The Production of Smart Cities: An Analysis of Barcelona and Toronto

By Marisabel Tadesse supervised by Teresa Abbruzzese

Major Paper submitted to the Faculty of Environmental and Urban Change in partial fulfillment of the requirements for the degree of Master in Environmental Studies

York University, Toronto, Ontario, Canada

August 28th, 2024

ABSTRACT

The paper examines the discursive, governance, and territorial strategies of smart city initiatives, focusing on the comparative analysis of Barcelona and Toronto. By analyzing the narratives, systems of governance, and geographical consequences of these technological changes, the research uncovers the intricate and difficult aspects of the idealistic concept of smart cities. Barcelona's citizen-centric strategy, which prioritizes participation and municipal control, stands in contrast to Toronto's corporate-driven approach, underscoring notable disparities in social equity and stakeholder engagement. The results emphasize the significance of inclusive and participatory governance structures in guaranteeing that smart city projects contribute to equitable and sustainable urban development. Furthermore, the study explores the profound implications for urban planners, who are required to include innovative technology, foster cross-disciplinary collaboration, and tackle challenges related to digital exclusion, privacy, and community cohesion. This research proposes a balanced approach to smart city development that combines technology developments with social justice and environmental sustainability. By drawing lessons from Barcelona and Toronto, the aim is to create urban futures that are more democratic and resilient urban futures.

FOREWORD

This research meets the demanding criteria of the Master in Environmental Studies (MES) degree by showcasing a thorough comprehension and discerning knowledge of the complex challenges related to smart city initiatives. The research exemplifies the fundamental goals of the MES program by combining diverse information and methodologies from many fields within environmental studies. It notably focuses on the social, political, and economic aspects that influence ongoing discussions about urban growth.

The methodical investigation of smart city initiatives in Barcelona and Toronto showcases the program's focus on cultivating specialized expertise and discerning comprehension. This research explores intricate urban governance models and stakeholder dynamics, demonstrating the MES program's dedication to tackling contemporary issues and generating novel insights that are at the frontier of academic and professional practice. The multidisciplinary nature of this work, which combines digital technology, data analytics, and urban planning concepts, demonstrates the MES program's objective of promoting expertise in the creation and execution of unique research. This research enhances our comprehension of urban sustainability and resilience by examining the consequences of smart city initiatives for planners and emphasizing the significance of inclusivity, transparency, and equity. This major paper adheres to the standards of methodological competence and conceptual understanding set by the MES program through the implementation of an individual Plan of Study and directed research.

ACKNOWLEDGEMENTS

I would to extend my utmost appreciation to my supervisor, Teresa Abbruzzese, and advisor, Anna Zalik, for their essential guidance, expertise, and continuous support throughout this research endeavour. Your insightful input and support have played a crucial role in defining this project and assisting me in navigating its intricacies.

I am also appreciative of the contributions of professors in the Faculty of Environmental and Urban Change, especially those who taught the courses that I have enrolled in. I would like to express my gratitude to all the lecturers and colleagues who have intellectually stimulated me and shared their knowledge with me throughout my tenure in the Master in Environmental Studies program. This journey has been a collective endeavour, and I am grateful to all those who have contributed to it.

Table of Contents

Introduction

The integration of technology in urban landscapes has led to the emergence of smart cities, which combine digital technologies and urban administration to create more efficient, sustainable, and habitable settings. The concept of a smart city represents an urban development vision that utilizes cutting-edge technologies to streamline city operations, enhance services, and improve the overall quality of life for its inhabitants. This technology revolution encompasses more than just physical infrastructure. It also entails redefining cities' perception, governance, and experience with their residents. Within this framework, the study of smart cities goes beyond technological aspects and explores the socio-political and geographical processes that shape urban existence in the age of digitalization.

This study examines the various aspects of smart city efforts, with a specific focus on the ways in which Barcelona and Toronto implement discursive, governance, and territorial strategies. This study aims to analyze the narratives that influence public perception, the network governance models that guide policy implementation, and the spatial implications of technological advancements in order to understand the intricacies of the idealized image of smart cities. The discursive part entails understanding the impact of smart city discourse on policy and public opinion, as it advocates for a vision of technological advancement and revitalization in metropolitan areas. Governance models reveal the complex network of connections between governmental entities, commercial enterprises, and civil society, emphasizing the power dynamics and cooperative endeavours required for the execution of smart city initiatives.

We can gain insight into the wider effects of smart city initiatives on social justice and equity by conducting a comparative urbanism examination of Barcelona and Toronto. The contrasting approaches of Barcelona and Toronto in terms of citizen empowerment and collaborative governance against a corporate-driven approach demonstrate the various strategies that cities might employ to address the difficulties and opportunities brought about by smart city technologies. By comparing these two cities, the study sheds light on the diverse outcomes in terms of inclusion, transparency, and social fairness that can result from alternative governance structures and stakeholder engagements. This comparison also shows how important the local environment is in shaping the implementation and outcomes of smart city initiatives. It shows that a standard strategy is not enough to meet the unique needs and goals of urban residents from different backgrounds.

This study aims to contribute significantly to the ongoing urban development discourse by thoroughly assessing the potential applications of smart city projects in promoting inclusive, equitable, and environmentally sustainable urban futures. The findings show that the governance systems in place and their ability to effectively address social justice and equity concerns heavily influence the effectiveness of smart cities in enhancing urban life. This paper argues for a balanced approach to urban innovation that combines technological advancements with social inclusion and environmental sustainability. It does so by examining the strategies and outcomes of smart city projects in Barcelona and Toronto, providing a nuanced understanding of the topic.

Methodology

I used mixed methods for my research to utilize an interdisciplinary approach and to minimize the gaps in the research process. Triangulation principles, which have an advantage over other approaches, allow for the gathering of evidence from a variety of sources, thereby balancing often dismissed information. Triangulation is the utilization of evidence from various sources to support a single fact or conclusion (Turner et al., 2015). The approach used for a literature review is crucial in addressing studies pertaining to the development of smart cities and its implications for urban planning and social equity. The literature review provides valuable insights into the historical forces that have shaped the present condition of urban development and technology incorporation. This aids in understanding the formulation, quantification, and examination of these notions in previous research. In general, doing a literature review serves as a basis for understanding the current information, theories, and methodologies that are relevant to the research issues. It assists in placing the study within the wider academic conversation, informs the development of a theoretical structure, and directs the choice of suitable research methodologies. Furthermore, the literature review helps to identify limitations in the current understanding.

The analysis of comparative urbanism provides insights to existing conversations in urban theory that focus on a comparative evaluation of smart cities (Ward 2010; Söderström et al., 2014; Caprotti and Cowley 2019; Burns et al., 2021; Montero and Baiocchi 2022). This paper builds on these conversations by shedding light on the implications for planning practice and policy decision-making. This analysis compares the development of smart city programs in Toronto, Canada, and Barcelona, Spain, and offers a contextualized perspective of the digital and spatial manifestations of capitalism in the two cities. This investigation reveals numerous significant insights into the distinct influences

and demonstrations of these manifestations in each location. Both cities demonstrate unique strategies for incorporating technology and surveillance in their digital representations. The Quayside project in Toronto, led by Sidewalk Labs, focuses on utilizing data-driven technologies for urban management. This includes gathering a large amount of data, implementing intelligent infrastructure, and utilizing IoT devices to enhance and improve services. This project has received criticism due to concerns about potential privacy issues and the commercialization of urban data. On the other hand, Barcelona's "Barcelona Digital City" initiative prioritizes open data, data sovereignty, and participatory democracy. It places a strong emphasis on openness, giving residents the power to govern their own data.

The existence of public-private partnerships serves to emphasize the conflicting capitalist frameworks of the two cities. The participation of a prominent technology business strongly impacts Toronto's smart city initiatives, exemplifying a capitalist pattern in which private companies take significant roles in public infrastructure, frequently emphasizing profitability and effectiveness. Barcelona actively cultivates alliances with small enterprises and cooperatives, with the goal of harmonizing public and private concerns and reducing the influence of major corporations. Both cities' innovation ecosystems also exhibit distinct capitalist methodologies. Toronto's approach to attracting digital companies and investments establishes it as a prominent global tech hub, exemplifying a neoliberal capitalist strategy in which cities vie internationally for cash and talent. In contrast, Barcelona places a strong emphasis on social innovation and the growth of a collaborative economy. This support extends not only to digital companies but also to social enterprises and cooperatives, which highlights a more diversified and inclusive economic model.

The emphasis on infrastructure and public spaces also differs. Toronto's focus on advanced technological infrastructure may result in the privatization of public areas, where corporate entities control their access and usage. This reflects a capitalist inclination towards turning things into commodities. Barcelona's efforts to uphold public authority over urban areas and guarantee their alignment with community needs demonstrate an alternative strategy to capitalist urban development, prioritizing the common good over monetary gain. Governance and citizenship further exemplify the cities' diverse perspectives. Toronto's governance model is predominantly hierarchical, influenced by corporate and government interests, often resulting in the exclusion of community perspectives and a focus on economic benefits rather than social requirements. Barcelona advocates for participatory government, which entails engaging residents in decision-making processes, democratizing urban development, and questioning conventional capitalist governance institutions.

These comparative insights uncover crucial subjects such as the protection of data privacy, the analysis of economic models, and the development of urban planning. Toronto's methodology prompts

inquiries regarding data privacy and the possibility of corporate spying, whereas Barcelona's emphasis on data sovereignty presents an alternative perspective in which digital infrastructures cater to the welfare of the general population. Toronto's strategy follows a neoliberal capitalist ideology that emphasizes economic growth and innovation driven by technology. In contrast, Barcelona's approach leans towards social democracy, seeking to achieve a balance between economic development and social equality, as well as empowering the community. The report emphasizes the dangers of worsening socioeconomic disparities in Toronto's smart city initiative and presents Barcelona's strategies to alleviate these dangers through inclusive and participative approaches. Ultimately, the analysis of comparative urbanism in Toronto and Barcelona provides insight into the diverse digital and geographical expressions of capitalism in the 21st century. It delves into the intricate relationship between technology, governance, and social fairness, offering crucial insights for cities worldwide. Through an analysis of these two different models, policymakers and urban planners can gain a greater understanding of the possible advantages and drawbacks of smart city efforts within the framework of modern capitalism.

In conclusion, this study employs a technique that combines various research methods to provide a comprehensive understanding of smart city initiatives. By utilizing triangulation, the research effectively gathers evidence from diverse sources, allowing for a balanced perspective that addresses the complexities often overlooked in singular methodologies. The literature review plays a fundamental role by providing valuable information on the historical background and theoretical frameworks that influence ongoing discussions on urban development and smart city initiatives. This method not only places the study within the wider academic discussion but also emphasizes the current lack of understanding regarding the effects of technology on urban planning and social equity. This technique allows for a comprehensive analysis of comparative urbanism of the smart city models in Barcelona and Toronto, which enables a critical evaluation of their governance systems, stakeholder participation, and the resulting societal effects. The purpose of this extensive framework is to provide policymakers and urban planners with information regarding the possible advantages and difficulties associated with smart city initiatives, with the goal of promoting a more inclusive and equitable urban future.

Literature Review

The Comparative Turn in Urban Studies

The rise of smart cities has caused a significant change in urban studies, resulting in a reassessment of conventional research paradigms and approaches. Scholars are increasingly studying and comparing

smart city programs in various urban regions to better understand how digital technology affects urban governance, infrastructure, and social dynamics. The mid-20th century saw the rise of comparative urbanism, which significantly influenced discourses on urban lifestyles. This approach emphasized the significance of studying cities in various contexts to comprehend the range of urban experiences and identify both their differences and similarities. Through the examination of urban phenomena and behaviours in different cities, researchers were able to discern overarching patterns and distinctive features that set apart one urban environment from another. The researchers employed a comparative method to identify how general urban-industrial tendencies, prevalent in many cities, influenced certain aspects of urban life, and how distinctive social, cultural, and historical factors unique to each city influenced these aspects (Robinson, 2006, p. 60). Furthermore, comparative urbanism provided a framework for investigating the interdependence of cities and the ways in which different urban configurations coexist within the global urban environment. Through the analysis of various urban settings, researchers can acquire valuable knowledge about the intricacies of city life and the multitude of ways in which individuals engage with their urban surroundings. The inclusion of a comparative viewpoint not only enhanced our comprehension of urban diversity but also emphasized the importance of recognizing the distinct attributes of each city while acknowledging the overarching patterns that go beyond individual urban contexts (Robinson, 2006, p. 64). Essentially, the practice of comparative urbanism throughout the mid-twentieth century promoted a sophisticated understanding of urban lifestyles by emphasizing the importance of examining cities in relation to each other. Scholars were able to go beyond simplistic categorizations and preconceptions using comparison analyses, enabling a more nuanced and contextually grounded investigation of urban phenomena. This approach has a lasting impact on current urban studies as it urges scholars to acknowledge the intricate and varied nature of urban life while also acknowledging the interdependence of cities in a globalized world.

The comparative turn in urban studies indicates a transition towards methodically comparing diverse urban conditions in order to reveal trends, disparities, and distinctive attributes in urban development and policy. It extends beyond individual urban case studies to a wider, more comprehensive approach. This methodology enables a more profound comprehension of urban phenomena by emphasizing discrepancies and resemblances among diverse cities and areas. This concept questions the idea of using universal models in urban planning and development and instead promotes customized solutions that take into account specific local circumstances. Understanding the socio-economic and cultural environment is crucial in the study of smart cities, as the effects of technology solutions can vary significantly. The comparative turn in urban studies is crucial in the context of smart cities, as it allows researchers to analyze and compare how different cities implement and experience smart

technologies. Through the examination of smart city projects in different urban environments, researchers can discern optimal strategies, obstacles, and potential disparities that may result from the implementation of these technologies. This comparative research aids in comprehending the diverse applications of smart technologies in different urban environments and their effects on residents, businesses, and policymakers. An essential aspect of understanding the impact of technical interventions in smart city projects on urban settings is to critically analyze capitalist urbanization through comparative urban studies. This analysis allows for an evaluation of how these interventions interact with existing power dynamics and social inequities. Capitalist systems naturally influence urban governance and power dynamics, impacting decision-making processes, resource distribution, and access to opportunities in cities. Through comprehending the influence of capitalism on these systems of governance, scholars and policymakers may evaluate how smart city efforts might strengthen or question prevailing social disparities and power asymmetries.

The comparative shift in urban studies within a capitalist framework means changing the way you look at urban processes and dynamics across multiple cities and regions to find similarities, differences, and patterns that are shaped by capitalist systems. This methodology empowers scholars to scrutinize the responses of diverse urban environments to capitalist influences, including economic globalization, neoliberal policies, and class dynamics. Scholars can analyze urban growth, governance arrangements, and socioeconomic inequality in various capitalist contexts to find shared issues encountered by cities under capitalism. This analysis can also help explore alternate options for tackling these challenges.

Smart cities, Datafication, and Digital Capitalism

Smart cities have been defined in various ways in the literature, reflecting the complexity and diversity of this phenomenon. According to Kitchin et al. (2015), a widely accepted definition of smart cities is the integration of digital technologies into the urban environment through urban planning and administration activities (Burns et al., 2021, p. 462–63). This definition highlights the utilization of digital tools to improve efficiency, sustainability, and the participation of citizens in urban areas. Expanding on this idea, Townsend (2013) regards smart cities as more than only the integration of technology but also as a wider restructuring of urban economies using digital methods (Burns et al., 2021, p. 463). This viewpoint emphasizes the profound impact that digital technology can have on changing urban development and governance. In addition, Albino et al. (2015) observe

the diversity in defining smart cities, highlighting a lack of agreement within the sector (Burns et al., 2021, p. 463). De Jong et al. (2015) have emphasized the simultaneous existence of several terms such as sustainable, eco-city, resilient, and knowledge cities, alongside the concept of smart cities (Burns et al., 2021, p. 463). This demonstrates the complex and diverse character of urban innovation. Overall, these definitions emphasize the complex and diverse aspects of smart cities, which include technology, economics, and governance. These critical viewpoints in the literature have also expressed concerns about the neoliberal and market-oriented foundations of smart city projects, highlighting the importance of taking into account equality and inclusiveness while implementing smart technologies. The several definitions shown here illustrate the complex and multi-dimensional character of smart cities, which involve technological progress, community involvement, and regulatory structures that influence the changing urban environment.

Smart cities are characterized by their innovative and technology-driven approach to urban development, which includes a variety of fundamental traits and components. These encompass the application of Information and Communication Technologies (ICTs) to improve the economic, political, social, and cultural dimensions of urban life. Smart cities highlight the optimization of urban processes and services by seamlessly incorporating technology, with a focus on efficiency, sustainability, and enhancing the quality of life for their citizens (Kummitha and Crutzen, 2017, p. 45). The essential elements of smart cities consist of interconnected infrastructures, data-centric decision-making procedures, and Information and Communication Technology (ICT) based solutions for delivering services. The notion highlights the significance of human capital, infrastructural capital, social capital, and entrepreneurial capital in propelling the advancement of intelligent urban environments (Kummitha and Crutzen, 2017, p. 43). Furthermore, smart cities prioritize the development of intelligent, efficient, secure, and environmentally sustainable metropolitan areas that meet the varied requirements of their residents (Kummitha and Crutzen, 2017, p. 45). Smart cities heavily rely on technology, but there is also an increasing acknowledgment of the importance of considering social justice, sustainability, and inclusivity in urban design and development (Kummitha and Crutzen, 2017, p. 44). The dynamic nature of smart cities emphasizes the continuous discourse and endeavours to harmonize technical progress with social and environmental factors in order to establish thriving and habitable metropolitan areas.

Over decades, historical advancements that have influenced the intersection of urban planning and technological integration have contributed to the development of smart cities. ICTs have greatly contributed to the development of smart city programs. In the 2000s, firms like IBM started

investigating the idea of improving public services and infrastructure using information technology and data analysis, which set the foundation for the smart city movement (Halegoua, 2020, p. 12). In the early 21st century, the proliferation of IoT devices and sensors has given cities the ability to gather real-time data and monitor urban activity. This has facilitated better informed decision-making and improved resource management (Halegoua, 2020, p. 31). In addition, the ideology of new urbanism, which prioritizes the creation of urban settings that are both sustainable and liveable, has had a significant impact on the advancement of smart cities (Halegoua, 2020, p. 31). We achieve this by emphasizing the importance of integrating technology to address urban challenges. Historical trends, increasing urbanization, and the desire for more efficient and sustainable urban solutions influence the advent of smart cities, responding to the complex demands of modern urban living (Halegoua, 2020, p. 20). Smart cities are constantly evolving and innovating, building on historical foundations. They use technology to create urban areas that are more connected, efficient, and inclusive for citizens.

The emergence of digital technologies, internet connectivity, and data analytics has laid the groundwork for smart city programs to utilize technology for urban development. Global initiatives like the Kyoto convention and policies like the Europe 2020 strategy, which have prompted towns to embrace innovative solutions for sustainable growth, have significantly advanced the smart city movement (Kummitha and Crutzen, 2017, p. 43). Governments and organizations are exploring smart city ways to tackle the difficulties of rapid urbanization and environmental deterioration, spurred by the growing emphasis on efficiency, sustainability, and quality of life in urban areas. Furthermore, collaborative partnerships among governments, private sector companies, and international organizations have had a substantial impact on advancing smart city initiatives and stimulating technical advancement in urban areas (Kummitha and Crutzen, 2017, p. 49). These events in the past have established the foundation for the rise of smart cities as a revolutionary method of urban planning that combines technology, sustainability, and social inclusivity to generate inventive and enjoyable urban spaces.

The notion of smart cities has developed over time, mirroring advancements in technology, urban planning approaches, and societal requirements. Smart cities were originally characterized by the integration of digital infrastructure and information and communication technologies (ICTs) to improve urban systems and increase services (Halegoua, 2020, p. 12). However, as the idea developed, the emphasis turned towards utilizing data and technology to tackle an increased number of urban issues and enhance the overall standard of living for people. Smart cities have started to prioritize the integration of IoT devices, sensors, and data analytics in order to facilitate real-time

monitoring and decision-making processes (Halegoua, 2020, p. 5). The progression has resulted in a comprehensive approach to urban development, wherein smart city projects prioritize sustainability, citizen involvement, and inclusivity as crucial factors (Halegoua, 2020, p. 8). In addition, the notion of smart cities has broadened to include the ability to predict future urban situations and trends using big data analytics. This allows cities to take proactive measures in response to changing circumstances. As smart cities progress, there is an increasing acknowledgment of the significance of human-centred design and fair access to technology and services. This reflects a move towards more inclusive and people-focused approaches to urban development. Smart cities have transformed into dynamic and flexible urban settings that value innovation, sustainability, and citizen well-being by adjusting to changing technical landscapes and societal needs.

Advocates have highlighted the significance of utilizing human capital, infrastructural capital, social capital, and entrepreneurial capital to stimulate the advancement of intelligent urban environments (Kummitha and Crutzen, 2017, p. 43). Smart cities have evolved to adopt a more comprehensive strategy that takes into account the social and environmental consequences of integrating technology in urban areas. Smart city efforts have faced criticism due to worries about their possible negative impacts, including social inequities, the privatization of urban space, and the dominance of corporations in design and execution (Kummitha and Crutzen, 2017, p. 48). The ongoing discourse and contention surrounding smart cities exemplify a fluid progression of the idea, with an increasing focus on harmonizing technical progress with principles of social equity, environmental sustainability, and active involvement of the community in urban planning and growth.

Datafication refers to the process of converting various aspects of urban life into measurable data using digital technologies and sensors. Datafication, in the context of smart cities, is the process of transforming real-world events into digital data with the goal of extracting economic, political, or societal value from this information (Walentek, 2021, p. 1). This process entails creating large-scale digital representations of different parts of reality, collecting data from interested parties, and using this data for analysis and decision-making. In smart cities, datafication is critical for optimizing urban infrastructure and services. Smart city authorities may make informed decisions to improve mobility, resource management, security, and general quality of life by collecting and analyzing data on inhabitants (Walentek, 2021, p. 2). This data-driven strategy enables cities to implement cutting-edge technologies, enhance operational effectiveness, and promote sustainable growth. By utilizing information and communication technology (ICT), smart cities can use datafication to create a more linked, responsive, and intelligent urban environment that meets the changing demands of people and

stakeholders. Datafication plays a crucial role in the advancement of smart cities by establishing a basis for the enhancement and streamlining of urban infrastructure systems. Smart city technology encompasses the gathering, analysis, and application of digital information to improve different areas of urban life, including transportation, efficient use of resources, safety, social progress, and economic expansion (Walentek, 2021, p. 2). Smart cities can effectively control various systems such as heating, cooling, electricity supply, water supply, public safety, waste management, and resident mobility by utilizing information and communication technology (ICT) (Walentek, 2021, p. 2). By utilizing a data-driven strategy, cities may enhance the well-being of their citizens while simultaneously fostering sustainability and efficiency in municipal operations.

Datafication profoundly transforms the traditional functions of urban government and planning, through the use of a data-driven strategy that revolutionizes decision-making processes and strategies for managing cities. Datafication in smart cities enables city authorities to go beyond traditional governance and planning methods by utilizing digital data to shape policies, initiatives, and resource distribution (Walentek, 2021, p. 4). Real-time, detailed data insights from a variety of sources, such as sensors, social media, and citizen feedback, can now inform urban government. This allows for a more accurate and up-to-date approach rather than depending exclusively on historical data or personal accounts (Walentek, 2021, p. 2). The adoption of data-driven governance enables better informed and evidence-based decision-making, resulting in optimum resource allocation, improved service delivery, and greater urban sustainability (Walentek, 2021, p. 1). In addition, datafication facilitates a proactive and agile approach to urban planning, enabling authorities to predict and tackle developing concerns in real-time rather than responding to issues after they have already happened. By adopting datafication, urban governance and planning can become more flexible, responsive, and focused on citizens' needs, ultimately promoting creativity, effectiveness, and resilience in urban space administration (Walentek, 2021, p. 12).

Urban planners may enhance the usefulness and sustainability of cities by transforming urban interactions and activities into data streams and using advanced algorithms to forecast trends, discover patterns, and make informed decisions. This technique's data utilization allows for a proactive and flexible approach to urban planning, enabling real-time modifications and responsive plans based on growing data insights. Consequently, urban governance improves in terms of efficiency and effectiveness, as policymakers can depend on empirical facts and data-driven insights to tackle urban challenges and take advantage of opportunities (Yuksekdag, 2024, p. 7). The shift to data-driven governance poses a challenge to conventional decision-making methods by highlighting the

significance of evidence-based practices and data-driven insights in creating municipal policies and strategies. By prioritizing data-driven methodologies, cities may improve their ability to adjust to evolving urban dynamics, optimize resource allocation, and stimulate innovation in urban development, ultimately creating a more sustainable and resilient future for urban settings.

While datafication offers several advantages for urban government and planning, it also has specific disadvantages and obstacles that must be resolved. An important limitation is the possibility of data bias and prejudice in decision-making procedures. Yuksekdag (2024) posits that the collection and analysis of data in urban areas may unintentionally perpetuate existing prejudices and inequalities (Yuksekdag, 2024, p. 8). This can lead to decisions that perpetuate socioeconomic imbalances. In addition, the dependence on data-driven insights may disregard qualitative components of urban life that are not readily measurable, thereby disregarding the needs and viewpoints of underprivileged people. More importantly, the growing reliance on data and algorithms in urban planning could lead to privacy and data security concerns, given the potential for misuse or illegal access to sensitive citizen information. The speed at which technology is improving in datafication may be faster than how well urban governance systems can adapt and regulate. This could leave gaps and make it harder to make sure that decision-making processes are open and accountable. To overcome these limitations, it is necessary to find a delicate balance between utilizing data for well-informed decision-making and protecting against unforeseen negative outcomes. This highlights the importance of ethical considerations and community involvement in the implementation of data-driven urban governance and planning strategies.

The integration of digital technologies with the conventional capitalist economic system, known as digital capitalism, fundamentally transforms the creation, trading, and accumulation of value. Digital capitalism refers to the use of digital technologies and platforms within the context of capitalism, resulting in the development of new economic models and social structures (Sadowski, 2020, p. 49). The incorporation of technology into the capitalist system has significant ramifications for multiple facets of society, such as production methods, consumer habits, and power structures. Companies in the digital capitalism sector utilize data-driven insights, automation, and algorithmic decision-making to improve operations, target markets more efficiently, and increase profitability. Moreover, this highlights that digital capitalism is not a deviation from traditional capitalism but rather a progression that maintains fundamental aspects of exclusion, extraction, and exploitation, although inside a technologically sophisticated framework (Sadowski, 2020, p. 50). The interdependence between digital technologies and capitalist practices highlights the profound impact of digital capitalism, which

influences enterprises' operations, individual interactions, and the functioning of economies in the digital era.

The influence of digital capitalism on the economic structures and power dynamics is significant in shaping the development and implementation of smart cities. Smart technology serves as a tool for transforming society to establish conditions that support the requirements of digital capitalism (Sadowski, 2020, p. 52). This process entails restructuring fundamental environments such as workplaces, residences, and urban areas to conform to the demands of a digitally-oriented economic system. Entrepreneurs want to establish integrated networks of businesses, platforms, applications, and devices within smart cities. This collective integration aims to disturb the current balance and revolutionize the urban landscape. Sadowski (2020) raises an important question about these ecosystems' features, pointing out that they could have many kinds of interactions, such as mutualistic, symbiotic, or parasitic partnerships (Sadowski, 2020, p. 52). This implies that the advancement of smart cities driven by digital capitalism may favor specific interests, resulting in unequal distribution of benefits and power imbalances among stakeholders. In addition, Sadowski (2020) highlights the concept of "microenclosure," which emphasizes how firms maintain ownership and control over the digital aspects of tangible assets in smart cities. This eventually affects the access, usage, and ownership rights of individuals (Sadowski, 2020, p. 63). The current trend towards digital enclosure represents a broader shift towards a "landlord 2.0" paradigm, where individuals adopt the role of technology renters instead of owners, subject to the terms and conditions set by companies (Sadowski, 2020, p. 63). In urban settings, digital capitalism fundamentally influences the development of smart cities by altering the concepts of ownership, control, and power dynamics. This, in turn, has a significant impact on the integration and utilization of technology in city ecosystems.

The impact of digital capitalism on smart cities is significant, as it shapes the collection, analysis, and utilization of data in urban areas. Digital capitalism's emergence has transformed data into a commodity, leveraging information as a valuable resource for economic gain (Walentek, 2021, p. 2). Within the framework of smart cities, the process of turning data into a commodity has significant consequences for the management and organization of urban regions. Private technology companies and data-focused businesses frequently have a significant impact on smart city projects by supplying the necessary technological systems and solutions. This results in a situation where digital capitalism influences the development and execution of municipal policies and services. In addition, the use of data-driven technology in smart cities might give rise to difficulties concerning data privacy, security, and ownership (Walentek, 2021, p. 11). The impact of digital capitalism in smart cities raises

questions about power dynamics, responsibility, and the fair allocation of advantages resulting from datafication and technological progress. As smart cities progress, it is crucial for policymakers, urban planners, and stakeholders to carefully analyze the influence of digital capitalism on urban development. This analysis should ensure that data-driven initiatives prioritize the well-being and interests of all citizens while also promoting transparency and ethical use of data.

Within the domain of smart cities, multiple stakeholders have an essential role in both the establishment and governance of these kinds of cities. The stakeholders encompass various government authorities at different tiers (local, regional, and national), private sector organizations (technology companies, infrastructure developers), academic institutions, non-governmental organizations (NGOs), and citizens. Government entities play a crucial role in establishing laws, regulations, and standards for smart city efforts (Barns et al., 2017, p. 21). They provide a framework for the structure and guidelines for smart city initiatives. These entities frequently work together with private sector partners to execute technological remedies for urban challenges. Technology enterprises, especially those in the private sector, play a crucial role in supplying the essential digital infrastructure and services required for smart cities. These individuals possess specialized knowledge in the creation and implementation of technologies such as Internet of Things (IoT) devices, data analytics platforms, and communication networks that serve as the foundation of smart city systems (Barns et al., 2017, p. 25). Academic institutions play a role in advancing the understanding of smart urbanization and digital infrastructures through research, innovation, and information sharing (Barns et al., 2017, p. 26). Non-governmental organizations (NGOs) and citizen groups are crucial in promoting openness, inclusivity, and citizen engagement in smart city projects. They make sure to consider the community's interests and requirements in the decision-making processes (Barns et al., 2017, p. 26).

Overall, the cooperation and organization among these varied participants are crucial for the effective establishment and management of intelligent urban areas. Every stakeholder contributes unique viewpoints, resources, and expertise, which collectively contribute to the creation of urban settings that are sustainable, inclusive, and technologically sophisticated. Through collaboration, these key participants can tackle the intricate obstacles presented by digital infrastructures in urban environments and utilize the capabilities of smart technology to enhance the citizens' quality of life. Utilizing data to inform urban governance provides numerous advantages, such as better decision-making, more efficiency in delivering services, and enhanced transparency and accountability (Barns et al., 2017, p. 25). Municipal leaders can use data analytics and real-time

information to get useful insights into urban trends, citizen requirements, and infrastructure performance. This allows them to make better-informed and evidence-based decisions. This can result in efficient resource allocation, improved urban planning, and more prompt public services customized to the unique requirements of the community (Barns et al., 2017, p. 28). Data-driven governance can promote innovation and economic growth by providing possibilities for data scientists, entrepreneurs, and technology companies to provide novel services and solutions that tackle urban concerns.

Nevertheless, the implementation of data-driven municipal governance is not without its disadvantages and obstacles. An important problem to consider is the possibility of privacy violations and improper use of data, as the gathering and examination of large quantities of personal information give rise to ethical and security concerns (Barns et al., 2017, p. 21). Digital exclusion refers to the potential for specific groups of people to face exclusion or disadvantage due to limited access to technology or a lack of digital skills (Barns et al., 2017, p. 24). Furthermore, the dependence on data-driven decision-making may occasionally neglect qualitative aspects of urban life and community preferences, resulting in a more technical and less participatory method of administration. Municipal leaders must prioritize addressing these difficulties by proactively establishing strong data protection measures, fostering digital literacy among residents, and ensuring that data-driven policies are inclusive, transparent, and in line with the values and requirements of the community (Barns et al., 2017, p. 28).

The potential for a digital divide and exclusion in data-driven urban governance stems from inequalities in access to digital tools, varying levels of data literacy, and inequities in opportunities for online interaction among citizens. In the context of smart cities, where data analytics and technology play a crucial role in governance processes, individuals who do not have access to the required digital tools or skills may face marginalization. As a result, they may be unable to fully engage in decision-making processes or reap the benefits of smart city projects (Bibri, 2019, p. 3). This exclusion can worsen pre-existing social disparities by further marginalizing disadvantaged populations and expanding the gap in access to digital resources in urban areas. Vulnerable populations, including impoverished households, senior citizens, and residents of underserved communities, have a heightened risk of exclusion from data-centric urban government initiatives. Without fair access to digital platforms or the ability to comprehend and use data effectively, these communities might lose the chance to shape urban policies, priorities, or services that directly affect their well-being. Consequently, the advantages of smart city projects, such as better public services,

upgraded infrastructure, and sustainable development, may not reach those who need them the most, thus perpetuating inequality and exacerbating existing socioeconomic inequities in urban environments. To lower the risk of digital exclusion in cities that are run by data, it is important for city leaders and other interested parties to prioritize digital inclusion strategies that ensure everyone has equal access to technology, support programs that teach people how to use data, and offer ways for people to really get involved in their communities (Bibri, 2019, p. 3). Cities can achieve more inclusive, responsive, and socially equitable urban governance by narrowing the gap in access to digital technology and enabling all people to actively engage in decision-making processes related to smart city initiatives.

The intersection of datafication and digital capitalism in the creation of smart cities entails an intricate connection where the commercialization of data and the pursuit of economic objectives collide with the alteration of urban environments through digital technology (Barns et al., 2017, p. 29). Datafication refers to the process of transforming different elements of urban life and infrastructure into units of data that can be gathered, examined, and employed for the purpose of making informed choices and enhancing efficiency (Barns et al., 2017, p. 24). Within the framework of smart cities, this data-focused approach allows city authorities and private sector entities to improve operational efficiency, provide tailored services, and generate new sources of income through data-driven insights (Barns et al., 2017, p. 25). Digital capitalism flourishes by extracting, processing, and profiting from data, as tech companies and service providers utilize digital technologies to take advantage of the economic value produced by data exchanges and transactions. Smart city technologies, including IoT devices, sensors, and data analytics platforms, enable the ongoing gathering and analysis of data on urban processes, human behaviour, and infrastructure performance (Barns et al., 2017, . 26). This data serves multiple purposes, including optimizing resource allocation, enhancing service delivery, fostering innovation, attracting investment, and promoting economic growth in metropolitan areas (Barns et al., 2017, p. 28).

Nevertheless, the intersection of datafication and digital capitalism in smart cities gives rise to apprehensions regarding data privacy, security, and the consolidation of power among a small group of dominating technology companies (Barns et al., 2017, p. 29). The commercialization of urban data can result in problems related to surveillance, data exploitation, and unequal distribution of digital technology's advantages. This emphasizes the necessity for ethical governance frameworks, transparency, and accountability in the administration of urban data ecosystems (Barns et al., 2017, p. 24). It is essential to strike a balance between the economic demands of digital capitalism and the social and ethical concerns of datafication in order to guarantee that smart cities foster inclusive economic growth, empower citizens, and support sustainable development (Barns et al., 2017, p. 26).

Smart cities: Implications for Governance, Inclusion, Access ad Equity

Smart cities, with their potential to increase efficiency and enhance quality of life through new technologies, have important implications for inclusion, access, and equity. With the growing implementation of intelligent technologies in urban regions to regulate resources, transportation, and infrastructure, it is essential to analyze the beneficiaries of these progressions and the potential exclusion of some groups. The integration of digital technologies has the potential to close gaps in access to services and opportunities. However, if not handled properly, it also has the potential to worsen existing disparities. To ensure that smart city efforts are inclusive and equitable, it is necessary to engage in careful planning and governance that takes into account the various needs of all people, especially those in marginalized and underserved communities.

Blesset et al.'s (2019) "The Social Equity Manifesto" principles outline key areas of focus that can facilitate progress towards attaining social equity in the study, teaching, and application of public administration (Blessett et al., 2019, p. 296). One crucial aspect highlighted is the basic role of social fairness as a central element rather than merely a distinct component within public administration (Blessett et al., 2019, p. 296). Researchers, teachers, and practitioners have a duty to actively advocate for social fairness in their individual professions, making sure that this advocacy aligns with other fundamental aspects of the discipline. In addition, the manifesto emphasizes the dedication of public administration professionals to promote ethical governance, social fairness, and resilient communities (Blessett et al., 2019, p. 296). This requires a willingness to confront and question preconceived notions, actively participating in conversations that may be uncomfortable, and making a dedicated effort to continually educate oneself in order to integrate the principles of fairness and cultural comprehension into everyday routines. Moreover, social equity aims to eradicate any types of disparities, requiring both systemic and institutional modifications as well as self-reflection and dedication from academics and professionals (Blessett et al., 2019, p. 296). This comprehensive strategy includes promoting social fairness in teaching, research, recruitment methods, policy enforcement, and managerial decision-making. The Social Equity Manifesto aims to direct public administrations to incorporate social equity as a core value and practice in the sector. This will ultimately promote more inclusive and fair governance by focusing on five important areas of emphasis.

The Social Equity Manifesto defines inclusion, access, and equity as core values that are crucial for promoting social justice in public administration (Blessett et al., 2019, p. 297). Inclusion refers to the

active participation and empowerment of all persons, especially those who belong to marginalized or underrepresented groups, in decision-making processes and the provision of public services. The focus is on establishing settings that appreciate and incorporate a wide range of viewpoints to cultivate an atmosphere of inclusion and engagement for all individuals in society. Access, however, refers to the removal of obstacles that prevent individuals from fully participating in opportunities, resources, and services. This involves guaranteeing equal access to education, healthcare, employment, and other vital services for all citizens, irrespective of their background or circumstances. Equity, as stated in the manifesto, refers to the right allocation of resources, opportunities, and advantages to rectify past and systemic inequalities and foster justice and fairness for everyone (Blessett et al., 2019, p. 297). It highlights the significance of actively striving to eradicate disparities and establishing circumstances in which every individual has the opportunity to flourish and achieve their maximum capabilities. The Social Equity Manifesto highlights the importance of inclusion, access, and equity in developing policies, practices, and attitudes within public administration to promote a fair and just society.

Within the framework of smart cities, the principles of inclusion, access, and equity are of crucial significance. These concepts strive to guarantee that the advantages of technological progress and urban growth are available to every individual in society. The concept of smart cities encompasses more than just digital technology. Instead, Caragliu and Del Bo (2022, p. 1100) view sustainability as a method to achieve long-lasting economic development, a superior standard of living, and prudent resource utilization through inclusive government. This explanation highlights the significance of investing in human and social capital, along with both conventional and modern communication infrastructure. This refers to the active engagement and participation of varied communities in the decision-making procedures and advantages of smart city programs. This aspect emphasizes the importance of involving all stakeholders, especially marginalized groups, in the planning and execution of digital initiatives to promote social unity and mitigate tensions across diverse communities. Within this context, inclusion pertains to the concept that every individual, irrespective of their background or socioeconomic status, should have equitable access to the benefits derived from technological breakthroughs and urban services (Caragliu and Del Bo, 2022, p. 1100). Access, however, refers to the accessibility and affordability of these technologies and services for all inhabitants, regardless of their socio-economic position or geographical location (Lahat, 2023, p. 14). The objective is to guarantee universal access to technology without exacerbating pre-existing disparities or perpetuating social exclusion among different populations. Equity, in the context of smart cities, refers to the goal of ensuring impartiality and righteousness in the allocation of resources and opportunities, with the aim of diminishing inequalities and fostering equitable access to

advantages (Caragliu and Del Bo, 2022, p. 1100). The process entails repairing inequalities and guaranteeing that every person has equitable access to services and opportunities offered by smart city initiatives. By prioritizing inclusion, access, and equity in the development of smart city initiatives, urban regions can work towards establishing more sustainable, habitable, and all-encompassing communities for all inhabitants.

Smart city initiatives have a lot of promise, but they face obstacles such as digital disparities, socioeconomic influences, and privacy concerns. These obstacles impede underprivileged populations from fully reaping the benefits of these breakthroughs. To ensure equal access to the benefits of smart cities, it is necessary to implement targeted interventions and inclusive policy frameworks. Certain demographics face obstacles that impede their full participation and benefit from smart city initiatives. These barriers may include digital exclusion, which refers to the situation where people lack access to technology or the internet, thereby restricting their ability to participate in smart city services. Socioeconomic inequality significantly affects the ability of excluded communities to benefit from smart city efforts. These groups may have insufficient financial means to purchase smart gadgets or access advanced technological infrastructure, hence worsening the already-existent digital divide (Sugandha et al., 2022, p. 6). Because of a lack of access to essential technology, people in these communities are unable to fully participate in the services and possibilities provided by smart cities, exacerbating social and economic disparities. Cultural issues play a role in limiting the involvement of specific people in smart city programs. Communities may harbour valid apprehensions over data privacy and security while engaging with smart city technologies (Sugandha et al., 2022, . 6). This lack of trust may arise from past instances of surveillance, prejudice, or data breaches, resulting in a hesitancy to interact with digital platforms that gather personal data. To ensure the acceptance and adoption of smart city solutions among varied cultural groups, it is crucial to address these issues and establish confidence by implementing a transparent methodology. In order to tackle these difficulties, it is essential to prioritize inclusive design principles that take into account the accessibility needs of all members of the community, guaranteeing that smart city solutions are usable and beneficial for everyone.

The discrepancy between the commitments made in smart city plans and the tangible results observed in reality arises from the inclination of smart city discourse to prioritize technology remedies for urban challenges, such as digital connection and data-driven decision-making (Wigg, 2016, p. 548). Although these technological advancements are praised as powerful tools for tackling urban challenges, they frequently oversimplify the intricate and deeply ingrained issues that cities face,

particularly those linked to long-standing problems such as post-industrial economic decline, marginalization of inner cities, and limited economic opportunities for residents. Smart city projects that prioritize technical solutions may overlook the complex and deep-rooted urban difficulties that require a more comprehensive approach. Challenges such as the economic downturn and social exclusion necessitate comprehensive and all-encompassing strategies that go beyond the mere adoption of technology solutions. An excessive focus on technology-driven solutions may result in a disregard for the fundamental social, economic, and political elements that contribute to urban inequality (Wigg, 2016, p. 548). Hence, it is imperative for smart city programs to transcend a limited emphasis on technological advancement and encompass a broader comprehension of urban challenges. By recognizing the intricate nature of urban problems and embracing a more comprehensive and collaborative style of government, cities can strive for fair and sustainable solutions that advantage all inhabitants, particularly those in marginalized communities.

The digital divide describes the discrepancy or inequality that exists between individuals or communities who have access to and can proficiently utilize digital technologies and those who lack such access, resulting in unequal opportunities and outcomes (Shin et al., 2021, p. 4). Originally, the digital divide concept concentrated on unequal access to technology, but it has now broadened to encompass the unequal use of technology that contributes to social inequality. This issue leads to substantial disparities in individuals' daily lives, affecting different facets such as education, work, healthcare, and general welfare. Within the framework of smart cities, the digital divide encompasses not only the availability of technology but also the level of user involvement with emerging technologies (Shin et al., 2021, p. 17). Factors such as age, education level, income, and geographic location influence the digital divide, highlighting the intricate socio-demographic variables that contribute to this split (Shin et al., 2021, p. 6). Providing equal access to digital resources is crucial to closing the technology gap. Encouraging everyone to participate in the digital revolution and benefit from the advancements in smart city technologies is crucial.

The combination of multiple critical factors influences the digital divide in advanced smart city ideas. Socio-demographic factors, including gender, age, socio-economic status, and geography, have a substantial impact on the formation of the digital divide (Shin et al., 2021, p. 6). These factors can lead to varying experiences and levels of involvement with technologies, eventually affecting individuals' ability to access and use smart city innovations. Furthermore, factors such as digital literacy and the perceived importance of new technologies contribute to this variation. People who do not possess the necessary skills or knowledge to proficiently utilize digital technology may face a

disadvantage in capitalizing on the progress made in smart city infrastructure. The requirement for active participation of citizens in the implementation of smart city technologies introduces an additional aspect to the digital divide, underscoring the significance of not only having access to technology but also engaging with it in a meaningful manner (Shin et al., 2021, p. 6). By comprehending and tackling these factors, smart city authorities can strive to create inclusive and sustainable urban settings. This would enable all residents to engage in and reap the benefits of the digital transition.

Smart cities can implement proactive strategies to promote equitable access to and utilization of digital technology for all people, especially those who are disadvantaged. An essential approach is to develop user-friendly services that specifically address the requirements of various social demographics and offer continuous education and assistance about digital literacy and the benefits of emerging technologies (Shin et al., 2021, p. 18). Smart cities may empower individuals in demographic groups such as the elderly, low-income families, and residents in rural regions by providing tailored education programs. These programs aim to equip individuals with the necessary skills and knowledge to effectively engage with digital technologies. In addition, establishing booths to provide 5G technology demonstrations and hosting regular lectures on mobile literacy and 5G technologies can contribute to reducing the digital gap by raising awareness and encouraging the adoption of technology in a more inclusive manner (Shin et al., 2021, p. 18). Smart cities can mitigate the digital divide by prioritizing user interaction with technologies rather than mere physical connectivity, thereby guaranteeing equal opportunities for all residents to engage in and reap the benefits of smart city improvements (Shin et al., 2021, p. 4). By implementing these ideas and tactics, smart cities can strive to create inclusive and fair digital ecosystems that enable everyone to prosper in the digital age.

Smart cities' planning and implementation have significant social justice implications because they shape the perception and experience of urban life in various areas. As urban areas adopt cutting-edge technologies to enhance efficiency and promote sustainability, there is a potential danger of exacerbating pre-existing disparities if these endeavours target wealthier regions or neglect the needs of marginalized communities. Concerns of utmost importance include ensuring fair access to digital infrastructure, implementing decision-making processes that involve active participation, and addressing the risks of surveillance and infringement on privacy. Ensuring social justice in smart city development involves pushing for inclusive policies that take into account the varied needs of all people, especially those who are vulnerable and underprivileged. This aims to promote fairness,

equity, and community empowerment in the digital era. Smart city development and implementation have substantial social justice implications that necessitate careful consideration to ensure fair outcomes for all citizens. Caragliu and Del Bo (2023) provide insights into how smart urban features can affect urban inequality in terms of the digital divide dimension (Caragliu and Del Bo, 2023, p. 1). An important social justice implication is the potential for worsening existing disparities if smart city efforts disproportionately benefit privileged groups or disregard the concerns of vulnerable areas.

If the distribution of digital technologies and services among diverse demographic cohorts is not equal, smart city development may unintentionally worsen socioeconomic disparities. This can exacerbate the digital divide, hence restricting prospects for socioeconomically disadvantaged populations to fully engage in the digital society (Caragliu and Del Bo, 2023, p. 1). In addition, the impact of multinational corporations on defining smart urban changes can give rise to issues over the prioritization of interests in the decision-making process, potentially leading to the marginalization of particular populations (Caragliu and Del Bo, 2023, p. 2). In order to tackle the social justice concerns, it is essential for smart city planners to embrace inclusive and participatory methods that involve a wide range of stakeholders, including community members from marginalized demographics, in the creation and execution of smart city initiatives (Caragliu and Del Bo, 2023, p. 1). By integrating ideas of equity and social justice into the processes of developing smart cities, metropolitan areas can strive to develop urban settings that are more inclusive and easily accessible to all citizens. Furthermore, allocating resources towards digital literacy initiatives and infrastructure in disadvantaged regions can help narrow the gap in access to technology and encourage more equitable social development in smart cities (Caragliu and Del Bo, 2023, p. 3). Cities can aim to build equitable and inclusive regions that benefit all citizens, regardless of their socioeconomic standing or background, by actively considering social justice factors in smart city development and implementation.

Based on the findings and discussions of Caragliu and Del Bo (2023), various strategies can be utilized to achieve equal distribution of smart city resources. An important approach is to concentrate on inclusive smart city projects that stress equitable access to digital technology and advantages among various demographic groups. We can utilize targeted investments in human and social capital, along with both traditional and modern communication infrastructure, to foster sustainable economic growth and enhance the overall quality of life for all people (Caragliu and Del Bo, 2023, p. 4). Incorporating a participatory governance strategy can effectively consider the requirements and viewpoints of many groups during the planning and execution of smart city projects.

It is crucial to tackle the disparity in digital literacy and skills among marginalized populations, including individuals with limited education, cognitive disabilities, and the elderly, who may be disproportionately concentrated in underprivileged regions (Caragliu et al., 2023, p. 3). Offering training programs and assistance to these demographics to improve their digital proficiency will help narrow the gap in access to technology and guarantee that all individuals can take advantage of the advantages provided by smart city technologies. Furthermore, policymakers should take into account the spatial aspect of the digital divide, specifically the disparities between urban and rural regions in terms of their access to high-speed broadband connections (Caragliu and Del Bo, 2023, p. 3). Enhancing connectivity in rural and remote locations can mitigate discrepancies in digital access and guarantee equitable opportunities for individuals in all regions to engage in the digital economy. Cities can strive to create more inclusive and equitable digital societies by adopting a comprehensive and diversified approach to smart city development that takes into account the various demands and conditions of urban residents. The solutions are in line with the objective of utilizing intelligent technology to advance social inclusion and tackle urban disparities.

Case Study

Toronto: Sidewalk Labs

The Sidewalk Labs effort by Waterfront Toronto was a major development project with the goal of improving a specific portion of the Toronto waterfront, known as the Quayside area. The project, which was announced on October 17, 2017, received support from influential political figures such as Prime Minister Justin Trudeau and Ontario Premier Kathleen Wynne (Filion et al., 2023, p. 1625). People regarded it as a potential blueprint for upcoming smart city initiatives. Sidewalk Labs, a subsidiary of Alphabet (the parent company of Google), presented a comprehensive strategy that encompassed innovative urban solutions, including reduced carbon emissions, a pedestrian-friendly environment, and the incorporation of cutting-edge technologies to improve quality of life (Filion et al., 2023, p. 1625). Nevertheless, the project encountered substantial obstacles, such as widespread resistance to the suggested monitoring technologies and apprehensions regarding corporate dominance and democratic procedures. Critics argued that a foreign technology business could perceive the project as a form of "colonization," potentially weakening local governance and institutions (Filion et al., 2023, p. 1634). Although Sidewalk Labs started to gain some traction (particularly in municipal economic development, real estate, corporate, and tech circles), the political environment changed, especially following the election of a new provincial government that expressed disapproval of the project (Filion et al., 2023, p. 1625). The recent administration, under the leadership of Premier Doug Ford, openly condemned the agreement, denouncing it as a "terrible deal for taxpayers" and

expressing apprehension regarding Sidewalk's significant expectations for control over waterfront land (Filion et al., 2023, p. 1636). This skepticism not only reduced the political backing that Sidewalk had initially received, but also intensified public resistance as individuals became increasingly conscious of the consequences of corporate involvement with municipal governance. The interplay of these political dynamics posed increasing difficulties for Sidewalk Labs in maneuvering through the local political landscape and obtaining the necessary support from both government officials and the community, ultimately hindering their efforts to actualize the project (Filion et al., 2023, p. 1636). On May 7, 2020, Sidewalk Labs announced that it was pulling out of the project. The COVID-19 pandemic's economic uncertainty served as the stated reason (Filion et al., 2023, p. 1625). However, some experts argue that concerns about public trust and governance had a greater influence on the decision. (Filion et al., 2023, p. 1626)

The Sidewalk Labs project in Toronto exemplifies how smart city initiatives can commercialize urban space and data, giving rise to substantial problems surrounding privacy and public ownership. Sidewalk Labs wanted to build a more efficient urban environment and improve the quality of life for people by proposing a redevelopment plan that incorporated modern technology for data collection and surveillance (Filion et al., 2023, p. 1625). This vision, however, also involved the transformation of public space into commercial spaces, where urban areas would be planned not only for public use but also as opportunities for corporate companies to generate data and make profits (Filion et al., 2023, p. 1634). The consequences of this commercialization are significant, especially for privacy. Sidewalk Labs' comprehensive data gathering proposal raised concerns about the potential for overt monitoring and the violation of individual privacy rights, as it could track and examine people's movements and behaviors (Filion et al., 2023, p. 1625). In addition, the project brought attention to the conflict between public ownership and private control. The participation of a technology giant such as Sidewalk Labs in urban governance indicated a move towards privatized management of public resources, which could potentially marginalize community interests and democratic processes (Filion et al., 2023, p. 1636). Critics, particularly local advocacy groups, pointed out that the project posed a potential "land grab" situation in which private corporations may redefine and control public places, compromising the values of public ownership and democratic governance (Flynn and Valverde, 2019, p. 267). Waterfront Toronto's governance system gave Sidewalk Labs significant leverage, raising concerns about the transparency and oversight of urban data management and utilization. This situation highlights the necessity of strong systems that safeguard the interests of the public and guarantee that urban growth prioritizes involving the community and protecting privacy rights, rather than focusing solely on corporate profits. The Sidewalk Labs initiative acts as a warning,

highlighting the importance of strong regulatory frameworks that protect the public's interests and ensuring that urban development is a collaborative effort rather than a means of commercialization.

The governance challenges observed in the Sidewalk Labs arrangement with Waterfront Toronto were complex, bringing attention to important issues like responsibility, openness, and the involvement of public authorities in urban development. An important problem was the absence of clear jurisdiction and power for Waterfront Toronto to establish a smart city. The collaboration between Waterfront Toronto and Sidewalk Labs has sparked notable apprehensions regarding the extent of control that Sidewalk Labs may wield over urban planning and governance in the Quayside neighbourhood. Initially, the partnership envisioned the project as a smart city that would incorporate advanced technologies to improve urban living. However, as the project progressed, Sidewalk Labs put out an extensive development plan that included an increased number of initiatives than initially expected. This broadening of scope encompassed not just the incorporation of smart technology but also substantial modifications to land utilization, infrastructure, and public amenities. Consequently, the idea sparked a process of scrutinizing and possibly dismantling the existing governance structures that supervised urban development in Toronto. Critics contended that the vast powers and aspirations of Sidewalk Labs might potentially undermine the jurisdiction of local governments and public agencies, who traditionally bear the responsibility for urban planning and community involvement. The concern stemmed from the possibility that a profit-driven private corporation, influenced by corporate interests, could have the power to determine the conditions of urban development, disregarding the importance of public input and accountability systems that are crucial for democratic governance (Flynn and Valverde, 2019, p. 268).

The situation brought attention to the potential dangers of public-private partnerships in urban areas, where the authority could shift from elected officials and community stakeholders to a private corporation. This raised concerns about the impact on public ownership, transparency, and the overall management of urban spaces. Critics argued that democratically elected municipal authorities, not a public organization with appointed boards, should bear this responsibility (Flynn and Valverde, 2019, p. 267). In addition, the agreement has prompted concerns regarding the level of control that Sidewalk Labs has over urban planning and governance. The organization has put forward an extensive development plan that goes beyond the original scope, resulting in the destruction of current governance systems (Flynn and Valverde, 2019, p. 279). The lack of transparency surrounding the project, especially regarding data collection and privacy consequences, has made it more difficult to gain public trust and engagement. Advocacy groups such as #BlockSidewalk have demanded further

transparency (Flynn and Valverde, 2019, p. 267). The lack of a strong legislative structure to safeguard public interests and guarantee responsibility in the presence of private sector participation highlights the necessity for more explicit guidelines in upcoming smart city projects (Flynn and Valverde, 2019, p. 283). These governance difficulties highlighted the intricate nature of public-private partnerships in urban development and emphasized the crucial requirement for institutions that prioritize democratic supervision and public well-being.

The governance framework of the Sidewalk Labs project in Toronto serves as a prime example of wider capitalist tendencies in the digital era, specifically highlighting the substantial impact of technology corporations on urban planning and policy formulation. By enlisting Sidewalk Labs, a subsidiary of Google, as a development collaborator for the Quayside district, the project highlighted the significant influence that private technology businesses may have in creating urban environments. The goal of this collaboration was to use advanced technology to stimulate economic growth. It also generated significant apprehensions around data privacy and public supervision. The governance of the project was characterized by a lack of transparency and insufficient public participation, which led to public mistrust and hostility. The failure to establish public trust stems from the lack of engagement and openness in the planning and execution phases of the Sidewalk Labs initiative. A significant number of locals had a sense of exclusion from the decision-making process and harboured concerns over the utilization of personal data, which resulted in suspicion regarding the project's underlying motives. The idea that the program prioritized corporate financial gain over genuine public welfare intensified the lack of trust. The governance framework of the Sidewalk Labs initiative serves as a prime example of wider capitalist patterns in the digital era, including the growing impact of technology corporations on urban planning and policy formation. Sidewalk Labs aimed to establish itself as a pioneer in urban innovation, utilizing its technological expertise and financial capabilities to transform Toronto's urban environment. This effectively positioned a private corporation as a key player in public urban development (Filion et al., 2023, p. 1638). This phenomenon exemplifies an emerging pattern in which technology companies, armed with sophisticated data analysis and smart technologies, are not just participating in but also leading the efforts of urban governance. In doing so, they often marginalize the traditional roles and responsibilities of the public sector (Filion et al., 2023, p. 1639).

Furthermore, the Sidewalk initiative demonstrated the ability of corporate interests to influence governmental decisions. The corporation aggressively participated in lobbying activities to increase its control over the planning process, often disregarding public participation and openness (Filion et al.,

2023, p. 1636). This phenomenon raises significant questions about the responsibility and democratic legitimacy of urban governance, as profit-oriented motivations increasingly influence decisions that affect the public good and community welfare, rather than collective public concerns. All of these components combined to establish a delicate equilibrium between innovation and democratic accountability. The project's objective was to provide innovative answers to urban problems. However, its underlying philosophies and the absence of public confidence ultimately weakened its legitimacy and feasibility. The Sidewalk Labs project's failure serves as a warning about the need to incorporate democratic ideals and public participation into urban innovation initiatives to ensure that technological progress does not undermine accountability and community engagement.

The Sidewalk Labs initiative in Toronto is a significant case study that showcases the intricacies and difficulties of incorporating private technology companies into urban administration. Originally conceived as a groundbreaking endeavour to improve city life by implementing cutting-edge technologies, the project encountered substantial opposition from the community and local advocacy organizations due to concerns around privacy, public ownership, and the possible undermining of democratic procedures. The partnership between Waterfront Toronto and Sidewalk Labs prompted significant inquiries on the distribution of authority in urban planning, as skeptics expressed concerns that corporate interests would precede public engagement and responsibility. The shift in political backing, particularly after the election of a new provincial government, ultimately compromised the project's feasibility and led to its withdrawal, fostering growing public distrust. This circumstance highlights the need for strong regulatory frameworks and transparent governance structures in future smart city projects to ensure that technical progress benefits the public interest rather than corporate financial gain. The Sidewalk Labs experience underscores the significance of community participation and democratic oversight in changing urban settings, serving as a reminder to stakeholders that innovation must be in line with the values and needs of the communities it seeks to benefit.

Barcelona: The Success of Smart City Initiatives

The notion of smart cities emerged as a revolutionary method for urban growth, utilizing cutting-edge technologies to improve the effectiveness, sustainability, and quality of urban regions. Barcelona is a notable example among the numerous cities that have adopted this concept. Notable events and policies that have influenced its urban environment have firmly grounded the city's progression towards becoming a smart city. Comprehensive and interdisciplinary policies, combining technological advancements with urban planning and community involvement, distinguish Barcelona's strategy to become a smart city. This case study provides insights into the intricate

processes involved in the creation of smart cities, as well as their impact on future urban development. It examines the relationship between historical context, governance models, stakeholder roles, technological infrastructure, and social justice. The historical development of Barcelona has had a profound impact on its smart city projects, moulding a distinctive urban environment that encourages innovation and citizen participation. Barcelona's transformation from a conventional city to a contemporary city has been characterized by its commitment to incorporating technology into urban governance and public services. This development is based on the city's abundant cultural legacy and its unique position as a centre for innovation and enterprise (Ferrer, 2017, p. 75). The city has utilized its historical background to cultivate a dynamic environment that promotes cooperation among different entities, such as government organizations, businesses, and citizens.

The inception of the smart city concept in Barcelona occurred in the late 2000s, mirroring a worldwide trend where cities aimed to utilize technology to enhance the quality of urban life. It was during the leadership of Mayor Xavier Trias from 2011 to 2015 that Barcelona wholeheartedly embraced this vision, with the goal of positioning itself as a pioneer in intelligent urban planning (March and Ribera-Fumaz, 2019, p. 231). This dedication was exemplified by the deliberate integration of information and communication technology (ICT) into urban planning procedures. Under Trias's guidance, the city acknowledged the capacity of ICT to tackle diverse sustainability issues, including energy efficiency, waste management, and transportation (March and Ribera-Fumaz, 2019, p. 231). The city saw the incorporation of these technologies as a way to improve the standard of living for its residents while simultaneously promoting economic development. The concept's goal was to create a highly networked and efficient urban environment in which the use of data-driven solutions could result in improved resource management and superior public services. The prioritization of social equity was a crucial element of this smart city concept. The government aimed to ensure universal access to the benefits of technological breakthroughs, therefore fostering inclusion in urban development. During this period, Barcelona saw a notable change in its urban strategy, striving to find a balance between modernization and sustainable, equitable growth. The city aspired to be a role model for other cities around the world.

Barcelona faced notable difficulties in executing smart city initiatives, mostly related to citizen involvement and tackling social disparities. For instance, the Vincles BCN initiative specifically targeted the problem of social isolation among seniors. Although the previous administration developed the concept, it did not effectively implement it until 2017, indicating a delay in prioritizing projects that directly enhance individual lives and enhance community well-being (March and

Ribera-Fumaz, 2019, p. 233). The 2015 local elections in Barcelona were a significant turning point in the city's governance, with the left-wing party Barcelona en Comu, under the leadership of Mayor Ada Colau, assuming control (March and Ribera-Fumaz, 2019, p. 233-4). The change in leadership resulted in a shift in vision, moving away from a solely technology-focused approach to one that prioritized public empowerment and technological sovereignty. The new administration acknowledged the constraints of first smart city plans, which frequently prioritized corporate interests and infrastructure advancement while neglecting community concerns and equitable society (March and Ribera-Fumaz, 2019, p. 234). March and Ribera-Fumaz (2019, p. 238) introduced the new Barcelona Digital Plan in response to these concerns, aiming to redefine urban governance by promoting concepts such as transparency, circularity, and democracy. This strategy aims to establish a comprehensive framework for technological innovation, ensuring that the advantages of smart city projects are available to all citizens and that their voices play a crucial role in the decision-making process. Barcelona seeks to create a more equitable urban environment by giving importance to community involvement and social justice. The city aspires to ensure that technological progress is in line with the needs and desires of its citizens.

Barcelona's historical focus on community involvement and participatory governance is evident in the construction of innovation laboratories and citizen-driven programs. For example, projects such as "Barcelona in your pocket" showcase the city's dedication to improving urban living through technology by fostering the creation of mobile applications specifically designed to meet the requirements of its inhabitants (Ferrer, 2017, p. 74). This program incentivizes local developers and entrepreneurs to develop applications that offer vital services and information, such as public transportation timetables, local events, and municipal services. Barcelona strives to enhance the quality of life for its residents by enabling simple access to these digital technologies, thereby increasing convenience and efficiency in daily tasks (Ferrer, 2017, p. 74). This effort demonstrates the city's commitment to incorporating technology into everyday life and also promotes a culture of creativity and entrepreneurship in the community. A cyclical and interdisciplinary innovation paradigm distinguishes Barcelona's strategy for smart city development. This model prioritizes interdepartmental collaboration within the City Council, guaranteeing that different sectors cooperate to provide cutting-edge services that effectively address the evolving requirements of its inhabitants (Ferrer, 2017, p. 72). By dismantling organizational barriers and fostering collaboration across different departments, the city can formulate all-encompassing strategies that effectively tackle various urban issues simultaneously. This comprehensive approach enables the ongoing adjustment and enhancement of services, guaranteeing their continued relevance and effectiveness in addressing the needs of a constantly shifting urban environment. Barcelona's policies embody their vision of a

smart city that places civic engagement as a top priority and utilizes technology to establish a more habitable and adaptable urban environment. Barcelona's historical growth has provided a solid basis for its smart city ambitions, highlighting the significance of citizen participation, technology integration, and collaborative governance in establishing a sustainable urban environment.

Barcelona's smart city efforts have utilized several governance models that reflected top-down strategic planning with rising participatory frameworks. During Mayor Xavier Trias's administration, the governance model in Barcelona was defined by a top-down approach (Charnock et al., 2021, p. 586). The city council aggressively supported the smart city agenda and aimed to establish Barcelona as a global leader in smart urbanism (Charnock et al., 2021, p. 587). This approach entailed substantial collaborations with private companies and the creation of a specialized department, Habitat Urba, to link city administration with information and communication technology (ICT) procedures (Charnock et al., 2021, p. 588). Nevertheless, this hierarchical approach received backlash for favouring the concerns of multinational companies and property developers over those of the community members, resulting in social conflicts and opposition (Charnock et al., 2021, p. 582). The governing environment underwent a transformation following the election of the citizens' platform Barcelona en Comu in 2015, which implemented a more inclusive and participatory approach to governance (Charnock et al., 2021, p. 582). This novel strategy prioritized transparency, active citizen involvement, and their right to information, with the goal of redirecting the smart city agenda towards meeting the needs of residents rather than external corporate interests (Charnock et al., 2021, p. 588). The governance of smart city initiatives in Barcelona has shifted from a primarily top-down approach to one that aims to include input from local residents and promote democratic participation. This change aligns with the broader movement towards radical democracy in urban governance. This dichotomy underscores the complexity of implementing smart city policies in a way that strikes a balance between technological progress and social justice while also engaging the community.

The governance of Barcelona's smart city initiatives involves the participation of various levels of government, including municipal, regional, and national authorities. The interconnected responsibilities of each level of government contribute to the overall structure and execution of these programs. The Barcelona City Council has been the main catalyst of smart city initiatives at the local level, especially since 2015, under the leadership of the citizens' platform Barcelona en Comu (Charnock et al., 2021, p. 283). The local government has prioritized redirecting the smart city agenda towards public engagement, transparency, and the common good. Their goal is to empower residents and meet their demands. The local government's strategy focuses on the development of participatory

platforms and the promotion of digital democracy. This reflects their dedication to inclusive governance. At the regional level, the Catalan government establishes a comprehensive policy context and regulatory framework that impacts local efforts (Charnock et al., 2021, p. 591). The regional government in Catalonia has actively promoted smart city initiatives by fostering collaboration among municipalities and providing assistance for projects that are in line with regional development objectives (Charnock et al., 2021, p. 587). At this level, the government can allocate funds and offer resources to support local smart city initiatives, strengthening municipalities like Barcelona's ability to develop creative solutions. At the national level, the Spanish government is responsible for establishing comprehensive policies and frameworks that impact the development of smart cities. Local governments can leverage national goals in digitalization, urban development, and sustainability to integrate their actions with broader national objectives. Nevertheless, the dynamic between national and local governments can occasionally be complex, as local authorities may want to establish their independence in decision-making while simultaneously negotiating national policies that may not consistently correspond with local interests. In Barcelona's smart city initiatives, the interaction between local, regional, and national governments demonstrates a governance model that operates on multiple levels. Collaboration and negotiation among these different levels are crucial for successfully implementing policies and achieving a citizen-focused urban agenda.

The network governance models have a significant impact on decision-making and policy implementation in Barcelona's smart city programs. They promote collaboration among many stakeholders, such as public agencies, business entities, and civil society. Barcelona's City Council has implemented a primarily top-down governance strategy, taking the lead in setting the strategic direction for smart city programs (Gasco, 2016, p. 2986). At the same time, it collaborates with enterprises, universities, and other public administrations through public-private partnerships. This collaborative structure facilitates the consolidation of resources, experience, and new ideas, which are crucial for the effective execution of intricate urban projects. However, the success of this network governance paradigm depends on the active involvement of all stakeholders. Although the City Council has taken initiative in establishing and guiding the smart city strategy, there has been limited involvement of individuals and local communities. This has frequently led to a top-down approach that may not fully consider the needs and desires of the population (Gasco, 2016, p. 2988). The absence of citizen engagement could hinder the credibility and adoption of smart city initiatives, as inhabitants may perceive a detachment from the decision-making procedures that impact their lives.

In addition, maintaining stable governance despite political shifts has had both positive and negative consequences. On one hand, it has guaranteed the continuation of ICT adoption and smart city projects. However, it has raised questions about how well the strategy can adapt to changing political conditions and community needs. Network governance models in Barcelona promote collaboration and resource sharing (Gasco, 2016, p. 2988). However, they also emphasize the significance of inclusive involvement and adaptation in decision-making processes to improve the effectiveness and sustainability of smart city projects. The focus on openness and participatory government has made it easier to create platforms for public engagement. This allows residents to actively participate in the decision-making process and hold authorities responsible for their actions. The collaborative approach not only increases the credibility of smart city programs but also ensures that policies are more adaptable to the varied requirements of the urban population. The network governance models used in Barcelona's smart city projects demonstrate the capacity of collaborative frameworks to transform urban governance, enhancing its inclusivity and effectiveness in tackling the complexity of modern urban reality.

Significant events and policies that have shaped Barcelona's inventive urban environment have influenced its progression towards becoming a smart city. A significant turning point occurred when the Barcelona City Council established the Smart City Program with the objective of incorporating digital technologies into municipal administration and public services (Ferrer, 2017, p. 70). This project established the foundation for a comprehensive plan that prioritized community participation and technology progress. Barcelona received the "European Capital of Innovation Award" from the European Commission in 2014, acknowledging the city's dedication to promoting innovation and enhancing urban life through technology (Ferrer, 2017, p. 74). This recognition not only confirmed the effectiveness of the city's efforts but also motivated additional financial support and cooperation from those involved. Urban innovation labs have emerged as crucial platforms for testing and implementing new technologies and services, marking a critical milestone in this transformation (Ferrer, 2017, p. 75). These labs enable experimentation and customization of solutions to address specific local requirements. In addition, the "Barcelona in your pocket" project demonstrated the city's emphasis on citizen-driven innovation by encouraging the development of mobile applications that improve daily urban experiences. The city's approach is defined by a periodic and cross-cutting innovation model (Ferrer, 2017, p. 72). This model incorporates collaboration across different departments of the City Council to continuously enhance and modify services to meet the changing expectations of citizens. A combination of events and regulations has made Barcelona a prominent model of smart city development. This development highlights the significance of collaboration, innovation, and citizen participation in influencing the future of metropolitan areas.

The key stakeholders in Barcelona's smart city initiatives include the municipal government, private technology enterprises, research institutions, and the local community. The Barcelona City Council assumes a crucial role in coordinating the smart city strategy, with the objective of improving the public's quality of life and promoting sustainable urban growth (Zygiaris, 2013, p. 224). Private enterprises, for instance Cisco, play a vital role as partners by offering their technology knowledge and infrastructure to support the city's objectives in innovation (Zygiaris, 2013, p. 226). The Cisco Innovation Centre serves as a collaborative space for public and private entities to work together. Zygiaris (2013) describes it as a "smart city laboratory" that allows the experimentation and evaluation of innovative goods and services in real urban environments (Zygiaris, 2013, p. 227). Research institutes play a role in creating and studying smart city plans, while the local population is involved through efforts that encourage online involvement and digital knowledge, enabling individuals to actively engage in cultural events and express their views (Zygiaris, 2013, p. 225). Lastly, international institutions such as the European Commission and the United Nations contribute to smart city programs by offering frameworks and financial opportunities (Ferrer, 2017, p. 72). The cooperation of various stakeholders is crucial for promoting innovation and attaining the long-term goals of Barcelona's smart city vision. By adopting a multi-stakeholder approach, Barcelona ensures that its smart city efforts are comprehensive, inclusive, and in line with global standards, supporting the city's goal of becoming a self-sustaining and highly interconnected urban region.

International organizations, local communities, and private corporations all have important responsibilities and exert major influence in Barcelona's smart city efforts, adding to the complexity and dynamic of municipal government. International organizations, such as the City Protocol Society and different European Union entities, offer structures for cities worldwide to collaborate and share expertise. They advocate for the establishment of shared guidelines and optimal methods, which can assist cities such as Barcelona in establishing themselves as pioneers in intelligent urban planning (Charnock et al., 2021, p. 587). These organizations frequently support financial opportunities and provide technical assistance, allowing local governments to carry out innovative projects that are in line with global sustainability and digitalization objectives. Smart city programs recognize local communities as essential stakeholders. The Barcelona en Comu administration has prioritized citizen engagement in decision-making processes, highlighting the significance of participatory governance (Charnock et al., 2021, p. 582). Local communities provide essential insights and feedback, ensuring that smart city initiatives effectively meet their specific needs and concerns. The active participation of local citizens not only increases the credibility of initiatives but also cultivates a feeling of responsibility among them, which is essential for the sustained effectiveness of municipal programs

(Charnock et al., 2021, p. 588). Private enterprises also have a crucial role in the advancement and execution of intelligent urban technology. Collaborations with prominent firms like Cisco and Schneider Electric have enabled the implementation of sophisticated infrastructure and services in Barcelona (Charnock et al., 2021, p. 588). These organizations possess specialized knowledge, abundant resources, and creative ideas that can improve the productivity and efficacy of urban services. However, their involvement can also raise concerns about whether corporate interests will prevail over public well-being. This highlights the need for careful consideration and oversight to make sure that smart city efforts benefit society as a whole and not just for financial gain (Charnock et al., 2021, p. 582). Overall, the interaction of international organizations, local communities, and business entities influences the framework of Barcelona's smart city projects, resulting in a complex governance model that aims to achieve a harmonious blend of innovation, inclusion, and accountability in urban development.

Public-private partnerships (PPPs) play a crucial role in influencing the progress and execution of smart city initiatives in Barcelona by fostering cooperation between the municipal government and private technology sector. During the Trias administration, the city government made a deliberate effort to utilize the knowledge and resources of major firms like Cisco and IBM to improve municipal services and infrastructure (Tomas, 2023, p. 3). Through these agreements, the city was able to experiment with cutting-edge technology without incurring any expenses. This effectively turned Barcelona into a testing ground for pilot projects in several fields, like waste management, energy, and mobility (Tomas, 2023, p. 3). These collaborations allow the city to utilize private experience, technology, and financing, which are crucial for the effective implementation of new urban programs. For instance, the partnership with Cisco in creating the Innovation Centre demonstrates how public-private partnerships (PPPs) may form a "smart city laboratory" that promotes the study and advancement of innovative technologies specifically designed for urban requirements (Zygiaris, 2013, p. 227). This centre not only improves the technological capacities of the city but also functions as a platform for testing new products and services, fostering a cycle of innovation that benefits both the city and its citizens (Zygiaris, 2013, p. 226). As part of the Open Integrated Barcelona initiative, different smart services are being combined into a single urban platform. This shows how public-private partnerships (PPPs) can improve data processing and make many industries, like transportation and utilities, more efficient (Zygiaris, 2013, p. 226). Mutual benefits marked the connection between the local government and the private sector. The government sought to improve effectiveness and service provision, while companies expected that successful trial initiatives would result in additional city investments and contracts (Tomas, 2023, p. 3). Nevertheless, this model has sparked concerns regarding the prioritizing of corporate interests above citizen engagement, as the

public's involvement in decision-making has remained restricted (Tomas, 2023, p. 3). As the governance model progressed, there was a transition towards integrating more participatory components, but the fundamental importance of public-private partnerships (PPPs) in driving smart city initiatives in Barcelona continued to be a distinguishing characteristic of its urban transformation (Tomas, 2023, p. 4). Public-private partnerships (PPPs) play a crucial role in stimulating economic growth, improving service delivery, and ensuring that Barcelona continues to lead in the development of smart cities.

Barcelona's smart city initiatives have progressively centred around tackling social justice and inclusivity challenges. This is especially evident under the governance of the Barcelona en Comu platform, which prioritizes citizen engagement and the collective welfare (Charnock et al., 2021, p. 583). The local administration has aimed to shift the focus of the smart city agenda from a solely technological and market-oriented strategy to one that gives priority to the interests and rights of citizens (Charnock et al., 2021, p. 588). The promotion of participatory governance models, which encourage community engagement in decision-making processes and ensure a wide range of perspectives are considered in the formulation of municipal policies, reflects this shift (Charnock et al., 2021, p. 588). Added to that, efforts focused on improving digital access and literacy are essential for promoting inclusiveness. The city's objective is to narrow the digital gap and empower marginalized areas by equipping inhabitants with the necessary skills and expertise to interact with smart technology (Charnock et al., 2021, p. 593). The emphasis on transparency and open data enhances social justice by empowering citizens to demand accountability from authorities and actively engage in governance. In addition, the incorporation of social innovation projects, such as community-led initiatives in housing and energy services, demonstrates a dedication to tackling systematic disparities and fostering fair access to urban resources (Charnock et al., 2021, p. 587). These endeavours form part of a broader strategy to ensure the equitable distribution of the benefits of smart urban advancements across all societal sectors, instead of favoring privileged groups. Barcelona's smart city programs aim to promote social justice and inclusivity by encouraging participatory government, improving digital access, and supporting community-led projects. The goal is to create an equitable urban environment for all citizens.

Barcelona's smart city initiatives prioritize inclusivity and participatory government to ensure that underrepresented communities receive benefits. The Barcelona Digital City Plan specifically seeks to promote the remunicipalization of crucial urban infrastructure. Remunicipalization is the act of returning the ownership and control of public services and utilities to local governments or municipal

authorities, following their privatization or outsourcing to private enterprises. This movement frequently emerges as a result of apprehensions about the inefficiencies, injustices, and lack of accountability associated with privatized services. Within the framework of smart city projects, remunicipalization aims to ensure the administration of vital services such as water, electricity, transportation, and data management, prioritizing the public interest and community needs over profit-driven objectives. Reestablishing public control over these services allows municipalities to enhance transparency, improve service quality, and ensure equitable distribution of the benefits of urban development among all individuals, particularly marginalized populations (Mann et al., 2020, p. 1110). The objective of this strategy is to create a city data commons that promotes collaborative participation, enabling a wide range of community perspectives to shape urban development and decision-making. These initiatives aim to empower citizens by improving their ability to manage their personal data and comprehend its usage within the smart city framework. It is crucial to empower marginalized groups to protect their privacy and avoid reducing them to mere data providers for corporate agendas (Mann et al., 2020, p. 1110). The city aims to promote technological sovereignty in order to ensure equal access to the advantages of digital advancements. This will help address systemic inequalities and enable all community members to participate in and benefit from the smart city ecosystem (Mann et al., 2020, p. 1110). This strategy is in line with the overarching objectives of social justice and inclusivity, since it aims to provide local governments the authority to make decisions that accord with the values and requirements of their communities. This fosters a more democratic and participatory governance model in urban areas.

Although there have been attempts to enhance equality in Barcelona's smart city programs, significant gaps in the allocation of advantages across various social groups continue to exist. Although the Barcelona en Comu administration has intended to redirect the smart city agenda towards the collective welfare, the actual situation frequently mirrors preexisting socio-economic disparities. For example, marginalized communities, especially those residing in lower-income neighbourhoods, may have restricted availability of technology resources and digital literacy programs, which are crucial for complete engagement in smart city projects (Charnock et al., 2021, p. 582). A digital divide can exacerbate pre-existing disparities by isolating individuals who do not have sufficient access to technology or the necessary skills to use it from the benefits of intelligent urban services. In addition, the emphasis on obtaining foreign investment and forming business alliances may result in a preference for initiatives that benefit wealthy regions or commercial objectives, thus neglecting the need of underprivileged populations (Charnock et al., 2021, p. 588). For instance, a proliferation of advanced technological advancements and smart infrastructure may be observed in more wealthy districts. However, in less prosperous locations, individuals may still encounter difficulties pertaining

to fundamental amenities like housing and public transit (Charnock et al., 2021, p. 582). The introduction of smart city technology might occasionally result in gentrification, resulting in the displacement of longstanding residents and the transformation of the social structure within neighbourhoods (Charnock et al., 2021, p. 588). As new advancements allure wealthier residents and enterprises, the first population may face displacement, exacerbating socioeconomic inequalities. Overall, Barcelona's smart city programs strive to promote inclusion and social justice. However, there are notable differences in the allocation of advantages across various social groups. This emphasizes the importance of continuous focus on equity in urban policy and planning.

Barcelona's efforts to execute smart city initiatives have faced numerous significant obstacles. An essential challenge lies in the complexity of incorporating diverse digital technologies into current urban infrastructures. The process of integrating these various components generally requires significant financial investments and a coordination of efforts among multiple entities, such as governmental bodies, commercial enterprises, and non-governmental groups. However, this collaborative approach can sometimes result in bureaucratic delays and operational inefficiencies (Smith and Prieto Martin, 2021, p. 313). Clear and open communication, along with public confidence in the implemented technologies, is another obstacle to overcome. Many people express concerns about the security of their personal information and the potential for surveillance, which can hinder their engagement in smart city projects. The use of public-private partnerships also prompts questions about accountability and the influence of corporate interests on municipal management, thereby marginalizing citizen needs and objectives (Smith and Prieto Martin, 2021, p. 313). The participatory budgeting processes, although intended to increase community involvement, have encountered challenges during their execution. For instance, in Madrid, similar initiatives faced frustrations as a result of delays in project implementation. This can result in disillusionment among individuals who actively engaged in the decision-making process (Smith and Prieto Martin, 2021, p. 321). The mismatch between citizens' aspirations and the administration's capabilities could potentially undermine the efficacy of smart city projects and their perceived legitimacy. Finally, the task of guaranteeing fair and equal access to the advantages of smart city technologies is of utmost importance. Neglecting communities with limited resources during the digital transformation process could exacerbate existing disparities instead of reducing them. To achieve its goal of becoming a fully inclusive and participatory smart city, Barcelona must address these issues.

Barcelona has implemented numerous techniques to effectively address and alleviate the obstacles and criticisms encountered during the execution of smart city initiatives. An important strategy that has

been employed is the prioritization of participatory governance, which aims to actively include individuals in the decision-making procedures pertaining to urban development. We have improved initiatives like participatory budgeting to enhance transparency and responsiveness, empowering residents to propose and vote on initiatives that directly affect their communities. This method aims to rebuild trust and ensure the recognition of diverse community perspectives (Smith and Prieto Martin, 2021, p. 313). In order to address issues pertaining to data privacy and surveillance, the city has enacted policies with the objective of guaranteeing transparency in the processes of data collection, utilization, and distribution. This entails creating explicit data management protocols and actively participating in public dialogues about the consequences of data-reliant technology. Barcelona seeks to mitigate concerns and cultivate a well-informed public by promoting an open exchange of ideas with its residents (Smith and Prieto Martin, 2021, p. 311). By prioritizing inclusive design principles, the city has sought to achieve an equitable distribution of the advantages of smart city initiatives. We must actively involve marginalized communities in the development of smart technology and prioritize their demands in urban planning processes. We have implemented initiatives targeting digital literacy and technology access to empower these groups and reduce the digital divide (Smith and Prieto Martin, 2021, p. 313). In addition, the creation of the City Technology Officer has enhanced collaboration among all parties involved, leading to more efficient processes and improved execution of smart city initiatives. The work of this agency is essential in coordinating the interests of public and private entities while also prioritizing citizen involvement (Smith and Prieto Martin, 2021, p. 319). Barcelona's plans demonstrate their dedication to tackling the difficulties of implementing smart cities by promoting a more inclusive, open, and fair urban environment.

The smart city initiatives implemented in Barcelona have resulted in various concrete outcomes that have a favourable effect on urban planning and social justice. An important outcome is the implementation of a more inclusive governance framework that encourages citizens to actively participate in decision-making processes. The transition has facilitated the participation of marginalized communities in urban development, acknowledging and addressing their demands and concerns (Mann et al., 2020, p. 1111). The city's emphasis on remunicipalization has led to the restoration of vital services under public control, mitigating the disparities commonly linked to privatized services and fostering increased accessibility and fairness for all inhabitants (Mann et al., 2020, p. 1111). Additionally, the Barcelona Digital City Plan has facilitated the establishment of a local data commons with the objective of democratizing access to data and technology. This program not only increases transparency but also enables citizens to employ data for community-driven projects, further advancing social justice (Mann et al., 2020, p. 1111). The focus on technical sovereignty in these efforts has resulted in an equitable allocation of resources and opportunities,

enabling the city to effectively tackle urgent social and environmental issues. Barcelona's smart city efforts demonstrate a dedication to incorporating social justice principles into urban design, leading to a more inclusive and environmentally sustainable metropolitan environment for all its inhabitants.

Barcelona's transformation into a smart city showcases a progressive method of urban government that focuses on empowering the public, promoting social equality, and ensuring technical independence. The city's transition from a previous corporate-centric paradigm to one that prioritizes community engagement and diversity demonstrates a wider dedication to ensuring that technological progress benefits all citizens. The municipal administration has aggressively engaged residents in decision-making processes through programs like the Barcelona Digital Plan and participatory governance models. This approach aims to cultivate a sense of ownership and responsibility within the community. For instance, *Decidim.* Barcelona is a digital participation platform (using open-source software) that allows citizens to provide feedback on development proposals and actually debate these developments. Furthermore, the deliberate use of public-private partnerships has enabled the incorporation of cutting-edge technologies while also prompting significant questions about the equilibrium between corporate influence and public well-being. Barcelona must continue to diligently address equity and access concerns during its digital transformation to guarantee the inclusion of vulnerable populations. In the end, the city's experience serves as a great example for other metropolitan regions that want to advantage from smart technologies while still maintaining a democratic and inclusive urban environment.

Smart cities: Discursive, Governance, and Territorial Strategies

The emergence of the smart city concept signifies a notable transformation in urban development, marked by the incorporation of digital technology into the essence of urban life. Smart city efforts have developed as a viable answer to the complex challenges faced by cities globally, including growing urbanization, resource management, and social inequality. This case study conducts a comparative urbanism examination of the smart city projects in Barcelona and Toronto, with a specific emphasis on the consequences for urban planning and social equity. Toronto and particularly Barcelona have emerged as frontrunners in the worldwide smart city movement, with each city implementing diverse tactics that align with their specific socio-political circumstances and urban challenges. Barcelona, known for its progressive urbanism and citizen-centric policies, has aimed to utilize technology to improve democratic administration and public participation. Conversely, Toronto's initiatives to create a smart city have been characterized by significant support from private

companies, which has led to concerns around the management of data and the fair allocation of advantages. This case study examines the discursive, governance, and territorial strategies that form the basis of the smart city projects in these two cities. By analyzing these tactics, we aim to uncover the processes that shape and employ smart city narratives, the governance models that shape stakeholder involvement and power dynamics, and the spatial planning policies that impact social justice outcomes. This case study aims to enhance our understanding of the advantages and disadvantages of smart city development in fostering equitable and sustainable urban futures by comparing different perspectives.

Barcelona and Toronto's administrations employ discursive techniques that have a significant impact on the narrative around smart cities in their various contexts. These strategies reflect distinct goals and approaches to urban governance. Barcelona's narrative revolves around the concepts of technical sovereignty and citizen empowerment, highlighting the importance of technology benefiting the public rather than corporate interests. With a focus on fostering remobilization and collaborative engagement, the Barcelona Digital City Plan envisions technology serving people (Mann et al., 2020, p. 1110). The goal is to ensure that all inhabitants may benefit from digital improvements. This discourse presents the city as a frontrunner in promoting social justice by addressing disparities and improving participatory governance. This effort aims to create a narrative of inclusivity and encourage community engagement. In contrast, the Sidewalk Labs waterfront project in Toronto has witnessed conflicts between the public's needs and corporate goals. The government frequently emphasizes the possibility of innovation and economic expansion by collaborating with technology companies, presenting the smart city as a means to address urban problems (Mann et al., 2020, p. 1104). However, this strategy has encountered substantial opposition from community organizations that are worried about privacy, data ownership, and the consequences of corporate dominance in public areas. A careful analysis of the social permission to function in Toronto has influenced the narrative, as the community's opposition to perceived excessive corporate influence has led to a reassessment of the necessary components of a responsible smart city (Mann et al., 2020, p. 1104). These discursive techniques ultimately represent larger ideological variations in the conceptualization and execution of smart cities. Barcelona prioritizes social equality and citizen empowerment, whereas Toronto faces challenges in dealing with the intricate nature of corporate participation in urban administration.

The governance models applied to the smart city programs of Barcelona and Toronto demonstrate different methods that have a substantial impact on stakeholder involvement and power dynamics.

Barcelona's governance model is characterized by a framework that encourages participation and collaboration, with a focus on technical independence and empowering its citizens. The Barcelona Digital City Plan advocates for the transfer of basic services back to municipal control and the creation of a shared pool of urban data. This approach aims to foster collaborative decision-making and community participation in urban planning. This concept promotes a fairer allocation of power among individuals or groups with an interest in a particular issue. It does so by actively involving marginalized communities in the decision-making process, which in turn increases their ability to have a say and influence local developments. On the other hand, Toronto's approach to governance, particularly regarding the Sidewalk Labs project, has been characterized by a hierarchical structure and a strong influence of corporations, with an emphasis on collaborations between the city and private technology companies. The prevailing approach has frequently given greater importance to economic growth and innovation, presenting the smart city as a way to attract investment and improve municipal efficiency. This strategy has resulted in notable conflicts, as community organizations and advocates have expressed worries regarding privacy, ownership of data, and the possible reduction of public authority over urban areas. Corporate interests have significantly influenced the power dynamics in Toronto, resulting in restricted public participation that frequently only involves consultations rather than true collaboration in shaping municipal policy. Barcelona's strategy emphasizes inclusivity and shared governance, while Toronto's approach has revealed the difficulties of reconciling public interests with corporate goals, eventually influencing the success and credibility of their smart city programs.

The territorial strategies and spatial planning policies of Barcelona and Toronto are essential in determining the social justice outcomes of their smart city initiatives. Barcelona has implemented a proactive spatial planning strategy that focuses on inclusivity and ensuring fair access to urban resources. The Barcelona Digital City Plan prioritizes the transfer of vital services back to municipal control, as well as the development of public spaces that encourage active participation and cooperation within the community. This technique aims to ensure that technological advancements benefit all individuals, particularly the excluded, by integrating social equity into urban development. The city's emphasis on establishing a data commons reinforces this objective, as it enables residents to get and employ data for community-led initiatives, thus augmenting their ability to actively engage and contribute to municipal administration. However, Toronto's strategies for organizing physical space, specifically in relation to the Sidewalk Labs project, have faced criticism for favouring the interests of corporations over the requirements of the community. The prioritization of attracting private investment and promoting economic growth has raised apprehensions over gentrification and

the possible relocation of low-income inhabitants. The governance paradigm in Toronto frequently marginalizes public participation, restricting the capacity of marginalized communities to have influence over urban planning decisions that directly impact their lives. Consequently, the spatial techniques implemented in Toronto may worsen pre-existing disparities, undercutting the desired social justice effects of smart city projects. Barcelona's territorial plans prioritize inclusivity and equal access, while Toronto's approach raises concerns about the trade-off between economic development and social equality in urban planning.

The examination of smart city projects in Barcelona and Toronto highlights notable disparities in governance structures, stakeholder engagement, and the impact on equality for all. Barcelona's strategy, marked by a dedication to empowering citizens and promoting collaborative governance, places importance on inclusivity and the transfer of critical services back to municipal control. This approach aims to create a participative atmosphere that aims to tackle social inequalities. On the other hand, Toronto's approach, which is strongly influenced by corporate interests, frequently places a higher importance on economic expansion and innovation, even if it means sacrificing meaningful involvement of the public. This has raised concerns over privacy, ownership of data, and the exclusion of community opinions. This contrast emphasizes the intricacies of incorporating technology into urban government. Barcelona's approach showcases the possibility of smart city projects in advancing social justice, whereas Toronto's case shows the dangers linked to corporate control in urban planning. In conclusion, this study highlights the importance of cities thoroughly evaluating their governance structures and stakeholder relationships to guarantee that smart city initiatives effectively contribute to fair and environmentally friendly urban futures.

Discussion

Analyzing smart city efforts requires a close examination of their development and implementation methods, including the discussions, governance, and spatial plans involved. Smart cities often present an optimistic perspective, highlighting modern technologies that enhance efficiency, connectivity, and sustainability. However, this narrative may conceal broader ideological and cultural values that permeate the discourse. Through an analysis of the language and rhetoric used in discussions on smart cities, we may discover how these narratives shape public opinion and policy creation. Examining the governance techniques uncovers the impact of network models, stakeholder dynamics, and regulatory frameworks on the implementation of smart city projects. This analysis emphasizes the importance of

accountability and transparency. Territorial methods provide additional insight into the ways in which these projects affect the organization, accessibility, and fairness of urban spaces, particularly for vulnerable people. Examining the techno-utopian vision from a relational standpoint highlights the degree to which technology influences urban change compared to human action and local adjustment. Through a rigorous evaluation of these components, we can gain a deeper comprehension of the constraints of the prevailing smart city framework and investigate alternative models that foster greater inclusivity, fairness, and sustainability in urban development.

Deeply entwined with broader ideological and cultural values, particularly those associated with neoliberalism and technological optimism, are the narratives and rhetoric surrounding smart cities. This highlights that the prevailing idea of smart cities frequently favours the interests of capital and state authority, restructuring governance to conform to market-oriented principles (Kitchin et al., 2019, p. 1). By emphasizing efficiency, innovation, and economic growth, this framing portrays smart cities as remedies for urban challenges. This reflects a cultural tendency to highly value technology as a cure-all for social issues. In addition, Kitchin et al. (2019) argue that without a critical normative critique, the claims made by proponents of smart cities remain unchallenged, allowing for a commonsense acceptance of these narratives as non-ideological (Kitchin et al., 2019, p. 13). Smart city technologies' acceptability can sometimes conceal the underlying inequalities and injustices that may result from their implementation. The language describing these technologies often overlooks the social and political ramifications of data governance and surveillance. This emphasizes that various ideological perspectives, such as libertarianism and egalitarianism, interpret the notion of justice in smart cities in contrasting manners. Some perceive the neoliberal smart city as inherently just, while others criticize it for perpetuating systemic inequalities (Kitchin et al., 2019, p. 13). The narratives around smart cities ultimately portray an intricate interaction between cultural values that stress individual autonomy, market efficiency, and technical growth, frequently disregarding social justice and collective well-being.

An in-depth analysis of the intricate relationship between citizenship, social justice, and individual rights in the context of smart cities is a crucial subject of study. Social justice is primarily concerned with how people are treated and how they live. Citizens' rights and privileges directly relate to social justice. Citizens often dispute and deliberate within societal structures, anticipating a range of rights such as freedom of speech, housing access, voting rights, and healthcare (Kitchin et al., 2019p. 12). Social justice theories, such as distributional and procedural, offer distinct perspectives for assessing fairness and rights, especially in the context of smart cities (Kitchin et al., 2019, p. 3). The adoption of

smart city technology can result in societal divisions and disparities. In the absence of effective measures to deter discriminatory procedures, the ethical justifications for equity may diminish in significance (Kitchin et al., 2019, p. 3). This emphasizes the need for governance frameworks in smart cities to take into account the impact of technologies on different segments of the population and to guarantee fair and just treatment. There is a strong emphasis on the significance of examining the underlying assumptions of smart city programs. Without a normative framework to challenge prevailing narratives, proponents of smart cities may present their approaches as neutral or pragmatic, overlooking the ideologies that shape these urban environments (Kitchin et al., 2019, p. 13). There are several ideological positions, such as libertarianism, egalitarianism, and feminism, that have different interpretations of the concept of a "just smart city." Libertarians might argue that market-driven results are fair, but egalitarians would advocate for equal treatment and opportunities for all individuals (Kitchin et al., 2019, p. 12). The wide range of differences among cities necessitates an accurate assessment of what constitutes a just smart city and the practical steps to achieve it. Additionally, the notion of the "Right to the City," derived from Marxist ideology, functions as a political justification for regaining control over urban areas and guaranteeing that every person has the opportunity to influence the development of their cities. This concept promotes a collaborative method of managing urban affairs, giving importance to the needs and rights of all individuals within the community (Kitchin et al., 2019, p. 23). The analysis of these linkages highlights the importance of taking a critical approach while designing and governing smart cities. It emphasizes the necessity of implementing frameworks that prioritize social justice and fair treatment for all residents.

Media, policy documents, and public discourse commonly portray smart city initiatives as revolutionary measures designed to enhance urban living through the use of technology and data-driven governance. This framing commonly prioritizes efficiency, sustainability, and enhanced quality of life for citizens. Nevertheless, the narrative can also reveal underlying tensions regarding transparency, equity, and civic engagement. Media portrayals tend to emphasize the creative features of smart technologies, but they often fail to acknowledge the challenges involved in implementing them and the possibility of excluding certain communities, especially those with limited resources (Kitchin et al., 2019, p. 112). Policy documents often promote smart city projects as a way to update municipal infrastructure and enhance service delivery. Their primary emphasis lies in highlighting the advantages of gathering and analyzing data for decision-making procedures, advocating for a vision of effortless incorporation of technology into urban management (Kitchin et al., 2019, p. 115). However, this positive perspective can hide the difficulties associated with public involvement and the requirement for strong civic interfaces that enable substantial engagement with new technologies (Kitchin et al., 2019, p. 116). The public discourse surrounding smart cities frequently alternates

between excitement about technology progress and doubt about how it may impact privacy and an equitable society. Critics argue that the invisibility of smart city technologies can result in a lack of responsibility and citizen supervision, giving rise to apprehensions regarding the beneficiaries of these endeavours and the use of data (Kitchin et al., 2019, p. 121). The framing of smart city programs is complex, encompassing both the potential for innovation and the need for careful examination to ensure that these projects benefit all community members rather than simply developers and vendors. Despite the positive portrayal of smart city initiatives in various discourses, it is crucial to meticulously assess their impact on civic engagement and social equity to ensure their effective enhancement of urban living for all inhabitants.

The main participants in discussions on smart city efforts often consist of government officials, urban planners, technology vendors, and corporate players who promote the incorporation of cutting-edge technologies into urban settings. The actors in question commonly highlight the advantages of intelligent technologies, such as heightened productivity, enhanced public services, and bolstered economic expansion (Kitchin et al., 2019, p. 122). Their viewpoints exert significant influence on media narratives and policy texts, portraying smart cities as essential for contemporary urban development and presenting technology as a universal remedy for diverse urban issues (Kitchin et al., 2019, p. 123). However, the discussion often excludes or disregards the perspectives of community members, especially those who belong to marginalized or economically disadvantaged communities. Individuals who do not have access to technology or the required expertise to participate in smart city initiatives often face exclusion from decision-making procedures (Kitchin et al., 2019, p. 117). Additionally, the viewpoints of activists and civic organizations that support transparency, equity, and accountability in the implementation of smart technology are frequently sidelined (Kitchin et al., 2019, p. 113). These parties raise significant concerns about privacy, data ownership, and the possibility of surveillance, arguing that the benefits of smart city initiatives are not evenly distributed. Often, the dialogue overlooks the experiences of marginalized people, including the homeless, low-income individuals, and marginalized communities, who may face disproportionate impacts from the introduction of smart technologies, even though they were not involved in their creation or implementation (Kitchin et al., 2019, p. 117). The dominant narrative of inclusive urban innovation often overlooks the diverse perspectives and needs of all city dwellers, revealing a significant gap in the discourse. This calls for more focus on civic engagement and participatory practices in smart city planning.

The prevailing narrative surrounding smart cities has been subject to several criticisms that question its idealistic view of technology. An important issue is the technocratic character of smart city government, which frequently gives more importance to data-driven decision-making rather than considering the interests and opinions of regular inhabitants. Critics contend that this strategy consolidates authority among a limited number of individuals responsible for making decisions, potentially marginalizing grassroots involvement and resulting in a governance framework that prioritizes corporate interests over community needs (Kitchin, 2014, p. 10). The process of transforming city governance into a corporate structure raises concerns about the impact of private corporations on determining urban policy, potentially leading to a prioritization of financial gain over public well-being.

Furthermore, critics argue that the use of big data and real-time analytics is creating a "panoptic city," characterized by widespread surveillance and monitoring. This raises ethical problems regarding privacy and individual freedoms (Kitchin, 2014, p. 11). Motivated by a need for safety and organization, the prevailing culture of surveillance may lead to a society that consistently monitors and regulates individuals' actions, thereby compromising the fundamental democratic principles intended to preserve urban areas (Kitchin, 2014, p. 11). Critics also emphasize the inherent conflicts within smart city programs, such as the conflict between catering to global capital and addressing the demands of local residents, which might worsen socioeconomic inequities instead of reducing them (Kitchin, 2014, p. 2). Overall, these criticisms highlight the necessity of adopting a comprehensive and fair approach to urban development that takes into account the varied experiences and ambitions of all urban residents rather than exclusively prioritizing technological remedies.

The criticisms of the prevailing smart city narrative contribute to alternate frameworks and perspectives on urban growth by promoting more inclusive, participatory, and equitable methods. These alternative methods prioritize community interaction and local expertise when developing municipal policy, in contrast to the technocratic government sometimes seen in smart city programs (Kitchin, 2014, p. 11). In order to ensure that the varied needs and aspirations of all inhabitants influence urban development, these approaches prioritize citizen engagement (Kitchin, 2014, p. 12). Additionally, the emphasis on ethical considerations and privacy in urban government presents a challenge to the extensive surveillance associated with the panoptic city. Alternative perspectives argue for the importance of transparency in the collecting and use of data, advocating for a system where individuals have authority over their personal information and can actively engage in decision-making procedures. This transition towards a more democratic governance model promotes

the creation of urban areas that are both efficient and socially equitable, while also being adaptable to the intricacies of urban life. Furthermore, these criticisms emphasize the importance of incorporating many policy tools and strategies to tackle the socio-economic inequalities within urban areas. Alternative models provide a comprehensive approach that integrates technology with social policies to promote fairness and sustainability, acknowledging the limitations of relying solely on technological solutions (Kitchin, 2014, p. 10). In essence, these different perspectives on urban development question the belief that technology by itself can resolve urban problems. Instead, they advocate for a more sophisticated comprehension of how technology, society, and governance interact with each other.

Network Governance Model

Network governance is highly significant in the context of smart cities because it enables the incorporation of many viewpoints and specialized knowledge, which is essential for successfully implementing groundbreaking solutions. Network governance models significantly influence the development and implementation of smart city initiatives by fostering collaboration among various stakeholders, including local governments, commercial corporations, and civil society. These models highlight the significance of interconnectivity and collective obligations, which are crucial for tackling the intricate issues encountered by urban regions. Dameri et al. (2014) assert that a triple helix approach, involving local government, universities, and companies, enhances the smart city's capacity to produce knowledge resources (Dameri et al., 2024, p. 251). This partnership encourages the implementation of smart initiatives and facilitates the exchange of expertise and resources, ultimately resulting in more efficient urban administration.

Network governance models are structured systems that enable cooperation among diverse stakeholders, such as government bodies, private sector organizations, and civil society, in order to efficiently tackle intricate urban issues. These models highlight the interdependence of several actors and the significance of collective responsibility in decision-making processes. Dameri et al. (2014) emphasize the importance of the triple helix concept, which entails collaboration between local governments, universities, and businesses to generate knowledge resources that facilitate smart projects (Dameri et al., 2024, p. 251). This cooperative method not only increases the ability for originality but also promotes a feeling of communal ownership and involvement in urban development. Network governance models facilitate flexibility and adaptability, empowering cities to effectively address evolving circumstances and emergent difficulties. By harnessing the advantages of different parties involved, these models can enable the exchange of resources, expertise, and optimal

methods, ultimately resulting in improved efficiency and effectiveness in urban management (Dameri et al., 2014, p. 252). This highlights that network governance can improve accountability and transparency by involving multiple stakeholders in the decision-making process, hence ensuring the representation and consideration of diverse interests. Network governance models are crucial for promoting collaboration and creativity in smart city initiatives. They help cities effectively manage the challenges of urbanization and enhance the quality of life for their citizens.

Network governance methods, however beneficial for promoting cooperation among various stakeholders in smart city initiatives, can encounter numerous obstacles that can hinder their efficiency. A major obstacle is the intricacy of coordinating several participants with diverse interests, priorities, and levels of power. According to Dameri et al. (2014), when municipal governments, corporate sector entities, academic institutions, and civil society organizations are involved, their different goals might create conflicts, making it challenging to reach an agreement (Dameri et al., 2014, p. 252). This complexity can result in delays in decision-making and implementation, as stakeholders may struggle to align their goals and negotiate compromises. Another issue that may arise is the potential for power imbalances among stakeholders. Bureaucratic impediments and resource limitations often restrict municipalities' capacity to effectively collaborate with the private sector and civil society, despite their substantial power in governance procedures. However, private corporations may prioritize profit over public safety if there are not enough regulations. This dynamic can result in an absence of accountability and transparency, which diminishes public trust in the governing process (Dameri et al., 2014, p. 253). The dependence on technology and data in smart city initiatives gives rise to problems regarding privacy, security, and ethical considerations. Stakeholders are responsible for managing the intricacies of data governance, ensuring that the process of collecting and using data is in line with the values of the community and the legal frameworks in place (Dameri et al., 2014, p. 256). Ensuring citizen participation and engagement is crucial, as excluding citizens from decision-making processes or failing to adequately address their concerns can diminish public interest. Network governance models provide a cooperative method for overseeing smart city initiatives, but they do come with difficulties. To tackle these problems, it is necessary to have continuous discussions, establish trust, and implement systems that ensure the interests of all stakeholders are considered and balanced. This will ultimately result in more efficient and inclusive urban governance.

Territorial Strategies

By integrating cutting-edge technologies into urban infrastructure, smart city initiatives significantly influence the organization of cities, thereby enhancing accessibility and connectivity. These programs frequently prioritize implementing digital tools and data-driven solutions to enhance urban services, including transportation, energy management, and public safety. However, this focus on technology may lead to a dispersed urban environment that does not equally distribute the benefits of smart technology. For example, affluent areas may benefit from enhanced connectivity and access to services, whereas marginalized communities frequently encounter obstacles that prevent them from participating in these improvements. This creates a digital divide that worsens pre-existing inequalities (Karvonen, 2018, p. 249). The implications of these shifts for social justice and equity are significant. Smart city initiatives often prioritize efficiency and economic growth, but they may neglect the needs of vulnerable populations. This can result in urban governance that prioritizes corporate interests over community engagement (Karvonen, 2018, p. 202). This can occur in the form of gentrification, whereby the arrival of technology-driven advancements displaces residents with low incomes, reinforcing existing social disparities. Furthermore, the utilization of data and algorithms in decision-making may lead to the marginalization of voices from underrepresented groups, as the data used for urban planning may not accurately reflect or prioritize their demands (Karvonen, 2018, p. 202). Overall, smart city initiatives have the capacity to enhance urban living by improving accessibility and connectivity. However, they also present notable threats to social justice and equity. Ensuring that these technological advancements are comprehensive and adaptable to the needs of all community members, particularly those on the margins, poses a significant challenge (Karvonen, 2018, p. 248). An in-depth examination and active community involvement are critical for understanding and addressing the intricacies of urban challenges and advocating for a fairer urban future.

Smart city efforts have a significant impact on urban planning and design techniques because they incorporate modern information and communication technologies (ICT) into the city's infrastructure. This improves the efficiency and efficacy of urban systems. These projects advocate for the use of data to govern urban areas, enabling the continuous monitoring and study of urban dynamics. This can result in better decision-making and allocation of resources. As cities transition from traditional models to smarter frameworks, urban planners are increasingly expected to incorporate interdisciplinary knowledge that includes not only sustainability principles but also advanced technical capabilities (Bibri & Krogstie, 2017, p. 186). This shift promotes the creation of urban structures that combine different elements and prioritize sustainability, while using information and communication technologies (ICT) to maximize urban functions and services. (Bibri & Krogstie,

2017, p. 205). These shifts have significant long-term consequences for urban sustainability and resilience. Cities may effectively tackle environmental concerns, promote social fairness, and increase the overall quality of life for their citizens by adopting a comprehensive approach that combines smart technologies with sustainable practices (Bibri & Krogstie, 2017, p. 203). Furthermore, the focus on flexible urban structures enables the ability to adjust to evolving environmental circumstances and societal requirements, thereby enhancing urban resilience (Bibri & Krogstie, 2017, p. 204). Urban planners must transition their attention from rigid design principles to adaptable, process-oriented methods that can develop and change over time (Bibri & Krogstie, 2017, p. 208). Planners should adopt innovative approaches that integrate data analytics and stakeholder involvement to develop urban landscapes that are both smart and capable of long-term sustainability and resilience.

Worldwide patterns frequently influence smart city development, advocating for the use of information and communication technology (ICT) to enhance urban efficiency, sustainability, and inclusivity. Nevertheless, the interplay between these worldwide patterns and specific regional circumstances can be intricate, since urban areas must modify these broad ideas to harmonize with their distinct social, economic, and environmental objectives. This section examines the interaction between global trends in smart city development and local contexts and priorities. It draws insights from cities such as Barcelona and Toronto's experiences with adopting smart city policies. Smart city development trends on a global scale commonly prioritize the use of information and communication technologies (ICT) solutions to effectively tackle various urban issues. Nonetheless, the efficacy of these solutions is frequently dependent on their successful adaptation to the specific requirements and circumstances of local contexts. Barcelona's strategy to transform into a smart city is a component of a larger effort to rethink its urban environment. The city is concentrating on developing self-sustaining neighbourhoods that prioritize local needs and integrate global technological advancements (March & Ribera-Fumaz, 2016, p. 818). This approach acknowledges the need to tailor smart city projects to address the unique challenges and opportunities in each city, rather than making them universally applicable.

Barcelona prioritizes self-sufficient neighbourhoods, highlighting the importance of aligning local priorities with global technological advancements. The city strives to achieve a harmonious integration of advanced technological solutions while also assuring the availability of necessary services, thereby guaranteeing that all citizens may utilize the advantages offered by smart city technology. This approach emphasizes the importance of taking into account local cultural, economic, and social issues while building smart cities to ensure that programs are not just technologically sophisticated but also socially and economically inclusive. Barcelona and Toronto's experiences provide useful insights into how various cities manage the problems and potential of smart city

development. Barcelona's utilization of self-sufficient blocks exemplifies how cities can customize global smart city concepts to suit their specific circumstances, highlighting the significance of offering fundamental services in conjunction with advanced technological solutions (March & Ribera-Fumaz, 2016, p. 827). This strategy not only addresses specific community problems, but also encourages the community to be more resilient and inclusive. Conversely, Toronto's smart city initiative encountered substantial public scrutiny and opposition. Concerns about data privacy and the influence of corporate interests emphasized the importance of transparency and community engagement in smart city design (March & Ribera-Fumaz, 2016, p. 818). The difficulties encountered by the Sidewalk Lab project highlight the significance of guaranteeing that smart city endeavours are not solely characterized by technological novelty but also by social accountability and alignment with the community's values and needs. It is essential to involve locals in the planning process to establish confidence and ensure that smart city developments are in line with local goals.

The case studies of Barcelona and Toronto illustrate the intricate nature of the interplay between worldwide smart city trends and specific local circumstances, necessitating cautious adjustment. To develop equitable and sustainable environments, effective smart city initiatives should prioritize engaging with the local community, being transparent, and integrating the different demands of the community. The insights gained from these cities underscore the significance of customizing global smart city concepts to align with local circumstances. Cities may enhance their ability to navigate the intricacies of smart city development by recognizing and tackling the distinct challenges and opportunities present in their own environments.

Relational Perspective on the Techno-Utopian Vision

The techno-utopian view of smart cities frequently places greater importance on technology than on human agency and social processes. This perspective implies that technological progress will ultimately result in improved urban living conditions. It presents urban government as largely focused on data-driven approaches. This viewpoint has a tendency to remove the political aspects of urban life, simplifying the role of citizens to just being producers of data rather than actively participating in influencing their surroundings (Wilson, 2011, p. 857). It conceals the complexities of urban life and the diverse needs of its inhabitants. This approach may pose challenges in comprehending the historical and physical contexts of smart city initiatives. This can result in a standardized model that does not consider the specific requirements and values of the local area (Shelton et al., 2015, p. 22). According to Vanolo (2014), the smart city discourse tends to frame specific objectives and strategies as "natural" and "univocal," which risks creating a non-critical consensus that marginalizes alternative

viewpoints and the voices of local communities (Vanolo, 2014, p. 894). Additionally, the focus on technology can cause urban fragmentation, wherein private entities dominate technological infrastructures, leading to a division between affluent, technology-driven communities and marginalized spaces (Vanolo, 2014, p. 891). Communities and local actors actively engage in negotiating, resisting, and reframing the smart city vision to better correspond with their own needs and values, in opposition to the prevailing narrative. They question the belief that technology alone can resolve urban issues, promoting a more comprehensive approach that takes into account social dynamics and local circumstances. Vanolo (2014) highlights how the rhetoric surrounding smart cities can lead to a reduction in political conflict and resistance, favouring a "disciplined" urban environment that serves capital interests (Vanolo, 2014, p. 884). However, local resistance movements and grassroots initiatives frequently arise, underscoring the significance of community engagement and participatory planning in influencing urban futures. People are increasingly acknowledging that sustainable urban development requires the integration of technological advancements, equitable resource distribution, and environmental protection. This guarantees that all residents can benefit from smart city initiatives instead of just a few.

Thinking of technology as a separate and influential factor in shaping social change can have a significant impact on our understanding and approach to society's progress. Perceiving technology as a deterministic catalyst of change can lead to neglecting the intricate relationship between technology and society (Kirkpatrick, 2020, p. 53). This viewpoint may result in a reductionist outlook that ascribes societal changes exclusively to technological progress, disregarding the influence of human actions, cultural beliefs, and power dynamics in influencing the effects of technology on society. Furthermore, perceiving technology as a separate and autonomous entity may obscure the ethical and political aspects of technological advancements. By placing excessive emphasis on the inherent capabilities of technology to promote progress and innovation, there is a risk of disregarding the possible adverse effects, such as violations of privacy, disparities in society, and environmental harm, that may result from thoughtless adoption and implementation of technology (Kirkpatrick, 2020, p. 125). This perspective may also limit options for democratic decision-making and citizen involvement in influencing the course of technical advancement and its societal consequences. Considering technology as a separate and influential factor in shaping social development might result in a deterministic perspective that diminishes the ability of individuals and communities to impact the direction of technological advancement. Failure to consider the social, cultural, and historical settings in which technology functions can lead to the continuation of inequities, the strengthening of current power dynamics, and the exclusion of diverse voices and viewpoints in the creation and use of technological solutions (Kirkpatrick, 2020, p. 53). Overall, perceiving technology as a separate and

influential factor in shaping social change can restrict our capacity to thoroughly evaluate the wider consequences of technological progress on social, political, and ethical aspects. By embracing a more sophisticated and discerning viewpoint that takes into account the societal and cultural aspects of technology, we can gain a deeper comprehension of the intricate interplay between technology and society. This will enable us to strive for technical advancements that are more inclusive, fair, and environmentally responsible.

Theories of technological determinism have a tremendous impact on moulding the narratives around smart cities by influencing the perception of technology as a driving factor in urban development. Kirkpatrick (2020) argues that Feenberg's critical theory of technology challenges deterministic perspectives by highlighting the social and cultural aspects of technical advancements. According to technological determinism theories, the advancement of digital technology and data-driven solutions can profoundly alter urban landscapes and improve quality of life in the context of smart cities (Kirkpatrick, 2020, p. 33). Technological determinism theories commonly depict technology as the main catalyst for change, implying that the integration of intelligent technologies such as IoT devices, sensors, and data analytics would result in urban systems that are more efficient, sustainable, and responsive. These theories suggest that technology's intrinsic powers can restructure cities, optimize resource allocation, and enhance service delivery. However, they may not fully reflect the wider social, political, and ethical consequences of these changes (Kirkpatrick, 2020, p. 66). Feenberg's critical perspective, however, counters this deterministic viewpoint by highlighting that social values, power structures, and historical circumstances have a significant role in shaping technical evolution. Feenberg's theory underscores the social and cultural dimensions of technology, fostering a more profound understanding of how human behavior, societal norms, and institutional practices shape and influence technical advancements (Kirkpatrick, 2020, p. 53). This analytical approach emphasizes the significance of taking into account the consequences of technological interventions on matters such as fairness, confidentiality, management, and public involvement in the advancement of intelligent urban areas.

Technological determinism theories argue that digital advancements can fundamentally change urban environments and improve quality of life. However, Feenberg's critical theory of technology offers a more nuanced perspective, emphasizing the importance of critically evaluating the social and cultural aspects of technological change in the context of smart city development. By integrating these crucial perspectives into discussions about smart cities, stakeholders can ensure the implementation of technology in ways that align with societal values, promote inclusivity, and empower communities to

actively shape the future of urban life (Kirkpatrick, 2020, p. 53). These ideas frequently present smart city projects as unavoidable consequences of technological advancement, depicting technology as the main catalyst for urban innovation and effectiveness. Proponents of technological determinism contend that smart technologies, including IoT devices, sensors, and data analytics, may optimize city operations, improve service delivery, and foster more sustainable and resilient urban ecosystems (Kirkpatrick, 2020, p. 33). This viewpoint often places a higher importance on the influence of technology in defining the future of cities, occasionally disregarding the intricate relationship between technology, society, and governance in the creation of smart cities. Feenberg's critical approach questions deterministic perspectives by emphasizing the significance of including social values, power dynamics, and democratic engagement in the development and utilization of technology (Kirkpatrick, 2020, p. 33). Feenberg's thesis challenges the idea that technology alone can solve urban issues, fostering a deeper understanding of how smart city narratives shape and align with broader societal objectives and principles. Technological determinism theories can shape smart city narratives by highlighting the transformative capabilities of technology. However, critical perspectives, such as Feenberg's, provide a more comprehensive outlook that takes into account the social, political, and ethical consequences of smart city initiatives (Kirkpatrick, 2020, p. 33). Those with a vested interest can ensure the implementation of technology in smart cities that promotes inclusivity, sustainability, and citizen empowerment.

Future Directions and Alternatives

As a response to the constraints of the techno-utopian concept of smart cities, alternative models are emerging that prioritize inclusivity, equity, and sustainability. These models question the prevailing belief that technological progress automatically leads to urban development, instead promoting a comprehensive approach that incorporates social, environmental, and economic factors. These models question the prevailing narrative that gives more importance to technological solutions than to social and environmental factors. The notion of "smart cities" promotes a comprehensive strategy that incorporates social, economic, and environmental aspects. It goes beyond technology progress and emphasizes human-centred development (Bibri & Krogstie, 2017, p. 796). This transition promotes the involvement of many individuals and groups, such as citizens, in the processes of making decisions, thereby cultivating a feeling of responsibility and liability in the management of urban affairs (Bibri & Krogstie, 2017, p. 796). Community-led initiatives and participatory planning processes are becoming increasingly popular, highlighting the significance of local knowledge and the active engagement of residents in designing their urban settings (Vanolo, 2014, p. 893). These ideas acknowledge that technology should function as a tool for enhancing human agency instead of controlling urban life.

In addition, alternative models frequently centre around the notion of "just cities," which seek to tackle systemic disparities and guarantee that all members of the community reap the advantages of urban growth. This perspective endorses the idea that planning metropolitan areas should take into account the needs of diverse communities, rather than solely focusing on financial gain or technological demands (Vanolo, 2014, p. 894). Additionally, the concept of "smart boroughs" and "smart villages" expands the range of smart city efforts to encompass smaller urban and rural areas, acknowledging that urban development is not confined to major urban centres (Bibri & Krogstie, 2017, p. 797). By adopting a more comprehensive viewpoint, it becomes possible to develop customized strategies that effectively tackle the distinct obstacles encountered by various communities, thereby fostering fair and equitable access to resources and opportunities. The incorporation of sustainable development goals (SDGs) into urban planning frameworks emphasizes the interdependence of different urban challenges, prompting cities to embrace approaches that are both economically feasible and socially equitable while also being environmentally responsible (Bibri & Krogstie, 2017, p. 797).

These alternative models can enhance more comprehensive urban development strategies by promoting cooperation among diverse stakeholders, such as municipal authorities, community organizations, and citizens. By prioritizing conversation and co-creation, these initiatives can result in urban landscapes that are both technologically advanced and socially equitable, while also being environmentally robust. Incorporating these alternative views can ultimately contribute to the transformation of urban development, guaranteeing that it aligns with the values and requirements of all community members rather than a privileged few (Vanolo, 2014, p. 891). By adopting these alternative approaches, urban development policies can become more inclusive and equitable, guaranteeing that the advantages of smart city efforts are distributed impartially among all citizens. This strategy not only improves the overall well-being of citizens but also strengthens their ability to withstand and overcome the social and economic inequalities that often arise from rapid urbanization and technological progress. Ultimately, these evolving models promote a reimagined urban future that places human well-being and ecological practices as higher priorities than mere technological advancement.

Conclusion

In conclusion, the analysis of smart city initiatives in Barcelona and Toronto highlights the notable differences in the systems of administration, involvement of stakeholders, and effects on social fairness. The inclusive strategy of Barcelona, which prioritizes citizen participation and the restoration of municipal control over essential services, demonstrates the capacity of smart city projects to promote social justice. Barcelona showcases the possibility of designing smart city projects that emphasize the needs and rights of citizens by actively engaging citizens in decision-making processes and ensuring transparency in the administration of urban technologies. This kind of participation not only encourages a feeling of shared responsibility but also ensures fair and equitable access to the advantages of technological progress.

However, Toronto's corporate-driven approach raises concerns about privacy, data ownership, and the exclusion of community perspectives. The significant role of private corporations in influencing the smart city agenda in Toronto underscores the dangers of prioritizing profit-oriented goals at the expense of public well-being. The potential drawbacks of a corporate-centric strategy are evident in issues such as monitoring, data exploitation, and the exclusion of vulnerable people from the planning process. This poses important questions regarding the distribution of authority and the preservation of individuals' rights in the context of smart city advancement, underscoring the necessity for strong regulatory structures that safeguard public interests.

As cities globally incorporate digital technology into their urban infrastructure, the experiences of Barcelona and Toronto can provide valuable insights for shaping policies that prioritize inclusivity, transparency, and equity. The results of this study support the idea of adopting a well-rounded strategy for the development of smart cities. This approach should take into account the societal consequences of technical progress and aim to narrow the divide between innovation and social equality. Smart cities can transform into exemplars of urban resilience and equity by advocating for governance models that prioritize inclusivity and participation and enacting regulatory measures to safeguard citizen rights. By consistently examining and adjusting, smart cities may create conditions that promote the well-being of all residents, guaranteeing that advancements in technology benefit everyone and contribute to the development of fair and impartial urban futures.

Smart city projects have significant and diverse consequences for urban planners. The incorporation of digital technologies and data-driven systems in urban contexts requires a reassessment of conventional planning methods to adapt to the intricacies and possibilities offered by smart cities. Planners are responsible for integrating cutting-edge technologies and data analytics into their planning procedures to improve the effectiveness, sustainability, and overall quality of life in

metropolitan settings. This transition necessitates planners to embrace an interdisciplinary and collaborative methodology, involving a wide range of stakeholders, technologists, policymakers, community members, and industrial partners. The objective is to ensure the successful implementation of smart city initiatives that effectively cater to the requirements of the urban population. Engaging in cross-sector alliances and participatory processes is essential for developing smart city solutions that are inclusive, egalitarian, and responsive.

As cities globally incorporate digital technologies into their urban infrastructure, the experiences of Barcelona and Toronto might provide valuable insights for shaping policies that value inclusiveness, transparency, and fairness. Engaging technologists in the planning process enables the integration of state-of-the-art technologies and data-driven systems, which can improve the efficiency and sustainability of urban infrastructure. Policymakers possess specialized knowledge in governance and regulation, guaranteeing that smart city initiatives adhere to legal and ethical norms. Community members offer essential perspectives on local requirements, preferences, and concerns, assisting planners in developing customized solutions that are suitable for the city's unique circumstances. Industry partners provide resources, skills, and innovation to facilitate the implementation of smart city programs. Through promoting collaboration among these varied stakeholders, planners can use a broad spectrum of viewpoints, knowledge, and assets to tackle the social, economic, and environmental obstacles confronting metropolitan regions. The collaborative approach improves the quality and efficiency of smart city initiatives and encourages transparency, accountability, and community involvement in the planning process. In order to guarantee that smart city solutions are inclusive, sustainable, and useful for all members of the urban community, planners must collaborate across sectors and involve several stakeholders.

Planners are critical in addressing the social sustainability concerns that arise from the development of smart cities. Planners must meticulously evaluate the potential ramifications of digital technologies on several facets of society, such as social disparities, community solidarity, and individual self-governance. Planners can effectively address the potential negative outcomes of smart city initiatives by prioritizing social sustainability principles in their planning decisions. Planners must consider the need to address the problem of digital exclusion by ensuring that all members of the community have access to and can take advantage of the technological improvements implemented in smart cities. To address the digital divide and promote social justice in urban regions, planners can bridge the gap by implementing digital literacy initiatives, ensuring access to technology, and creating inclusive digital solutions. Planners must prioritize addressing privacy problems while constructing smart city projects. Planners can safeguard individuals' personal information and ensure ethical and transparent data collection and utilization by incorporating privacy-by-design principles into their

planning processes. Implementing this proactive strategy can cultivate trust among citizens and stakeholders, promoting a feeling of security and assurance in smart city technologies. Additionally, planners must take into account the potential ramifications of digital technology on social connections and community cohesion. To mitigate the potential social disconnection and isolation resulting from excessive reliance on digital technologies, urban planners can employ strategies such as creating urban spaces that facilitate face-to-face interactions, promoting public involvement in decision-making, and cultivating a sense of belonging and connection among residents.

This comparison of urbanism shows how important it is to carefully look at governance structures and stakeholder relationships to make sure that smart city efforts really do lead to fair and environmentally friendly urban growth. The disparities between Barcelona and Toronto highlight the importance of customizing smart urban planning approaches to the specific circumstances and distinct socio-political environments of each metropolis. Policymakers and urban planners can design more sophisticated strategies to meet the unique requirements of their communities by comprehending the accomplishments and difficulties encountered by these cities. Future development and sustainability of smart cities necessitate considering a variety of perspectives and ensuring that technological interventions do not exacerbate existing disparities.

By advocating for inclusive and participatory governance models and enforcing regulatory measures to safeguard citizen rights, smart cities have the potential to transform into exemplars of urban resilience and equity. By carefully examining and adjusting, smart cities may create conditions that promote the well-being of all residents, guaranteeing that advancements in technology benefit everyone and contribute to the development of fair and impartial urban futures.

REFERENCES

Barns, S., Cosgrave, E., Acuto, M., & Mcneill, D. (2017). Digital Infrastructures and Urban Governance. *Urban Policy and Research*, *35*(1), 20–31.

Bibri, S. E. (2019). The anatomy of the data-driven smart sustainable city: instrumentation, datafication, computerization and related applications. *Journal of Big Data*, *6*(1), 1–43.

Bibri, S. E., & Krogstie, J. (2017). Smart sustainable cities of the future: An extensive interdisciplinary literature review. *Sustainable Cities and Society*, *31*, 183–212.

Blessett, B., Dodge, J., Edmond, B., Goerdel, H. T., Gooden, S. T., Headley, A. M., Riccucci, N. M., & Williams, B. N. (2019). Social Equity in Public Administration: A Call to Action. *Perspectives on Public Management and Governance*, *2*(4), 283–299.

Burns, R., Fast, V., Levenda, A., and Miller, B. (2021). Smart cities: between worlding and provincialising. *Urban Studies* 58 (3), 461-470.

Caragliu, A., & Del Bo, C. F. (2022). Smart cities and urban inequality. *Regional Studies*, *56*(7), 1097–1112.

Caragliu, A., & Del Bo, C. F. (2023). Smart cities and the urban digital divide. *Npj Urban Sustainability*, *3*(1), 43–11.

Charnock, G., March, H., & Ribera-Fumaz, R. (2021). From smart to rebel city? Worlding, provincialising and the Barcelona Model. *Urban Studies (Edinburgh, Scotland)*, *58*(3), 581–600.

Dameri, R. P., Ricciardi, F., & D'Auria, B. (2014). Knowledge and intellectual capital in smart city. *European Conference on Knowledge Management*, *1*, 250–257.

Ferrer, J.-R. (2017). Barcelona's Smart City vision: an opportunity for transformation. *Field Actions Science Reports*, 70–75.

Filion, P., Moos, M., & Sands, G. (2023). Urban neoliberalism, smart city, and Big Tech: The aborted Sidewalk Labs Toronto experiment. *Journal of Urban Affairs*, *ahead-of-print*(ahead-of-print), 1–19.

Gasco, M. (2016). What Makes a City Smart? Lessons from Barcelona. *2016 49th Hawaii International Conference on System Sciences (HICSS)*, 2983–2989.

Halegoua, G. (2020). *Smart Cities*. MIT Press.

Karvonen, A., Cugurullo, F., & Caprotti, F. (Eds.). (2018). *Inside Smart Cities : Place, Politics and Urban Innovation* (First edition.). Routledge.

Kirkpatrick, G. (2020). *Technical politics : Andrew Feenberg's critical theory of technology*. Manchester University Press.

Kitchin, R. (2014). real-time city? Big data and smart urbanism. *GeoJournal*, *79*(1), 1–14.

Kitchin, R., Lauriault, T. P., & McArdle, G. (2015). Smart cities and the politics of urban data. In *Smart Urbanism* (1st ed., pp. 16–33). Routledge.

Kitchin, R., Cardullo, P., & Feliciantonio, C. (2019). Citizenship, Justice, and the Right to the Smart City. In *The Right to the Smart* City (pp. 1 – 24). Emerald Publishing Limited

Kummitha, R. K. R., & Crutzen, N. (2017). How do we understand smart cities? An evolutionary perspective. *Cities*, *67*, 43–52.

Lahat, L., & Nathansohn, R. (2023). Challenges and opportunities for equity in public management: Digital applications in multicultural Smart cities. *Public Management Review*, 1–24.

March, H., & Ribera-Fumaz, R. (2016). Smart contradictions: The politics of making Barcelona a Self-sufficient city. *European Urban and Regional Studies*, *23*(4), 816–830.

Mann, M., Mitchell, P., Foth, M., & Anastasiu, I. (2020). BlockSidewalk to Barcelona: Technological sovereignty and the social license to operate smart cities. *Journal of the Association for Information Science and Technology*, *71*(9), 1103–1115.

Robinson, J. (2006). Re-imagining the city through comparative urbanism: On (not) being blasé. In *Ordinary Cities* (1st ed., pp. 41–64). Routledge.

Sadowski, J. (2020). *Too smart : how digital capitalism is extracting data, controlling our lives, and taking over the world*. MIT Press.

Shin, S.-Y., Kim, D., & Chun, S. A. (2021). Digital Divide in Advanced Smart City Innovations. *Sustainability*, *13*(7), 4076-.

Shelton, T., Zook, M., & Wiig, A. (2015). The 'actually existing smart city.' *Cambridge Journal of Regions, Economy and Society*, *8*(1), 13–25.

Smith, A., & Martín, P. P. (2021). Going Beyond the Smart City? Implementing Technopolitical Platforms for Urban Democracy in Madrid and Barcelona. *The Journal of Urban Technology*, *28*(1–2), 311–330.

Sugandha, Freestone, R., & Favaro, P. (2022). The social sustainability of smart cities: A conceptual framework. *City, Culture and Society*, *29*, 100460-.

Tomàs, M. (2023). The smart city and urban governance: the urban transformation of Barcelona, 2011–2023. *Urban Research & Practice*, 1–18.

Vanolo, A. (2014). Smartmentality: The Smart City as Disciplinary Strategy. *Urban Studies (Edinburgh, Scotland)*, *51*(5), 883–898.

Walentek, D. (2021). Datafication process in the concept of smart cities. *Energies (Basel)*, *14*(16), 4861-.

Ward, K. (2010). Towards a relational comparative approach to the study of cities. Progress in Human Geography, 34(4), 471-487.

Yuksekdag, Y. (2024). Commodification, datafication and smart cities: An ethical exploration. *Journal of Urban Affairs*, 1–17.

Zygiaris, S. (2013). Smart City Reference Model: Assisting Planners to Conceptualize the Building of Smart City Innovation Ecosystems. *Journal of the Knowledge Economy*, *4*(2), 217–231.