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Strategic planning for smart cities: a case study of Maribor's transformation based on existing strategies

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Abstract: Background: Maribor faces challenges in transitioning to a smart city, requiring strategic planning that integrates technology and sustainability. Objectives: To develop a comprehensive strategic framework for Maribor's smart city transformation. Methods/Approach: Qualitative methods, including interviews with stakeholders, document analysis, and comparative case studies with other cities, were used to assess Maribor's strategic needs. Results: Key findings emphasize the need for infrastructural upgrades, public-private partnerships, and community engagement, offering actionable recommendations for sustainable urban development.

Keywords: smart city, strategic planning, sustainable development, public-private partnerships, urban infrastructure, community engagement, Maribor

JEL classification: O18, R58, Q01, H54

Strateško načrtovanje za pametna mesta: študija primera preobrazbe Maribora na podlagi obstojećih strategij

Povzetek: Ozadje: Maribor se sooča z izzivi pri prehodu v pametno mesto, kar zahteva strateško načrtovanje, ki združuje tehnologijo in trajnostni razvoj. Cilji: Razviti celovit strateški okvir za preobrazbo Maribora v pametno mesto. Metode/Pristop: Uporabljene so bile kvalitativne metode, vključno z intervjuji z deležniki, analizo dokumentov in primerjalnimi študijami z drugimi mesti za oceno strateških potreb Maribora. Rezultati: Ključne ugotovitve poudarjajo potrebo po nadgradnji infrastrukture, javno-zasebnih partnerstvih in vključevanju skupnosti ter ponujajo konkretna priporočila za trajnostni urbani razvoj.

Ključne besede: pametno mesto, strateško načrtovanje, trajnostni razvoj, javno-zasebna partnerstva, urbana infrastruktura, vključevanje skupnosti, Maribor

1 INTRODUCTION

1.1 Research Problem

As urbanization accelerates globally, cities are increasingly recognized as critical drivers of economic growth, innovation, and social transformation. However, this rapid urban expansion poses significant challenges, particularly regarding sustainability, environmental degradation, and resource management. Urban centers, like Maribor, face the pressing need to adopt advanced technological solutions that can facilitate sustainable development. Integrating technology, often called the "smart city" approach, provides opportunities for optimizing resource use, improving urban services, and promoting environmental sustainability.

Maribor, a prominent city in Slovenia, is not immune to the challenges faced by cities worldwide. Despite its strategic location and potential for growth, Maribor grapples with several pressing issues. These include aging infrastructure, economic stagnation, environmental sustainability concerns, and limited public participation in urban development processes. The city has long sought to transition towards a more sustainable future, but a lack of coordinated and comprehensive approaches has often hampered its strategic planning efforts. The fragmented nature of its existing strategies and the absence of a cohesive plan to integrate technological innovation and sustainability further exacerbate the city's struggles (Bobek, 2022).

While Maribor's development strategies, such as the "Strategija razvoja Maribora 2030," provide a framework for economic and social growth, these documents often fail to fully address the technological and infrastructural changes required for sustainable urban development. The lack of a clear, actionable strategic plan incorporating smart city principles, including digitalization, energy efficiency, and public-private partnerships, creates a significant gap in Maribor's ability to compete with other European cities (Hauser & Marjanovič, 2010).

This research seeks to bridge this gap by proposing an integrated approach to strategic planning in Maribor, grounded in the principles of sustainability and smart city development. The research problem, therefore, centers on how Maribor can overcome its existing infrastructural, economic, and environmental challenges by adopting a strategic planning framework that integrates technological innovation and sustainability. Such a framework would enable the city to transition towards a smart city model, ensuring its competitiveness and sustainability in the long term.

1.2 State of the Art

The smart city concept has gained significant attention in recent years as urban centers worldwide seek to address the challenges of urbanization and environmental sustainability. A smart city is typically defined as an urban area that utilizes information and communication technologies (ICT) to enhance the efficiency of urban services, improve the quality of life for residents, and promote sustainable development (Camilleri & Ratten, 2019). The smart city model emphasizes using technology to manage resources more effectively, reduce carbon emissions, and foster innovation in various sectors, including transportation, energy, and public administration.

Research on smart cities highlights the importance of strategic integration in achieving sustainable urban growth. According to Pozdniakova (2018), critical components of a smart city include smart governance, smart mobility, smart environment, and smart living. Each component must be strategically integrated to ensure that technological innovations

contribute to sustainability and improved quality of life. For example, smart governance requires the adoption of digital platforms that facilitate public participation and transparency. In contrast, smart mobility uses data-driven solutions to optimize transportation networks and reduce congestion.

Several cities worldwide have successfully implemented smart city strategies, providing valuable case studies for Maribor. Cities such as Stockholm, Amsterdam, and Singapore have become leaders in smart city development, leveraging technology to address urban challenges and promote sustainable growth. These cities have implemented comprehensive strategic plans that integrate ICT with urban planning, significantly improving energy efficiency, transportation, and public services (Haller et al., 2018). For instance, Stockholm's use of smart grids and renewable energy has significantly reduced the city's carbon footprint. At the same time, Amsterdam's open data platforms have enhanced public engagement in urban decision-making processes (Ribas & Guerino de Carlo, 2019).

Despite the growing body of research on smart cities, there needs to be more literature concerning smaller urban centers, particularly those in transition economies like Maribor. Much existing research focuses on large metropolitan areas with extensive resources and technological infrastructures. In contrast, cities like Maribor often need more financial and institutional capacity to implement large-scale smart city initiatives. As a result, there is a need for more research that addresses the specific challenges and opportunities faced by smaller cities in adopting smart city strategies (Horvath, 2019).

This study contributes to the existing body of knowledge by focusing on the unique context of Maribor and its potential to transition into a smart city. The research builds on the theoretical frameworks of smart city development while addressing the practical challenges of implementing such strategies in a mid-sized, post-industrial city. By drawing on examples from other cities and adapting their strategies to the specific needs of Maribor, this research provides a roadmap for integrating technological innovation and sustainability in the city's strategic planning efforts.

1.3 Research Objectives and Questions

The primary objective of this research is to develop a strategic planning framework that enables Maribor to transition towards a smart city model. This framework aims to integrate technological innovation with sustainability, ensuring that Maribor can address its current challenges and enhance its long-term competitiveness. Specifically, the research seeks to identify the critical components of an effective smart city strategy for Maribor and provide actionable recommendations for its implementation.

To achieve this objective, the study addresses the following research question:

How can Maribor develop and implement an effective strategic plan to become a smart city that integrates technology and sustainability?

This central question is further broken down into several sub-questions, which guide the research:

1. What are the specific technological and infrastructural challenges Maribor faces in pursuing sustainable development?
2. How can existing smart city models from other cities be adapted to the unique context of Maribor?
3. What are the critical components of an effective strategic plan integrating technological innovation with sustainability in Maribor?

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4. How can Maribor engage stakeholders, including the public and private sectors, in developing and implementing its smart city strategy?
 5. What are the potential barriers to implementing smart city solutions in Maribor, and how can these barriers be overcome?

The research also seeks to address several gaps in the existing literature. Firstly, it aims to contribute to the limited research on smart city development in mid-sized cities, particularly those in transition economies. Secondly, it explores the role of stakeholder engagement in the strategic planning process, emphasizing the importance of public-private partnerships in driving urban innovation. Finally, the study addresses the challenges of financing and resource allocation in smart city projects, providing recommendations for securing funding and building institutional capacity.

In conclusion, this research offers a comprehensive approach to strategic planning in Maribor, grounded in the principles of smart city development and sustainability. The study aims to provide a blueprint for Maribor's transformation into a smart, sustainable city by addressing the city's specific challenges and leveraging the potential of technological innovation.

2 METHODS

2.1 Data Collection

The research for this study employed a qualitative approach, drawing on several data collection methods to gain a comprehensive understanding of the strategic planning processes and the potential for Maribor to transition into a smart city. The primary data collection methods included semi-structured interviews with key stakeholders, document analysis of existing strategic plans and policy documents, and comparative case studies with other European cities that have successfully implemented smart city initiatives.

Interviews: Seven semi-structured interviews were conducted with stakeholders from various sectors, including urban planners, local government officials, business representatives, and experts in technology and sustainability—the interviews aimed to gather insights into Maribor's challenges regarding infrastructure, governance, and technology integration. Stakeholders were selected based on their involvement in strategic planning processes and knowledge of the city's development needs. The semi-structured format allowed for flexibility in the conversation while ensuring that critical themes—such as urban governance, technological integration, and sustainability—were consistently explored across interviews (Divjak, n.d.).

Document Analysis: Besides interviews, the study involved an extensive analysis of existing strategic plans and policy documents, including the *Strategija razvoja Maribora 2030* and the *Regionalni razvojni program Podravja 2021-2027*. These documents provided a detailed overview of the city's current strategic priorities, infrastructure plans, and development goals. The analysis focused on identifying gaps in the existing strategies, particularly in integrating technological solutions and addressing sustainability challenges. Additional documents, such as the *Strategija digitalne transformacije gospodarstva za Slovenijo do leta 2030*, were also reviewed to understand how national policies influence local development efforts (RRA Podravje, 2022; Mestna občina Maribor, n.d.).

Comparative Case Studies: To benchmark Maribor's situation against other cities, a comparative analysis was conducted using case studies from cities that have successfully transitioned into smart cities. Cities such as Stockholm, Kaunas, and Amsterdam were selected for comparison based on their similar size, geographic location, economic context,

and successful implementation of smart city technologies (Haller et al., 2018). This comparative analysis helped to identify best practices and innovative solutions that could be adapted to Maribor's unique challenges.

2.2 Justification of Approach

A qualitative research approach was selected for this study due to its ability to provide in-depth insights into the complex and multifaceted challenges of urban planning and development. Unlike quantitative methods, which primarily focus on numerical data and generalization, qualitative research is well-suited for exploring the subjective experiences, perceptions, and motivations of individuals and organizations involved in strategic planning (Creswell, 2013). The goal of this research was to understand the specific needs, challenges, and opportunities faced by Maribor in its journey toward becoming a smart city, and qualitative methods were ideal for achieving this depth of understanding.

The use of **semi-structured interviews** allowed for a rich collection of data from key stakeholders, offering direct insight into the city's planning processes and technology's role in its future development. The flexibility of the semi-structured format ensured that interviewees could discuss topics in detail, providing both expected and unexpected insights while still addressing the core themes of the study. This method was precious in understanding the diverse perspectives of stakeholders, from policymakers to business leaders, and how these perspectives influence strategic decisions in Maribor (Divjak, n.d.).

Document analysis was another essential method, as it provided an opportunity to evaluate the existing strategic frameworks guiding Maribor's development critically. By reviewing key documents such as the *Strategija razvoja Maribora 2030* and other regional and national strategies, the study identified areas where current planning efforts fall short, particularly in integrating technological innovation and sustainability. This analysis was also helpful in understanding the policy context within which Maribor operates and the alignment between local and national objectives (RRA Podravje, 2022; Mestna občina Maribor, n.d.).

The **comparative case study** method was crucial for benchmarking Maribor against other cities successfully implementing smart city initiatives. Benchmarking is an established technique in strategic planning that allows organizations and cities to learn from the successes and failures of others (Haller et al., 2018). In the context of this research, benchmarking provided a valuable means of identifying best practices that could be adapted to Maribor's context. For example, the study of Stockholm's energy-efficient systems and Amsterdam's open-data platforms revealed innovative approaches to smart city development that could address some of the critical challenges Maribor faces, such as improving energy efficiency and enhancing public participation in urban governance (Ribas & Guerino de Carlo, 2019).

The choice of qualitative methods, particularly the combination of interviews, document analysis, and comparative case studies, was driven by the need for a holistic understanding of Maribor's unique context. Qualitative research allows for exploring the specificities that quantitative data may overlook, such as the social and cultural factors that influence the success of strategic planning initiatives. Furthermore, it enables researchers to identify what works and why specific strategies may or may not be effective in a particular setting (Creswell, 2013).

Benchmarking against other cities was particularly crucial in this study because Maribor, like many mid-sized cities, faces constraints in terms of financial and technological resources. By learning from cities that have successfully navigated similar challenges, Maribor can adopt feasible and effective strategies within its limited resource base. The cities selected for

comparison were chosen based on their relevance to Maribor's size, economic situation, and geographical location, ensuring that the lessons drawn from these case studies apply to Maribor's development needs (Horvath, 2019).

In conclusion, the combination of interviews, document analysis, and comparative case studies provided a robust framework for exploring how Maribor can develop and implement a strategic plan to transition into a smart city. The qualitative approach enabled the study to capture the complexity of Maribor's challenges and opportunities, offering a nuanced understanding of the city's strategic planning processes and the potential for integrating technology and sustainability in urban development.

3 RESULTS

3.1 Main Findings

The research into Maribor's strategic planning for its transition into a smart city yielded several key findings that highlight the city's challenges and opportunities. These findings are crucial for understanding Maribor's current infrastructure needs, institutional support's importance, and public-private partnerships' role in fostering sustainable development.

1. Infrastructure Needs: Maribor's existing infrastructure presents significant challenges that must be addressed to facilitate its transformation into a smart city. The research revealed that much of the city's infrastructure, particularly transportation, energy, and digital connectivity, is outdated and cannot support smart city technologies. For instance, the public transportation system needs modernization to improve efficiency and reduce traffic congestion. Additionally, the city's energy grid is not equipped to integrate renewable energy sources at a scale necessary for sustainable development. Without substantial upgrades, Maribor risks falling behind other European cities that have successfully implemented smart infrastructure (RRA Podravje, 2022).

2. Institutional Support: The role of institutional support emerged as a critical factor in Maribor's strategic planning process. The research identified that while there are several strategic documents, such as the *Strategija razvoja Maribora 2030* and the *Regionalni razvojni program Podravja 2021-2027*, these plans are often fragmented and lack cohesive implementation. Institutional support from both local and national government bodies is essential for aligning these strategies and ensuring their successful execution. One of the main findings was that the city government must enhance its capacity to manage and coordinate smart city initiatives, particularly by fostering closer cooperation between municipal departments and external stakeholders (Mestna občina Maribor, n.d.).

3. Public-Private Collaboration: The study also found that collaboration between the public and private sectors is vital for Maribor's transition to a smart city. Smart city projects require significant investment, and public resources alone cannot cover the necessary costs. Therefore, partnerships with private sector companies, particularly those specializing in technology and innovation, are critical. The research showed that cities that have successfully implemented smart city strategies, such as Amsterdam and Stockholm, have benefited from solid public-private collaborations that facilitated access to financial and technological resources (Haller et al., 2018). In Maribor, efforts to engage private enterprises have been limited, and more proactive measures are needed to attract investment and innovation partnerships.

4. Community Engagement: Another significant finding was the need for greater community engagement in Maribor's strategic planning. The research revealed that many

residents feel disconnected from the city's decision-making processes, particularly large-scale development projects. Cities like Amsterdam have demonstrated the importance of involving citizens in smart city initiatives through open data platforms and participatory governance models. Maribor could benefit from similar approaches, which would not only improve public trust in government but also ensure that smart city solutions are tailored to the needs and preferences of its citizens (Ribas & Guerino de Carlo, 2019).

5.Comparative Analysis: The benchmarking analysis with other European cities highlighted several areas where Maribor can learn from best practices. For example, Stockholm's approach to integrating renewable energy into its urban infrastructure and Amsterdam's use of data-driven platforms for urban mobility offer valuable insights into how Maribor can address its challenges in these areas. Furthermore, Kaunas, a city of comparable size to Maribor, has successfully implemented smart public transportation solutions that Maribor could adopt to improve its system (Horvath, 2019). This comparative analysis reinforced the importance of aligning Maribor's strategies with proven models from other cities while customizing these approaches to fit the local context.

The following table highlights Maribor's strategic needs compared to other cities. This representation provides a clear overview of the critical areas where Maribor's infrastructure and strategic planning efforts require improvement and the successful models other cities have implemented.

Table 1: Comparative Analysis of Smart City Infrastructure Needs

City	Key Smart City Features	Infrastructure Gaps	Best Practices for Maribor
Stockholm	Renewable energy integration, smart grids	Limited digital connectivity	Focus on renewable energy integration and upgrading the grid to support it
Amsterdam	Open data platforms, smart mobility	Aging public transportation	Adapt Amsterdam's data-driven mobility strategies to improve public transport efficiency.
Kaunas	Smart public transportation, digital inclusion	Lack of digital literacy programs	Implement digital literacy initiatives and upgrade transportation systems
Maribor	Focus on sustainability, fragmented strategy	Outdated energy grid, limited public-private partnerships	Strengthen institutional support and foster public-private collaborations for investment

Sources: Stockholm (Haller et al., 2018); Amsterdam (Ribas & Guerino de Carlo, 2019); Kaunas (Horvath, 2019); Maribor (Mestna občina Maribor, n.d.; RRA Podravje, 2022).

4 DISCUSSION

4.1 Interpretation of Results

The results of this study reveal several essential insights into the challenges and opportunities Maribor faces in its transition to a smart city. One of the most significant findings is the city's urgent need for infrastructural improvements, particularly in transportation and energy. Maribor's outdated energy grid and limited digital infrastructure hinder its integration of the technological innovations necessary for a sustainable future. This challenge is consistent with similar findings in other mid-sized cities undergoing smart city transformations, such as Miskolc, which faced similar infrastructural limitations before implementing smart grids and energy-efficient solutions (Horvath, 2019).

Maribor's lack of cohesive institutional support further complicates the city's strategic planning process. The research demonstrates that while strategic documents like the *Strategija razvoja Maribora 2030* exist, they are fragmented and lack a unified approach to implementation. This starkly contrasts cities like Stockholm, which has successfully integrated smart city initiatives through coordinated governance structures that align local and national strategies (Haller et al., 2018). Without more robust institutional backing, Maribor's strategic plans risk remaining theoretical exercises rather than practical, actionable policies.

Another key result is the importance of collaboration between the public and private sectors. The research highlights that Maribor has yet to fully leverage the potential of public-private partnerships (PPP), essential for financing and implementing smart city technologies. This is a critical gap, as cities like Amsterdam have shown that solid PPPs are fundamental to successful smart city development, enabling cities to access financial capital and technological expertise (Ribas & Guerino de Carlo, 2019). In Maribor, fostering such collaborations could help overcome the financial constraints limiting the city's ability to modernize its infrastructure and adopt smart technologies.

Community engagement also emerged as a critical element in successful smart city transitions. The research shows that Maribor's residents are often excluded from the decision-making processes that shape the city's development. This lack of engagement can lead to resistance or apathy toward smart city projects, undermining their long-term sustainability. Cities like Amsterdam have demonstrated the benefits of involving citizens through open data platforms and participatory governance, improving transparency and ensuring that smart city initiatives are tailored to the community's needs (Ribas & Guerino de Carlo, 2019). Maribor could benefit significantly from adopting similar practices to ensure that its smart city strategy is both inclusive and responsive to the needs of its citizens.

Finally, the benchmarking analysis with cities like Kaunas and Amsterdam revealed that Maribor could adopt several best practices from these cities. For example, Kaunas' success in implementing smart public transportation solutions provides a model that Maribor could adopt to improve its outdated public transport system (Horvath, 2019). Similarly, Amsterdam's use of open data and technology-driven mobility solutions offers valuable lessons for Maribor, particularly in improving urban mobility and reducing congestion (Ribas & Guerino de Carlo, 2019).

4.2 Implications

The findings from this study have several implications for both theoretical discussions on urban planning and practical applications in smart city development. Theoretically, this

research contributes to the growing body of literature on smart cities by focusing on the unique challenges that mid-sized cities like Maribor face. Much of the existing research on smart cities centers on large metropolitan areas with significant financial and technological resources. By contrast, this study highlights the difficulties that smaller cities with limited resources encounter when attempting to transition into smart cities. The findings suggest that traditional smart city models, which often emphasize high-tech solutions and large-scale infrastructure investments, may need to be adapted for smaller cities. This adaptation could involve focusing on incremental improvements in infrastructure and fostering partnerships that allow for resource sharing and technological innovation (Horvath, 2019).

From a practical perspective, the study's findings provide actionable recommendations for Maribor's strategic planning efforts. First, the city must prioritize infrastructure upgrades, particularly in the areas of energy and transportation. Learning from cities like Stockholm and Kaunas, Maribor can adopt proven solutions, such as smart grids and energy-efficient public transportation, to enhance its infrastructure while promoting sustainability. Second, the city must strengthen its institutional capacity by ensuring local government bodies work cohesively to implement smart city strategies. This could involve creating a dedicated task force or office for smart city initiatives that coordinate efforts across different municipal departments and align local strategies with national policies, similar to what has been done in Stockholm (Haller et al., 2018).

Another important practical implication is the need for Maribor to foster stronger public-private partnerships. The success of smart city projects in cities like Amsterdam shows that collaboration with private companies can provide the financial and technological resources necessary to implement large-scale urban innovations (Ribas & Guerino de Carlo, 2019). Maribor should actively seek partnerships with technology firms, infrastructure developers, and other relevant private sector entities to accelerate its smart city transition.

Furthermore, the findings underscore the importance of engaging citizens in the city's strategic planning process. Maribor's future smart city initiatives should incorporate mechanisms for public participation, such as open data platforms or participatory budgeting tools. These approaches have been successful in other cities, ensuring that smart city projects are not only technologically advanced but also socially inclusive and responsive to the community's needs (Ribas & Guerino de Carlo, 2019). By adopting such strategies, Maribor can build public trust and support for its smart city efforts, which is critical for long-term sustainability.

Finally, the study's comparative analysis provides valuable lessons for other mid-sized cities facing similar challenges. Cities that share Maribor's characteristics—such as limited resources, fragmented strategies, and a need for infrastructural upgrades—can benefit from the best practices identified in this research. By focusing on incremental improvements, fostering public-private partnerships, and engaging the community, these cities can make significant progress toward becoming smart cities, even with constrained financial and technological capacities (Horvath, 2019).

4.3 Limitations

While this study provides important insights into Maribor's smart city development, it has limitations. One significant limitation is the scope of stakeholder engagement. The research primarily relied on interviews with local government officials and business representatives, which may have excluded essential perspectives from other stakeholders, such as residents and non-governmental organizations (NGOs). Future research should include a more diverse range of stakeholders to understand better the challenges and opportunities related to smart city development in Maribor (Divjak, n.d.).

Another limitation is the specific focus on Maribor, which may limit the generalizability of the findings to other cities. While the study's comparative analysis with cities like Stockholm, Amsterdam, and Kaunas offers useful benchmarks, Maribor's unique context as a mid-sized, post-industrial city may mean that not all of the lessons from these other cities are directly applicable. Additionally, the study focused primarily on infrastructure and governance challenges. It did not explore other important aspects of smart city development, such as digital literacy or cybersecurity, which are increasingly relevant in the context of smart city technologies.

Finally, the study's reliance on qualitative data, such as interviews and document analysis, may limit the ability to quantify the potential impact of the proposed solutions. Future research could incorporate quantitative methods, such as surveys or economic modeling, to provide a more robust assessment of the financial and social benefits of smart city initiatives in Maribor.

5 CONCLUSION

This study has contributed to the strategic planning discourse by offering a tailored approach for Maribor's transformation into a smart city. The findings emphasize the need for Maribor to adopt a holistic, integrated strategy that combines technological innovation with sustainability. Several key recommendations have emerged from this research that urban planners and policymakers in Maribor must consider.

First, the city's infrastructure requires significant upgrades, particularly in the energy and transportation sectors. Drawing on examples from cities like Stockholm and Kaunas, it is clear that Maribor can benefit from adopting smart energy grids and public transportation solutions that prioritize energy efficiency and reduce congestion (Haller et al., 2018; Horvath, 2019). These improvements are essential for creating the foundation for smart city technologies to thrive.

Second, institutional support must be strengthened to ensure Maribor's strategic plans are cohesive and effectively implemented. This involves fostering closer collaboration between local government agencies and aligning municipal strategies with national development goals. Furthermore, establishing a dedicated task force or coordination body for smart city initiatives would ensure that these efforts are streamlined and more likely to succeed (Mestna občina Maribor, n.d.).

Public-private partnerships (PPP) are also crucial in Maribor's smart city development. The city must proactively seek collaboration with private sector companies, particularly in technology and infrastructure, to secure the necessary financial and technological resources (Ribas & Guerino de Carlo, 2019). The example of Amsterdam shows that PPPs can provide the essential support needed for large-scale urban innovation, and Maribor should follow this model.

Finally, the research highlights the importance of community engagement in the smart city transition. Maribor's residents need to be more involved in their city's decision-making processes. Urban planners and policymakers should adopt participatory governance models, such as open data platforms, to ensure that the voices of the community are heard and that smart city solutions are tailored to their needs (Ribas & Guerino de Carlo, 2019).

While this study has provided actionable insights for Maribor, it also opens up several avenues for future research. One key area that requires further exploration is stakeholder involvement. Although this research emphasized the need for greater community

engagement, future studies could investigate more deeply how different stakeholders—such as local businesses, NGOs, and educational institutions—can be integrated into the strategic planning process. Understanding these groups' motivations, concerns, and priorities would provide a more comprehensive view of the challenges and opportunities associated with smart city development in Maribor.

Another area for future research is comparative studies with more diverse urban contexts. While this study benchmarked Maribor against cities like Stockholm and Kaunas, which share similar characteristics, future research could explore smart city initiatives in cities from other regions or with different economic contexts. Such comparative studies would provide valuable insights into how Maribor can adopt best practices from cities with varying resources, governance structures, and technological infrastructures.

Additionally, future research could focus on the financial and social impacts of implementing smart city solutions in mid-sized cities like Maribor. Quantitative studies that assess the long-term cost savings, environmental benefits, and improvements in quality of life resulting from smart city initiatives would help build a stronger case for investment in such projects. This would provide policymakers with the data needed to justify large-scale urban development projects and ensure that these initiatives deliver tangible benefits to the community.

In conclusion, this study has laid the groundwork for Maribor's strategic planning efforts as it seeks to become a smart city. By addressing the city's infrastructural challenges, strengthening institutional support, fostering public-private partnerships, and engaging the community, Maribor can position itself as a leader in sustainable urban development. Future research will be crucial in refining these strategies and ensuring the city's smart city transition is effective and inclusive.

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