

Strategic Research on Construction and Promotion of China's Intelligent Cities

Editor-in-chief

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This book series is the first in China on “Intelligent City” research, with systematic and thorough contributions from more than 200 Chinese experts including 47 academicians of the Chinese Academy of Engineering (CAE) in related fields. The book series is co-published with Zhejiang University Press, Hangzhou, China and consists of 13 volumes as planned, including one general report and 12 sector reports. In 2010, CAE conducted a research on the development of “smart cities” and concluded that urban development in China has reached a crucial turning point. Therefore, CAE kicked off the key consultancy research project on “Strategic Research on Construction and Promotion of China’s Intelligent Cities”, on which this book series is based. Firsthand and research results, surveys and analysis are provided on almost every aspect of urban development and smart cities in this series. Representing the highest level of research in this field in China, the book series will offer an authoritative reference resource for international readers, helping them to understand intelligent city construction in China, a movement expected to be highly influential around the globe.

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Yunhe Pan

Strategic Research on Construction and Promotion of China's Intelligent Cities

General Report

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Foreword

In 2008, IBM proposed the concept of “Smarter Planet,” in which “Smart City” was one of its components, mainly referred to 3I, namely instrumented, interconnected, intelligent, and the goal was to implement the company’s “solutions,” such as smart transportation, medical, government services, monitoring, grid, water, and other items.

In early 2009, US President Barack Obama publicly acknowledged IBM’s “Smarter Planet” concept. In December 2012, the Global Trends 2030 (Atlantic Council 2013), published by the National Intelligence Council, noted that the four most influential technologies for global economic development were information technology, automation and manufacturing technology, resource technology, and health technology, in which “Smart City” was one of the information technology contents. Envisioning 2030: US Strategy for the Coming Technology Revolution report pointed out that the world was on the cusp of the next major technological change, the “third industrial revolution” represented by manufacturing technology, new energy and Smart City would have an important influence on shaping future political, economic and social development trends.

In May 2011, after the implementation of the “i2010” Strategy, the EU Net! Works forum introduced Smart Cities Applications and Requirements White Paper, emphasizing low carbon, environmental protection, and green development. After that, the EU said it would set “Smart City” as the key development content of the Eighth Framework Programme (FP8).

In August 2009, in the Smarter Planet to win in China plan, IBM tailored for the Chinese six intelligent solutions: “Intelligent Power,” “Intelligent Medical,” “Intelligent City,” “Intelligent Traffic,” “Intelligent Supply Chain,” and “Intelligent Banking.” In 2009, “Smart City” spreads in succession at all levels in China, as till September 2013, there were a total of 311 cities under construction or planning to build Smart City in China.

In 2010, Chinese Academy of Engineering carried out research on the “smart city” construction. It considered that the current urban development in China had reached a key transition period, but since national conditions were different, there were still some problems in “Smart City” construction.

To this end, in February 2012, the Chinese Academy of Engineering launched a major consulting research project “China Intelligent City Construction and Promotion Strategy Research.” Since the project started, many city leaders and scholars have shown a keen interest, and expected to devote to the research and practice of intelligent city construction. With the strong support of people from all walks of life and the efforts of academicians and experts of the “China Intelligent City Construction and Promotion Strategy Research” project group of the Chinese Academy of Engineering, we have combined three research efforts: experts of the relevant national ministries (such as the National Development and Reform Commission, the Ministry of Industry and Information Technology of the People’s Republic of China, the Ministry of Housing and Urban-Rural Development of the People’s Republic of China), experts of typical cities (such as Beijing, Wuhan, Xi’an, Shanghai, Ningbo), 47 academicians and more than 180 experts of the Department of Information and Electronic Engineering of the Chinese Academy of Engineering, the Department of Energy and Mining Engineering, the Department of Environment and Textile Engineering, the Department of Engineering Management and the Department of Civil Engineering, Water Conservancy and Construction Engineering, and other departments. The research project was divided into 13 task groups, involving urban infrastructure, information, industry, management, and so on. In addition, the project also has a comprehensive group, whose main task is to comprehensively formulate the integrated volume of the book series *Strategic Research on Construction and Promotion of China’s Intelligent Cities* on the basis of the results of 13 task groups.

After more than two years, the research team has formed a number of research results and research comprehensive report by carrying out inspection and investigation in the site, carrying out the forums and exchanges with experts and scholars at home and abroad, having informal discussion with the national authorities and local authorities responsible comrades, and team research and analysis itself and so on. In the study, we put forward that it will be more suitable for China’s national conditions to carry out intelligent city (iCity) construction and promotion in China. The intelligent city construction will become an accelerant of deepening the system reform and development, and become a strong starting point for the economic and social development and the realization of “China Dream” in China.

Christopher Kojm

Reference

Atlantic Council, 2013. *Envisioning 2030: US Strategy for the Coming Technology Revolution*. Washington, D.C.: Brent Scowcroft Center on International Security.

Preface

The book series *Strategic Research on Construction and Promotion of China's Intelligent Cities* is compiled and published by 47 academicians and over 180 experts on the basis of the research achievements obtained after two years of in-depth investigation, research and analysis, and the study on China's Intelligent City Construction and Promotion Strategy, which is one of the major consulting and research projects conducted by the Chinese Academy of Engineering after revision in accordance with publishing requirements. The book series, consisting of 1 comprehensive volume and 13 sub-volumes, have been published in succession by Zhejiang University Press. The comprehensive volume mainly discusses how to conduct the intelligent city construction and promotion with Chinese characteristics in the intelligent urbanization development of our future cities; the sub-volumes focus on the construction and promotion of intelligent city in terms of urban economy, science, culture, management and education, spatial organization pattern of cities, intelligent transportation and logistics, intelligent grid and energy network, intelligent manufacturing and design, knowledge center and information processing, intelligent information network, intelligent building and smart home, intelligent medical and health care, urban security, urban environment, intelligent business and finance, intelligent city's time and space information infrastructure, intelligent city's evaluation indicator system, etc.

As a consultant of "Strategic Research on Construction and Promotion of China's Intelligent Cities" project group, I have participated in several research meetings of the project group and put forward some "humble opinions." Overall, I think, under the leadership of the project group leader—academician Pan Yunhe—"Strategic Research on Construction and Promotion of China's Intelligent Cities" has made significant progress, which is mainly shown in the following aspects.

Since the 1990s, the world entered into the era of information technology, and the city had gradually developed from the traditional binary space to the ternary space. The mentioned first metaspaces refers to a physical space (P), which consists of physical environment of the city and the urban physical; the second metaspaces refers to a human social space (H), that is, the human decision-making and social interaction space; the third metaspaces refers to a cyberspace (C), that is, the

“network information” space composed of computer and Internet. The city intelligence is the development trend of cities throughout the world. Only the development stage of cities in each country is different, and the content is different. At present, the “Smart City” construction proposed at domestic and abroad is mainly focused on the building of the third metaspaces, and the city intelligence of our country should be “ternary space” to coordinate with each other so that planning and industry, life and social and social public service could be mutual cooperation and promotion; it should be beyond the existing e-government, digital city, network city, and Smart City construction concept.

The new technological revolution will promote the arrival of urban intelligence era. Nowadays, about the new technological revolution, authors holding varying viewpoints: there it is described as “the second economy”, “the third industrial revolution”, “industry 4.0” “the fifth industrial revolution” and other concepts. And when it comes to the city, the new technological revolution is characterized by integrating a new generation of sensor technology, Internet technology, big data technology, and engineering technical knowledge into the city’s systems to form the upgrading of urban construction, urban economy, urban management, and public service, so as to embrace a new era of urban intelligence development. If China’s urbanization and the new technological revolution are organically linked together, it can not only promote the benign and healthy development of China’s urban intelligence process, but also promote the birth of more new technologies. China shall undoubtedly actively participate in this process and make a greater contribution to the development of the world’s economy, science, and technology.

It has been repeatedly deliberated and considered by the project group to use “Intelligent City” (iCity) to replace “Smart City.” The reasons are as follows: First of all, the western developed countries have completed the urbanization, industrialization, and agricultural modernization, the main tasks of the Smart City they refer to are limited to the intelligence of government management and service, and the administrative functions of their city managers are much narrower than those of city mayors in China; secondly, currently China is in the simultaneous development stage of industrialization, informatization, urbanization, and agricultural modernization, the confusions and problems it encountering have uniqueness in quality and quantity, so China’s urban intelligence development path must be different from the Europe and the USA, and it will be difficult to solve many development problems which Chinese cities confront by only interpreting the Smart City from the perspective of developed countries and moving this concept to China. Thus, the project group decided to use the term “Intelligent City” (iCity) and expected this term would be more in line with China’s national conditions.

The construction and promotion of intelligent cities have far-reaching significance to China’s current economic and social development, the construction and promotion of intelligent cities are just located in the cross-point of “Four Modernizations,” and its significance is mainly embodied in the following aspects. Firstly, it can be used as the basic platform for the simultaneous development of “Four Modernizations” and become a focal point of China’s economic and social

development to avoid the “middle income trap,” so as to create a new urbanization development path with Chinese characteristics. Secondly, by putting the intelligent city as an important basis (point), it can promote the development of “One Belt, One Road” (line) and new area (plane) and constitute a reasonable development layout of “point, line, and plane.” Thirdly, it is conducive to promote the structure upgrading and transformation of manufacturing and its service industry, to achieve the transformation from the urban industry to the intensive pattern so as to slow down the material growth, accelerate the value growth, and improve the added value; it is conducive to the usage and integration of a variety of e-commerce, big data, cloud computing, and Internet of Things technologies to achieve the “broadband, pan, mobile, integration, security, green” development of information and network technology, promote the improvement of urban industry efficiency, form the new factors of production and new formats, and create new conditions for entrepreneurship and employment. Fourthly, it developed from the simple and linear decision-making based on limited information to the networked and optimized decision-making based on urban comprehensive system information, so as to help the government improve the level of urban management services and promote the in-depth urban administrative system reform and development. Fifthly, it can use new technologies to optimize and improve the planning of urban construction, roads, transportation, energy, resources, environment, etc., to increase the utilization efficiency of elements; and further protect, inherit, develop, and sublimate the urban history, landforms, local culture, etc.; and achieve the change of the public health management from the concept to reality and so on. Sixthly, it can find and cultivate a number of urban planners, management experts, high-level scientists, data science and security experts, engineering and technical experts, etc., to adapt to the new technological revolution trends; learn from past experience and lessons, and pay attention to the renovation during intelligent city operation and maintenance, and it can focus on cultivating a large base number of operation and maintenance engineers and technical staff of urban functions to both understand the theory and practice, achieving the gradual transformation from relying on the demographic dividend to relying on knowledge and talent dividends so as to support health, sustainable development of China’s urban intelligence.

To sum up, the book series *Strategic Research on Construction and Promotion of China’s Intelligent Cities* has rich content and clear views, and the proposed development goals, ways, strategies, and recommendations are reasonable and operational. I think this series of books is the literature of urban management innovation and development research with high reference value, and it has important theoretical significance and practical value to the development of new urbanization in China. I believe that readers of all sectors will get a lot of new inspiration and harvest after reading them, and the book will inspire the enthusiasm of everyone to participate in the construction of intelligent city, so as to put forward more thinking and unique insights.

China is a developing country with long history and much agricultural population, and is committed to the economic society to be developed in good and fast and commercial manner and the construction of new urbanization. I am convinced that the publication of the book series *Strategic Research on Construction and Promotion of China's Intelligent Cities* will play an active and positive role in promoting this. Let us strive and work together for the realization of the great "Chinese dream"!

Hangzhou, China
January 2015

Yunhe Pan

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