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Understanding Smart City Policy: Insights from the Strategy Documents of 52 Local Governments

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Abstract: Today, many cities around the globe are interested in developing or adopting smart city policy frameworks; however, the complexity of the smart city concept combined with complicated urban issues makes it a highly challenging task. Moreover, there are limited studies to consolidate our understanding of smart city policymaking. The aim of this study was to bridge this knowledge gap by placing a set of official smart city policy frameworks under the policy analysis microscope. The study approached the analysis by, firstly, internationally collating the smart city policy frameworks of 52 local governments from 17 countries. The methodology then progressed to a deductive content analysis of the identified policies with a thematic data analysis software. The investigation employed the main themes to identify common urban issues in smart city policies—i.e., smart economy, smart environment, smart governance, smart living, smart mobility, and smart people. The results revealed the targeted key planning issues, goals, and priorities, and the ways that smart city policies address these key planning issues, goals, and priorities. The study findings inform policymakers, planners and practitioners on the smart city policy priorities and provide insights for smart city policymaking.

Keywords: smart city; smart economy; smart environment; smart governance; smart living; smart mobility; smart people; smart city policy; urban policy; urban technology

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1. Introduction

Smart urban technology adoption is a popular trend in cities as it is often portrayed as a solution to the many contemporary challenges that cities face [1]. In most cases, these technologies are promoted as part of a broader smart city agenda [2], but despite the increasing practice, there is no commonly agreed definition for smart cities [3–5]. The key perception difference comes from what smart means. For instance, for some, the smartness element in a smart city is the technology and data, and for some it is the people and policy, while for others it is a combination of both [6]. This difference in the conceptualization and perception of what a smart city is reflects on how a city strategizes their smart city planning [7].

This conceptualization and perception difference has an impact on urban policy. The authors of [8] identify that each city has unique urban priorities that affect the conceptualization of a smart city policy; however, aspects such as the application of information and communications technology (ICT) to the urban infrastructure, a collaboration of the stakeholders in all stages of planning and development, and the investment in innovation are all some of the basic building blocks of the smart city concept that applies pretty much to all smart city initiatives [9–11].

Given their broad scope and contextually varied applications in urban settings, smart city policies nevertheless have continued to attract funding from local governments to take advantage of the proposed benefits [12,13]. Most recently, the COVID-19 pandemic stimulated smart city technologies to develop rapidly in response to the urban crisis that it generated worldwide [14]. The contribution of smart technologies in dealing with the

COVID-19 pandemic [15] prompted a drastic increase in the long-term and widespread use of technology in urban governance and permanently altered the dimensions of health, data, logistics and crisis management [16–18]. These changes in planning trends have brought both benefits and challenges, while increased digitization has created the benefit of accelerating innovation for how cities plan, manage and govern their urban infrastructures. According to [19], the COVID-19 pandemic is turning into a "welcomed lubricant for the innovative stakeholders of many smart city development policies". This will likely boost smart city development during the post-COVID-19 era [20–22].

Nonetheless, it has also intensified the challenges of the digital divides between vulnerable community members, with technology progressing sooner than device serviceability. This challenge highlights the recent trends in smart city discourse and its relationship to participatory and collaborative governance, for though communities are identified as key components of a smart city, top-down initiatives dominate policymaking [23,24]. The concept inspires suggestions that smart city strategies should focus on institutional changes to provide context-sensitive outcomes in local urban areas [25,26]. This may include changing the structure of smart policy creation from being conceived within institutions and industries outwards to instead begin from the bottom-up for a more community-based approach.

Research into the effectiveness of existing smart city policies is limited [27,28]. This may be attributed to the relative newness of smart cities as a concept and the variety of how policies are incorporated in worldwide contexts. Most of the literature in this domain focuses on a single city's or only a few cities' policy analyses [29,30]. For instance: Clement & Crutzen [31] investigated how local policy priorities set the smart city agenda in the cases of London and Melbourne; Angelidou [32] analyzed four European cities' smart city strategies; Mancebo [33] compared smart city strategies of Amsterdam, Barcelona, and Paris. There are a relatively limited number of studies that compare, contrast, and analyze smart city policies in a large number of city cases. For example: Yigitcanlar [27] scrutinized the smart city development strategies of 15 cities; Angelidou [34] conducted research on 15 smart city policies and provided insights into the roles that ICTs play in urban systems; Joss et al. [35] captured the smart city storylines and critical junctures of 27 cities.

Moreover, the global rise in urbanization levels and associated economic, social, environmental, and governance challenges have been at the forefront of urban discourse in recent years. The concept of the smart city has been closely linked to these issues as a possible solution. Subsequently, the development of smart city strategy frameworks, in the form of smart city policy bundles, is gaining prominence globally. Today, many cities are interested in developing or adopting smart city policy frameworks; however, the complexity of the smart city concept combined with complicated urban issues makes it a highly challenging task. Moreover, as mentioned above, there are limited studies to consolidate our understanding of smart city policymaking.

Against this background, the study at hand discusses the existing knowledge gaps in smart city policy frameworks to offer understanding into how different cities are adapting smart urban technologies in response to their urban needs, with its own set of smart city characteristic measures. The paper focuses on addressing the following research questions: (a) What do smart city policies target in terms of key planning issues, goals, and priorities? (b) How do smart city policies address these key planning issues, goals, and priorities? The study aims to aid in the understanding of a smart city policy that would lead to a consolidated view on how smart city policies can be utilized in tackling the urban challenges faced by cities worldwide more effectively.

For the empirical analysis, the study identified 52 smart city frameworks from the local governments of 17 countries—Australia (n = 17), Austria (n = 1), Canada (n = 6), China (n = 1), Croatia (n = 1), England (n = 9), Germany (n = 1), Ireland (n = 2), Malaysia (n = 1), New Zealand (n = 1), Northern Ireland (n = 1), Poland (n = 2), Scotland (n = 2), Sweden (n = 1), Switzerland (n = 1), USA (n = 4), and Wales (n = 1).

The policy data then underwent a qualitative and quantitative content analysis with the guidance of six overarching smart city themes—namely, smart economy, smart environ-

ment, smart governance, smart living, smart mobility, and smart people [36]. The findings inform urban policymakers and planners on the common and distinctive policies being adopted in other cities and provide insights into smart city policy formulation.

Following this introduction, Section 2 of the paper outlines the research design. Next, Section 3 presents the results of the analysis, and Section 4 offers a discussion on the findings. Finally, Section 5 presents the conclusions of the study.

2. Materials and Methods

This study concentrates on addressing the following research questions of: (a) What do smart city policies target in terms of key planning issues, goals, and priorities? (b) How do smart city policies address these key planning issues, goals, and priorities? Most academic and practical references outline that there is no singular or uniform policy perspective that exists for smart city transformation that is generic enough to be adopted directly [37]. By extension, this issue also carries over when analyzing smart city policies that vary in scope and focus based on the local context and characteristics. Considering the contextual differences worldwide, smart city initiatives largely vary in focus depending on the planning issues of each locality. To simplify the scope of the research, the EU's smart city wheel was utilized under its six central characteristics: (a) smart economy; (b) smart environment; (c) smart governance; (d) smart living; (e) smart mobility; (f) smart people [26]. A study by [38] identified these six characteristics "as a roof for the further elaboration of smart cities", and this smart city wheel approach is widely utilized in both academic and policy studies [39,40]. The use of this categorization aids in the analysis of smart city policies, given that for a city to be considered truly smart it must perform well under all the smart wheel areas/categories [41].

The study adopts a qualitative and quantitative thematic analysis of keywords as the primary data collection method. The basis for selecting this method for smart city policies was that "thematic analyses move beyond counting explicit words or phrases and focus on identifying and describing both implicit and explicit ideas within the data, that is, themes" [42]. This study, hence, identified themes with guidance from the abovementioned six smart city characteristics for a holistic view of smart city policies.

The methodological approach for the thematic analysis was undertaken with the use of the NVivo software (v.12) to analyze the smart city policies both qualitatively and quantitatively. The software is used widely for use in qualitative and mixed-methods research and in this study, it was used for analyzing and organizing the smart city policy documents. To develop a comprehensive analysis with NVivo, the research initially collected data through search queries executed on the Google search engine. This search was intended to provide the widest range of results for smart city policy documents globally. Given the variety of smart city policy document titles, different combinations for the search statements were selected to ensure accuracy in the query results.

The search Boolean string used was as follows: ("smart city" AND "digital" AND "smart communit *") OR ("government" OR ("policy" AND "strateg *" AND "plan" AND "blueprint" AND "framework" AND "roadmap" AND 'masterplan")). Additionally, the following Boolean string was also used to make sure of the capture of the policy documents of the renowned smart cities: ("smart city" AND "digital" AND "smart communit *") OR ("government" OR ("policy" AND "strateg *" AND "plan" AND "blueprint" AND "framework" AND "roadmap" AND 'masterplan")) AND ("smart city name")—such as ("San Francisco"). The list of smart cities used for this purpose was obtained from the IMD Smart City Index 2021 that provides the international ranking of smart cities (available at https://www.imd.org/smart-city-observatory/home (accessed on 28 March 2022)). Figure 1 shows the specifics of the policy document selection process.

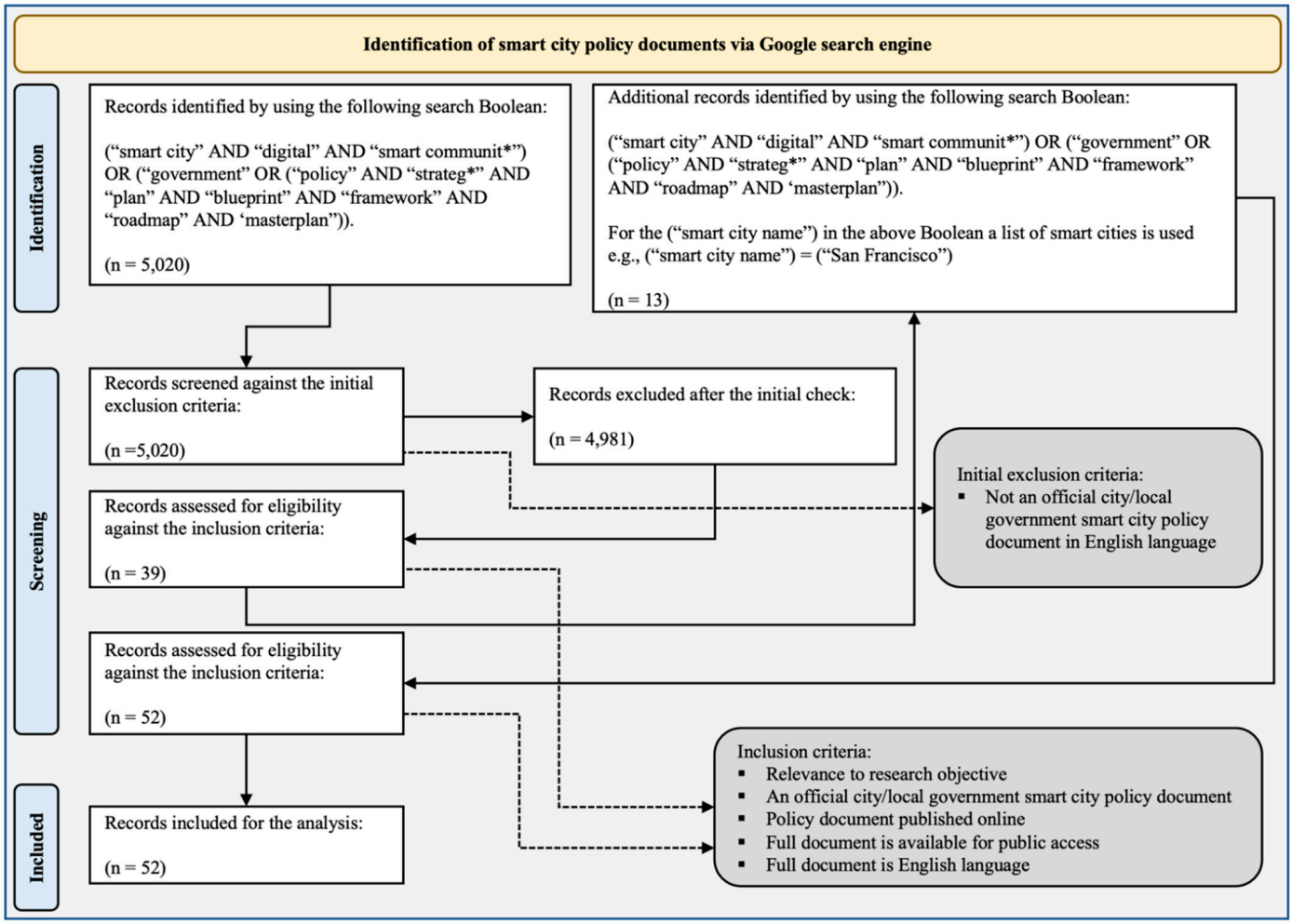

Figure 1. Policy document selection process.

The inclusion criteria for the search included the requirement that the policy documents must have been written in English and available online. Documents that did not meet these criteria were excluded from the analysis. The search results produced a total of 52 documents from local governments globally. Those cities varied demographically and geographically. Table 1 presents the salient characteristics of these 52 cities from 17 countries—Australia (n = 17), Austria (n = 1), Canada (n = 6), China (n = 1), Croatia (n = 1), England (n = 9), Germany (n = 1), Ireland (n = 2), Malaysia (n = 1), New Zealand (n = 1), Northern Ireland (n = 1), Poland (n = 2), Scotland (n = 2), Sweden (n = 1), Switzerland (n = 1), USA (n = 4), and Wales (n = 1).

All the smart city policy documents identified in the search were produced by or associated with the respective city's local government body and are presented in Table 2. The 52 policy documents related to a total of 16 countries, with Australia (n = 17), England (n = 9), and Canada (n = 6) as the countries with the most policy documents included in the research. The recency of the policy document publication dates was also prioritized in the search results. Consequently, the documents were all dated within about the last ten-year period, ranging between 2011 and 2021.

Table 1. Salient characteristics of the case cities.

City	Country	Capital	State Capital	Metropolitan	Population
Brisbane	Australia	No	Yes	Yes	2,560,720
Canterbury Bankstown	Australia	No	No	No	380,406
Casey	Australia	No	No	No	364,600
Charles Sturt	Australia	No	No	No	120,733
Marion	Australia	No	No	No	88,618
Darwin	Australia	No	Yes	Yes	147,231
Geelong	Australia	No	No	No	282,412
Hobart	Australia	No	Yes	Yes	238,834
Hobsons Bay	Australia	No	No	No	98,189
Newcastle	Australia	No	No	No	167,363
North Sydney	Australia	No	No	Yes	75,094
Norwood Payneham and St Peters	Australia	No	No	Yes	37,462
Parramatta	Australia	No	No	Yes	260,296
Sunshine Coast	Australia	No	No	No	348,343
Sydney	Australia	No	No	Yes	248,736
Townsville	Australia	No	No	No	183,32
Wyndham	Australia	No	No	No	283,294
Vienna	Austria	Yes	No	Yes	1,944,910
Winnipeg	Canada	No	Yes	Yes	632,063
St. Albert	Canada	No	No	No	65,589
Ottawa	Canada	Yes	Yes	Yes	812,129
Mississauga	Canada	No	No	Yes	668,549
Edmonton	Canada	No	Yes	Yes	712,391
Calgary	Canada	No	No	Yes	1,019,942
Hong Kong	China	Yes	No	Yes	7,598,189
Zagreb	Croatia	Yes	No	Yes	806,341
Birmingham	England	No	No	Yes	1,020,589
Bristol	England	No	No	Yes	399,633
Cambridge	England	No	No	Yes	116,701
Greenwich	England	No	No	Yes	286,186
Leeds City	England	No	No	Yes	726,939
Liverpool	England	No	No	Yes	467,995
London	England	Yes	No	Yes	7,074,265
Manchester	England	No	No	Yes	430,818
Sheffield	England	No	No	Yes	530,375
Munich	Germany	No	No	Yes	1,553,373
Cork	Ireland	No	No	Yes	208,669
Limerick	Ireland	No	No	Yes	94,192
Putrajaya	Malaysia	No	No	Yes	91,900
Wellington	New Zealand	Yes	No	Yes	212,700

Table 1. *Cont.*

City	Country	Capital	State Capital	Metropolitan	Population
Belfast	Northern Ireland	Yes	No	Yes	483,418
Krakow	Poland	No	No	Yes	755,050
Warsaw	Poland	Yes	No	Yes	1,702,139
Edinburgh	Scotland	Yes	No	Yes	448,850
Glasgow	Scotland	No	No	Yes	616,430
Stockholm	Sweden	Yes	No	Yes	975,551
Zurich	Switzerland	No	Yes	Yes	402,762
Chula Vista	USA	No	No	Yes	268,920
Las Vegas	USA	No	No	Yes	634,773
Philadelphia	USA	No	No	Yes	1,603,797
San Francisco	USA	No	No	Yes	874,961
Cardiff	Wales	No	Yes	Yes	315,040

Table 2. Salient characteristics of the policy frameworks.

Local Government	Policy Framework	Year	Reference
Brisbane City Council	Smart, Connected Brisbane Framework	2019	[43]
City of Canterbury Bankstown	The SMART CBCity Roadmap	2018	[44]
City of Casey	Smart Casey Launchpad	2021	[45]
City of Charles Sturt	Smart City Plan	2018	[46]
City of Marion	Smart CoM Strategy Plan	2020	[47]
City of Darwin	Smart Darwin: Our Smart City Strategy	2019	[48]
City of Greater Geelong	Smart City Framework	2021	[49]
City of Hobart	Connected Hobart Smart Cities Framework	2019	[50]
Hobsons Bay City Council	Enterprise Digital Strategy	2018	[51]
Newcastle City Council	Smart City Strategy	2017	[52]
North Sydney Council	North Sydney Smart City Strategy	2019	[53]
City of Norwood Payneham and St Peters	Smart City Plan	2020	[54]
Parramatta City Council	Smart City Masterplan	2018	[55]
Sunshine Coast Council	Smart City Implementation Plan	2016	[56]
City of Sydney	Smart City Strategic Framework	2020	[57]
Townsville City Council	Townsville City Council Smart City Draft Strategy	2018	[58]
Wyndham City Council	Wyndham Smart City Strategy	2019	[59]
City of Vienna	Smart City Wien Framework Strategy	2019	[60]
Calgary City Council	Calgary's Smart City Approach	2018	[61]
Edmonton City Council	Edmonton Smart Cities	2019	[62]
Mississauga City Council	SMRTCTY Master Plan	2019	[63]
City of Ottawa	Ottawa Smart City 2.0	2019	[64]

Table 2. *Cont.*

Local Government	Policy Framework	Year	Reference
City of St. Albert	City of St. Albert Smart City Master Plan	2016	[65]
City of Winnipeg	Winnipeg Smart Cities Proposal	2018	[66]
City of Zagreb	Integrated Action Plan: City of Zagreb	2018	[67]
Birmingham City Council	The Roadmap to Smarter Birmingham	2014	[68]
Bristol City Council	Connecting Bristol	2019	[69]
Cambridgeshire City Council	Connecting Cambridge	2018	[70]
Royal Borough of Greenwich	Greenwich Smart City Strategy	2014	[71]
West Yorkshire Combined Authority	Leeds City Region Digital Framework	2019	[72]
Liverpool City Region	LCR Digital Strategy	2021	[73]
London City Hall	Smart London Plan	2015	[74]
Manchester City Council	Manchester Digital Strategy	2020	[75]
Sheffield Executive Board	Smart Sheffield Report	2015	[76]
City of Munich	Project Smarter Together Munich	2016	[77]
Government of Hong Kong	Hong Kong Smart City Blueprint 2.0	2020	[78]
Belfast City Council	The Smart Belfast Framework	2018	[79]
Cork City Council	Cork City Digital Strategy	2018	[80]
Limerick City and County Council	Smart Limerick Roadmap	2018	[81]
Perbadanan Putrajaya	Smart City Blueprint	2019	[82]
Wellington City Council	Wellington Towards 2040: Smart Capital	2011	[83]
Krakow Metropolitan Authority	Smart_Kom Strategy	2015	[84]
City of Warsaw	Warsaw Towards a Smart City	2018	[85]
The City of Edinburgh Council	Edinburgh Digital and Smart City Strategy	2020	[86]
Glasgow City Council	Digital Glasgow Strategy	2018	[87]
City of Stockholm	Strategy for Stockholm as a Smart & Connected City	2017	[88]
Zurich City Council	Smart City Zurich	2018	[89]
City of Chula Vista	City of Chula Vista Smart City Plan	2017	[90]
Las Vegas City Council	Smart Vegas: A Forward Focused Plan	2019	[91]
City of Philadelphia	Smart City PHL Roadmap	2019	[92]
City and Council of San Francisco	Strategic Vision for Smart Cities and the Internet of Things	2018	[93]
Cardiff Council	Cardiff Smart City Road Map	2018	[94]

After the initial identification of the 52 relevant policy documents from online searches, the documents were thoroughly read to ensure suitability before commencing the analysis. Once the documents were identified as appropriate, the collected policies underwent a thematic analysis to identify the most significant nodes and sub-nodes related to the smart city content. To guide the identification of nodes in a subject as broad as smart cities, six smart city characteristics were used as the following six nodes: smart economy; smart environment; smart governance; smart living; smart mobility; smart people [38]. From the six overarching nodes, nine sub-nodes corresponding to each characteristic were manually

identified from reading the contents of each policy document. Table 3 lists the nodes and their associated sub-nodes.

Table 3. Coding of the policy framework data.

Node	Sub-Node
Smart Economy	Business competitiveness, Business efficiency, Business intelligence, Business technology, Digital assets, Digital innovation, Economic business growth, Entrepreneurship, Market
Smart Environment	Carbon neutral, Climate change, Environmental conservation, Natural disaster, Reduce energy consumption, Renewable energy, Sustainable city, Sustainable Development, Waste and water management
Smart Governance	Citizen engagement, Collaborative leadership, Community engagement, Digital democracy, E-government, Multi-sector collaboration, Open data portal, Stakeholder engagement, Urban innovation
Smart Living	Attractive city, Cultural diversity, Data privacy, E-services, Entertainment, Livability, Sense of place, Smart home, Urban infrastructure
Smart Mobility	Active transport, Electric vehicle, Mobility as a service, Noise and air pollution, Public transport, Smart parking, Sustainable mobility, Traffic management, Transportation management
Smart People	Collaboration networks, Community environment, Digital citizenship, Digital education, Digital inclusion, Diverse population, Equal opportunity, Resilient community, Skill development

3. Results

3.1. Quantitative Content Analysis

The smart city policy data was evaluated using quantitative content analysis tools within NVivo software (v.12). Initially, word clouds were created to present word frequencies within the policy documents where the largest words were the most repeatedly mentioned. Figure 2 presents the frequency of words throughout all 52 policy documents, while Figure 3 presents the frequency of words within the coded data. Following the initial analysis, the mentioned frequencies of the nodes and sub-nodes were analyzed. Table 4 contains a list of all the analyzed nodes, sub-nodes, number of sub-nodes mentioned within policies, frequency of sub-nodes, and total frequencies. From the six nodes, the three with the highest total sub-node frequencies were 'smart mobility' (n = 307), 'smart living' (n = 306), and 'smart environment' (n = 302). The least referenced nodes were 'smart people' (n = 193) and 'smart governance' (n = 224). All the sub-nodes were mentioned throughout all 52 policy documents, where 'economic business growth' (n = 37) was the most frequently mentioned individual sub-node, followed by 'urban infrastructure' (n = 30).

Following the word frequency analysis, Figure 4 presents a hierarchy chart created in NVivo software of all the nodes and sub-nodes with the aggregated policy document data. The size of each rectangular section is relative to the node frequency and provides a holistic view of each of the six nodes and their nine corresponding sub-nodes. The chart demonstrates that the most prominent nodes in the policy analysis were those of 'smart mobility', 'smart living', and 'smart environment'. Additionally, the hierarchy chart displays the prominence of the nine sub-nodes within the overarching nodes. The frequency is reflected by the comparative rectangle size, with the largest being the most frequent and smallest being the least frequent.

Figure 2. Word cloud of the policy content.

Figure 3. Word cloud of the coding.

Table 4. Nodes, sub-nodes, and mention frequencies.

Node and Node Frequency	Sub-Node	Sub-Nodes Mentioned in Policies	Frequency of Sub-Node	Total Frequency of Sub-Nodes
Smart Economy = 29	Business competitiveness	1	2	=284
	Business efficiency	1	1	
	Business intelligence	9	18	
	Business technology	1	3	
	Digital assets	6	7	
	Digital innovation	14	35	
	Economic business growth	37	107	
	Entrepreneurship	24	43	
	Market	28	68	
Smart Environment = 18	Carbon neutral	10	17	=302
	Climate change	26	80	
	Environmental conservation	2	12	
	Natural disaster	1	1	
	Reduce energy consumption	6	8	
	Renewable energy	25	75	
	Sustainable city	14	22	
	Sustainable development	15	48	
	Waste and water management	16	39	
Smart Governance = 8	Citizen engagement	13	21	=224
	Collaborative leadership	4	4	
	Community engagement	22	42	
	Digital democracy	2	7	
	E-government	6	13	
	Multi-sector collaboration	2	3	
	Open data portal	10	30	
	Stakeholder engagement	12	81	
	Urban innovation	7	20	
Smart Living = 16	Attractive city	4	4	=306
	Cultural diversity	5	11	
	Data privacy	7	18	
	Entertainment	23	45	
	Livability	27	101	
	E-services	8	35	
	Sense of place	2	5	
	Smart home	6	8	
	Urban infrastructure	30	79	

Table 4. *Cont.*

Node and Node Frequency	Sub-Node	Sub-Nodes Mentioned in Policies	Frequency of Sub-Node	Total Frequency of Sub-Nodes
Smart Mobility = 27	Active transport	2	3	=307
	Electric vehicle	15	26	
	Mobility as a service	8	14	
	Noise and air pollution	17	32	
	Public transport	18	80	
	Smart parking	20	41	
	Sustainable mobility	5	6	
	Traffic management	16	23	
	Transportation management	22	82	
Smart People = 21	Collaboration networks	1	1	=193
	Community environment	2	2	
	Digital citizenship	3	5	
	Digital education	18	54	
	Digital inclusion	29	94	
	Diverse population	5	12	
	Equal opportunity	2	3	
	Resilient community	3	5	
	Skill development	13	17	

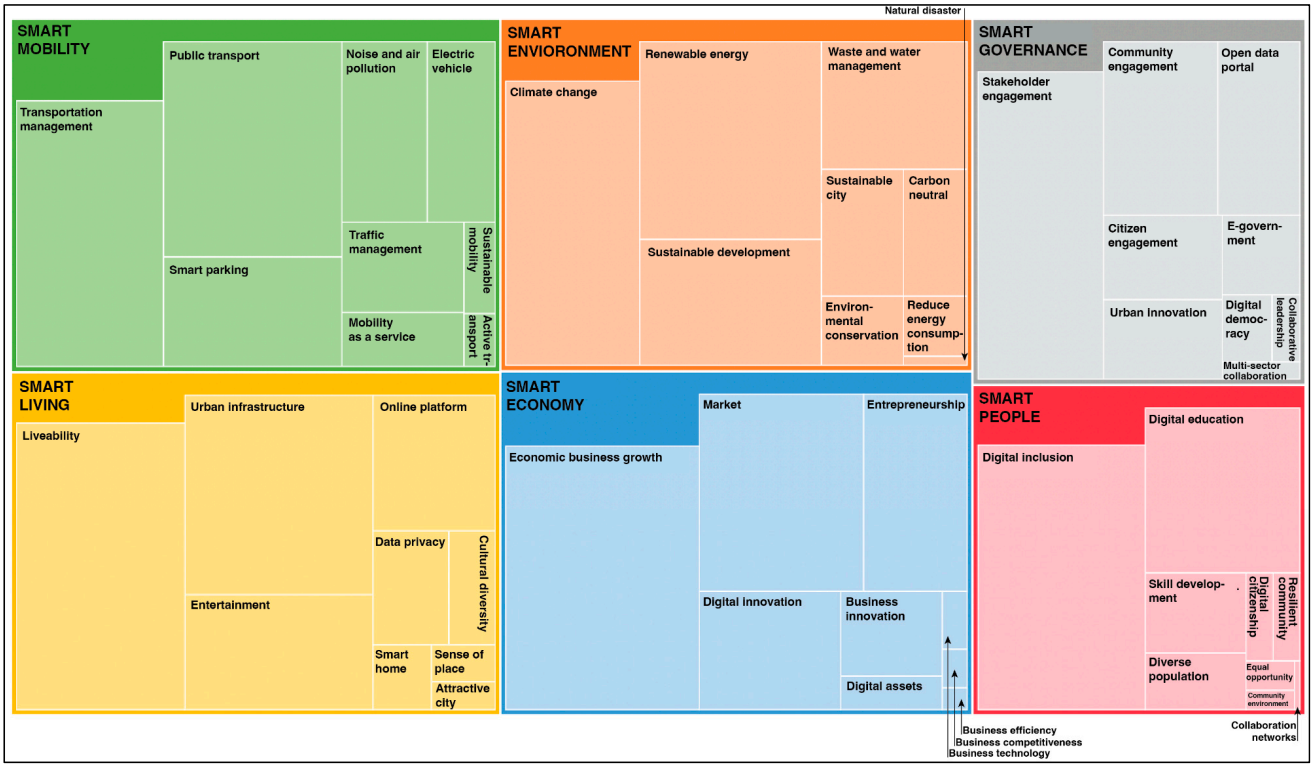

Figure 4. Hierarchy of nodes and sub-nodes.

3.2. Qualitative Content Analysis

Following the quantitative analysis task, a qualitative content analysis task was undertaken. Figure 5 presents a concept map for each of the six nodes and corresponding sub-nodes that were analyzed against the smart city policy frameworks. The map presents the aggregated text searches and their coding which were used to develop the total frequency figures for quantitative analysis. The results are presented under the six category areas below.

3.2.1. Smart Economy with Economic Growth Focus

The findings from the 'smart economy' category offered insight into the economic priorities that the smart city policies were focusing on in the context of local governments. The most noticeable economically linked policy implementations fell under the following categories: (a) business competitiveness; (b) business efficiency; (c) business intelligence; (d) business technology; (e) digital assets; (f) digital innovation; (g) economic business growth; (h) entrepreneurship; (i) market. The categories identified many conventional economic goals that the local governments pursued, with the most prominent being an overall business and economic growth. Smart city policies were seen to focus on traditional technological implementations to achieve growth, such as innovation, investment, and entrepreneurship; however, the local governments were also concentrating on new digital assets that their economies engaged with, such as data and artificial intelligence (AI). The Digital Glasgow Strategy [87] elaborated on this new economic and business growth focus as follows:

> *"The growth in digital technology is no longer about traditional software and hardware technologies. Increasingly digital innovation is being driven by the power of data, data analytics and artificial intelligence."*

Due to the prominence of data in modern cities, the discussion of how to best utilize this asset to improve business and economic functions was encouraged in various smart city policies as outlined by the St. Albert Smart City Master Plan [65] as below:

> *"A smart city promotes entrepreneurship and supports business requirements, particularly as the cost or ability to obtain valued data and education is a barrier to some businesses. A city can support the growth and success of its existing businesses, the attraction of new businesses, and the commercialization of its data through specific smart city services."*

In another example from Ottawa's Smart City 2.0 [64], harnessing data for economic benefits also extended to the socioeconomic benefits that smart city policies encompass as described next:

> *"The premise behind this is that shared data encourages community participation in smart city solutions. Equally important, it also facilitates knowledge-based business growth by providing third parties with data that enables the development of digital applications and smart city solutions. Essentially, it enables socioeconomic growth by providing access to data to those trying to analyze and solve problems."*

Alongside the outlined benefits of data innovation, the smart policies were also considering the dilemmas that may arise with new technologies and their influences on economic growth. The Smart City Wien Framework Strategy [60] discussed this alternative perspective as follows:

> *"End-to-end digitalization is penetrating all spheres of life. This phenomenon raises a host of new issues, for instance regarding the transparent handling and careful treatment of large quantities of data, the ethical and moral boundaries associated with the use of digital innovations such as artificial intelligence, and equitable distribution of the benefits and opportunities afforded by new technologies."*

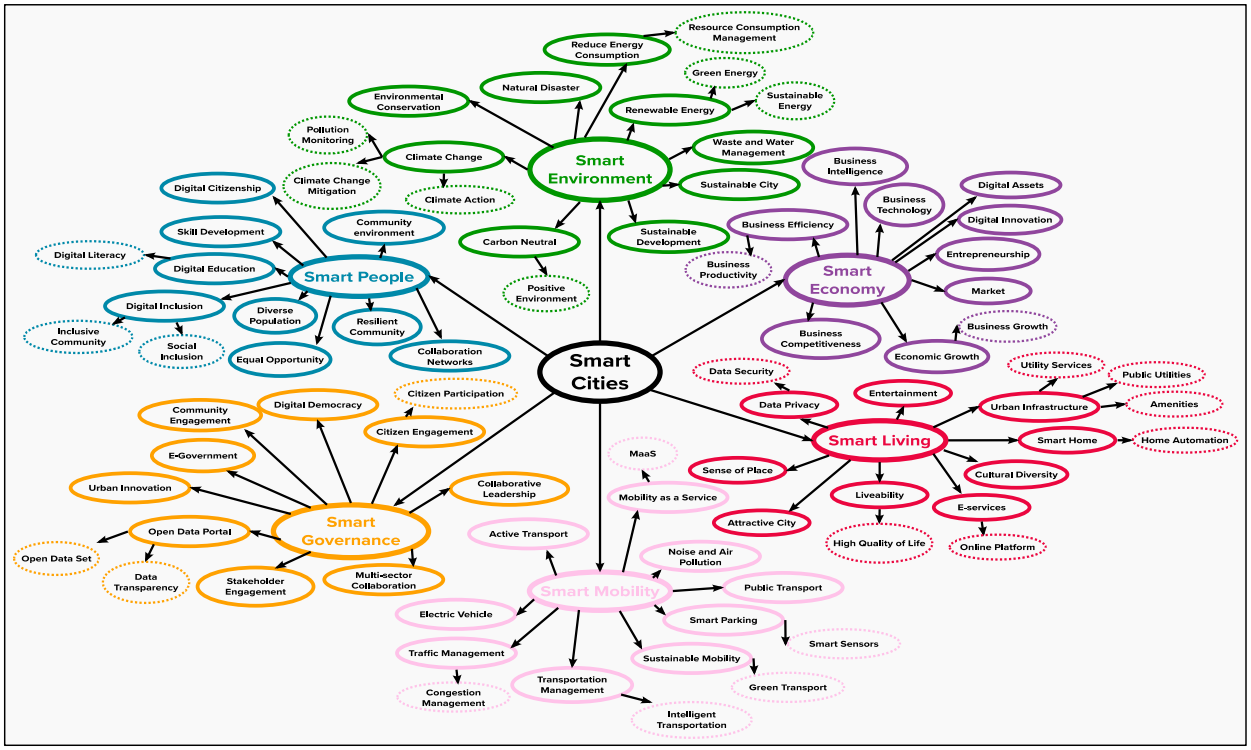

Figure 5. Smart city policy concept map.

The benefits of applying new technologies to achieve economic and business growth in the identified policy frameworks was prominent. Nevertheless, the local governments were also increasingly aware of the negative consequences that may arise if these technologies are not handled appropriately to achieve not only economic growth but also to work in unison with other smart city objectives. For example, if local governments focus solely on advancing their economy through new technologies, they risk neglecting other characteristics that create a smart city. Recognizing the need for this balance facilitates economic growth while also providing an enriching opportunity for their communities overall [95].

3.2.2. Smart Environment with Climate Change Focus

The findings from the 'smart environment' category assisted in finding the most prominent environmental foci within the identified policies. From the local government perspective, the main categories associated with environmental smart city policy included: (a) carbon neutral; (b) climate change; (c) environmental conservation; (d) natural disasters; (e) reduce energy consumption; (f) renewable energy; (g); sustainable city; (h) sustainable development; (i) waste and water management. Of these categories, the most frequently recurring smart city initiatives focused on climate change and the importance of renewable energy. This prominence was related to the perception that renewable energy is a means of achieving overarching environmental objectives. As an example, Sydney's Smart City Strategic Framework [57] described the drive towards renewable energy as below:

> *"Technological advancements can support us to accelerate the transition to affordable, renewable energy and a carbon-neutral future. Data and digital technology can help to manage flows of materials and assets across the city, fostering an urban system that is regenerative and restorative."*

After commenting on the perceived value of renewable energy as a method and a means to ensure a healthier environmental future, several frameworks outlined the renewable energy adoption methods currently operating in their councils. The Smart City Wien Framework Strategy [60] outlined their approach as follows:

> *"The energy supply of Smart City Wien is based almost exclusively on renewable energy sources that are also used locally: solar installations on rooftops and facades generate power and heat. Efficient heat pumps allow waste and ambient heat to be used for heating and cooling of buildings. Deep drilling draws hot water from a depth of 3000 m underground and feeds it into the district heating network. Wind turbines, photovoltaic installations, hydroelectric and biomass plants both inside and outside the city use renewables to meet the city's daily energy requirements."*

Likewise, the Digital Glasgow Strategy [87] stated the following as their renewable energy priorities:

> *"Smart grid technologies, together with digitally-enabled renewable energy sources are allowing energy companies to improve the efficiency of energy supply, and technologies such as electric vehicles and autonomous vehicles provide opportunities to transform transport and to reduce pollution."*

These approaches highlight the importance of renewable energy as a prominent policy method for tackling urban environmental challenges. Nonetheless, given the vast number of complex environmental externalities—e.g., carbon emissions, pollution, and climate change—renewable energy policies alone are not enough to overcome these issues. Smart city policies establish that renewable energy is most effective when implemented alongside technology that enhances its overall effectiveness. Ultimately, for a city to be smart, it must consider the environmental policies that it can implement to improve its chance of overall success. This brings the necessity for smart cities to also become sustainable cities, providing a triple-bottom-line sustainability [96,97].

3.2.3. Smart Governance with Stakeholder Engagement Focus

The findings from the 'smart governance' category offered insight into the structural changes that local governments present to achieve their smart city objectives. The central governance categories from the selected policies were: (a) citizen engagement; (b) collaborative leadership; (c) community engagement; (d) digital democracy; (e) e-government; (f) multi-sector collaboration; (g) open data portal; (h) stakeholder engagement; (i) urban innovation. The categories generally displayed the growing interest in increasing community interaction and transparency in the application of new technologies. Moreover, the local governments perceived that community and stakeholder participation policies are a viable method of adapting the existing top-down government practices to better target urban issues. The Greenwich Smart City Strategy [71] outlined how they are implementing this approach in the following words:

> *"In a consultative and collaborative approach, the council sees service delivery as a collaborative process in which citizens are active co-creators of public services. It will empower people to create their own solutions both to their own needs and to the needs of others in Greenwich. It will also use new, digitally enhanced forms of civic engagement to ensure direct, meaningful, and real-time participation of citizens in the planning, policy, budgeting, and management decisions of the Council."*

Additionally, Wyndham's Smart City Strategy [59] displayed an example of their methods as outlined below:

> *"Emerging technology offers exciting opportunities to enhance both the transparency, accountability, and integrity of planning and decision-making and the physical safety aspects of the city. Real time reporting, smart sensors, open data, and digital democracy will be key elements of this change and Wyndham will embrace these advancements."*

Smart governance is critical for smart cities as it is the enabler domain for the other five smart city domains; therefore, smart governance has a special importance as it aligns closely with the planning, development, execution/implementation, and management of all smart city policies. For this reason, local government agencies should pay a special

attention on this domain—particularly wider stakeholder engagement that will increase the legibility and acceptability of the policy.

3.2.4. Smart Living with Enhanced Livability Focus

The findings from the 'smart living' category provided insight into the smart city priorities that the local governments implemented to enhance the overall quality of life. From this perspective, the categories most prominent under the smart living umbrella included: (a) attractive city; (b) cultural diversity; (c) data privacy; (d) e-services; (e) entertainment; (f) livability; (g) sense of place; (h) smart home; (i) urban infrastructure. Given the significance of livability as one of the primary objectives of smart cities, this theme also translated to smart city policy. Newcastle's Smart City Strategy [52] explained this priority as follows:

> *"Livability is crucial to the creation of a sustainable city community, as is the quality of amenity within its built urban fabric. The livability, amenity and attractiveness of a city refers to the quality of social space, its economic dynamism, and the overall ability of local authorities and other stakeholders to develop a progressive and inclusive economy."*

Alongside establishing the importance of livability for smart cities, the local governments were discovering how to integrate new technologies to achieve their community goals. Primarily, the smart city policies discussed the technologies being implemented in public infrastructure and in transforming existing communal areas.

The St. Albert City Smart City Master Plan [65] outlined how they were incorporating technology to realize the smart city objective of improved livability as below:

> *"In St. Albert, local amenities, street furniture, public art, and events are infused with technologies that seek to inspire and delight. Modern convenience features such as charging stations and Wi-Fi connectivity are widely available, digital information and wayfinding kiosks are integrated into the community's tourist sites, and the city offers a host of e-services for its residents to ensure maximum flexibility and convenience."*

In another example, Ottawa's Smart City 2.0 [64] elaborated how they were introducing technologies into urban infrastructure and receiving feedback from multiple social levels to understand improvements to livability in the following blurb:

> *"Smart Community Pilots: The pilot smart city technology and amenities in Ottawa communities will allow for the demonstration and development of smart city applications at the residential, business, and entrepreneurial level, while at the same time allowing the community the unique opportunity to evaluate technology and observe socioeconomic impacts."*

The policies outlined the importance of livability in the development of a smart city world-wide. Increasingly, a primary aspect that the local governments had adopted was the integration of technologies to improve the quality of life for their communities; however, feedback on the viability of these technologies is still required. This is where the governance and community engagement aspect of smart cities is necessary. If no communication or follow up is provided, the investments into new technologies and infrastructure may not reflect the needs of communities. Effectively, to increase the livability in smart cities, local governments must also adapt their governance strategies to ensure that their citizens are part of the process [98].

3.2.5. Smart Mobility with Transportation Management Focus

The findings from the 'smart mobility' category provided an understanding of the importance that smart city policymakers placed on the provision of efficient transportation methods. The predominant mobility-linked policy implementation fell under the following categories: (a) active transport; (b) electric vehicle; (c) mobility-as-a-service; (d) noise and air pollution; (e) public transport; (f) smart parking; (g) sustainable mobility; (h) traffic management; (i) transportation management. The categories presented multiple transport-

related foci that the smart city policies were targeting. A common theme throughout the policies was a push towards public and active forms of transport but many local governments were still providing smart solutions for more efficient car use. This resulted in many frameworks having a combination of policies to increase public transport while, conflictingly, also improving the smart experience for car users. Specifically, the traffic management and smart parking categories identified smart technology that improves car use through smart sensors and parking apps. Wyndham's Smart City Strategy [59] mentioned examples of the benefits that this technology provides as follows:

> *"Information about parking bay availability makes it easier for citizens to find parking when and where they need it, assists with infrastructure planning and can also reduce air pollution by minimizing time spent looking for free spaces."*

Additionally, the City of Norwood Payneham and St Peters Smart City Plan [54] elaborated on the technologies they were implementing for both car use and other modes of travel in the following blurb:

> *"Mobility outcomes such as parking, wayfinding and journey-planning were identified as areas of our city that can be enhanced through smart technology. The availability of real-time data, collected from smart sensors and devices, can be used to enhance a range of smart mobility outcomes in our city."*

Traditionally, car use can be associated with various urban issues including traffic, noise, and air pollution; however, the smart mobility concept for many local governments raises the conflict between either investing more in improving car use or improving more efficient modes of transport. If a council prioritizes smart technologies that make car use more efficient, it may impact the effectiveness of investment in smart technologies for public or active transport that reduce the negative impacts of car use. Various policy frameworks aimed to address this issue by facilitating electric vehicle use. The Hong Kong Smart City Blueprint 2.0 [78] presented one of the common approaches as follows:

> *"Implement a pilot subsidy scheme to promote installation of electric vehicle charging-enabling facilities in car parks of existing private residential buildings."*

The smart mobility category identified that the smart city policies were aiming to address complex and often contradicting transport issues. Overall, many local governments were prioritizing smart technologies to increase public transport use while at the same time encouraging private motor vehicle use. There is a significant concentration in smart city policymaking on making transport autonomous, connected and platform-based—such as mobility-as-a-service (MaaS). Nevertheless, there is a major gap in the smart city policy field in making transport affordable and accessible for all citizens, particularly for those socially excluded and disadvantaged [99].

3.2.6. Smart People with Digital Inclusion Focus

The findings from the 'smart people' category offered insight into how local governments were putting efforts into including their communities in creating a smart city. The predominant policies under the smart people category included: (a) collaboration networks; (b) community environment; (c) digital citizenship; (d) digital education; (e) digital inclusion; (f) diverse population; (g) equal opportunity; (h) resilient community; (i) skill development. These categories provided a wide-range of people-based policies that were currently being implemented in local governments. In particular, the concept of a digital presence was prominent within the categories of digital citizenship, digital education, and digital inclusion. Mississauga's SMRTCTY Master Plan [63] highlighted these interconnected concepts in the lines of the below:

> *"Success in the increasingly digitized social and economic realms requires a comprehensive approach to fostering inclusion. Digital inclusion brings together high-speed internet access, information technologies, and digital literacy in ways that promote success for communities and individuals trying to navigate and participate in the digital realm."*

Significantly, the smart city policies were identifying a correlation between digital exclusion and other forms of exclusion including poverty, education, age, gender, and several other issues prevalent in urban centers. Further, the concept of digital inclusion identified that providing digital services was not enough. Many smart city policies were actively addressing the fact that citizens need to be educated on how to use the technologies available to them rather than simply assuming that people will immediately understand how to use those services. The Smart Casey Launchpad [45] was one such policy that identified and addressed this notion in the following way:

> *"Digital inclusion is critical to maximizing and sharing the benefits of the digital revolution. Free public Wi-Fi, digital training sessions, and online-safety courses help to ensure everyone in the community can participate and benefit."*

Similarly, the Smart Sheffield policy [76] presented an example of the same concept along the lines of the below:

> *"However, having access to the Internet and knowing generally how to use it is not enough—a truly digitally included person also knows how to apply these technologies to their own social and economic advantage."*

Exclusion is a widespread and complex urban issue; however, using technology to improve this concern was one of the primary themes identified in the smart city policies. In addressing this, the smart city policies were increasingly concentrating on the integration of the feedback and participation of citizens in the entire governance process to ensure that infrastructure would effectively meet the needs of each community. For example, by ensuring that citizens have a digital identity and voice, local governments can implement enhanced smart city policies in the future. Citizens who previously were excluded from governance processes can voice their concerns digitally and local governments can approach urban issues with a greater perspective. Moreover, the presence of digital inclusion policies demonstrates that local governments understand the value of citizen input in the function of a successful smart city [100].

4. Discussion

4.1. Insights from International Smart City Policy Frameworks

The study at hand focused on capturing smart city themes that arose in policies from cities worldwide. For that purpose, 52 smart city frameworks from the local councils of 17 countries—Australia (n = 17), Austria (n = 1), Canada (n = 6), China (n = 1), Croatia (n = 1), England (n = 9), Germany (n = 1), Ireland (n = 2), Malaysia (n = 1), New Zealand (n = 1), Northern Ireland (n = 1), Poland (n = 2), Scotland (n = 2), Sweden (n = 1), Switzerland (n = 1), USA (n = 4), and Wales (n = 1)—were placed under the microscope. The results provided an understanding of the key urban planning issues that these policies were often targeting. The study on smart city policies revealed that local governments implemented smart city strategies in response to a wide range of urban concerns or issues. These are discussed below under the six smart city domains.

Smart economy: As the node frequency analysis (see Table 4) has indicated, smart economy was the most popular policy domain amongst the investigated smart city policy documents. The main challenge for most of the investigated smart cities was to become economically competitive or to maintain their already established competitive edge. Economic business growth was, thus, reflected as the primary issue for smart city policies when discussing the relevance of 'smart economy' foci—whether it is technology or creativity concentrated [101,102]. In response to this issue, the policies encouraged the investment in smart city technologies as crucial business infrastructures to attract innovative businesses that, in turn, would increase employment opportunities. In support of this, the policies mentioned how the adoption of data, data analytics, AI, and other new technologies can support the overall planning goals and priorities of business and economic growth by driving innovations in communities. The existing research has suggested that the emergence of

data and AI can substantially aid urban economic growth [103–106], and that the priority smart city policies give this aspect is reflective of this knowledge.

The policies also identified the socioeconomic benefits from the incorporation of these new technologies. Specifically, shared data was outlined with its benefit of enabling community and business participation in the formation of smart city solutions. Given the dominance of economic efficiency goals for the use of data, the mention of data-related concerns is a new form of rhetoric that raises concerns around data use [107]. This rhetoric was also reflected in the smart city policies where the transparency of data, AI boundaries, and the overall equitable distribution and ethical use of new technologies were identified as possible areas of concern—in line with the literature [108].

Smart environment: For many of the investigated smart cities, one of the leading challenges was to tackle, through their policy frameworks, the unsustainable development problem. In this perspective, the central planning issue identified under the 'smart environment' aspect of the smart city policies was climate change. Together with climate change, renewable energy was derived as both a goal and a priority for targeting multiple environmental urban challenges. The strategies mentioned various technologies—e.g., solar installations, wind turbines, heat pumps, photovoltaic installations, and smart grids—being utilized to contribute to renewable energy goals and objectives. The incorporation of these technologies in the smart city policies reflects renewable energy's wide regard as a key solution for climate change and energy security challenges in urban centers [109]. The findings from the smart city initiatives reflected the existing knowledge that technological innovations are highly interconnected with sustainability, as well as with the values and concerns that invariably shape the discourse and aims of new technologies [110].

Though many policies prioritized the importance of smart grids to increase the effectiveness of renewable energy [111], few policies fully mentioned how their renewable energy targets functioned beyond the local government level. The study findings of [112] indicate that local renewable energy strategies need to be coordinated with global, national, and neighboring cities to meet the challenges of climate change effectively. Considering that the existing policies lacked this focus, future smart city policies are provided with an opportunity for extending renewable energy contributions beyond their localities. Overall, the local governments were optimistic about policies related to the outcomes of renewable energy sources in combination with technology that improves its effectiveness to contribute to a smarter environment; however, improvements can be made to extend the positive impacts beyond the local level.

Smart governance: Good governance practice is the enabler of smart city (trans)formation, and in that respect, governance to become smart(er) would help in the efficiency and effectiveness of smart city decisions [113]; however, the lack of or limited stakeholder and public participation in the decision-making process is an important issue for cities. This was also the case for the smart cities. The investigated smart city cases showed that stakeholder engagement was the prevalent issue for 'smart governance' in the identified smart city policies. Engagement at all levels was the major focus for many of the local councils, where community and citizen engagement were identified as goals and priorities for smarter governance. Technologies for civil engagement, real-time reporting, smart sensors, and open data were among the technologies being implemented by various policies. Where previous studies have raised concerns in relation to the ethical implementation of data in smart city economies, smart governance plays a central role in managing these concerns. A study by [114] similarly suggested that policy based on data analysis promotes technocratic decision-making and that the priorities of stakeholder, community and citizen engagement in policy is reflective of this. The concept of community engagement also significantly overlapped between the smart governance and smart people nodes within the policies. This is indicative of the growing importance for citizens to hold participative roles in the decision-making process [115]. This focus additionally supports the existing suggestions that there is a current transition from the dominance of traditional top-down planning initiatives to a model that incorporates citizens not only as users but as collaborators [116,117]. Nonetheless, though

the policies suggested the importance of stakeholder engagement, many policies did not provide specific bottom-up planning approaches. The smart governance results reflected this, as it was one of the least mentioned characteristics in the smart city policies. These results mirror the study findings of [34], whereby many policies were addressing the issue of engagement but in a limited capacity. With evidence to suggest that smart cities need adjusted governance to support stakeholder engagement, future smart city policies need to increase this priority for smart governance.

Smart living: One of the main promises of the smart city movement is to increase the quality of life/living in cities through infrastructural and technological innovation offerings; however, a lack of significant quality of life improvements or improvements for only a small group of privileged locations/people remains as an important problem for so-called smart cities. In most of the investigated smart city cases, hence, livability was suggested to be the prominent issue under the 'smart living' aspect of the smart city policies. The policies targeted and prioritized new technologies with the goal of effective integration into public infrastructure and amenities. This was often targeted in the form of Wi-Fi and e-services that provide digital information for public users. Primarily, the presence of livability as a central priority in the smart city policies shows that local governments understand that smart cities can generate safe, healthy, and sustainable communities [118]. Smart city applications were also utilized to enable direct feedback and evaluations from the public on the impacts of these technologies and their effectiveness. The prioritization of these technologies demonstrates that the local councils were endeavoring to integrate citizens into the decision-making process of local government, and it highlights the interrelation of the smart living, smart governance, and smart people aspects.

Smart mobility: As the node frequency analysis has indicated, smart mobility was the second most popular focus in smart city policy, after a smart economy. This was probably due to the rapid advancements in urban mobility domain—such as autonomous driving, electric vehicles, and mobility-as-a-service (MaaS) [119]—and the importance of addressing urban mobility problems as negative externalities of the environment and societies, causing transportation disadvantage and social exclusion [120,121]. In this perspective, this study outlined various policy implementations related to 'smart mobility' with the most prominent issue being transportation management. It is widely accepted that governments worldwide identify public transport as a primary goal and priority over private vehicle use [122]. This factor was further reflected in the smart city policies with public transport being the second most mentioned characteristic; however, there was also a significant focus on investing in private vehicle use. These priorities may be reflective of the wide range of contexts that the policies originated from, with many being in areas that have a significant reliance on private vehicles. Additionally, COVID-19 exacerbated the dependence on individual vehicle use and local governments should adjust their future transport policies to improve public transport that is safe and efficient beyond the pandemic [123].

Many policies referenced parking sensors, parking applications, wayfinding applications, and electric vehicles as some of the most beneficial technologies for effective transportation management. These technologies indicate that smart city policies are aiming for overall improvements in transport by increasing the efficiency of car use and other modes of transportation at the same time; however, applying these technologies for use in the development of shared mobility transit enables a greater benefit to the overall social and environmental goals [115]. In future, these findings suggest that smart city policies should adjust their transport management values and priorities for public transport above private vehicles in their cities.

Smart people: As the node frequency analysis has indicated, smart people was the third most popular focus in smart city policy. This importance is warranted as smart cities should place people in the center of the development—e.g., forming smart communities [124]. One of the main challenges in the progress towards a smart community formation is the lack of or limited initiatives or opportunities for inclusion/involvement [125,126]. In this regard, digital inclusion was suggested as the most prevalent 'smart people' plan-

ning issue within the analyzed smart city strategies. Many frameworks created goals and priorities related to digital inclusion and access to urban amenities. Additionally, these priorities were frequently identified as critical challenges related to responsible and ethical governance [127]. In response, the policies often referenced how the technologies they were implementing could be utilized to public advantage and how they could reduce exclusion by providing training that focuses on general digital education and safety.

Additionally, the digital inclusion focus further strengthens the intrinsic link between the smart governance and smart people aspects of policy to construct a form of urban digital governance. A study by [128] suggested that community-led smart initiatives increase inclusion and better address urban issues. By prioritizing digital inclusion, smart city policies are signifying a shift in the approach to the community as both users and collaborators of a smart city [129–131]. The inclusion and engagement of communities ensure that smart city frameworks are accountable for planning outcomes and further indicate a paradigm shift in the governance and structure of planning processes to become more user-centered and co-designed [132–135].

The study findings presented in this paper are insightful and should be considered in the discussion and formation of future smart city policies. Specifically in the identification of urban issues that exist contextually in a local council area and of how smart city technologies can be directly implemented to achieve targets. Additionally, the research presents goals and priorities that existing policies are implementing alongside key planning issues to provide guidance in planning processes. The data provides insight into the interpretation of the major urban challenges worldwide and how the current policies and technologies are being used to overcome them in the creation of a smart city. Though each policy document provided varying levels of focus and represented differing contexts, each smart city strategy incorporated some element from each of the six central categories that provided the foundation for the study. The results suggest that each element is crucial for overall smart city policy success, and a holistic approach is needed for smart city policy.

4.2. Limitations of the Study

The study explored primary urban planning issues, goals, and priorities that smart city policies worldwide are intending to target and tackle; however, four limitations should be noted when interpreting the study findings. Firstly, though the study included a significant number of smart city policies (n = 52) from multiple countries (n = 16), a wider range of policies may provide a more accurate view of overall urban target issues. Secondly, the study was limited by its identification of policies written in English. If other languages were included in the study, the results may have afforded a richer discussion with the inclusion of wider country and city contexts. This limitation is particularly reflective with the prominence of smart city policies from Australia, England, and Canada in the study. Thirdly, although the smart city policies were thorough in nature, they do not fully consider broader—or other complementary—policies and government operations that could impact their implementation and, thus, their success levels. Lastly, the methodological choices give space for inadvertent researcher biases to form in the selection of the nodes and themes when examining the policy documents. Our prospective studies into this area will aim to consider these limitations to provide a more comprehensive and contextually accurate analysis of the smart city policies.

5. Conclusions

The study reported in this paper focused on tackling the research questions of: (a) What do smart city policies target in terms of key planning issues, goals, and priorities? (b) How do smart city policies address these key planning issues, goals, and priorities? In total, 52 smart city policy frameworks were put under the policy analysis microscope with the guide of smart economy, smart environment, smart governance, smart living, smart mobility, and smart people domains to generate insights into urban planning issues and their associated priorities and goals. With respect to each of these six domains, the

following most predominant and challenging planning issues were identified: economic growth, climate change, stakeholder engagement, livability, transport management, and digital inclusion.

In terms of the first research question of 'What do smart city policies target in terms of key planning issues, goals, and priorities?', the key findings include the following.

When discussing the goals and priorities of each smart city domain, the smart city policies identified various foci that are highly dependent on context. When addressing the economic growth issue, many policies identified innovation as a goal and new technologies as the priority to achieve this outcome. For addressing the climate change issue, the frameworks identified renewable energy as both a goal and a priority. When addressing stakeholder engagement planning issues, many frameworks centered their priorities and goals on increasing community and citizen engagement. The livability issue was identified to be primarily addressed from the perspective that it is an overarching goal for smart cities, hence, the priorities and goals were aimed at successfully implementing technologies within the infrastructure to the benefit of users. The transport management issue presented conflicting goals and priorities depending on the context of each city. While many frameworks specified a priority for public transport, many of the technologies being implemented benefited individual vehicle use. Regarding the digital inclusion issue, the smart city policies largely generated goals centered on ensuring that communities were able to effectively benefit from new technologies and prioritized a reduction in digital exclusion.

In terms of the second research question of 'How do smart city policies address these key planning issues, goals, and priorities?', the key findings include the following.

Many policies accredited the deployment of new smart urban technologies and their implementation into the daily functions of their cities to achieve their policy targets. Overall, the policies supported the integration of smart urban technologies to advance each domain of the smart city policy, but the analysis also raised an appreciation for the interconnected nature of each smart city domain. This was particularly evident in the correlations between the smart governance, smart living, and smart people domains, where the policies presented a holistic prioritization for incorporating citizens in the urban planning, development, and management decision-making processes.

In sum, in the first decade of the smart city movement, there were not any/many local governments with official and publicly available smart city policy documents. During the last decade, particularly the last five years, local governments have started to formalize their overall smart city perspectives through official policy documents. An analysis of 52 of these documents from 17 countries disclosed that while the existing smart city policies seemed to be headed in a somewhat more focused direction—that is (at least at the policy-level) targeting desired urban outcomes that ranged from sustainable development to good governance, and from digital inclusion to community formation—future policies should learn from their drawbacks and apply the concept of smart cities at a holistic level considering all smart city domains.

Additionally, the provided summative collection of the existing smart city policy frameworks from the investigated 52 cities of 17 countries, informs urban policymakers, planners, and practitioners in applying a gained understanding into their future smart city policy, planning, development, and management decisions, hence, enhancing the existing governance processes to create smarter cities.

While this study generated insights into smart city policymaking, further research is needed to reinforce such understanding. Moreover, as stated by [126], "the presentation of smart city initiatives must be compared against the actions that are implicit or explicit in these policies". Prospective studies, hence, will also need to concentrate on identifying the impact of local government smart city policies, outlined in their policy documents. This will help in understanding the success and failure factors in translating smart city policies into desired smart city outcomes and will support local governments in forming a consolidated view on how smart city policies can be utilized for tackling urban challenges more effectively.

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