PPP model to develop new Smart Cities
The case in China

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About iSoftStone

15-year development history; headquarters in Beijing, serving the global market.

Established branches in 56 cities, 48 of which are in Greater China Region and 8 overseas.

1000+ Chinese and overseas corporate customers, covering 10+ major industries and businesses, including 90+ of the Fortune 500 companies.

35,000+ employees in China and overseas.
Pioneer & Leader of Smart City Development in China

Strategically engaged cities: 120+
Actual operating cities: 50+
Total projects: 300+
Solutions: 80+

iSoftStone joined the delegation led by Premier Li Keqiang, displaying achievements of smart city to the whole world.

iSoftStone entered into a strategic cooperation agreement with Seoul City, Korea.
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China's rapid urbanization growth as a key economic driver.

China's urbanization has developed rapidly. From 1978 to 2015, the number of cities has increased from 193 to 653, and the urban population has increased from 170 million to 750 million. The scale of the city has changed greatly and the urban agglomeration has been gradually formed. Among the three major urban agglomerations of Beijing, Tianjin, the Yangtze River Delta and the Pearl River Delta, 2.8% of the land area has a population of 18%, creating a GDP of 36%, which is the major platform for China's rapid economic growth and international economic cooperation.

China's urbanization and America's high-tech will be “the two great engines” of world economic development in the 21st century.

Joseph E. Stiglitz
Nobel laureate in economics, Professor of Columbia University
Challenges facing China’s Urban Development

Information resource utilization problems
• Fragmented urban data and data isolation
• Low data utilization and deficient value of data
• Low data capitalization and restricted transaction
• Data security vulnerabilities, and no unified authority platform
• Insufficient operation of IT project, and poor sustainability

Society and population problems
• Livelihood demands for education, social security and health care due to increase of urban population
• Bursting social problems due to serious shortage of resources

Economic problems
• Extensive economic development is restricted by resources and environment
• Environmental issues
• Urgent demand for restructuring and upgrading industries

Outstanding problems

Urban planning and service supply
• Irrational layout of internal urban space
• Insufficient supply of urban infrastructure and public services
Smart City Objectives – Economy, Quality of Life, Governance

1. Sustainable Economic Growth
   - Optimize resources allocation and stimulate economic development.
   - Balanced development between human and nature, people and society.
   - Utilize natural resources wisely, reduce pollution and waste.

2. Quality of Life (QOL) Improvement
   - Improve the quality of urban residents' material and spiritual life.
   - Give citizens psychological security and well-being.

3. From City Governance to City Services
   - Meet people’s physical and cultural needs, achieve social harmony.
   - Achieve coordinated, high-efficient city operation management.
Acceleration of China’s Smart City’s Construction

By the end of 2014, 500+ cities had announced own construction of smart city, as time passing by, the number will continue to increase. The overall construction of smart city has stepped into a fast-forward period from the concept introduction period.

- There are obvious differences in the construction level of the smart cities, but the local governments have paid more and more attention to the exploration and practice of the smart cities.
- At present, the Yangtze River Delta, Pearl River Delta and the Circum-Bohai Sea Economic Zone have relatively high levels of exploration and practice of smart cities.
- The exploration and practice of the smart city has entered the rapid promotion period from concept introduction period.
- A number of departments have proposed smart city pilots. Much governmental involvement and impetuous overheating characteristics are obvious.
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Disruptive Technologies for Smart City

Apply SMART digital technologies to provide innovative IT solutions for smart cities

Social Networking
Mobile Internet
Analytics of Big Data
Cloud - Computing Resources Sharing
Internet of Things

Consulting Services
Master Dev. Plan (top layer design)
Critical Projects Investment Package
Operation design & Implementation consulting
Application Development
Operation & Maintenance

Industries
Citizen Services
Environment Protection
City Operation Management

Cognitive Computing
Artificial Intelligence
3D Printing
AR/VR
Robotics

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Smart City Trend – **Data-driven** urban development: from urban planning to operational management

- **Overall sensing**
- **Big data acquisition**
- **Interconnection**
- **Data Analytics**
- **Urban innovation**

**Instrumented**

**Interconnected**

**Intelligent**

- **GPS**
- **Wireless Gateway**
- **CCTV**
- **Weather Monitoring**
- **RFID**
- **Telemetric Sensing Devices**
- **CO₂**, **Wind Speed**, **Direction**

**Infrastructure**

- **Weather Data**
- **Economic Data**

**Security and Public Safety**

**Economy and Environment**

**Government Services for Citizens**

**Citizen Behavior**

**Environment Data**
Pyramid of Urban Sustainability Architecture

Smart government administration
Smart industry
Smart livelihood
Smart infrastructure
Smart environment

Guarantee information safety
Develop information industry
General Framework for Smart City Solutions

Application Layer

Smart Solutions Support Services Platform

Basic ICT Infrastructure Architecture

Application Services

Computing
- Cloud Server
- Cloud Desktop
- Container
- Cloud Storage

Middleware
- Data Bases
- Data Buffering
- Open API Platform

IOT
- Data Acquisition
- Data Processing
- Sensor Mgmt

Security
- Access Control
- ID Mgmt
- Security Assessment

Big Data Services
- Big Data Development Platform
- Big Data Acquisition Platform
- Big Data Foundation Platform

Basic Services

Computing Infrastructure
- Cloud Computing Data Center

Cloud Computing
- Data Center

Disaster Recovery
- Data Center

Network Communications
- Government’s LAN
- MAN / WAN

Internet
Smart City Solution Market Participants and Roles

Solution provider
To provide industry solutions, and various aspects of the various types of industry products, pre-installed platform to provide the overall unified end-to-end solutions;
For example (foreign manufacturers): IBM, Accenture

System integrators

Network service provider
Provide collaborative networks to connect people, assets, systems and utilize their networks to provide M2M, data analysis and other value-added services;
For example (foreign manufacturers): Cisco, Verizon, AT&T, Ericsson

ICT equipment manufacturers
ICT equipment manufacturers to provide "hard assets of equipment" such as smart meters, automatic switching, control equipment, infrastructure for the main part of the operation;
For example (foreign manufacturers): Honeywell, Schneider, Siemens

Management service provider
Management service providers to provide consulting, configuration management, compliance, around-the-clock system management services; services can be provided by the scene or remotely;
For example (foreign manufacturers): IBM, Infosys, SAIC
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Characteristics of Smart City development projects: Heavy capital investment, long period, and the success relies on operation.
PPP - an Effective Approach to deal with Challenges for Smart City Projects

- Multi-stakeholders interests
  Government, citizens, public utilities companies, ICT infrastructure providers, IT enterprises, Internet companies, operation companies, research institutions, etc.

- Long time for income
  Neither construction nor income of smart cities can be accomplished at one stroke, and both require a long period. They need to be understood and maintained with participating enthusiasm from multiple parties. They also need sound and efficient business model, and sufficient and reasonable fiscal support. Therefore, they will last for long time.

- Hidden value
  The income of smart cities is embodied in the positive externality and scale economy, which are macro, profound and hard to quantify. Compared to the income from direct investment, it is more invisible and difficult for investors to notice. Therefore, profound knowledge and unconscious influence are required.
National strategic level promotion

In 2015, Premier Li Keqiang in the government work report, actively promote the Public-Private Partnership (PPP) model in infrastructure, public utilities and other fields. Prior to that, provincial governments hold their own “two meetings” to include PPP model in their report.

2013.11.12 《中共中央关于全面深化改革若干重大问题的决定》
2014.9.23 《关于推广运用政府和社会资本合作模式有关问题的通知》
2015.3.17 《关于鼓励和引导社会资本参与重大水利工程建设运营的实施意见》
2014年9月21日 《关于加强地方政府性债务管理的意见》
2015年2月13日 《关于市政公用领域开展政府和社会资本合作项目推介工作的通知》
Financing diversification - PPP model acceptance and in practice

- The first stage, to attract foreign investment as the main purpose of the project operation concept, “Cross the river by feeling the stones “, largely determines the associated top-level design is difficult to promote and complete.
- In the second stage, the program development sector is no longer the only dominant party in the PPP model, including construction, transportation, environmental protection, state-owned industries, and local governments.
- The third stage, PPP model of the top-level design gradually improved, the Chinese PPP moves into the standardization stage of development.

As of end of November 2015, the National Development and Reform Commission publicly recommended the first batch of 1043 PPP projects, has signed 329 projects, representing the proportion of the number of projects to promote 31.5%. Signed projects mainly concentrated in municipal facilities, public services, transport facilities and other fields. As of end of December 2015, Development and Reform Commission PPP project library contains a total of 2125 projects, a total investment of 3.5 trillion yuan.
Common PPP Models applicable in China

- **BOT:** Build - Operate - Transfer
- **BOO:** Build - Own - Operate
- **BOM:** Build - Operate - Manage
- **BOOT:** Build - Own - Operate - Transfer
China Smart City PPP Projects—General Cooperation Frameworks

- Government
- Authorization
- Consultation & recommendation
- PPP responsible agencies
- Franchise/Subsidy contract
- Intermediary agencies
- Financial institutions
- PPP project cooperative companies
- Financing
- Business Contract
- Construction companies
- Capital investment
- Equity investment institutions on behalf of government
- Private equity investors/investment institutions
- Construction companies
Effect – Ease Government’s Pressure for Payments

- The constraints of the single-year government budget are lifted, and the construction period is accelerated
- The huge costs have been divided into many years, in line with annual IT budget allocations

Annual payment

Cash inflow

Cash outflow

Accelerated return on investment

Time

4th month 1st year 2nd year Nth year ......
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Case 1 – YinChung City
Holistic Outsourcing DBO (Design – Build – Operate) Model

- Smart City Construction Content: An innovative design of "Cloud-Network-Graph" to construct 13 sub-modules in 10 major systems, such as Intelligent City Big Data Center, Intelligent Network, Safe City, Intelligent Transportation, Intelligent Community, Wisdom Government and Wisdom Environmental Protection.

Yinchun Government

cooperate

ZTE

Franchise Purchase Services

invest

return

ZTE(Yinchun) Smart Industry Ltd.

Plan to invest \( x \) billion (RMB)

in 3 phases

To purchase annually \( xxx \) million (RMB) information service, for a period of 50 years.

Proceedings from IPO
To pay back investment and Service purchase

IPO

Smart City Projects

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Case 2 – Hefei City (Hi-Tech Zone)
DBO (Design – Build – Operate) Model

- Government finance to buy services
  Joint venture company responsible for the implementation of plans for approval, bidding, construction supervision, organizational acceptance, operation and maintenance.
- Market-Owned Projects
  Joint venture company responsible for the implementation of the plan for approval, construction supervision, organization and acceptance.

Purchase of services:
- FIXED COST: All costs incurred in completing and adopting the top-level design approved by the Smart City Leadership Team (PMO).
- Changes in the cost of government services mainly for the purchase of services arising from investment and financing costs, project construction management fees, project operating costs.
Case 3 – Wuxi City——Business Model & Market Mechanism

Wuxi sets up smart city professional fund, and invests RMB 100 million per year in constructing smart city. The fund is raised leveraging market capital rather than drawn from the construction fund.
Case 4 – Tus Holdings

- Tus Holdings Co., Ltd

- Incubator/Park/Cities
  - Science & Tech. Service
    - >70 incubators
    - >2000 startups
  - Science Parks/Cities
    - 30 Science Parks
    - 24 Science Cities
    - In/out China
  - Supporting Services
    - Hotel Group
    - S&T Service
    - Media Group
    - Education Group

- Environmental
- New energy
- Health care
- Digital China

Tus-Ecosystem = Incubator/Park/Cities + Industrial + Financial
Case 4 – Tus Holdings: Incubator, science and technology park, science and technology city construction

General model: the Government holds land price shares in the establishment of a joint venture company. Government ownership generally accounts for 20% -30%

**TusCity (Fuzhou)**
- Covering an area of about 2,240mu (1,493,333m²),
- The largest science city of TusHoldings
- Investment of RMB 17 billion,
- Planned construction area of 2,700,000m²;
- The completed TusCity (Fuzhou) is a multi-functional composite science new town that integrates scientific research, work, study, life and entertainment; and it becomes an intelligent center, new industrial center and new living center of Fuzhou City.

**Fashion TusCity (Suzhou)**
- Covering an area of 365mu (243,333m²);
- Planed construction area of about 500,000m².
- Fashion TusCity (Suzhou) is planned to create a community, park and campus linked complex of innovative service industry composed of entrepreneurial communities, headquarters bases and fashion institutes.
Case 5 – Beijing Subway line 4

- 30-year lease term, on metro subway line No.4;
- The planning and design costs of 300 million RMB;
- The construction cost of 15.3 billion RMB;
- Operating costs of 18.58 billion RMB;
- The external cost of 1.37 billion RMB;
- Total cost of 35.55 billion RMB, 1.85 billion per annum
- 70% of construction costs funded by Beijing municipal government construction, PPP company responsible for the remaining part of the 30% of the construction and operation.

After the completion and acceptance of the project, the project company obtains the right to use part A of the assets. It is responsible for the operation and management, maintenance, asset updating and commercial operation of the subway line 4, and reclaiming the investment through subway ticket revenue and commercial business income.

The IRR of the project is about 7% ~ 8%, and the IRR on equity is about 10%. The investment recovery period is 16 years.

At the end of the franchise, The PPP company will transfer Part B to the municipal government designated departments.
Case 6 – Dongsheng Group
People First PPP, a tool to achieve the SDGs

• China-first Science-Tech Park “Zhongguancun” in Haidian District, Beijing
• Supported by local and district government
• Create 30+ thousand jobs, employment of graduates through innovative entrepreneurship
• Improve ecological environment and reduce pollution

Improve quality of life

- Enterprises in the parks solve the problem of employment
- Greening the land to improve local environment
- Garden style and building division to bring a good working environment and reduce mental stress
- Make city complex of work, life, leisure, and entertainment.

Measure of life improvement

- More than 30 thousand employees in the park
- Greening rate: more than 51%
- Economic growth: output from 1.8 billion RMB to 19.2 billion RMB
- 51% of enterprises are electronic information industry

Ecological Effects

- Electric transportation, energy saving, reduce the environment pollution.
- Due to no industry production, so it reduces the industrial pollution
- Under the innovation policy to develop the environment for enterprises growing
- Create a platform for the experience exchange and cooperation between enterprises

Public Organization
Beijing City Haidian District Dongsheng Town People Government

Capital Providers
Beijing Dongsheng Bo Zhan Investment & Management Co., Ltd

Private Organization
794 Natural Persons

Supported by local and district government
• Create 30+ thousand jobs, employment of graduates through innovative entrepreneurship
• Improve ecological environment and reduce pollution
THANKS