

Smart city construction is spreading like wildfire in China. However, many developments are fraught with issues such as unclear strategic goals, inadequate technology implementation and poor execution models. City planners should take a step back and re-examine what makes a smart city work click and what not. The new generation of Chinese smart city development should aid city administrators in creating an urban environment that's smart, innovative and sustainable for its citizens: essentially a supercharged smart city.

Supercharging the Smart City

—Smarter people and better governance

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Backed by the burgeoning Internet of Things (IoT) technology, smart city construction is spreading like wildfire in China, accounting for over half of the global smart city development. Yinchuan, located 720 kilometers west of Beijing, is one among China's 500 smart cities that is using technology and data to revolutionize an increasingly connected society. While commuters on public buses simply give the driver a friendly smile, facial recognition technology recognizes and charges the commuters for the transportation. Intelligent lockers are installed around residential areas so that packages are collected when their recipients are not home. The garbage bins are also wirelessly connected and are equipped with an air conditioning system to help dissipate foul odors, while an alert is sent to the central server when it is full.

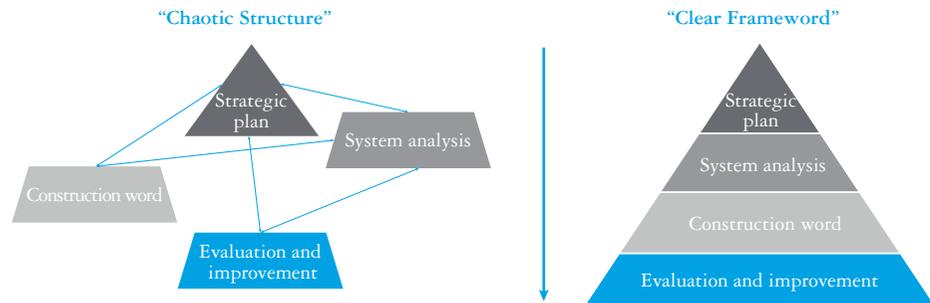
This is just a small glimpse into what future Chinese cities could look like. However, despite rapid advances, certain issues remain unresolved such as unclear strategic goals, inadequate technology implementation and poor execution models. To address these problems, city planners need to take a step back and re-examine the success factors of a smart city. The new generation of Chinese smart city developers should support city administrators in creating an urban environment that is smart, innovative and sustainable for its citizens: a supercharged smart city. We believe there are seven best practices that should be taken into consideration.



Establish a Clear Strategic Framework

In the past, designing and planning of smart cities used to vary to a great extent due to different interpretations among city departments and governing bodies. In contrast, the new generation of smart cities has a clear top-down strategic framework, incorporating strategic plans, system analysis, managed operations and supporting technologies into one package.

Figure 1: From chaotic to a clear framework



When designing a strategic framework for smart cities, planners should take strategic goals, leadership, success factors and potential risks into consideration.

- **Set strategic goals.** City planners should take a holistic approach and keep sustainability factors in mind. The design should be user centric, with a focus on the development of intelligent applications and an efficient service framework, which ultimately complements the economic and social development.
- **Coordinate leadership among all parties.** A clear design of smart cities cannot be realized without cooperation among all relevant parties, including governments at all levels, as well as the private sector and the public. The local government plays the role of a coordinator. Local government leaders are responsible for establishing sustainable development plans, conveying the plans and pushing the plans forward. By communicating among departments on city and district levels, local resources can be fully utilized. Different interests and goals among the parties should also be taken into account.
- **Focus on key success factors.** Top-level designers should pay full attention to key factors that determine the success of smart cities. A crucial measure to success is for example the experience a smart city brings to its citizens. In addition, adopting new technology architectures, new technology applications and new business models, as well as complex, interactive, evolving systems are also key to success.
- **Control potential risks.** Identifying and controlling potential risks is a vital part of top-level design. Top-level design is often limited to the integration of industry and technology, while missing urbanization and sustainability considerations. There were many irrational smart city constructions in the past due to a lack of risk control.

Avoid the Temptation of Mass Production

Many planners do not take local strengths and weaknesses into account when developing smart cities. Instead, solutions are copied directly from another city, which might not match the development requirements of another. In fact, it is better to exploit the city’s strengths to its own advantage. For example, the core of smart city planning in Shanghai is based on the Internet economy, which combines Internet with everyday life scenarios so that residents can enjoy a more convenient daily life. In contrast, Ningbo lags behind Shanghai in economic development but its livability index is higher. Therefore, Ningbo regards “livability” as its core when implementing a smart city.

Figure 2: From mass reproduction to uniquely constructed



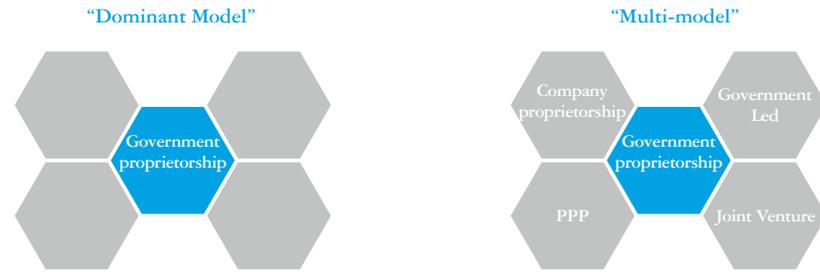
Source: Deloitte Research.

Multiple large cities can also exploit their own resource advantages and work together to create synergies. As an example, Nanjing is the core of the smart city cluster of Jiangsu, while Jiangbei New District is the gateway to connect Sunan and Suzhou, building an integrated smart infrastructure and platform to promote the integrated access for smart city groups in the Jiangsu Province. The collaboration of Hangzhou and Yunxi Town is another good demonstration of exploiting synergies in the Internet sector - Yunxi Town focuses on the cloud computing industry to assist Hangzhou in developing the IT industry.

Explore Innovative Cooperative Models

Currently, sole proprietorship is the typical model for smart cities, meaning that the government uses its own funding for all investments and operation activities. Under this model, the government has strict control and is able to oversee the entire construction and operation life cycle. However, since the government has to fund all bills, the financial burden is heavy. Thus, this model is only suitable for cities with an ample budget. In the future, the private sector is expected to be more involved, relieving the heavy financial burden of the government. Since governments at all levels have introduced policies to foster a healthy environment for the private sector, it is expected that more enterprises will follow.

Figure 3: From the single dominant model to the multi-model



Source: Deloitte Research.

Four types of smart city cooperation models are emerging, each with its own pros and cons:

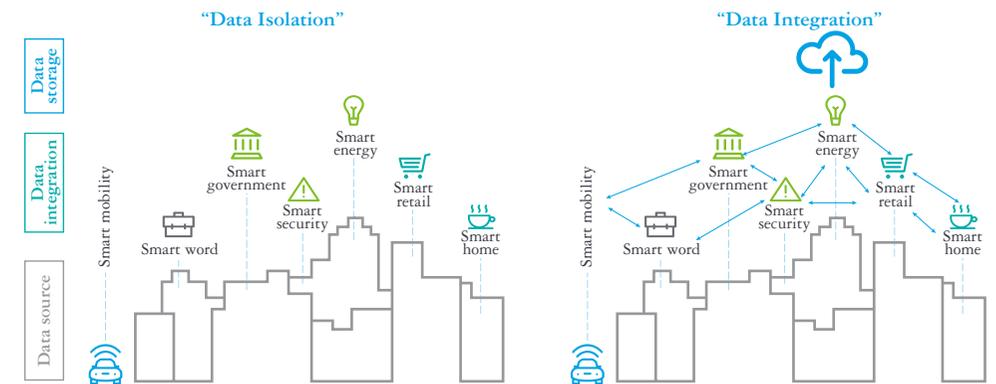
- 1. Government led:** The government leads investment while operators provide corresponding support. The government has strict control over projects, which reduces construction and operational risks.
- 2. Joint Venture:** In this model, the government provides only the necessary infrastructure funding and formulates related policies and regulations at early stage. Companies are then involved in the construction, operation and maintenance of the projects.
- 3. Public Private Partnership (PPP):** By obtaining a special license, the private sector can self-finance and build and operate projects independently. Projects will be transferred to the government upon expiration. In this case the private sector will bear the construction funding and operational risks, which may keep some enterprises away from participating.
- 4. Sole proprietorship:** The private sector owns the projects and is not required to transfer the ownership to the government. Companies bear the financial construction and operational burden, while the government has only little control. One example is the project of the Shanghai Hongqiao Business District that is under the responsibility of a strong private company, which is creating smart exhibition venues and intelligent commercial buildings.

Avoid Data Isolation Trap

Due to the adoption of different protocols and standards, data that comes out of IoT platforms is highly fragmented and isolated. Future IoT platforms will benefit from unified data standards and management, as well as technology advances that enable multiple sensors to be centralized in one device, enabling full connectivity and enhanced data collection capabilities.

With an enhanced interconnection of IoT platforms, data in sparsely distributed systems will also be connected. Open data will break data isolation, creating synergy effects and form an intelligent ecosystem. For example, artificial intelligence can actively predict traffic flows by analyzing a massive amount of traffic data and relieving traffic pressure by automatically sending traffic signals.

Figure 4: From data silos to data integration

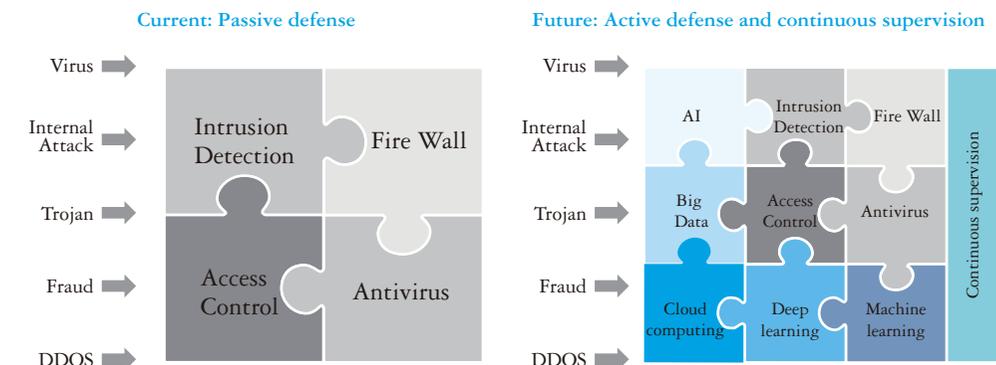


Source: Deloitte Research.

Actively Manage Security Risks

The current data security scheme of smart cities relies on a passive defense, which allows for upgrades of virus databases after an attack. With the adoption of new technologies, data security defense will shift from passive to active defense allowing to identify incoming attacks proactively. For example, using machine learning to identify malicious codes before fraudulent activities occur.

Figure 5: From passive to active security defense



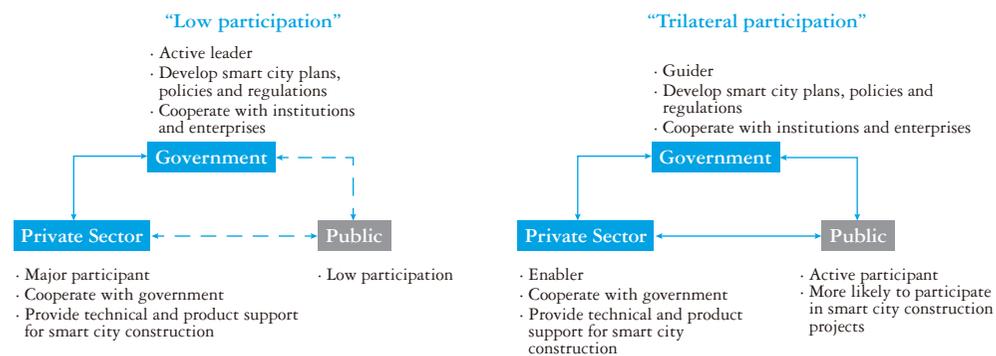
Source: Deloitte Research.

The creation of a data security defense scheme can be viewed from two levels: on the data transmission level, an integrated security solution can be devised to reduce network complexity. By establishing a comprehensive data security monitoring system, network security and malicious behaviors can react in real-time. On a data storage management level, distributed data storage can be set up and critical files can be divided into multiple data segments to be stored separately. For hardware, hardened servers and data centers can reduce environmental hazards and enhance reliability of operations.

Get All Participants Onboard

Currently, the governments are setting goals for smart city constructions, implementing plans, and formulating relevant laws and regulations to support the development of enterprises while protecting public interests. At the same time, governments use their own funds to invest in smart city constructions. Nevertheless, in future, governments will shift from being a leader to a guide instead for the private sector. The private sector will transform from being a side participant towards a major promoter by undertaking most of the projects. The public plays the role of a data producer and end-user. Though, public participation is still rare at the moment, it is expected to increase in future.

Figure 5: From low participation to trilateral participation



Keep Innovation Rolling

The innovation ecosystem consists of government agencies, research institutes, enterprises and service providers (incubators & science parks, financial institutions). The first three already consist of a sound coordination with the support of government policies, financial capital and subsidies. However, the role of service providers in the entire innovation system has yet to be optimized. For instance, the barriers for start-ups to apply funds from financial institutions are still high. With improved processes of the innovation system, service providers are expected to receive more policy support. Thus in the future, incubators & science parks, financial institutions and service agencies will be able to provide financial support to start-ups, while policies and laws favor the burgeoning next generation of smart cities.

Building the Next Generation Smart City - Xiong'an New Area

Located in the hinterland of Beijing, Tianjin and Baoding, the Xiong'an New Area is built to explore the model of urban innovation and development under the Collaborative Development of Beijing, Tianjin and Hebei Province. The new area will act as an important playground of China's next generation smart city constructions, introducing new technologies such as AI and autonomous driving. Different from other smart cities, the Xiong'an New Area is built from scratch, which means that it will be able to avoid many of the design pitfalls that other

cities have previously encountered. The top-level plan for the new district is under way, as local governments select solutions from world's leading urban design consultancies while combining best practices from other cities.

The construction of the Xiong'an New Area mainly relies on the participation of social capital: on one hand, newly established investment group is responsible for developing PPP projects through an innovative financing model; asset securitization is one example of this new way of financing, which will enable more investors including social capital to participate in the construction of Xiong'an New Area. On the other hand, SDIC (State Development Investment Company) will support high-end industries via its fund.

In terms of data sharing, since the smart city construction will start from scratch, the issue of data silos can be avoided. The New Area has created a digital group to build a data management integrated system for data sharing. China Telecom and ZTE cooperate to build a commercial IoT platform for data acquisition, which is already in use for intelligent parking lots, manhole covers and street lights. Moreover, in order to enhance data transmission, the three major carriers have deployed 5G and are expected to achieve a large-scale commercialization by 2020.

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