Chapter 7
Comparing Smart Governance Projects in China: A Contextual Approach

Huaxiong Jiang, Stan Geertman and Patrick Witte

Abstract Smart governance has been increasingly gaining momentum to deal with the challenges of fast urbanization in China. However, only limited English literature is available to enhance our understanding of Chinese smart governance. In this chapter, special emphasis is put on our transformative understanding of smart governance in China by identifying the impacts of urban context on smart governance arrangements from an urban planning perspective. As such, we concentrate on smart governance projects in different Chinese cities, foremost based on Chinese literature. We aim to investigate: (1) what smart governance means in Chinese urban planning settings, and (2) how urban context influences the smart governance projects in different Chinese cities. On the basis of an intensive review of Chinese literature on smart governance, we find that smart governance in China varies significantly. Therein, we can identify four types of smart governance in China, including: (1) constructing a pilot area, (2) improving government performance, (3) building trust in government, and (4) encouraging innovation. A comparative exploration of four Chinese projects representing these four types of smart governance shows that the urban context affects the interaction between technology and urban actors. Moreover, it shows that this interaction has a feedback effect on the urban context itself. From this we can conclude that knowledge on the urban context is vital to understand the expected outcomes of intended smart governance arrangements.

Keywords Smart governance · China · Urban context · Technology · Urban actors

H. Jiang (✉) · S. Geertman · P. Witte
Department of Human Geography and Planning, Faculty of Geosciences, Utrecht University, 3584 CS Utrecht, The Netherlands
e-mail: h.jiang@uu.nl

S. Geertman
e-mail: s.c.m.geertman@uu.nl

P. Witte
e-mail: p.a.witte@uu.nl

S. Geertman et al. (eds.), *Computational Urban Planning and Management for Smart Cities*, Lecture Notes in Geoinformation and Cartography,
https://doi.org/10.1007/978-3-030-19424-6_7

1 Introduction

An estimated one billion people in China will live in urbanized areas by 2025 (United Nations 2018). As a way to deal with these imminent challenges of fast urbanization, the concept of smart city and its governance has increasingly gained momentum in China. As of August 2013, 193 national smart city pilot projects have been announced by China's Ministry of Housing and Urban and Rural Development (MOHURD). After five years of construction, about 500 smart city pilots have been implemented in 2018, outnumbering all other countries combined.[1] In China, the development of Information and Communication Technology (ICT) and national policies have been key drivers of smart city initiatives (Hao et al. 2012). The use of ICT has enabled governments to promote public policy and provide better services to its citizens (Lin 2018). By reconsidering the role of governments in a knowledge-based smart city, traditional governing approaches are transformed into what has been called as 'smart governance' (Bolívar and Meijer 2016).

According to Batty et al. (2012), smart governance means using digital innovations to optimize the efficiency of city operations and services. Giffinger et al. (2007) claim that smart governance is a broader concept and includes political participation, services for citizens and the functioning of the administration. Based on an intensive literature review, Meijer and Bolívar (2016) define smart governance as a new form of human collaboration by using ICTs to gain more open governance processes and better outcomes. In the limited English literature dealing with the Chinese context, smart governance in China is mainly understood as the use of technology to integrate public services, community activities and city management (Lin 2018; Shi 2018). By utilizing the strengths of some top technology companies such as Alibaba, Tencent, and Huawei, a technology-centric approach is deemed as the main way to govern smart city initiatives.[2] In the next section we will elaborate more on the content of the smart governance concept.

Ruhlandt (2018:9) highlights that contextual factors should be assumed to impact the governance of smart cities. However, current research on smart governance mostly neglects the importance of urban contextual factors in shaping smart governance. Context refers to the circumstances and situations that form the setting for one specific smart governance approach, and in terms of which it can be fully understood and assessed. According to Nielsen and Pedersen (2014:412), 'decision-makers have different personal preferences […] and a range of contextual factors encourage different behaviors'. Factors such as 'political or demographic factors, administrative cultures, and technological factors' are assumed to affect smart governance (Bolívar and Meijer 2016). Thus, it is vital to take context-specificity into account in the decision-making process. Accordingly, Janowski (2015) presents a four-stage ICT-enabled governance model and argues that the success of ICT-enabled governance

[1] http://www.xinhuanet.com/english/2018-02/20/c_136987058.htm.

[2] https://www.businesswire.com/news/home/20180821005297/en/Ping-Showcases-Innovative-Solutions-Cities-China-Smart.

should evolve towards the complexity and greater contextualization and specialization. This means that the initiation of new forms of smart governance needs to be contextualized, since approaches that work in one city may fail in another (Meijer 2016). From literature (Meijer et al. 2016) it shows that the importance of context in influencing smart governance arrangements is increasingly stressed, but a more systematic analysis of the role of context is lacking.

In this chapter, special emphasis is put on a transformative understanding of smart governance in China by identifying the impacts of urban contexts on smart governance arrangements from an urban planning perspective. As such, we concentrate on smart governance projects in different Chinese cities, foremost based on Chinese literature. This brings us to the research questions we will address in this chapter: (1) what does smart governance mean in Chinese urban planning settings? and (2) how do urban contexts influence smart governance projects in different Chinese cities? To answer these questions, this chapter is structured as follows. Section 2 focuses on the theoretical debates on smart governance and its relationship with urban contexts. A conceptual model is presented to study smart governance projects in different Chinese cities. Section 3 outlines our methodology. Section 4 presents the empirical findings based on an explorative analysis of four distinctive types of smart governance projects described in the Chinese literature. Section 5 provides a discussion of the findings, along with the final conclusion.

2 Integrating Context into the Smart Governance Debate

2.1 Defining Smart Governance

Smart governance suggests an integration of new technologies into traditional urban governance processes. In this view, smart governance deals with the utilization of ICTs to promote a much stronger intelligence function for smartening the many different components of a city (Batty et al. 2012). Doing so, technology is identified as the defining characteristic of smart governance (Scholl and AlAwadhi 2016). ICTs such as big data, sensors, social media and monitoring tools provide the information basis. Information is extracted from multiple sources and organized by ICTs, which not only helps urban government and planners to analyze the urban problems, evaluate alternatives, and forecast future scenarios, but also facilitates engagement of distinctive stakeholders and produces greater transparency on the part of government (Bertot et al. 2010). The increased transparency further speeds up the process of democratizing decision-making. For instance, the advent of web-connected collaboration platforms allows individuals and communities to become more effectively self-organized in participatory urban planning and neighborhood governance (Kleinhans et al. 2015). The utilization of various ICTs in government organizations supports a transformation of the 'government-to-government' relationship to a

'government-to-citizen', 'citizen-to-government', or 'citizen-to-citizen' relationship (Linders 2012).

However, smart governance, as a sub-domain of governance theory, cannot avoid scrutinizing power and authority that is distributed over different actors (Gil-Garcia 2012), since governance is closely related to the steering and co-ordination of interdependent (usually collective) actors (Treib et al. 2007). From this perspective, smart governance highlights the importance of investments in human and social capital (Caragliu et al. 2011) and calls for pro-active and open-minded governance structures, with all actors involved, to improve urban performance (Kourtit et al. 2012). Interactions between different urban actors will help contribute to differentiated knowledge, ideas and opinions to enhancing the process of mutual learning and improve the effectiveness of decision-making. Besides, interactive power relations among different actors further impact the design, implementation and use of technologies in ICT-enabled governance, because technology as social artifact has various meanings to different urban stakeholders (Yang 2003).

Nevertheless, Gil-Garcia (2012) suggests a double-sided interaction between technology and social actors in ICT-enabled governance. In the same vein Johnston and Hansen (2011) claim that the governance of smart cities should not separate technology from human-based capital; instead, smart governance ought to bring smarter e-participation devices, government and society closer together for collaborating over proposed issues. According to Hammad and Ludlow (2016), the principle of integrating ICT with participatory decision-making is crucial to defining smart governance. As a result, the issue of socio-techno synergy has been put at the heart of the smart governance debate (Meijer and Bolívar 2013). The interaction between different social actors leads to technology change, which in turn transforms actor relations. Thus, conceptualizing smart governance as an emergent socio-techno practice will help to develop a better theoretical understanding of the concept of smart governance (Meijer and Bolívar 2016). Despite, Meijer (2016:75) argues that 'studying the effects of smart (city) governance is complicated since the relations between governance arrangements, use of technologies, and effects on the quality of urban life are contextual'. Hence, smart governance should place itself at a higher level of transformation because it not only demands a timely transformation of internal and external structures, but also requires the ability to express its context-sensitivity (Janowski 2015).

2.2 Why Context Matters

Several articles have theorized and investigated the importance of contextual factors in affecting smart governance. Bolívar and Meijer (2016) claim that factors such as 'political or demographic factors, administrative cultures, and technological factors' are assumed to affect smart governance. Meijer (2016) highlights the hidden role of 'the local cooperative knowledge potential' and 'the nature of the problem domain' in configuring smart city governance. For instance, according to Kalathil

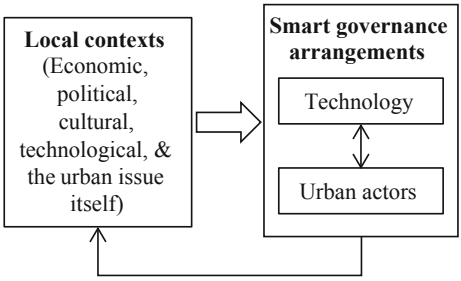

Fig. 1 A contextual approach towards smart governance

and Boas (2010), the level of economic development will impact how technology is organized and used in ICT-enabled governance. A recent comparative study by Lin (2018) indicates that different institutional and technological contextual factors have made smart governance in some Western countries relate more to e-governance and e-democracy, while smart governance in China is focusing more on smart management and services. Furthermore, it shows that the nature of the urban issue itself like social, economic and environmental challenges associated with urbanization also comprises an important contextual factor (Lin 2018; Meijer 2016). In summary, five contextual factors can be identified: economic, political, cultural, technological, and the urban issue itself. Nevertheless, Ruhlandt (2018) claims 'the influence of contextual factors on smart governance still remains unclear' and a lack of empirical studies weakens this connection. Thus, more detailed analyses of smart governance in different contexts are strongly needed (Meijer et al. 2016).

2.3 Integrating Context into Smart Governance

To examine the potential role of contextual factors in influencing smart governance, a contextual approach towards smart governance is proposed. Figure 1 suggests: (1) a potential relation between urban context and smart governance arrangements, (2) that the potential effect of the urban context on smart governance arrangements relies on the interaction between technology and urban actors, and (3) a potential feedback effect of smart governance arrangements on the urban context.

3 Methodology

This study is based on a systematic review of the Chinese literature on smart governance. The search for published journal articles was based on the China Academic Journals Full-text Database (CJFD)[3]—one of the most important online academic

[3] http://gb.oversea.cnki.net/kns55/support/gb/products.aspx.

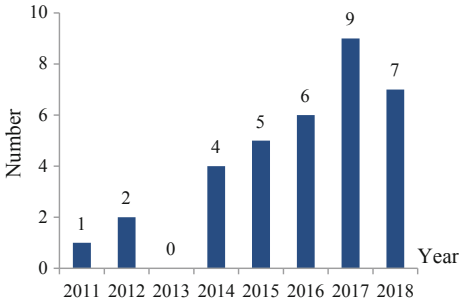

Fig. 2 Number of articles by year

databases in China—covering more than 7672 notable and significant Chinese journals, across 10 disciplines, from 1996 to the present. Because of its rigorous selection, the CJFD provides access to journals that have strict academic standards and these journals are often deemed as the leading journals of natural and social science in China.

Then, selected keywords—*smart governance, smart city governance, smart city and governance*—were used to identify the most relevant articles relating to smart governance. The search included all works between January 2010 and September 2018, since the rapid growth of the smart city and its governance research started from 2010 onwards (Dameri and Cocchia 2013). A three-step review process based on Tofthagen and Fagerström (2010) produced 34 Chinese articles concerning smart governance. The selected articles span over 8 years, ranging from 2011 to 2018 and the year 2017 saw the greatest increase of articles (Fig. 2). Among the 34 identified articles, 9 smart governance projects can be identified. Based on the five identified urban contextual factors as summarized in Sect. 2, these 9 smart governance projects can be further categorized into 4 groups (Table 1). These projects have been researched more in-depth with the help of additional literature, official reports, research documents, and index systems. For illustration reasons from each group just one project will be presented below.

The first group is featured with the urban issue itself in defining the vision and strategies for ensuring the smartness of these cities. Smart governance projects in these cities (mainly Tianjin, Guangzhou and Chengdu) are supposed to build pilot areas for future urban development. The second group consists of those cities (mainly Shenyang and Qiqihar) that once have been important industrial bases under the centrally planned economy but are currently facing restraints from local government's political-culture conservatism (e.g. excessive government intervention, centralization, and resistance to change) to transform its development. The third group includes smart governance projects (mainly in Beijing and Shanghai) that are influenced strongly by political intentions and pressures from the Chinese Central Government. Smart governance projects in these cities on the one hand are purposed to remove redundant functions within their organization and improve the delivery of services to key stakeholders by using ICTs. On the other hand, by facilitating citizens' trust towards governments and enhancing the capacity of governments to manage crises

Table 1 Identified smart governance projects in China

Groups/variables	Cities	Urban contextual difference	Smart governance projects
Group 1: Constructing pilot areas	Tianjin, Guangzhou, Chengdu	*The urban issue itself* Rapid urbanization and environmental pollution Large-scale pilots and experiments	Tianjin Smart Eco-city Project Guangzhou Smart Urban Management Chengdu Wenjiang Smart Planning and Management
Group 2: Improving government performance	Shenyang, Qiqihar	*Political-cultural conservatism* Excessive government intervention Centralization routineness and resistance to change	Shenyang Smart Social Governance Qiqihar Smart Eco-city Management
Group 3: Building trust in government	Beijing, Shanghai	*National political intentions* Facilitating service-oriented government Political dominance	Beijing Changyang Smart Community Shanghai Lujiazui Smart Community
Group 4: Encouraging innovation	Hangzhou, Shenzhen,	*Innovation economy and technology* Innovation culture Technological basis Human-centric development	Hangzhou Shanghang Smart Governance Project Shenzhen Nanshan Smart City Governance Projects

and to implement plans, it intends to consolidate government's political dominance. The fourth group is featured with its innovation culture and strong technological basis. Home to some of China's most renowned tech giants from Huawei to Alibaba, smart governance projects in these cities (e.g. Shenzhen, Hangzhou and Foshan) heavily rely on their innovation economy and technologies that foster open systems and platforms through communication and information sharing.

4 Comparing Smart Governance Projects in Different Chinese Urban Contexts

In this section we focus on four empirical smart governance projects and strive to investigate how urban context influences smart governance in these cases. These four projects are taken from the four identified groups and contain Tianjin Smart

Eco-city Project (Wang et al. 2017), Shenyang Smart Social Governance (Jia and Li 2017), Beijing Changyang Smart Community Project (Wang 2015), and Hangzhou Shanghang Smart Community (Wang 2014).

4.1 Constructing a Pilot Area: Tianjin Smart Eco-City Project

With Tianjin's rapid urbanization, a large territory of coastal land in South Tianjin has been polluted and influenced by industrial wastewater and salinization. This harsh situation has driven the Chinese government to find new ways to govern these urban problems. The construction of Tianjin Smart Eco-city is such a response made by the Chinese government in cooperation with the Singapore government aimed at building a pilot area—a place under experimentation to provide innovative solutions for urban development and ecological protection. Covering an area of thirty square kilometers, the key challenge of this project is to repair a degraded ecosystem and build an eco-city simultaneously. Specifically, the project focuses on repairing a large territory of degraded land, constructing affordable housing, building sustainable transportation, creating good quality jobs, and providing public services and social amenities within walking distance of residential estates. However, the scope of work and the large-scale of construction require a large amount of financial investment and strong political support, which has put government actors at the center of the governance of this project.

Collaboration between China and Singapore in the Tianjin Smart Eco-city Project occurs at two levels. At the national government level, a *Joint Steering Council* and a *Joint Working Committee* have established eight working-level sub-committees to govern the eco-city. At the private level, the Sino-Singapore Tianjin Eco-city Investment and Development Co., Ltd. is erected by a Singapore consortium and a Chinese consortium to develop this project. The inclusion of only the governments of China and Singapore has further determined the design, implementation, and use of technology. Drawing on the experience in Singapore, an ICT-enabled 'Systematic City Management' model has been developed to realize the governance of this eco-city at three eco-scales. At the eco-city scale, a comprehensive online platform—the *Intelligent Urban Service Platform*—is built to realize online declaration of forty-nine items relating to industrial and commercial registration, project establishment, environmental assessment, and other important approval matters. At the eco-community level, various e-citizen centers are put into use, providing residents with thirty online service items concerning medicine, food, housing, travel, music and education. And at the eco-cell level, different management and service teams—Social Work Station—are built to master the public sentiment and maintain social stability.

In this project, the political context (i.e. cooperation between the governments of China and Singapore) in combination with the extensiveness of the urban planning issue (e.g. degraded land restoration, housing construction, transportation building,

Fig. 3 A pilot Tianjin Smart Eco-city Project (*source* https://www.tianjinecocity.gov.sg/gal.htm)

jobs creation, and so on) constitutes the main urban contexts facing the smart governance of this eco-city. The effect of these urban contexts has produced a government-to-government relationship and closed technologies to implement this project. Then, closed technologies enhance government's ability in governing these urgent urban issues. As a result, the direction and activities of this project are much easier to be carried out and substantive outcomes such as better ecosystem, infrastructures, and economic vibrancy have been achieved at a prescribed time. However, in Tianjin Smart Eco-city Project, to restore such a large territory of degraded land and build a wholly new eco-city simultaneously makes the smart governance process more rely on national government's support, which distinguishes itself from other eco-city projects (Fig. 3).

4.2 Improving Government Performance: Shenyang Smart Social Governance

As one of the most important old industrial bases under the state-led development in China, Shenyang government's excessive market intervention (e.g. encouraging the survival of inefficient firms, government-led investment, insufficient public service, and unfair treatment of private companies) has caused a system of relatively antiquated values and beliefs within the government system. These antiquated values and beliefs contribute to the forming of a unique conservatism in political system and organization culture that Shenyang government has been slow to respond to the consistently changing environment. This conservatism strongly influences the process of Shenyang Smart Social Governance—a project aimed at improving government performance and spurring Shenyang's market vitality.

In this project, a public-private partnership is established between Shenyang government and a local agent company called NEUNN. However, the role of this local company is only restricted to developing relevant platforms that government requires. For instance, dedicated to departments interoperability, the *Smart Shenyang Collaborative Office Platform* is developed to allow for data exchange and information

sharing between different governmental components. To enhance government's ability of social control, the *Digital Smart Management System* is designed to combine transportation monitoring and public safety management with environmental protection. This platform divides Shenyang into different unit grids so that different urban management officers can specialize in their own territories. Then, by initiating the *Shenyang Public Service Portal (or Shenyang 12345)*, Shenyang government aims to improve its business environment by receiving complaints (e.g. lack of laws and regulations, traffic noise, environmental pollution) from private companies and citizens.

Identified as the key urban contextual factor in this project, the political-cultural conservatism of Shenyang government has made itself prefer to use technologies that promote a government-to-consumer relationship rather than build two-way communications between the government and non-government actors. Various government-steered platforms are only used to strengthen the ability of Shenyang government for policy-making, service provisions and social control. Although those technologies to some degree streamline processes and enable certain degree of participation in urban issues, private sectors and citizens are only allowed to post their ideas, comments, and requests as what government expects. Instead of promoting an inclusive government, this ICT-driven social governance actually has enhanced what government considers traditional values or behaviors and the conservatism of Shenyang government—a hesitance to share information and power with local citizens to reach its goal. Attentively, Shenyang Smart Social Governance is a typical smart governance model representing those old-industry cities.

4.3 Building Trust in Government: Changyang Smart Community Project, Beijing

As a suburban town located in the Southwest Beijing, Changyang has a 200,000 floating population while the household population is only around 50,000. A large number of migrants in Changyang have impeded its achievement of a livable town. More importantly, political pressures and intentions from the Chinese Central Government have largely affected the behavior and role of Changyang government since central government has a strong ambition to influence the development of Beijing's local member districts. They expect that increased satisfaction through better service delivery can improve citizens' trust in government on the one hand; and government's political authority and dominance can be enhanced through innovative governance approaches on the other.

Thus, Changyang Smart Community Project is proposed to build a "service-oriented and facilitating government", showing its determination of a human-centric development. Two aspects have been paid special attention. To smarten government's ability of urban management and social control, the *Public Information Platform of*

Smart Changyang has been introduced to break the segmentation between different government divisions and provide a one-stop management experience for city managers. To transform its external organization and build satisfaction and trust in government, Changyang government has directed the establishment of the *Community Service Management Platform* to create a community governance model for local Neighborhood Committees. This platform integrates administrative management, public affairs and daily services and improves the responsiveness of local governments and their efficiency and effectiveness of service provision. In addition, several open-source systems have also been formed to enable e-participation from civil society in managing their 'niggling' daily issues. For instance, *Elderly Care System* aims to mobilize the resources distributed among community volunteers, private companies, and non-government organizations to provide services to elderly people (e.g. psychological assessment, health monitoring, rehabilitation guidance, and financial services).

Although it is impossible for the central government to directly intervene in the governing affairs of Changyang, its political intentions and pressures have been strongly transmitted to Changyang government, constituting the unique urban context in Changyang Smart Community Project. To satisfy central government's requirement, a strategy of human-centric development is advanced to transform its internal and external organization. On the one hand, Changyang government invites technological companies to establish platforms to improve its ability of urban management and the quality of services. On the other, they create open technologies for government, private sectors and citizens to work together for their daily issues. Improved services, a more transparent government and allowed participation with the help of a combined use of open and closed technologies have not only increased the satisfaction and trust of local citizens in Changyang government, but also enhanced government credibility and authority. Conversely, the increased citizen's trust and government credibility and authority have enhanced central government's political intentions. Compared to other cities, the dual meaning of smart governance in Beijing (i.e. building trust in government with enhanced government authority) is more prominent due to central government's influence.

4.4 Encouraging Innovation: Shangcheng Smart Governance Project, Hangzhou

As a core urban district of Hangzhou, Shangcheng is among the first batch of Smart City Pilots initiated by MOHURD. The reason why Shangcheng can become a smart city pilot is mainly due to Hangzhou's technology strength. As one of the most influential hi-tech innovation and hi-tech industry bases in China, Hangzhou is the headquarters of Alibaba, one of the world's largest companies specializing in e-commerce, internet, retail, and artificial intelligence. In addition, major international tech companies such as Siemens, Motorola and Nokia have also established their

research and development centers in this city. The very active innovation economy and strong technological basis have escalated Shangcheng to the frontier of exploring new modes of smart city governance.

Aimed at enhancing its urban competitiveness through innovation and improving the quality of life for local people, the Shangcheng local government has adopted a strategy of "Smart Government, Smart Governance, and Smart living" to reach its goal. Smart government is about using big data and Internet of Things as important instruments to upgrade infrastructures and improve the efficiency and effectiveness of decision-making and service delivery in the public sector. Alibaba and Cisco have become the main partners to control the selection of hardware and software and facilitate the ICT strategy of Shangcheng government. For instance, *City Brain* initiated by Alibaba has replaced conventional road signages in Shangcheng, which allow digital signages and AR-based messaging systems to monitor the condition of roads and trigger alerts for any immediate maintenance work.

Smart governance here is about building open-source systems to enable citizen participation and engagement for concerned issues. For instance, all community service agencies in Shangcheng district have provided free WIFI, allowing citizens have access to internet and make comments on service delivery. *Shangcheng Safety 365 Platform* builds an effective interaction channel and local people can report their safety concerns. Officers are required to make a response and find an appropriate solution. Meanwhile, ICT has enabled different stakeholders to collaborate with each other and build various collaboration innovation spaces. An example of this is the Wangjiang Youth Innovation Street, where various resources such as financing, tutor, social, and legal affairs are integrated by an ICT-enabled collaboration network. This network provides differentiated online and offline services for entrepreneurial teams and enterprises at their different stages of development. The mass use of social media, websites and online platforms has created a culture of innovation in this area, which has incubated more than 200 startup companies.

In this project, the rise of the innovation economy and innovation culture in Shangcheng has constituted its specific urban context. The effect of these contextual factors has first enabled administrative officers to treat citizens not as observed subjects but as a source of creation. Different urban actors are allowed to organize their own governance networks to concurrently draft new connections, ideas and creations. Then, these contextual factors have led to a multiple use of technologies, (e.g. closed or open, informing or communicating, and single or complex), since technology innovation is a major advantage of Hangzhou over other cities. The various enacted technologies in Hangzhou have speeded up the forming of a collaborative society between different actors to deal with various urban issues such as urban innovation, technological development, living conditions, traffic congests, health and education services, water pollution, and so on. Reversely, these ICT-enabled collaboration networks produce a positive feedback to Hangzhou's innovation settings, which has enhanced its overall innovation capability and technological strength. However, attention should be paid that due to the existence of a large number of state-owned companies operating in market, government still has a role in the smart governance process of innovation economy. This differs from what has been

Fig. 4 ET city brain in Shangcheng, Hangzhou (*source* https://www.alibabacloud.com/et/city)

observed in some Western countries that innovation economy is mainly incubated among non-government actors [e.g. Helsinki's City-as-a-platform (Anttiroiko 2016)] (Fig. 4).

5 Discussion and Conclusion

In this chapter, special emphasis is put on a transformative understanding of smart governance in China by identifying the impacts of urban contexts on smart governance arrangement from an urban planning perspective. According to Lin (2018), smart governance in China is mainly linked with smart management and services. However, an extension of Lin's study through an intensive exploration of Chinese literature on smart governance projects has revealed that smart governance in China varies significantly. Four types of smart governance—constructing a pilot area, improving government performance, building trust in government, and encouraging innovation—have been identified through a systematic review of the Chinese literature on smart governance.

Based on our analysis of four Chinese smart governance projects, we verify that the effects of urban contexts on Chinese smart governance is mainly through the interaction between technology and urban actors. In Tianjin Smart Eco-city Project, the political context along with the urban issue itself have put government and its agent companies at the center, which further leads to a top-down organization of technology. In Shenyang Smart Social Governance, the relatively political-cultural conservatism makes Shenyang government resist opening up the governing process to outsiders and technologies are preferred to connect their internal organizations

and sectors. In Changyang Smart Community Project, national political pressures and intentions have encouraged a combined use of open and closed technological platforms to improve the connectivity and trust between government and non-government actors on the one hand, and enhance government's political authority and dominance on the other. Finally, strong innovation economy and technological basis have suggested the existence of a double-sided interaction between urban actors and technology in Shangcheng Smart Community Project.

Besides, our analysis also indicates that the interaction between technology and social actors can either reduce or enhance the effects of urban contexts on smart governance. For instance, Tianjin Smart Eco-city Project provides comprehensive experiences to fields of fundamental transformation including degraded land restoration, housing, employment, and so on, which to a large degree eliminates the negative impacts brought by the challenges of fast urbanization. In Changyang Smart Community Project, by promoting a service-oriented and facilitating government with the help of ICTs, an increase in citizen's trust and government's political authority and credibility has enhanced central government's political intentions. In Shenyang Smart Social Governance, ICT-driven social governance reinforces the conservatism of Shenyang government. In Shangcheng Smart Community Project, various ICT-enabled collaboration networks have optimized Hangzhou's innovation settings and enhanced its overall innovation capability and technological strength.

Based on our findings, we conclude that knowledge on the urban context is vital to understand the expected outcomes of intended smart governance arrangements. An in-depth understanding of the specificity of urban context will help develop an adaptive smart governance arrangement for that situation. However, due to geographical particularities and differences, a risk can exist when other contextual factors relating to smart governance have been neglected but may be significant (Ruhlandt 2018). Thus, more comparative empirical research between different places or cities on smart governance in the future is needed and will help to identify the diversity of smart governance modes and their usefulness in dealing with harsh urban issues.

References

Anttiroiko A (2016) City-as-a-platform: towards citizen-centre platform governance. In: Proceedings of the RSA winter conference

Batty M, Axhausen KW, Giannotti F, Pozdnoukhov A, Bazzani A, Wachowicz M, Ouzounis G, Portugali Y (2012) Smart cities of the future. Eur Phys J Spec Top 214(1):481–518

Bertot JC, Jaeger PT, Grimes JM (2010) Using ICTs to create a culture of transparency: e-government and social media as openness and anti-corruption tools for societies. Gov Inf Q 27(3):264–271

Bolívar MPR, Meijer AJ (2016) Smart governance: using a literature review and empirical analysis to build a research model. Soc Sci Comput Rev 34(6):673–692

Caragliu A, Del Bo C, Nijkamp P (2011) Smart cities in Europe. J Urban Technol 18(2):65–82

Dameri RP, Cocchia A (2013, Dec) Smart city and digital city: twenty years of terminology evolution. In: X Conference of the Italian chapter of AIS, ITAIS, pp 1–8

Giffinger R, Fertner C, Kramar H, Meijers E (2007) City-ranking of European medium-sized cities. Cent Reg Sci Vienna UT, 1–12
Gil-Garcia JR (2012) Enacting electronic government success: an integrative study of government-wide websites, organizational capabilities, and institutions, vol 31. Springer Science & Business Media, Berlin
Hammad R, Ludlow D (2016, Dec) Towards a smart learning environment for smart city governance. In: Proceedings of the 9th international conference on utility and cloud computing, ACM, pp 185–190
Hao L, Lei X, Yan Z, ChunLi Y (2012, June) The application and implementation research of smart city in China. In: 2012 international conference on system science and engineering (ICSSE), IEEE, pp 288–292
Janowski T (2015) Digital government evolution: from transformation to contextualization. Gov Inf Q 32(3):221–236
Jia L, Li Z (2017) Social governance in the process of smart city construction: a case study of Shenyang. J Northeast Univ 19(6):608–615
Johnston EW, Hansen DL (2011) Design lessons for smart governance infrastructures. In: Transforming American governance: rebooting the public square, pp 197–212
Kalathil S, Boas TC (2010) Open networks, closed regimes: the impact of the internet on authoritarian rule. Carnegie Endowment
Kleinhans R, Van Ham M, Evans-Cowley J (2015) Using social media and mobile technologies to foster engagement and self-organization in participatory urban planning and neighbourhood governance
Kourtit K, Nijkamp P, Arribas D (2012) Smart cities in perspective—a comparative European study by means of self-organizing maps. Innov Eur J Soc Sci Res 25(2):229–246
Lin Y (2018) A comparison of selected Western and Chinese smart governance: the application of ICT in governmental management, participation and collaboration. In: Telecommunications policy
Linders D (2012) From e-government to we-government: defining a typology for citizen coproduction in the age of social media. Gov Inf Q 29(4):446–454
Meijer A (2016) Smart city governance: a local emergent perspective. In: Smarter as the new urban agenda. Springer, Cham, pp 73–85
Meijer AJ, Gil-Garcia JR, Bolívar MPR (2016) Smart city research: contextual conditions, governance models, and public value assessment. Soc Sci Comput Rev 34(6):647–656
Meijer A, Bolivar M (2013, Sept) Governing the smart city: scaling-up the search for socio-techno synergy. In: 2013 EGPA conference proceedings
Meijer A, Bolívar MPR (2016) Governing the smart city: a review of the literature on smart urban governance. Int Rev Admin Sci 82(2):392–408
Nielsen JA, Pedersen K (2014) IT portfolio decision-making in local governments: rationality, politics, intuition and coincidences. Gov Inf Q 31(3):411–420
Ruhlandt RWS (2018) The governance of smart cities: a systematic literature review. Cities 81:1–23
Scholl HJ, AlAwadhi S (2016) Smart governance as key to multi-jurisdictional smart city initiatives: the case of the eCityGov alliance. Soc Sci Inf 55(2):255–277
Shi Y (2018) The model of smart governance of Lujiazui community in Shanghai. In: Lin YL, Wang SF, Geertman S, Deng ZH (eds) Smart governance and new forms of collaborative planning. The Commercial Press, Beijing (in press)
Tofthagen R, Fagerstrøm LM (2010) Rodgers' evolutionary concept analysis—a valid method for developing knowledge in nursing science. Scand J Caring Sci 24:21–31
Treib O, Bähr H, Falkner G (2007) Modes of governance: towards a conceptual clarification. J Eur Public Policy 14(1):1–20
United Nations (2018) World urbanization prospects: the 2018 revision
Wang J (2014) Smart city governance to integrate ICT, government functions, and sociality: an analysis of Hangzhou Shangcheng smart community [in Chinese]. Observation Ponderation 7:50–54

Wang D (2015) Case analysis of smart community: characteristics and contents of smart changyang [in Chinese]. Geomatics World 22(4):34–38
Wang D, Cui S, Yao X, Chi T (2017) Practice and research on intelligent information platform of eco-city construction based on integration with sky, space and earth [in Chinese]. Geomatics World 4:19–23
Yang K (2003) Neoinstitutionalism and e-government: beyond Jane Fountain. Soc Sci Comput Rev 21(4):432–442