governance mechanisms, as Coletta *et al.* (2019) observed in Dublin, Ireland.

Furthermore, the institutional context profoundly influences the role of public-private partnerships (PPPs) in smart governance. Voorwinden (2021) points out that PPPs are vital in creating smart infrastructure, but their effectiveness depends on local regulatory policies. An illustrative example is the use of PPPs in implementing intelligent transportation systems in the city of Nice, France, as Grimaldi and Fernandez (2019) noted, where collaboration between the public and private sectors was essential to the initiative's success.

Aligning institutional policies with sustainability objectives is also essential in smart governance. In Hamburg and Nantes, cities that are part of the European mySMARTLife project, institutional policies have been adjusted to maximize the impact of smart technologies in promoting urban sustainability (QUIJANO *et al.*, 2022). This alignment has allowed these cities to integrate technological solutions with sustainable practices, showing how an appropriate institutional context can facilitate the transition to more efficient and environmentally responsible urban development.

The socio-economic context of each city also plays a determining role in the implementation of smart governance. Cities like Amsterdam, as noted by Angelidou (2017), use their favorable economic context to attract investment and implement advanced technologies on a large scale, highlighting the importance of a robust economic environment for the success of these initiatives. In contrast, cities in emerging economies need more significant financial difficulties in investing in technological infrastructure, which limits the effective implementation of smart governance.

In addition, the interaction between institutional actors and information and communication technologies (ICTs) is fundamental to the success of smart governance. In the city of Helsinki, according to Gagliardi *et al.* (2017), integrating open data with visualization technologies was used to create new public services, showing how the institutional context can facilitate the use of ICTs to improve interaction between citizens and government. This example highlights how regulatory and normative frameworks can boost or restrict the effectiveness of smart governance.

Finally, the institutional context also plays a crucial role in the resilience of smart governance in the face of crises. During the COVID-19 pandemic, cities like Seoul demonstrated resilience by using smart technologies to monitor the spread of the virus and ensure the continuity of essential public services, according to Jiang *et al.* (2023). This case illustrates how a prepared and flexible institutional context can help cities overcome unexpected challenges, using smart governance to promote rapid and effective responses.

4.2.2. Challenges and Opportunities for Implementing Smart Governance

The implementation of smart governance faces a series of challenges that vary according to the specific conditions of each city. One of the main obstacles is the lack of a standardized governance model that can be replicated in different urban contexts. As noted by Allam *et al.* (2022), many cities implement smart governance solutions in a fragmented way, as in the case of Turin, where the lack of coordination between the different stakeholders has hampered the effectiveness of smart initiatives. This lack of cohesion challenges integrating digital technologies into urban management.

Financing remains another major challenge for smart governance. Almarri and Boussabaine (2023) point out that the scale of the investments needed to implement technological infrastructures can be prohibitive for many cities. However, cities such as Abu Dhabi and Dubai have managed to overcome these limitations through robust public-private

partnerships, according to Noori *et al.* (2020), which have enabled the implementation of technological solutions on a large scale, highlighting the importance of PPPs in overcoming financial constraints.

Technical issues are also significant challenges. Ahad *et al.* (2020) point out that adopting advanced technologies, such as artificial intelligence and sensor networks, requires a robust infrastructure, which not all cities have. However, cities such as Seongdong-gu in South Korea, according to Kim and Kim (2021), have shown that even with limited resources, it is possible to implement effective technological solutions by adapting and optimizing existing systems, highlighting a pragmatic approach to tackling technical challenges.

Despite these challenges, smart governance presents many opportunities. The automation of administrative processes and the use of big data for decision-making are clear advantages. As Shamsuzzoha *et al.* (2021) noted, cities like London use these technologies to optimize the use of urban resources and improve the efficiency of public services. This strategic use of technologies allows for more effective management and less waste of resources, increasing government efficiency.

Promoting urban sustainability is also a significant opportunity offered by smart governance. In Amsterdam, integrating energy and mobility management technologies, as indicated by Angelidou (2017), has proved crucial for reducing emissions and developing more efficient transportation solutions. Cities that adopt such technologies promote sustainable development while improving the quality of life of their citizens.

However, privacy and data security issues remain significant challenges. Kumar (2019) points out that collecting large volumes of data through smart technologies raises concerns about citizens' privacy and information security. In response, cities like Helsinki have adopted robust cybersecurity and data protection policies, ensuring the information collected is used ethically and securely (GAGLIARDI *et al.*, 2017). These practices show that, with appropriate regulations, it is possible to mitigate the risks associated with data security. Table 1 summarizes the aspects for implement smart governance.

Table 1 – Challenges and opportunities for smart governance implementation

Aspect	Challenges/Opportunities	Examples and Case Studies	Authors
Lack of Standardized Governance Model	The absence of a uniform model for smart governance creates fragmentation and hinders effective implementation in cities.	Turin (Italy) faced issues due to lack of coordination among stakeholders.	Allam <i>et al.</i> (2022)
Financial Constraints	Implementing technological infrastructures often requires large investments, which can be prohibitive for many cities.	Abu Dhabi and Dubai used public-private partnerships (PPPs) to overcome financial constraints.	Almarri and Boussabaine (2023); Noori <i>et al.</i> (2020)
Technical Challenges	Adoption of advanced technologies requires robust infrastructure, which many cities lack.	Seongdong-gu (South Korea) managed to implement solutions with limited resources by optimizing existing systems.	Ahad <i>et al.</i> (2020); Kim and Kim (2021)
Opportunities for Automation and Efficiency	Automation and big data analytics can optimize urban resource use and improve public service efficiency.	London utilizes these technologies to enhance management and reduce waste.	Shamsuzzoha <i>et al.</i> (2021)
Promotion of Urban Sustainability	Integration of energy and mobility management technologies can reduce emissions and improve transportation.	Amsterdam has effectively implemented technologies to foster sustainable development.	Angelidou (2017)
Privacy and Data Security	The collection of large volumes of data raises concerns about privacy and information security.	Helsinki has adopted robust cybersecurity policies to protect citizens' data.	Kumar (2019); Gagliardi <i>et al.</i> (2017)

Source: Authors (2024)

Therefore, despite challenges, such as lack of funding and technical issues, the opportunities offered by smart governance, including improved public management, greater citizen participation, and the promotion of sustainability, are significant. For these opportunities to be fully accomplished, cities must adopt strategic approaches adapted to their specific contexts, ensuring that smart governance contributes to inclusive and sustainable urban development.

5. Conclusions

This study makes a significant contribution by exploring the role of institutional contexts in shaping smart governance, especially in implementing public-private partnerships (PPPs) and information and communication technologies (ICTs). The systematic literature review revealed that the success of smart cities depends heavily on adapting these practices to the local institutional environment, demonstrating that there is no single model of smart governance. Policies and institutional structures need to be adjusted to the specificities of each location, allowing technological solutions to be applied efficiently and sustainably.

In addition to identifying challenges such as the lack of coordination between stakeholders and funding issues, the study points to significant opportunities for the strategic use of ICTs and PPPs. The automation of processes, the use of big data for decision-making, and the promotion of urban sustainability emerge as promising areas. With appropriate institutional policies and well-defined governance strategies, overcoming barriers and moving towards more innovative, efficient, and inclusive urban development is possible.

Future research could further investigate how different models of smart governance can be applied in different institutional contexts, particularly in developing countries, where the challenges are more complex. In addition, it is essential to explore how smart governance can adapt quickly to unexpected crises and new urban demands. Comparative studies between different governance models can offer valuable insights into best practices and how to adapt technological solutions to different institutional and economic realities.

Acknowledgements

The authors thank the Conselho Nacional de Desenvolvimento Científico e Tecnológico (CNPq) and the Coordenação de Aperfeiçoamento de Pessoal de Nível Superior (CAPES).

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