Chapter 2
Smart City Governance Model for Pakistan

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1 Introduction

Pakistan, like many other Asian countries, is becoming rapidly urbanized. The urban share of population has increased from 37.9% in 2013 to 40.54% in 2017 [1]. By 2030, an expected 50% of Pakistanis will live in cities, up from the current 40%. Pakistani cities contribute 55% of the country's total GDP [2]. Pakistani cities are a major source of employment opportunities for small- and medium-sized enterprises (SMEs) which provide the vast majority of Pakistan's nonagricultural jobs and high-growth industry jobs such as information technology [3]. Cities in Pakistan are also the hub for Pakistan's educational institutions which impart education, trainings, skills, and research and development opportunities in marketable disciplines [4].

However, Pakistani cities are suffering from many challenges and "without better urban planning to accommodate rapid growth, cities have the potential to become hotbeds of discontent and unrest rather than engines of growth and innovation" [5]. In this context, policy planners at federal and provincial level are aware of the situation. Pakistan Vision 2025 highlights the need of "transforming urban areas into creative, eco-friendly sustainable cities through improved city governance, effective urban planning, efficient local mobility infrastructure and better security." The document envisages the concept of Smart Cities in Pakistan—the cities that are "are digitally connected, equipped with wireless network sensors and there is e-connectivity in all parts where the free flow of information is possible, thereby laying the foundations for the cities of Pakistan to be smart and creative" [6].

On the other hand, these policy documents only hint upon Smart City transformation without going into the dynamics of Smart Cities in Pakistan context, particularly in governance context. However, researchers believe that governance is the key execution

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challenge for smart cites [7]. The issues like limited transparency, fragmented accountability, unequal city divisions, and leakage of resources are some of integral characteristics of regular governance. A move from this type of governance is essential for an effective and efficient administration of the smart cities [8].

Smart governance is an important characteristic of a smart city that is based on citizen participation [9]. Smart governance relies on the implementation of smart governance infrastructure that facilitates service integration, collaboration, communication, and data exchange [10].

2 Smart Governance: Theoretical Overview

Governance is an often-used concept with multiple connotations [11]; however at its root, governance refers to the way in which power and authority are exercised "to manage the collective affairs of a community (or a country, society, or nation)" [11]. Extending the same concept in a smart perspective, many definitions of smart governance also emerged. Albert Meijer defines smart governance as "using new technologies to improve urban governance through better use of information and better communications" [12]. According to Helmut Wilke, smart governance "is an abbreviation for the ensemble of principles, factors, and capacities that constitute a form of governance able to cope with the conditions and exigencies of the knowledge society" [13]. The author also associates the concept with "redesigning formal democratic governance" while maintaining the historically developed democratic principles and a free market economy. However, the definition of smart city governance is fragmented [14] and the many cities having smart city label often lack on a comprehensive understanding about the nature of governance required in purview of digital revolution [15].

However, N.V. Lopes considers smart governance as a key factor for the implementation of smart cities and achievement of its purposes by applying the appropriated policies. He maintains that the diversity of a city context, challenges, risks, and goals are unique factors in each city, and these factors require localized governance model that can enable and potentiate the creativity and innovation in the implementation of smart cities [7].

In order to capture the dimensions of smart city governance, first literature has been retrieved from Web of Science and Google Scholar, with key words "Smart governance" and "Smart City Governance." However, the search also indicated two full-length sets of literature reviews on the subject: one by A. Meijer and M.P. Bolivar, 2015, titled "Governing the smart city: a review of the literature on smart urban governance" [14], and second by S. Praharaj et al. titled "Towards the Right model of Smart City Governance in India" [16]. Most of the research articles related to smart city governance have already been discussed in these reviews; therefore some of the findings on the typology of smart city governance have been adopted from these studies. Since the key aspect of this research is to suggest appropriate governance model for smart cities in Pakistan, we could not find any suitable document

on the topic. Moreover, no focused literature is available even on cities' governance. Available literature in Pakistan context generally covered "urban development issues," local governance issues in the context of overall decentralization, and a few policy briefs on the governance of specific cities like Lahore and Karachi. Therefore, effort has been made to draw a picture of current urban governance in Pakistan collecting scattered information from available sources coupled with public-sector experience of the co-author in Pakistan. In addition, the research on smart cities available in the repository of United Nation University in the Unit on Policy Driven e-Governance [17] has been referred as a guiding tool to examine the best practices and required components for smart city governance.

Detailed review of the literature on smart cities conducted by A. Meijer and M.P. Bolivar in 2015 [14], and lately by S. Praharaj et al. in 2018 [16], identifies four major types of smart city governance, varying in the degree of institutional transformation necessary to implement different types of smart cities, starting from least transformative type, where there is a concept of maintaining the existing governance structure for making the policy choices for an effective and efficient implementation of smart city initiatives [18]. Within this type of governance, government approves the development of a smart city and prioritizes some areas of action [19] and merely promotes smart city initiative [20] without transforming the existing structure. Generally, cities with such policies aim at adopting the "smart" label [15]. Such cities are often backed by global tech giants, create dazzling websites, and use glamorous social media contents to attract global attention and investment [16]. India's Gujarat International Finance Tech-City (GIFT smart city) and Canada's Edmonton are quoted as classic examples of this type where primary emphasis is on business environment and business-led economy [16].

Second type of conceptualization of smart governance focuses on smart decision-making through collecting real-time data to understand and solve cities' real-life challenges [16]. The model is closer to United Nations framework on good governance, i.e., "the process of decision-making and the process by which decisions are made" [21]. Sensor and network technologies are the pivot of this conceptualization. Walravens is of the view that decision-making can become innovative by using networks of technologies [22] whereas Schuurman et al. define smart governance as the process of collecting all kinds of data concerning public management by sensor networks [23]. Spanish smart city is considered as an ideal example of this model. The city [24] has dense concentration of installed sensors around the city's streets and a robust monitoring system is exploiting the Internet of Things (IoT) to unite all the information coming from sensors [16].

The third level of conceptualization of smart city governance entails a higher level of transformation. It is all about "Smart Administration" [25], i.e., restructuring and integrating internal government system, through electronic governance tools, supported by advanced digital technologies, to integrate internal government system. Batty et al. highlight that "smart governance is a much stronger intelligence function for coordinating the many different components that comprise the smart city. It is a structure that brings together traditional functions of government and business" [18]. Smart administration in this model breaks silos within the government departments

by "interconnecting institutions, policies, information's and physical infrastructure to better service citizens and local communities" [16]. Smart administration model can be seen at its best in Singapore, having IoT foundational standards for information and service interoperability across infrastructure sectors. However, researchers also point out that manageable urban scale and the absence of overlapping state, local, and federal bureaucracies are the main reasons for success of the model in Singapore [16].

The fourth conceptualization of smart city governance focuses on urban collaboration as a major consideration. This type of governance involves a high-level transformation, as it requires integration of internal government structure, as well as partnership building with external organizations [14]. Nam and Pardo believe that smart governance primarily works through collaboration across government, industry, academia, nongovernmental organizations (NGOs), and people. This model of urban governance relies on the collective intelligence and creativity of the city dwellers [26]. Amsterdam Smart City [27] can be termed as the best example of this model which practices a unique partnership among various actors, i.e., the city government, businesses, research institutions, start-ups and innovators, investors, and common citizens. This model of smart governance may be considered the superlative type and very different from earlier conceptualizations that put the government at center stage and not people. All four types have been graphically depicted in Fig. 2.1, adopted from S. Praharaj et al. [16].

Study of different conceptualization provides a fair idea of the options and choices for the countries that have not started the journey of smart city and intend to leapfrog by developing a model suitable to their sociopolitical context. However, the choice for newcomers is still difficult due to certain complexities and confusions surrounding smart city governance. A. Meijer and M.P. Bolivar after extensive literature review of smart city governance hint that "the politics of smart cities have so far barely been analyzed" rendering the smart city an issue of puzzling nature. They indicate the following domains of confusion:

1. First domain of confusion is about the nature of smart city, i.e., technical or social. Some researchers have a technical focus while others emphasize the level of education of city inhabitants, whereas some combine these two perspectives in a socio-technical perspective on smart cities.
2. The second domain of confusion is whether smart city governance is mere "governance of a smart city" (first conceptualization) or an innovative way of decision-making, innovative administration, or even innovative forms of collaboration.
3. The third domain of confusion relates to the legitimacy claims of smart city governance. Some researchers consider that a city has a smart governance when it is sustainable or when citizens participate actively in governance. However a few academic publications also point out economic gains as legitimacy of smart city governance [14].

Another point which closely relates to the issue of politics and governance of smart cities is the role of local government structure in urban governance. City mayors have
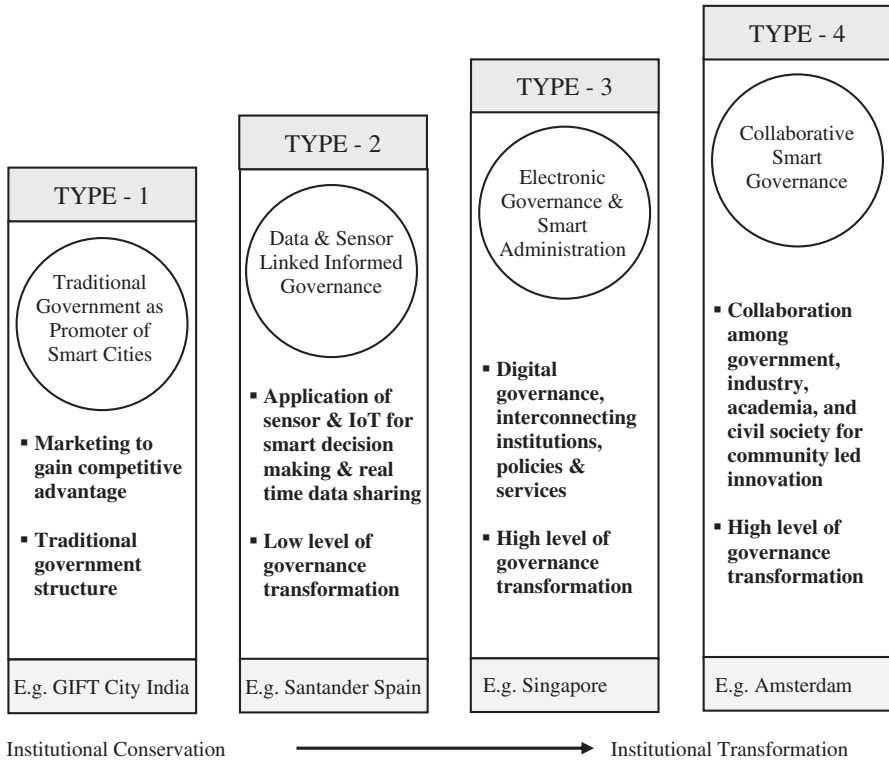
Fig. 2.1 Conceptualizations of smart city governance, adopted from S. Praharaj et al. [16]

a very important role in a good city governance [28]. They ensure the citizens' services, public good, and citizens' participation in local life [29]. Good governance for city dwellers entails five key aspects: (1) elected city governments; (2) city governments having capacity, power, and resources to act; (3) formal and informal avenues for civil society to influence and hold government accountable; (4) citizens' participation, particularly poor strata of urban population; and (5) rule of law not too biased against low-income groups [28]. This fairly justifies the role of local governments/city mayors in smart cities' governance.

In addition to the literature review conducted in two studies mentioned above, UNU-EGOV Reconnaissance Study on Smart Sustainable Cities [30] offers in-depth analyses of various attributes of smart cities on the basis of content analysis of 113 papers. The study looks at the governance attribute as part of smart city transformation which represents "how the Smart City government operates, how it manages public funds, how it delivers public infrastructure and services, how it supports sustainable city development, and how it engages its citizens in decision-making processes." As reflected in Fig. 2.2, governance and service delivery have been attributed to five smart principles, i.e., effectiveness, efficiency, transparency, collaboration, and openness. Functions and operations of smart city governance can
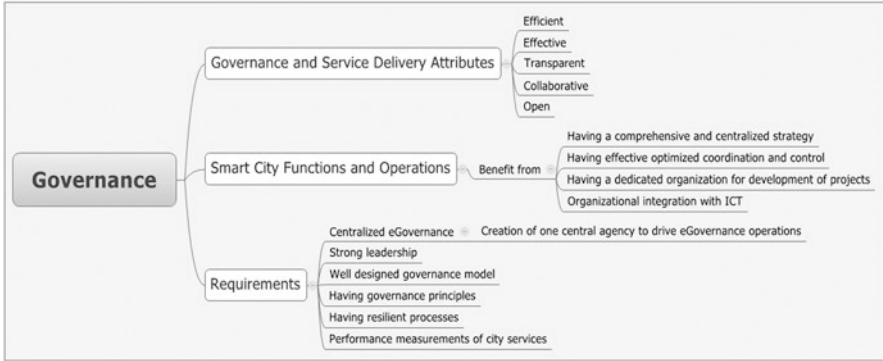
Fig. 2.2 Smart city governance attributes, adopted from UNU-EGOV, 2015 [30]

be beneficial if there is a comprehensive and centralized strategy, optimized coordination and control, dedicated organization for development of projects, and ICT-based organizational integration. The study also points out the requirements of smart city governance, which include centralized e-governance, strong leadership, well-designed governance model, governance principles, resilient processes, and performance measurements of city services.

With this description of various types of smart city governance concepts, practices, and confusions [14, 16] as well as the different attributes and requirements for smart city governance [30], we now are going to examine the current model and practices of urban governance in Pakistan, in order to frame a high-level model applicable to Pakistan context.

3   Cities' Governance in Pakistan

In Pakistan, the concept of urban governance led by elected city mayors is hardly visible. "The authority of the local government, the level of government closest to people, is restricted and overlaps with that of the provincial departments and local authorities" [31]. There is a long history of local government legislation, but city-level governments (municipal corporation/metropolitan corporation) are weak, with an institutional framework comprising general-purpose and single-function agencies operating at multiple tiers of government [32]. In fact, local governments are subservient to provincial governments. All four Pakistan provinces have their own local government Acts and a system of elected bodies also exist in urban as well as rural areas but "none of these Acts devolves sufficient functions and powers to the local governments, and all four provincial governments have retained the authority to suspend or remove the heads of an elected local government" [33]. Moreover, the functioning of the Local Government Fund is managed by the Finance Department and Finance Minister of the province [33]. Secondly, there is a challenge of fragmented governance. A number of organizations responsible for city planning, provision of the services, and development of

Fig. 2.3 Governance and service delivery in cities; example of Lahore, Pakistan

infrastructure are working in silos mostly under administrative control of provincial government, with overlapping functions and poor collaboration.

In order to elaborate the governance and service delivery mechanism example of Lahore, second largest city of Pakistan, has been depicted in Fig. 2.3. On the left side we have indicated various agencies actively engaged in service delivery (municipal services, ICTs, transport, development, communication, etc.) which are overwhelmingly under administrative control of provincial government departments reporting to the Chief Minister. On the right side there is local government (Lahore Metropolitan Authority) with nominal role in the city's governance and service delivery. The situation is more or less the same in all the other cities in Pakistan.

There are bureaucratic arrangements for coordination and administration of the cities headed by Deputy Commissioners at district level and Assistant Commissioners at Sub-District (tehsil) level. With fragmented and disintegrated governance "traditional establishments lack the essential technical expertise for current urban planning, have limited capacity and deficit of resources to deliver urban governance in an efficient manner" [4]. Therefore, for every significant innovative intervention federal and provincial governments have to make special arrangements, i.e., project management units, authorities, and companies. This is again evident from the example of Lahore city as it can be seen in Table 2.1, where a number of companies (i.e., put here the companies), authorities (i.e., put here the authorities), and units are working beside traditional service delivery agencies (i.e., put here the agencies). The majority of these agencies either are province wide or report to provincial departments.

4   Proposed Model

The Pakistan scenario described and discussed above shows how in Pakistan urban services are disintegrated and there is lack of a governance model ideal for smart cities. However, the present institutional and governance setup developed along the last 70 years cannot be undone and overcome overnight. Therefore, a balanced

Table 2.1 Example of urban service delivery by federal, provincial, and local governments in Lahore

	Federal government	Provincial government	Metropolitan corporation
Telecommunication infrastructure	Pakistan Telecommunication Authority and Pakistan Telecommunication Company		
IT and e-government services		Punjab Information Technology Board	
Electricity (infrastructure/supply)	Lahore Electric Supply Company		
Public transport		Punjab Mass Transit Authority, and Lahore Transport company	
Solid waste management			Lahore Waste Management Company
Emergency services		Rescue 1122	
Infrastructure development/city planning		Lahore Development Authority	
Housing and town planning		Punjab Housing and Town Planning Agency	
Parking			Lahore Parking Company
Water supply, sewerage, and drainage		Water Supply and Sanitation Agency (WASA) Lahore	
Parks and horticulture		Parks and Horticulture Authority, Lahore	
Tourism		Tourism Development Corporation of Punjab	
Environment		Environmental Protection Agency Punjab	

model towards smart governance is being proposed in this research work. Figure 2.4 shows the proposed model which is neither so ambitious to be impossible of being implemented nor so slack to compromise the overall principles of a smart city governance. In addition, the model is based on the principle of strong leadership while empowering local government with city mayors taking the responsibility of making their city smart. At the apex of smart city governance, there is a Smart City Steering Committee on each province.

Since local government is a devolved subject after 18th constitutional amendment in Pakistan and each province has its own local government legislation province-wise
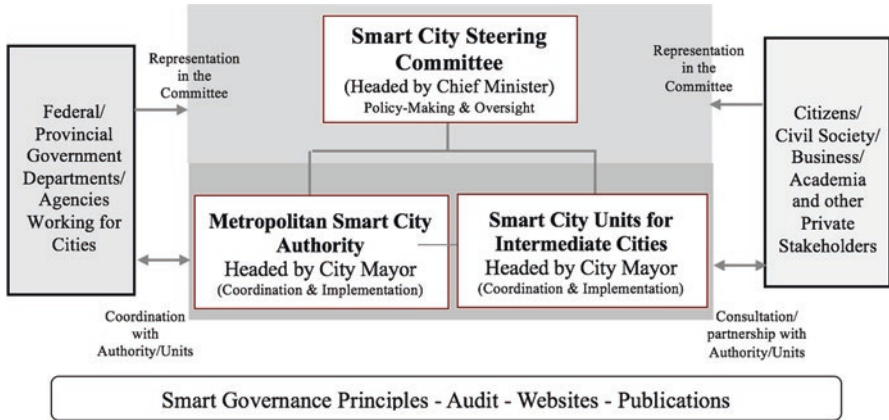
Fig. 2.4 Proposed smart city governance model for Pakistan

committees would be better positioned to develop a Smart City Vision/Mission/Plan for their respective provinces. The committees at federal level (for Smart City Islamabad only) would be headed by Prime Minister, whereas in provinces Chief Ministers would head the committee. Members of the committees will include mayors of respective smart cities, ministers of key ministries/departments (e.g., finance, planning, housing/urban development, IT), head of Metropolitan Smart City Authority, heads of smart city units, heads of major departments/autonomous bodies working in the cities, head of agencies implementing e-governance, and representatives of business, academia, and civil society. The committees will have the responsibility of leading the initiative, developing the vision and strategy, arranging resources, taking decisions for integration and alignment of ongoing development initiative with smart city plan where required, facilitating smart city legislation, facilitating the implementation tier (smart city authority), and monitoring and evaluating the execution of smart city initiatives.

Below the apex committees, a strong institutional arrangement is required to transform the smart city vision and strategy into practice through action plans, programs, and projects. For this purpose, two different models are being proposed: (1) metropolitan cities (provincial capitals) and (2) intermediate/small cities. In metropolitan cities (1) Metropolitan Smart City Authorities may be established as an autonomous specialized agency having corporate structure and manned by the experts of various smart city disciplines, whereas in intermediate/small cities (2) smart city units are proposed for each smart city within existing governance setup of the cities under the leadership of the mayor. Both the agencies would report to Smart City Steering Committee and work to implement smart city vision in accordance to the strategy decided at the apex level. These two slightly different models aim at (1) creating a balance between authorities of provincial governments and local governments; (2) availing the strong leadership of Prime Minister or Chief Minister for smart city transformation; (3) promoting the sense of an ideal city level of governance and service delivery among city mayors and city managers at metropolitan or

municipal corporations; and (4) gradually shifting the equilibrium towards city-centered governance.

Metropolitan Smart City Authority, established at provincial capitals, would be governed by a board of directors under the chairmanship of the mayor of concerned city. The board of directors would have members from public and private sector, deputy commissioner of the city, proactive parliamentarians elected from the city, and renowned technical experts of urban development and e-governance from private sectors. The Authority would have legal backing for its objectives and will be directly reporting to the respective Smart City Steering Committee. The authority will contextualize the smart city initiatives for people-centered smart cities; the functions of this authority will include the folowing:

1. Plan and implement the smart city vision, policies, and projects.
2. Coordinate all the agencies working in the city and provide them technical and strategic guidance for the alignment of their projects with smart city vision.
3. Collaborate with all the stakeholders and citizens for a genuine engagement of citizens and to win their trust in the smart revolution of the city.
4. Play advisory functions for supporting the smart city units in intermediate and small cities. The authority should help these units in building their capacity as well as empowering them to steer independently.
5. Closely work with planning and development department of the provincial government, participating in the meetings of development forums and approving bodies.

For the smart cities of intermediate and small size smart city units are proposed within the existing administrative setup. The units would also be fully equipped to implement the interventions. However, these would have comparatively lean structure and would work within existing city governance setup under the mayor. The mayor of the city and head of the unit may represent the city in Provincial Steering Committee.

Overarching this two-tier governance model are the principles of smart city, i.e., effectiveness, efficiency, transparency, collaboration and openness, accountability and pluralism, and e-governance and e-government [7]. All the agencies involved in smart city execution would be subject to financial and performance audit per each smart city plan.

5   Conclusion

The study concludes that governance is the most critical component for a successful smart city transformation. Without a correct understanding of the meaning of a smart sustainable city the transformation which supposedly intends to be smart can be a fallacy and may even worsen the city situation. Therefore, a comprehensive understanding of all underlying smart city concepts and methodologies for the correct smart city transformation is required at the very beginning. This research work makes

a thorough literature review on existing smart governance scientific papers as well as on policy documents about this topic, and then analyzes the particular case of Pakistan governance structure and conditions to finalize based on the previous two steps with the proposal of a suitable smart governance model for Pakistan context. The proposed two-tier smart governance model is flexible enough to be easily adjusted to Pakistan actual governance structure and to be gradually enhanced towards the ideal smart governance model for smart cities. The smart governance model is grounded in principles of what should be a good governance such as efficiency, transparency, collaboration and openness, accountability, and pluralism and the use of e-governance and e-government as an enabler and facilitator of those principles.

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