Research on Ecological Governance of Smart City in Lhasa under Big Data Environment

Rong Zhou 1,2*, Bingle Zhang 2 and Shanshan Wang 2

1School of Public Administration, Sichuan University, Chengdu, Sichuan, 610000, China
2School of economics and management, Tibet University, Lhsha, Tibet, 850000, China
*Corresponding author’s e-mail: tibetuzr@163.com

Abstract. Smart city is a brand-new urban form with a new generation of information technology as the core and digital information infrastructure as the platform to achieve intelligent management in the fields of population, environment and public services. The construction of smart cities should standardize the operation mechanism, and reflect the technological height and value connotation of the new era in information planning, platform construction, and collaborative management. In the context of big data, smart cities are an effective way to solve the current urban development problems. However, it is difficult to adopt a unified model for the construction of smart cities. Therefore, smart cities need to be classified. Aiming at the current situation and problems of smart cities in Lhasa, the corresponding smart city construction suggestions are proposed, aiming to provide a realistic solution path and method for different types of cities to carry out smart city construction, which has certain reference significance for the future study of smart city classification construction problems.

1. Introduction

The ecosystem of smart city is an interdependent, coexistent and mutually prosperous system where citizens, enterprises and the government play their roles and take what they need. Depending on ICT (Information Communication Technology) related technical innovation, citizens can participate in urban governance and enjoy services. Enterprises can use technologies and capitals to improve urban conditions and achieve commercial profits. The government can formulate various systems, regulations and rules, open data for encouraging and guiding innovation, achieve various products for improving efficiency and urban governance and obtain tax revenues due to scientific and technological innovation. The involvement of enterprises and citizens has provided long-lasting vigor for smart city, as a result, smart city will have more abundant connotation, powers and vigor for sustainable development. This paper has researched the ecosystem of smart city in Lhasa City in which citizens, enterprises and the government of Lhasa City coordinate and govern together depending on new information technology.
2. Current management situations of ecosystem of smart city in Lhasa City

On the basis of completely learning from domestic and foreign advanced construction experience for smart city and deeply combining with actual development conditions, Lhasa City has proposed domestic advanced and international first-class construction concept for new-type smart city to execute in three stages and focus more on the smart application system of urban transportation, public service and tourist industry development.

2.1. Smart transportation

Urban transportation has been one of indexes to measure urban development. The construction of smart transportation in Lhasa City has reflected detailed application of new-generation network technology and intelligent technology in transportation system, based on current transportation situations, realized construction of comprehensive transportation system with innovative technology, resource conservation and sustainable development. The smart transportation system includes one center, one
platform and seven systems, We have expanded command center of the traffic police division and comprehensive management platform for transportation, Transformed intelligent traffic sign control system for 104 intersections, Provided 40 sets of traffic information acquisition equipment, 20 sets of traffic guidance screens, 11 variable marks, Added 200 sets of mobile police service systems, one set of interval velocity measuring system, 3 high-point monitoring equipment and 10 high-definition monitoring equipment, The smart transportation project has realized intelligent traffic management in Lhasa City, through designing perfect sensing network of the Internet of Things, uploading detailed monitoring images and data information in real time, processing and analyzing data, deep-processing and exploring important information, provided precision data support for intelligent management decision.

2.2. Smart community

Based on targets of maintaining public security and public administration, the smart community realizes community administration and service in intelligent form, Lhasa City has, first, greatly improved coverage of broadband network in community, basically built the community with full coverage of broadband network and implemented management for broadband network in the whole city, Second, checked public facilities in urban area and community, including street lamps, gas pipeline and drainage pipeline, Installed sensor system for public facilities and equipment, comprehensively used 3S technology, Internet of Things, spatial information technology, network communication technology, data warehouse technology and data mining technology to transfer data in real time. The establishment of a database to form a unified digital information management platform, so that the government can fully and microscopically control the real-time situation of the infrastructure of various communities in Lhasa, so as to "monitor when there are no facts and report to the police in time when something happens". Finally, Lhasa City has strengthened video monitoring system in public area, implemented full image coverage for communities and workplaces with dense population, and enhanced networking integration of social resources for comprehensive social governance, The intelligent analysis platform in comprehensive monitoring system of community enables to build certain correlation between monitoring images and behaviors in image, realize real-time alarm and effective video monitoring and retrieval, which has really reached the purpose of prevention, declined various events endangering security and social order and completely improved comprehensive governance level for Lhasa City.

2.3. Smart tourism

As an important part of GDP of Tibet Autonomous Region, tourism plays an important role in construction of ecosystem of smart city. Tourist Administration of Chengguan District and administration office of the Potala Palace start from the scenic spot of Potala Palace to build smart tourism, The world cultural heritage and national 5A tourist attraction, Potala Palace is the window and visiting card of Tibet, The official platform was formally established on 9 May 2017, The functions include propaganda of tourism service, information publish, propaganda of public benefits, tourism crafts, brand promotion, cultural and creative products of the Potala Palace, propaganda of cultural products, Tibet art crafts, e-commerce, online shop, mobile commerce and Internet information, We can book tickets and reserve in the platform, For information about Potala Palace, please refer to official website, introduction, news and trends of Potala Palace, The services include scenic spot service, online shop, tourism service and online tourism, You can contact our service sector to view panoramic map of the scenic spot and contact the scenic spot of Potala Palace, The tourism data center at background of the platform will collect demands trends of tourists and recommend related information, First, the center will provide information about accommodation, shopping and entertainment during traveling for background big data analysis, recommend related information and guide tourists to share related resources and surrounding facilities, Second, refer to data about the Potala Palace in introduction to deeply understand the culture, Third, the center will integrate tourism related data, for example, hotel, inn, restaurant, travel
agency and vehicles and report to related sectors and enterprises to provide opinions and formulate related policies better. The official platform of the Potala Palace has provided convenience for tourists to the largest extent and improved user experience in the scenic spot.

3. Management problems for ecosystem of smart city in Lhasa City

According to current management situations, although remarkable results have been achieved in smart transportation, smart community and smart tourism, there are still some problems in overall construction of ecosystem of smart city in Lhasa City.

3.1. Top-down development and management mode of smart city

At present, the top-down and bottom-up development and management modes are popular for construction of smart city in China. The top-down development mode has been implemented in Lhasa City, in which the government and IT provider are dominant to comprehensively consider and solve problems from the view of overall urban development. The public administration activities in smart city are mainly reflected in smart government, smart urban management and smart public service. The administration activities of the government mainly include public administration, improvement for public products and administration for public affairs, which require public participation, coordination of enterprises and co-governance of the government and enterprises. The construction of smart city and supply of smart public services shall be demand-oriented. While describing and presenting dramatic prospect of smart city, the top-down development and management mode requires massive disposable investments due to huge system in the course of implementation, resulting in various problems and deficiencies. City is a dynamic and complicated system, while construction of smart city has greatly changed operation concept and procedures of the government, which may result in “endemic”. As a result, government functions cannot work.

3.2. The fundamental role of market distribution resources is not played completely, and operation maintenance is not long-term.

Nowadays, the construction of new-type smart city in Lhasa City mainly focuses on government investment which is funded by fiscal appropriation of the central government. There is not effective market mechanism. Although Lhasa government has signed agreement of joint development and cooperation with large-scale enterprises, for example, China Mobile, fundamental role of market distribution resources cannot be played completely. Besides, construction and management of smart city in Lhasa City lack long-term and effective mechanism for operation, maintenance and management. For example, in the construction of smart transportation, bicycle sharing has really provided convenience for citizens and travelers in short-distance transportation. However, in the course of operation, we have also found non-standard parking position, private occupancy and malicious damage. There is not long-term and effective operation and maintenance mechanism. The market supervision mechanism is not complete and corresponding roles have not been played completely.

3.3. Lack of positive interaction with IT industry

Compared with mainland, there is a certain gap in development of IT industry in Tibet. The supply of IT facilities is relatively weak. Many electronic accessories and equipment shall be shipped to Lhasa from Chengdu and Beijing and there are not enough IT talents, resulting in difficulties for construction of smart city. Although Lhasa City has signed strategic agreement with several enterprises, in view of subsequent operation and maintenance, it is urgent to develop local IT industry. For example, for social governance for comprehensive monitoring system of community and gridded social service management and information platform of smart community, monitoring information technology is lacked, and external experts shall be invited to check some monitoring videos. Simple technologies are required to dispose and solve some basic problems in smart monitoring system of public infrastructure of smart community, therefore, a huge number of professionals is required in Lhasa City.
3.4. Lack of related laws and regulations for ensuring construction of smart city
According to investigation,laws and regulations about ensuring orderly construction of smart city have not been issued temporarily,Lhasa City has directly advanced the work in accordance with related documents of Tibet Autonomous Region instead of formulating and issuing related opinions independently,The smart city in Lhasa City shall be constructed in accordance with related policies and regulations,As the saying goes,“nothing can be accomplished without norms or standards”,The construction of ecosystem of smart city in Lhasa City relies on participation and efforts of all related authorities and participants,Therefore,participants shall act in accordance with corresponding rules and laws to ensure orderly implementation of each step for construction of smart city.

4. Improvement measures and strategies for ecosystem management of smart city in Lhasa City

4.1. Innovate development and management mode of smart city,and completely consider subsequent operation
As more and more smart cities develop around the whole country,development mode of smart city transfers from government dominant top-down mode to social co-governance bottom-up mode,In order to build complete ecosystem of smart city,above two development modes shall combine to play their roles of citizens,enterprises,market and the government to form coexistent and co-prosperous operation condition and actually comply with the principle of “people first and demand orientation” for creating new-type smart city in Lhasa City.

4.2. Implement overall planning and build comprehensive coordination mechanism
The overall planning is required for development of smart city in Lhasa City,We shall plan three structures of urban space,scale and industry from urban construction,administration and services,Plan three work steps of urban development schedule,construction and administration,Plan three livable features of production,lifestyle and ecology,And plan three subjects of smart ecosystem of the government,citizens and enterprises,The construction of smart city involves in many fields,therefore,different industries and sectors shall strengthen communication,coordinate and utilization of information resources,learn from each other and offset weakness,mutually supervise and learn,encourage the orientation of public demands and implement the principle of “people first”,In addition,the main construction sector shall lead and guide to build comprehensive coordination mechanism,encourage and strengthen participation and communication,coordination and cooperation among citizens,enterprises,enterprises,market and the government.

4.3. Completely utilize strengths of market distribution resources and improve laws and regulations
We shall completely play the fundamental role of market distribution resources,closely cooperate with enterprises or the third party,increase capital investments to construction of smart city and improve effective market mechanism to realize co-prosperity,coexistence,coordination and co-governance of citizens,enterprises and the government,Besides,we shall improve corresponding laws and regulations,issue policies and regulations complying with actual conditions of Lhasa City,ensure orderly and high-efficient construction of ecosystem of smart city in Lhasa City and protect legal benefits of subjects in ecosystem of smart city.

4.4. Take proper measures based on local conditions and highlight prominent characteristics
As the capital of Tibet Autonomous Region,Lhasa City shall completely utilize its strengths to start construction of smart city,For example,starting from smart ecology will promote to strengthen harmonious coexistence between human and ecology,protect lucid waters and lush mountains,build safety barrier for ecology and protect the final pure land with intelligence,For smart tourism,through big data,cloud computing,Internet of Things,3D spatial information integration and other high technologies,the real-time and latest trends of scenic area will be presented to tourists at the first time and realize intelligent tourism completely.
5. Conclusion
With the further development of digital technology and the wide application of artificial intelligence, dynamic governance will be more integrated into the daily work of urban management, and promote the adjustment of government departments' organization and the reform of operation management mode. Under the background of big data computing, the provision of public services will become more real-time and accurate, all kinds of systematic conflicts can be effectively coordinated at an early stage, and all emergencies can be responded and dealt with in time, which ultimately makes the city run smarter.

Acknowledgments
This article is the phased achievement of the 2019 Tibet University Cultivation Plan Project (ZDCZJH19-30) and the 2019 Tibet University Cultivation Plan Project (ZDCZJH19-31) are phased results.

References
[1] Tibet Autonomous Region People’s Government, Guideline of Tibet Autonomous Region People’s Government about accelerating and advancing construction of national innovative city in Lhasa City [EB/OL] 2017-11-06. http://www.xizang.gov.cn/zgwg/xxgk/201711/20171106_147760.html.
[2] Tibet Autonomous Region People’s Government, Notice of Tibet Autonomous Region People’s Government about issuing the solution of advancing implementation of “Internet plus government administration service” in Tibet Autonomous Region [EB/OL] 2018-01-09. http://www.xizang.gov.cn/zgwg/xxgk/201801/t20180116_152709.html.
[3] WANG Peng, YU Peiyang, LI Hao, WU Nawei, LIANG Junhui, From bicycle sharing to smart streets – top-down ecological construction for smart city [J], Urbanism and Architecture, 2017.
[4] People.com.cn, Lhasa City will build new smart city [EB/OL]2017-11-24. http://xz.people.com.cn/n2/2017/1123/c138901-30955635.html.
[5] National Development and Reform Commission, Evaluation index system for new smart city will be issued recently [EB/OL] 2016-03-30. http://www.forestry.gov.cn/xxb/2526/content-920615.html.
[6] JIANG Jun, SU Yanfei, Research on current situations and problems of smart city in China [J], Journal of Beijing University of Civil Engineering and Architecture, 2016 (03).
[7] Hafedh Chourabi, Taewoo Nam, Understanding Smart Cities, An Integrative Frame-work[A], Ralph H, Sprague, Jr, Proceedings of the Forty-Fifth Annual Hawaii International Conference on System Sciences[C], Maui, Hawaii, CPS conference Publishing Services, 2012, 2289-2297.
[8] Rudolf Giffinger, et al, Smart cities, Ranking of European medium-sized cities[R], Vienna UT, Centre of Regional Science, 2007, 1-25.
[9] Sotiris Zygiaris, Smart City Reference Model, Assisting Planners to Conceptualize the Building of Smart City Innovation Ecosystems[J/OL], Journal of the Knowledge Economy, 2012 (1), http://www.springerlink.com/content/p8067z75w74n679/, 2012-03-08.
[10] Taewoo Nam, Theresa A, Pardo, Conceptualizing Smart City with Dimensions of Technology, People, and Institutions[A], Proceedings of the 12th Annual International Digital Government Research Conference, Digital Government Innovation in Challenging Times[C], New York, 2011, 282-291.