

Examining Failure of Smart City Public Value Co-Creation: The Role of Institutional Commitment

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ABSTRACT

The concept of a smart city holds a great promise for prosperity for its residents by delivering them public value that satisfies their needs. But the reality falls far from the vision, as the implementation of ambitious goals in the form of smart city projects in subcontracting mode occurs in complicated socio-techno-political settings, which often end up in failure. Institutional facets of political commitment and its impact on public value creation are not fully recognized. To close this gap, this study adopts the approach of political commitment to identify and analyze those elements that could hinder the provision of public value in a smart city project. To do so, we perform a qualitative analysis of four smart city initiatives' failures in different countries. The findings reveal that particular elements associated with political commitment in subcontracting projects impact public value provision in smart city initiatives. Particularly, the key role of the continuation of political commitment in its institutionalization phase leads to a loss of public value within strategic, political, and financial spheres. Our study contributes to better recognition of institutional settings that contribute to smart city initiatives' failure.

CCS CONCEPTS

• **Socio-technical systems**; • **IT governance**; • **E-government**;

KEYWORDS

smart city, institution, co-creation, commitment

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1 INTRODUCTION

The concept of a smart city entails a set of multiple promises, including economic, social, and environmental. Ultimately, smart city initiatives are expected to, among other things, reduce costs, meet the needs of residents, contribute to environmental protection, and be accessible to all [5, 31]. A smart city became a fashionable term, which is used to create a favorable picture for cities as well as

city leaders in terms of being innovative, citizen-respecting, and transparent places [16]. But the road leading from political proclamations to delivering public value to citizens is a far journey [22]. Literature indicates that innovative urban projects fail to deliver on their promises and, in fact, failures of smart city initiatives from a social or economic perspective [18, 26, 41, 47] are hampering the sustainability of such.

Given the limited capacity of local authorities to deploy smart city solutions, there is a need to carry out these initiatives with the participation of external partners [23]. This type of implementation is crafted in the form of outsourcing or Public-Private-Partnerships (PPP). These types of methods for implementation are considered risk-sharing associations founded on a goal that the public and private sectors share. In this case, the external providers for the initiatives have to provide both private values, for their company stakeholders, and public values serving the socio-economical needs of all city stakeholders. Those initiatives also require close collaboration with other government entities [13]. Local authorities demonstrate a high level of commitment at the stage of planning and developing solutions. However, the level of commitment is decreasing as the initiative comes to the execution phase and interactions with subcontracting partners are taking place.

To understand the impact of losing government commitment to smart city initiatives during the process of project execution, we define three research questions: RQ1: What are the perils of subcontracting smart cities initiatives? RQ2: How do subcontracting smart city initiatives' perils affect public value delivery? RQ3: How does the loss of institutional commitment affect the provision of public value when subcontracting smart city initiatives? The political commitment approach [14] is adopted to investigate the research question. As a methodology, we adopt a qualitative case study on four smart city initiatives which failed to deliver public value to their citizens.

The obtained results indicate the crucial role of institutional commitment as a key element to smart city initiative outsourcing, as well as highlight essential elements of public-private partnership which addressed may increase smart city initiative performance, namely resource dependency, mechanisms for multi-party incentives, and shared decision-making.

This paper consists of five sections. Section 2 provides a literature review on the premise of public value, smart city subcontracting, and political commitment. Section 3 presents the methodology of this study. Section 4 presents the case studies and cross-case analysis. Finally, Section 5 provides a discussion and conclusions.

2 LITERATURE REVIEW

This section presents the outcomes of the literature review on three topics. Firstly, Section 2.1 provides information on the promise of public value delivery. Secondly, Section 2.2 provides information on



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subcontracting smart city initiatives. Thirdly, Section 2.3 presents the concept of political commitment. The literature review is based on Webster and Watson [51] approach. The literature review outcomes lead to the definition of research questions and framework presented in Section 3.

2.1 The Promise of Public Value Delivery

The most known and applied approach to public value is that introduced by Moore [33] in his book 'Creating Public Value: Strategic Management in Government,' which is considered the seminal book on the subject. He declares that 'public managers are seen as explorers who, with others, seek to discover, define and produce public value' [33]. He wonders how public managers could support society in better finding and exploiting opportunities to create public value. He asserts that public managers are different from private ones and operate in a political rather than an economic 'marketplace', proposing that public organizations create public value for citizens and a wide range of other stakeholders. His concept of public value differs from the private vision of value, where value is created when goods and services are purchased, and these transactions generate easily measurable profit. For him, public value comes from the benefits generated by government in activities where the market cannot guarantee equitable production. Moore [33] emphasized the importance of meeting citizens' requirements for "properly ordered and productive public institutions" (p. 35). Since 2002, public value has also been considered as a counterpart to public sector reform [50]. Public value, as a primary concern of government, shifts the focus from providers of government services to recipients. In this case, managers are now more interested in satisfying citizens by providing effective and efficient services [28].

Various researchers in the field have questioned the most traditional views of public value as equivalent to private value [9, 40, 46]. This approach considers the creation of public value in a similar way that a private economic organization creates "private value" for its owners [17]. One of the main arguments in favor of this view was proposed by Cole and Parston [8], who argued that public managers, whom they considered the articulators of the organization's outcome, must answer the questions of why any government or programs exist?, and How will they know when an organization or program has achieved its intended goal or objective? These authors assume that public managers must make their organizations accountable in the eyes of the public, using similar tools to those used by private organizations to measure their performance. They argue that public organizations should demonstrate these results comprehensibly for all stakeholders (citizens, taxpayers, and public service recipients).

On the other hand, the public value approach as a representation of trust, legitimacy, and public interest is sustained by various researchers in the public management arena [4, 21, 46]. These researchers praised public value for its potential to assess the outcomes, the means used to deliver them, trust, and legitimacy. Bozeman [4] also challenged the prevailing idea of what he called the "utility of economic individualism" at the level of public administration, advocating a return to a theory that integrates measures of public interest in any analysis of government. He proposed a

theory that integrates the public interest as a viable measure of government performance. He suggested that this theory could combine a "Market-driven Attitude" with the idea of common good in government. Being a guardian of public interest is also an approach widely discussed and criticized in the literature. In this approach, that follows Moore's understanding of public value, public managers will be considered guardians of the public interest, playing a role that in earlier theories could only be guaranteed to the politicians.

The need to assess the provision of public value has led to the development of various conceptual frameworks, critical factors, and indicators [2, 20, 36, 39]. Bannister and Connolly [2] identified five value sources of value for public sector decision-making: individual values; professional values; organizational values; legal values, and public interest values. Additionally, these authors presented a taxonomy of values that classifies them as duty-oriented, service-oriented, and social-oriented. Table 1 summarizes this perspective.

Karunasena and Deng [20] stated that the public value expected by citizens from public organizations includes efficiency, openness, and responsiveness. For these authors, government actions add value to society because they fulfill citizens' aspirations for an organized society with efficient, transparent, and responsive public institutions. Puro-Cid [39] added the "causality" aspect of value creation, which is referred to in the literature as "value generating mechanisms" or "value generators," to create an integrative framework of public value. This framework takes into account the impact of digital government on citizens, governments, and society. The author claims that the impact on citizens is to achieve more effective, affordable, and high-quality public services in an environment of participation, openness, and collaboration. Governments can benefit because they will be better positioned strategically, legally, and financially to achieve their objectives. Finally, initiatives could assist society by raising living standards and promoting sustainable development based on improved citizens' and governments' conditions. Table 2 summarizes the public value expected by citizens.

2.2 Subcontracting Smart City Initiatives

Information technology has great potential in delivering public value to government organizations. These technologies allow them to manage digital data, automate processes, and generate intelligence to improve government efficiency. At the city level, digital transformation is occurring at a fast pace, and they are facing the question about how they can progress toward the provision of better services for citizens using all this new technological development with technological partners. The externalization of Information technology allows the city to structure its operations around the things they do best and externalize its non core processes to provide the expected public value. For the city to develop the proper mechanisms to work with IT contractors, they are facing challenges such as unequal power structures, suitable measures to assess the value provided, the adequacy of the city organizational structure, the organizational culture, and the level of government commitment [27]. The government has implemented two main mechanisms for externalizing service provision: Outsourcing (contracting out) and public-private partnerships.

IT outsourcing began in the 1960s with the use of external vendors for time-sharing or processing services, to evolve into network

Table 1: Perspectives of public value

Orientation	Scope
Duty-oriented	Values that incorporate non-financial aspects of civil servant' duty to the government and the state
Service-oriented	Values that cover the responsibility of public administrators to provide a high level of service to the citizen in the same manner as a commercial company would provide good service to a customer or client
Socially-oriented	Values that incorporate a wider, quasi-political view encompassing broader social goals.

Source: own elaboration

Table 2: Public value expected by the citizens

Value expected by citizens	Definition
Quality services	The provision of quality public services to citizens.
User-orientation	The provision of public services in user-friendly manner to satisfy users' needs
Efficiency	The manner in which the operations of the organization yield more benefits than costs incurred "more for the same or the same for less".
Openness	The transparency of public administration often involves publishing what it has to publish and answering questions from the public.
Responsiveness	Public administration complies more actively with the demands of the public, and responds to public opinions.
Sustainability	Leaving a clean environment and plentiful resources to our future generations, instead of willfully destroying what was created millions of years ago.

Source: own elaboration based on [39]

and telecommunications management, distributed systems integration, application development, and systems operation in the 1990s. [24]. Researchers and practitioners agree that the benefits of implementing IT outsourcing include lower costs, faster development cycles, performance assurance, quality, professional and geographically dispersed service, and creative and structured leases [11]. However, implementing IT outsourcing is challenging because it demands a change in managerial structure, task and roles, people and relationships, and information technology and infrastructure [30]. Next, successful implementation of IT outsourcing requires a clear view of how to measure its success. Most researchers mention efficiency, satisfaction, service quality, and cost reduction as accurate indicators of success. In this context, Lee et al. [25] added that the fundamental mechanisms that enable firms to manage the complexity of inter-organizational relationships and achieve success in an outsourcing project are cost-efficient transactions, control of critical resource dependency, and reciprocal relationship building.

According to Yang and You [53], a smart city project's nature determines the operationalization of its implementation, i.e., whether to use outsourcing or PPP. In projects with simple business requirements and low complexity, city governments apply outsourcing of services. For such cases, the municipal authority is responsible for operation and maintenance, while the business is responsible for the construction and a sufficient number of users. PPPs are the response of local governments to their lack of capacity to pursue smart city initiatives with their own resources. The characteristic features of PPP's projects are large-scale investment mostly in infrastructure, which require advanced managerial competencies and skills, which are hard to achieve in city governments [32, 53]. Evidence from India suggests that successful PPP requires partners

to join gains, autonomy, shared decision-making, accountability, and equity [3]. However, as indicated by Zhang [56], unexpected adverse effects in the construction of smart city PPP (SCP) projects exist, like APP zombies, image engineering, information islands, privacy leakage crisis, public-private confrontation, etc. Moreover, PPPs face several profitability challenges due to the unreasonable profit distribution, lower than the expected business value of "smart" applications, and unreasonable and unclear revenue structure [53]. The study of Zhang [56] identifies three key influencing factors to the behavior of the government and other public departments and their officials on the construct of PPP projects in smart cities, namely: 1) multi-party incentive and restraint mechanism; the government's effort to maintaining public interests, and 2) the official's adherence to public values.

2.3 Political Commitment

The political commitment as a concept originated from health research focusing on public policies toward HIV [14], hunger [29], nutrition agenda [37], and maternal mortality reduction [45]. Shiffman [45] presents the framework for agenda setting while the study of Fox, Goldberg, Gore and Bärnighausen [14] examines the political commitment to respond to HIV, juxtaposing political commitment to policy outcomes and distinguishing three conceptualizations of commitment in the literature, namely: 1) expressed commitment, 2) institutional commitment, and 3) budgetary commitment.

The level of expressed commitment is measured based on the quantity and the timing of public appearances of government politicians. The assessment determines whether the politicians themselves are willing to publicly relate on issues under commitment and at what time the open public declarations are occurring. The

later the occurrence of public speech, the lower commitment perceived by the public. Expressed commitment can also be regarded as a statement of political will, which is key to many public initiatives, and thus can be an object of political accountability. Expressed commitment can also be regarded as an object of the city brand marketing, as smart city is positively associated by public opinion with innovativeness, environment protection, social prosperity, and inclusion [7].

The concept of institutional commitment is consistent with the institutional governance approach. It emerges from the premise of establishing a governance framework comprised of relevant policies, the organizational infrastructure of the government body, and procedures, all of which combine to constitute the municipal authority's reaction performance [14]. Smart city institutions are understood as the facilitators of innovation within a complex social system [10] where democratic, innovative, inclusive, collaborative practices of governments based on civic society foundations occur [18, 38, 49]. Successful smart city institutions are learning organisations adapting their structure, processes, roles, and responsibilities to the smart city environment [22]. Public governance refers to how public affairs are managed and decisions are taken, and is a way of steering and positioning public organisation through legal rules, laws, procedures, and practices [6, 10]. Governance is a capacious concept including collaboration, leadership, championing, participation and partnership, communication, data-exchange, service and application integration, accountability, and transparency [6]. While smart city governance elements include stakeholders, structures and organizations, processes, roles and responsibilities, technology and data, legislation and policies, and exchange arrangement accompanied by contextual analysis [42]. Institutional governance is pointed out in smart city literature to be a key aspect of increasing the capacity to coordinate collective actions regarding social and managerial issues [6, 31, 34].

The third concept is the budgetary commitment which confirms resource allocation for a given initiative in support of expressed and institutional commitment. Budgetary commitment refers to the amount of money a public organization has set aside or allocated for a particular purpose. Budgetary commitment is an essential factor in the smart city initiatives' successes, as it helps to ensure that resources are in place, build public trust and confidence.

Despite extensive studies on citizen engagement, public value, and governance of smart city initiatives [31, 42, 49], studies focusing on institutional stability concerning the political aspect of smart city governance are scarce [23, 44]. This study addresses this knowledge gap by exploring the perils and consequences of losing institutional commitment in smart city initiatives held under PPP and outsourcing mechanisms.

3 RESEARCH DESIGN AND METHOD

This paper researches the role of institutional commitment when subcontracting smart city initiatives. Therefore, we formulate the following questions: 1) What are the perils of subcontracting smart cities initiatives? 2) How do subcontracting smart city initiatives' perils affect public value delivery? 3) How does the loss of institutional commitment affect the provision of public value when subcontracting smart city initiatives?

The research questions are investigated through exploratory case study research. According to Eisenhardt [12] Yin [54] case study is an appropriate method to understand phenomena and its volatility in real-life surroundings. Such a method is apt for cases that are characterized by complexity, the coexistence of various theoretical approaches, and significant background. The chosen method of scientific recognition is justified as, in this paper, we analyze a complex implementation phenomenon of smart city initiatives under subcontracting, combining three approaches: public value, political commitment, and externalising of IT services.

The primary outcome of the literature review is an integrative framework for institutional commitment for smart city initiatives. The framework is divided into four parts. The first part includes general information on smart city initiatives, such as country, city, city department involved, objectives and goals, duration, and stakeholders. The second part includes types of public value [39], and the public value assigned to e-government services [39]. The third part of the framework investigates expressed commitment [14], institutional commitment and budgetary commitment. Finally, the fourth part provides elements of subcontracting of smart city initiatives (vendor responsibilities, resource dependency, profit, and cost distribution, responsibility for user demand, quality of service, user satisfaction, shared decision-making, accountability, equity, conflict resolution framework, and multi-party incentive mechanism) [43, 53, 55].

The integrative framework is adopted to develop and analyze three case studies. The case study selection criterion is a failure of smart city initiative. We define a smart city initiative failure as an example where the government failed to deliver public value to their citizens. The index of possible causes for the failure is wide. The smart city failure can represent an ongoing project, a stage of the project which failed, or the terminated project. To perform case study analysis, we use official government websites, official websites of service providers, legal acts, agreements, newspaper articles, and published scientific articles. The integrative framework presents Table 3.

4 CASE STUDIES

This section presents four case studies of smart city initiatives with subcontracting, followed by a cross-case analysis. Each case study addresses the failure of a smart city initiative and is described within the four parts of the framework. The case studies are presented in Section 4.1 (Chile), Section 4.2 (Poland), Section 4.3 (Brasil), and Section 4.4 (Canada). Section 4.5 presents a cross-case analysis.

4.1 Chile - Transantiago

Initiated in 2007, the Transantiago initiative was to modernize the transport system in Santiago, the capital of Chile. The goals were to improve public transport service quality, efficiency, and economic, environmental, and social sustainability. The stakeholders involved were: the department of The Urban Transport Plan of the city Santiago (PTUS), the Ministry of Transport and Telecommunications, the Ministry of Housing and Urbanism, the Ministry of Public Constructions, Metro, bus operators, consulting companies, and citizens using public transport.

Table 3: Integrative framework for institutional commitment of subcontracted smart city initiatives

General	Country	Initiative	Stakeholders	Aim
	City	Project duration		Goals
Public value	Types of impact	Financial Political	Strategic Ideological	Social Stewardship
	Public value of e-government	Availability of choice and openness Efficiency	Access and use Service delivery Transparency	Development of trust Achievement of outcomes
Political commitment	Expressed commitment	Public appearances	PR Territorial marketing	Pro- and re-active commitment
	Institutional commitment	Structure Leadership Communication Relationship management	Legislation Human capacity Collaboration framework	Roles and responsibilities Coherence with policy and strategy
Subcontracting	Budgetary commitment	Financial capacity Vendor responsibilities Profit and cost distribution Equity Multi-party incentive mechanism	Budget Resource dependency User demand Conflict resolution Shared decision-making	Quality of service User satisfaction Accountability

The initiative's impact on the financial type of public value is negative. Transantiago was initially expected to be a self-financed service, which due to an inaccurate business model, turned to subsidies of US\$450,000 millions annually. In the first year of operations, it generated about a US\$400 million deficit. Political implications of the initiative were significant, leading to 1) a conflict in Christian Democratic Party, finally leading to a majority lost in Congress; 2) the results of the presidential election in 2009, and 3) a crisis within the government coalition. In terms of e-government public value, the following harms are identified: a) the access to e-card was accessible only after one year after the implementation; b) inefficient routes not covering the whole urban space and overstated transshipment rates; c) the service delivery was delayed and suffered from the inappropriate design of trunks and division of the fleets between zones; d) users refused to use the system and decreased their trust; e) the capacity to control and monitor project progress was insufficient; and f) no financial sustainability was achieved.

Initially, the initiative suffered from a lack of expressed commitment, and only reactive commitment appeared due to social dissatisfaction. There was no PR activity to deal with social criticism. The institution responsible for the initiative (PTUS) had no real decisive power to lead the project. Regarding institutional commitment, several issues are depicted: 1) no specification of a way to integrate multiple government agencies in a joint Committee was provided; 2) not only no coherent strategy and policy existed, but also there was no coordination between urban and transport policies; 3) the structure, roles and responsibilities were not identified and suffered from instability and continuous changes due to political power shifts; 4) the chronograms characterizes inadequate size, time due, and uncertainties; 5) the legislation was delayed

and insufficient to the size and complexity of the initiative; 6) overwhelming lack of information on needs, implementation status, design, coordination accompanied with no data support and limited human capacity; 7) lack of developed consensus with stakeholders, in particular with politicians, city government, Transantiago, bus owners association, and metro. The budgetary commitment was granted due to the size and importance of the initiative.

As for Transantiago subcontracting elements, no understanding of the importance of resource dependency existed. It failed to deliver several essential infrastructure elements before the deployment, such as fleet management, fare charge, technological support, or the supply of buses. This initiative did not support shared decision-making as (PTUS) suffered from a lack of legitimacy to decide, and administrative or political responsibility. The multi-party incentive mechanism ignored relations between supply and demand and quality of service provision.

4.2 Poland - MEVO

MEVO is Europe's largest public bicycle system, entirely made up of eclectic bicycles. The MEVO initiative, initiated in 2019, was intended to be accessible to the residents of the Tricity metropolitan area (14 municipalities) and visitors. The project's coordination agency is the Management of the Metropolitan Area Gdańsk-Gdynia-Sopot (OMGGS). The initiative stakeholders include 14 cities and municipalities, service providers - NB Tricity, Nextbike Polska, and citizens. MEVO is a long-awaited initiative to meet the citizens' and tourist needs in the Tricity agglomeration.

Regarding the impact on public value, the MEVO initiative affects the financial type of public value resulting in a PLN 9.7 million

loss transferred to BN Tricity for the first tranche of bicycle delivery. Due to the contract termination with the first service provider, both parties (OMGGS and NB Tricity) are undertaking mutual court proceedings. Secondly, as the NB Tricity declared bankruptcy, the whole infrastructure was passed to OMGGS (more than 1000 bicycles, apps, and bicycle parking facilities). Failure of the MEVO 1.0 initiative resulted in huge disappointment for the citizens since a) many of them did not recover their money for the subscriptions, b) they lost trust in the OMGGS regarding MEVO contract monitoring and control, 3) perceived waste of public funds. However, the service was available for a short period, and it failed as the contract was terminated due to the service provider's financial instability and delays in global supply chains affecting new bicycle supply. Currently, MEVO 2.0 public procurement is finished, and OMGGS awaits service delivery by the second vendor. A few issues to be highlighted around MEVO 1.0 initiative in subcontracting are: not including resource dependency as a variable to the public service provision, not including electric scooters as a competitive service to MEVO, focusing the primary contract on bicycle delivery, not public service provision.

4.3 Brasil - Rio Operation Center

The CICC-RJ system, developed in Rio de Janeiro, Brasil, serves as an emergency line, traffic monitoring, security planning, and operations headquarters. The system also implemented a critical early warning and evacuation system for Rio's favelas. The service provider of the initiative is IBM, and the agency responsible for the initiative is Rio Operations Center (ROC). The system is successfully deployed and operated. The system operation harms strategic and social types of public value as it addresses only chosen geographic areas, such as wealthier areas of the city, thus neglecting the inclusion of vulnerable societal groups. Therefore, the alignment of government actions or policies does not include requested and needed social outcomes for economically vulnerable groups. Access to the e-government service is not open. Information about the system is not accessible. Since CICC-RJ does not share data with the city, the city government cannot extract information relevant to public management and public value delivery. Moreover, as no transparency is provided, there is no development of trust between the citizens and the Rio Operations Center.

In terms of expressed commitment, the vendor and ROC undertook PR activity to manage public opinion. Institutional commitment inefficiencies are identified in unclear roles and responsibilities between the agencies as to the territorial control over urban space. The limited human capacity to operate the CICC-RJ is pointed out by Gaffney and Robertson [15]. The system's deployment was not preceded by an IBM software compatibility check, resulting in contract termination and additional cost of in-house software development. The framework of collaboration and establishing trust between the service provider and the agency has not been established.

4.4 Canada - Sidewalk Lab

A private company originated from the United States, Sidewalk Lab, a subsidiary of Alphabet, the parent company of Google, has

developed a vision of a smart city in Toronto, Canada. The city government partner was Waterfront Toronto, an agency legitimized to undertake the initiative in Quayside, a 12-acre waterfront area. The premise of public value delivery was huge: around 44,000 new jobs, more than US\$ 4 billion yearly tax revenue, ecology, inclusiveness, and smartness were to be achieved through the deployment of the new technologies.

Nevertheless, before the initiative started, several harms to public value were brought to public opinion. The most highlighted issue was the data ownership and use of data collected by Sidewalk Lab. The citizens feared Canada to become a client-state country. At the ideological level, public opinion reflects skepticism toward American culture. Socially, the legitimization given to Waterfront Toronto was also denied, pointing to overstepping its role and responsibilities for citizen data management. It was pointed to a lack of Sidewalk Labs accountability, unfavorable to citizen disbalance between private company's profit and harm to state democracy caused by the initiative.

The expressed commitment is identified through public appearances supporting the initiative by the Canadian Prime Minister and Toronto mayor. The initiative was intensively promoted as a "city of future", increasing place branding. Both parties undertake PR and pro- and re-active actions addressing public concerns. The institutional commitment points to the unclear role of Waterfront Toronto as an agency with limited decisive power, which served rather as an intermediary to Sidewalk Labs by reporting to the different levels of government (federal, provincial, and municipal) than as a single point of contact. The collaboration framework has not been established between the parties, and the vendor did not introduce the participatory design approach. The initiative was not coherent with policy, and public opinion pointed to gaps in national legislation regarding data management.

A lack of clarity in Sidewalk Lab's business model is identified. The initiative had not included shared decision-making involving engaged citizens and NGOs. The autonomy in development had been denied. No conflict resolution framework had been established.

4.5 Cross-Case Analysis

The cross-case analysis is guided by the integrative framework (Table 3), and analyses the case studies presented in Sections 4.1-4.4 of this study. The overall results of the cross-case study analysis are presented in Table 4.

General part: Each presented case addresses a smart city initiative with substantive promises of public service delivery to the citizens. Transantiago, MEVO, and Sidewalk Labs are large-scale implementation initiatives that focused public attention and triggered social control mechanisms. Each of them involved multiple smart city stakeholders. Two of them: Transantiago and Sidewalk Labs, involved state government politicians who publicly expressed their commitment to the initiative. While Sidewalk Lab is a terminated project, Transantiago, MEVO and ROC are still ongoing.

Regarding the impact of the initiative on public value, we notice: 1) all the projects negatively affect opportunities of individuals or groups of citizens and also limit strategic opportunities of cities; 2) in each case, families and communities were negatively affected by the initiative, and finally 3) in each case city governments failed to

Table 4: Cross-case study analysis

Element	Issue	Transantiago	MEVO	ROC	Sidewalk Lab
Public value	Financial	X	X	-	-
	Strategic	X	X	X	X
	Political	X	-	-	X
	Ideological	-	-	-	X
	Social	X	X	X	X
	Stewardship	X	X	X	X
Expressed commitment	Public appearance	X	-	-	X
	Territorial marketing	-	X	-	X
	PR	-	X	-	X
Institutional commitment	Political continuity	X	-	-	-
	Structure and Roles	X	-	-	X
	Organisation	X	X	X	X
	Processes	X	-	-	-
	Strategic coherence	X	-	X	X
	Legislation	X	X	X	X
	Leadership	X	-	-	X
	Human capacity	X	-	X	-
	Collaboration	X	X	X	X
	Communication	X	-	-	X
	Relationship	X	X	X	X
	Resource dependency	X	X	X	X
Subcontracting	Profit distribution	X	-	-	X
	Demand	-	-	-	X
	Quality of service	X	X	X	-
	Shared decision-making	X	-	-	X
	Autonomy	-	-	-	X
	Conflict resolution	X	X	-	X
	Multi-party incentives	X	-	X	-

shape the perception of the guardians of public value, detrimenting the established trust between citizens and government. Only Sidewalk Labs indicates the importance of ethics and moral beliefs of public opinion toward data management in Canada.

In terms of political commitment, the study identifies several common issues across the projects. Firstly, each initiative faced the challenge of properly organizing its activities, involving scheduling, arranging, leading, monitoring, and controlling. The next issue is the absence of a proactive legislature facilitating initiative implementation. Lastly, no initiative established effective cooperation and relationship frameworks with involved stakeholders, ultimately leading to a loss of trust among counterparts. Except for the ROC, where social scrutiny is present less than in the case of other initiatives, we did not observe any efforts to establish a conflict resolution framework.

The fourth area of analysis on subcontracting revealed the importance of resource interdependence in the success of all cases studied. Dependence on existing infrastructure managed by other agencies, technology support from different sources, ownership of infrastructure in case of failure, incompatibility of solutions with existing systems, risk of non-delivery of infrastructure components, or vendor soft lock-in represents the identified occurrences of resource dependence which were not considered either by governing bodies

or service providers. Of the cases examined, only the Sidewalk Lab failed to gain autonomy to implement the initiative.

5 DISCUSSION AND CONCLUSIONS

The purpose of this study is to explore smart city project failure in providing public value when subcontracted. In order to do so, three research questions were formulated: 1) What are the perils of subcontracting smart cities initiatives? 2) How do subcontracting smart city initiatives' perils affect public value delivery? 3) How does the loss of institutional commitment affect the provision of public value when subcontracting smart city initiatives? The literature review was conducted on public value, political commitment, and subcontracting smart city initiatives. On this basis, we designed an integrative framework that aggregates various concepts, definitions, and factors applicable to examine the failure of subcontracting smart city initiatives. We applied this framework to examine four case studies of smart city initiative failure and to obtain relevant information which allows us to respond to the research questions.

In order to respond to the first research question, "What are the perils of subcontracting smart cities initiatives?" This study highlights the following ones: 1) resource dependency, 2) ineffective multi-party incentives, 3) lack of conflict resolution mechanism,

and 4) no shared decision-making. Although a few studies highlight the topic of resource infrastructure [55] [19] this study shows how relevant it is to understanding resource dependency as a critical aspect when executing smart city initiatives. Moreover, one of the main perils of large-scale smart city projects is ineffective multi-party incentives directed to the stakeholders to support collaborative governance, which facilitates smart city execution [49]. Conflict resolution as a relevant factor of smart city performance and enabler of adaptive governance is also pointed out by [1, 35]. This study supports the finding of [1, 19] as to the importance of shared decision-making involving agencies on various levels of government, NGOs, and other stakeholders.

Regarding the second research question, “How do subcontracting smart city initiatives’ perils affect public value delivery? all four smart city initiatives decrease public value provision within strategic, stewardship, and social perspective. Resource dependency negatively affects strategic opportunities to design and implement innovative solutions, limiting the choice of such solutions, which will decrease financial expenditures. We observe that the creation of committees without the legal authority to not only make decisions but also to shape the framework for joint decision-making, negatively affects the image of the institution itself, as a result, it contributes to the loss of trust in the citizen-government line.

The third research question, “How does the loss of institutional commitment affect the provision of public value when subcontracting smart city initiatives?” was addressed with the analysis of the cases where the lack of continuation of political commitment in its institutionalization phase leads to a loss of public value within strategic, political, and financial spheres. Particularly evident is the effect of the institutional commitment loss for Sidewalk Lab, where an agency formed with no decision-making empowerment, accountable to three separate authorities, could not cope successfully with the challenge of establishing a legal and responsible data management framework. Our result falls in line with [18, 48, 52]. Our results support the view of [47] as to the importance of citizen discontent management to successful smart city initiatives.

This paper’s contribution is analyzing the four smart city initiatives labeled as “failure” to distinguish key elements responsible for the lack of public value provision. Building upon four case studies, this paper develops an understanding of the impact of political commitment and subcontracting elements on smart city success. This paper also identifies the impact of institutional commitment loss on various types of public value. The result of this study may bring knowledge to public managers on factors favorable to smart city initiative failure. This paper suggests that governments and politicians need to keep up with political commitment, with particular attention to the institutionalization of the committees, agencies, and accountability. The limitation of the study is the small number of case studies, the lack of inclusion of technological conditionals for smart city projects, the differences of the initiatives in terms of investment and goals. Future research could integrate other factors associated with the nature of the cities, their possible impact on the initiative results, and the nature of challenges faced by public managers.

REFERENCES

- [1] Suha Alawadhi, Armando Aldama-Nalda, Hafeedh Chourabi, J Ramon Gil-Garcia, Sofia Leung, Sehl Mellouli, Taewoo Nam, Theresa A Pardo, Hans J Scholl and

- Shawn Walker. 2012. Building Understanding of Smart City Initiatives. In *Proceedings of International conference on electronic government*. Springer, 40-53.
- [2] Frank Bannister and Regina Connolly. 2014. Ict, Public Values and Transformative Government: A Framework and Programme for Research. *Government Information Quarterly* 31, 1, 119-128. <http://dx.doi.org/https://doi.org/10.1016/j.giq.2013.06.002>
- [3] Susanta Kumar Barik and Himanshu Sekhar Rout. 2021. Outsourcing of Healthcare Services in a Smart City of Eastern India. *Journal of Facilities Management* 19, 4, 458-478.
- [4] Barry Bozeman. 2007. *Public Values and Public Interest: Counterbalancing Economic Individualism*. Georgetown University Press,
- [5] Andrea Antonio Caragliu, Chiara Del Bo, Karima Kourtiti and P Nijkamp. 2011. Comparative Performance Assessment of Smart Cities around the North Sea Basin. *Network Industries Quarterly* 13, 3, 3.
- [6] Hafeedh Chourabi, Taewoo Nam, Shawn Walker, J. Ramon Gil-Garcia, Sehl Mellouli, Karine Nahon, Theresa A. Pardo and Hans Jochen Scholl. 2012. Understanding Smart Cities: An Integrative Framework. In *Proceedings of 45th Hawaii international conference on system sciences*. IEEE, 2289-2297. <http://dx.doi.org/10.1109/HICSS.2012.615>
- [7] Michael Christofi, Vijay Pereira, Demetris Vrontis, Shlomo Tarba and Alkis Thrassou. 2021. Agility and Flexibility in International Business Research: A Comprehensive Review and Future Research Directions. *Journal of World Business* 56, 3, 101194. <http://dx.doi.org/https://doi.org/10.1016/j.jwb.2021.101194>
- [8] Martin Cole and Greg Parston. 2006. *Unlocking Public Value: A New Model for Achieving High Performance in Public Service Organizations*. John Wiley & Sons, New Jersey.
- [9] Antonio Cordella and Carla M. Bonina. 2012. A Public Value Perspective for Ict Enabled Public Sector Reforms: A Theoretical Reflection. *Government Information Quarterly* 29, 4, 512-520. <http://dx.doi.org/https://doi.org/10.1016/j.giq.2012.03.004>
- [10] John De la Mothe. 2004. The Institutional Governance of Technology, Society, and Innovation. *Technology in Society* 26, 2-3, 523-536. <http://dx.doi.org/https://doi.org/10.1016/j.techsoc.2004.01.009>
- [11] Subhankar Dhar. 2012. From Outsourcing to Cloud Computing: Evolution of It Services. *Management research review* 35, 8, 664-675. <http://dx.doi.org/https://doi.org/10.1108/01409171211247677>
- [12] Kathleen M. Eisenhardt. 1989. Building Theories from Case Study Research. *Academy of management review* 14, 4, 532-550. <http://dx.doi.org/https://doi.org/10.5465/amr.1989.4308385>
- [13] Ignacio Farias and Sarah Widmer. 2018. Ordinary Smart Cities. How Calculated Users, Professional Citizens, Technology Companies and City Administrations Engage in a More-Than-Digital Politics. *TECNOSCENZA: Italian journal of science & technology studies* 8, 2, 43-60.
- [14] Ashley M. Fox, Allison B. Goldberg, Radhika J. Gore and Till Bärnighausen. 2011. Conceptual and Methodological Challenges to Measuring Political Commitment to Respond to HIV. *Journal of the International AIDS society* 14, S5-S5. <http://dx.doi.org/https://doi.org/10.1186/1758-2652-14-S2-S5>
- [15] Christopher Gaffney and Cerianne Robertson. 2018. Smarter Than Smart: Rio De Janeiro’s Flawed Emergence as a Smart City. *Journal of Urban Technology* 25, 3, 47-64.
- [16] Rudolf Giffinger and Haendlmaier Gudrun. 2010. Smart Cities Ranking: An Effective Instrument for the Positioning of the Cities? *ACE: architecture, city and environment* 4, 12, 7-26. <http://dx.doi.org/http://10.5821/ace.v4i12.2483>
- [17] Teresa M. Harrison, Santiago Guerrero, G. Brian Burke, Meghan Cook, Anthony Cresswell, Natalie Helbig, Jana Hrdinova and Theresa Pardo. 2011. Open Government and E-Government: Democratic Challenges from a Public Value Perspective. In *Proceedings of Proceedings of the 12th Annual International Digital Government Research Conference: Digital Government Innovation in Challenging Times*. 245-253. <http://dx.doi.org/https://doi.org/10.1145/2037556.2037597>
- [18] Robert Hollands. 2008. Will the Real Smart City Please Stand Up? *City* 12, 303-320. <http://dx.doi.org/http://dx.doi.org/10.1080/13604810802479126>
- [19] Erik W Johnston and Derek J Hansen. 2015. Design Lessons for Smart Governance Infrastructure. In *Transforming American Governance: Rebooting the Public Square*, Routledge, 209-224.
- [20] Kanishka Karunasena and Hepu Deng. 2012. Critical Factors for Evaluating the Public Value of E-Government in Sri Lanka. *Government Information Quarterly* 29, 1, 76-84. <http://dx.doi.org/https://doi.org/10.1016/j.giq.2011.04.005>
- [21] Gavin Kelly, Geoff Mulgan and Stephen Muers. 2002. *Creating Public Value*. London, Cabinet Office.
- [22] Rob Kitchin. 2014. *The Data Revolution: Big Data, Open Data, Data Infrastructures and Their Consequences*. Sage, London.
- [23] Lily Kong and Orlando Woods. 2018. The Ideological Alignment of Smart Urbanism in Singapore: Critical Reflections on a Political Paradox. *Urban Studies* 55, 4, 679-701.
- [24] Jae-Nam Lee, Minh Q. Huynh, Ron Chi-Wai Kwok and Shih-Ming Pi. 2003. It Outsourcing Evolution— Past, Present, and Future. *Communications of the ACM* 46, 5, 84-89. <http://dx.doi.org/https://doi.org/10.1145/769800.769807>

- [25] Jae-Nam Lee, YoungKi Park, Detmar W. Straub and Yunmo Koo. 2019. Holistic Archetypes of It Outsourcing Strategy: A Contingency Fit and Configurational Approach. *MIS quarterly* 43, 4. <http://dx.doi.org/http://10.25300/MISQ/2019/14370>
- [26] Vernon J Lee, Marc Ho, Chen Wen Kai, Ximena Aguilera, David Heymann and Annelies Wilder-Smith. 2020. Epidemic Preparedness in Urban Settings: New Challenges and Opportunities. *The lancet infectious diseases* 20, 5, 527–529. [http://dx.doi.org/https://doi.org/10.1016/S1473-3099\(20\)30249-8](http://dx.doi.org/https://doi.org/10.1016/S1473-3099(20)30249-8)
- [27] Tingting Liu, Sherif Mostafa, Sherif Mohamed and Tuan Son Nguyen. 2020. Emerging Themes of Public-Private Partnership Application in Developing Smart City Projects: A Conceptual Framework. *Built Environment Project and Asset Management*. <http://dx.doi.org/https://doi.org/10.1108/BEPAM-12-2019-0142>
- [28] Don MacLean and Ryad Titah. 2022. A Systematic Literature Review of Empirical Research on the Impacts of E-Government: A Public Value Perspective. *Public Administration Review* 82, 1, 23–38. <http://dx.doi.org/https://doi.org/10.1111/puar.13413>
- [29] Edoardo Masset. 2011. A Review of Hunger Indices and Methods to Monitor Country Commitment to Fighting Hunger. *Food policy* 36, S102–S108. <http://dx.doi.org/https://doi.org/10.1016/j.foodpol.2010.11.007>
- [30] Khalid Mehmood and Amir Hussain. 2017. Managing Association of Information System Outsourcing: A Case of Information Technology (It) Service Provider. In *Proceedings of 2017 4th International Conference on Systems and Informatics (ICSAI)*. IEEE, 1703–1707. <http://dx.doi.org/http://10.1109/ICSAI.2017.8248558>
- [31] Albert Meijer and Manuel Pedro Rodríguez Bolívar. 2016. Governing the Smart City: A Review of the Literature on Smart Urban Governance. *Revue Internationale des Sciences Administratives* 82, 2, 417–435. <http://dx.doi.org/https://doi.org/10.1177/0020852314564308>
- [32] M. Milenković, M. Rašić and G. Vojković. 2017. Using Public Private Partnership Models in Smart Cities-Proposal for Croatia. In *Proceedings of 2017 40th International Convention on Information and Communication Technology, Electronics and Microelectronics (MIPRO)*. IEEE, 1412–1417. <http://dx.doi.org/https://doi.org/10.23919/MIPRO.2017.7973643>
- [33] Mark H. Moore. 1995. *Creating Public Value: Strategic Management in Government*. Harvard university press,
- [34] Taewoo Nam and Theresa A. Pardo. 2011. Smart City as Urban Innovation: Focusing on Management, Policy, and Context. In *Proceedings of Proceedings of the 5th international conference on theory and practice of electronic governance*. 185–194. <http://dx.doi.org/https://doi.org/10.1145/2072069.2072100>
- [35] Guna Sekhar Netheti, AK Shrivastava and Ragini Shukla. 2015. Analysis of E-Governance Services for Effective Communication to Citizens in Odisha State. *International Research Journal of Engineering and Technology* 2, 2.
- [36] Panos Panagiotopoulos, Bram Klievink and Antonio Cordella. 2019. Public Value Creation in Digital Government. *Government Information Quarterly* 36, 4, 101421. <http://dx.doi.org/https://doi.org/10.1016/j.giq.2019.101421>
- [37] David L. Pelletier, Edward A. Frongillo, Suzanne Gervais, Lesli Hoey, Purnima Menon, Tien Ngo, Rebecca J. Stoltzfus, A. M. Shamsir Ahmed and Tahmeed Ahmed. 2012. Nutrition Agenda Setting, Policy Formulation and Implementation: Lessons from the Mainstreaming Nutrition Initiative. *Health Policy and Planning* 27, 1, 19–31. <http://dx.doi.org/https://doi.org/10.1093/heapol/czr011>
- [38] Gabriela Viale Pereira, Luis F. Luna-Reyes and J. Ramon Gil-García. 2020. Governance Innovations, Digital Transformation and the Generation of Public Value in Smart City Initiatives. In *Proceedings of Proceedings of the 13th International Conference on Theory and Practice of Electronic Governance*. 602–608. <http://dx.doi.org/https://doi.org/10.1145/3428502.3428592>
- [39] Gabriel Puron-Cid. 2017. From Technology to Social Development: Applying a Public Value Perspective to Digital Government in Local Governments in Mexico. In *Proceedings of Proceedings of the 18th Annual International Conference on Digital Government Research*. 336–345. <http://dx.doi.org/https://doi.org/10.1145/3085228.3085272>
- [40] Rod A. W. Rhodes and John Wanna. 2007. The Limits to Public Value, or Rescuing Responsible Government from the Platonic Guardians. *Australian Journal of Public Administration* 66, 4, 406–421. <http://dx.doi.org/https://doi.org/10.1111/j.1467-8500.2007.00553.x>
- [41] Nina Rizun, Magdalena Ciesielska, Gabriela Viale Pereira and Charalampos Harris Alexopoulos. 2021. Mapping Negative Unintended Consequences of Disruptive Technologies Use in Smart Cities.
- [42] Robert Wilhelm Siegfried Ruhlandt. 2018. The Governance of Smart Cities: A Systematic Literature Review. *Cities* 81, 1–23. <http://dx.doi.org/https://doi.org/10.1016/j.cities.2018.02.014>
- [43] Tillmann Sachs, Robert Tiong and Shou Qing Wang. 2007. Analysis of Political Risks and Opportunities in Public Private Partnerships (Ppp) in China and Selected Asian Countries: Survey Results. *Chinese Management Studies* 1, 2, 126–148. <http://dx.doi.org/https://doi.org/10.1108/17506140710758026>
- [44] Jathan Sadowski. 2021. Who Owns the Future City? Phases of Technological Urbanism and Shifts in Sovereignty. *Urban studies* 58, 8, 1732–1744. <http://dx.doi.org/https://doi.org/10.1177/0042098020913427>
- [45] Jeremy Shiffman. 2007. Generating Political Priority for Maternal Mortality Reduction in 5 Developing Countries. *American journal of public health* 97, 5, 796–803. <http://dx.doi.org/https://doi.org/10.2105/AJPH.2006.095455>
- [46] Colin Talbot. 2009. Public Value—the Next “Big Thing” in Public Management? <http://dx.doi.org/https://doi.org/10.1080/01900690902772059>
- [47] Anouk Van Twist, Erna Ruijter and Albert Meijer. 2023. Smart Cities & Citizen Discontent: A Systematic Review of the Literature. *Government Information Quarterly*, 101799.
- [48] Liesbet Van Zoonen. 2016. Privacy Concerns in Smart Cities. *Government Information Quarterly* 33, 3, 472–480. <http://dx.doi.org/https://doi.org/10.1016/j.giq.2016.06.004>
- [49] Gabriela Viale Pereira, Maria Alexandra Cunha, Thomas J. Lampoltshammer, Peter Parycek and Mauricio Gregianin Testa. 2017. Increasing Collaboration and Participation in Smart City Governance: A Cross-Case Analysis of Smart City Initiatives. *Information Technology for Development* 23, 3, 526–553. <http://dx.doi.org/https://doi.org/10.1080/02681102.2017.1353946>
- [50] Franziska Wallmeier, Bernd Helmig and Mary K. Feeney. 2019. Knowledge Construction in Public Administration: A Discourse Analysis of Public Value. *Public Administration Review* 79, 4, 488–499. <http://dx.doi.org/https://doi.org/10.1111/puar.13005>
- [51] Jane Webster and Richard T. Watson. 2002. Analyzing the Past to Prepare for the Future: Writing a Literature Review. *MIS quarterly* 26, 2, xiii–xxiii.
- [52] Fan Yang and Jian Xu. 2018. Privacy Concerns in China’s Smart City Campaign: The Deficit of China’s Cybersecurity Law. *Asia & the Pacific Policy Studies* 5, 3, 533–543. <http://dx.doi.org/https://doi.org/10.1002/app5.246>
- [53] J. Q. Yang and J. L. You. 2019. Research on the Application of Ppp Model in Smart City Projects. In *Proceedings of IOP Conference Series: Earth and Environmental Science*. IOP Publishing, 052039. <http://dx.doi.org/10.1088/1755-1315/330/5/052039>
- [54] Robert K. Yin. 2009. *Case Study Research: Design and Methods*. sage,
- [55] Qingyuan Zhang, Chao Ye and Jinjun Duan. 2022. Multi-Dimensional Superposition: Rural Collaborative Governance in Liushe Village, Suzhou City. *Journal of Rural Studies* 96, 141–153. <http://dx.doi.org/https://doi.org/10.1016/j.jrurstud.2022.10.002>
- [56] Yong Zhang. 2022. Research on the Identification Model of Interest Conflict Influencing Factors in Ppp Projects Construction of Smart City. *Alexandria Engineering Journal* 61, 12, 12689–12698. <http://dx.doi.org/https://doi.org/10.1016/j.aej.2022.06.039>