



# A HARMONIOUS WAY TO AN INTELLIGENT CITY

*INTELLIGENT CITY WHITE PAPER*





1.Prelude: A City Manager’s Challenges and Historical Opportunities.....	01
2. <i>Intelligent City</i> : Smart + Connected + Collaborated.....	03
Case 1 Smart + Connected + Collaborated Safe City.....	06
Case 2 An Intelligent and Green City with Automated Environment Monitoring System.....	09
3. <i>Intelligent City</i> : An Innovative Approach towards A Harmonious City.....	11
Case 3 Intelligent City: Collaborative Service to Support Employment and Reemployment.....	15
4. <i>Intelligent City</i> : a Win-Win-Win Approach in City Management and Operation.....	17
Case 4 Intelligent Hangzhou: The Rise of Collaborative Applications and New Services Industry Value Chain.....	19
5. <i>Intelligent City</i> : Cultivate A People-Oriented System.....	21
Case 5 Jiaxing: Behind the “One-Stop” Services.....	24
6. Unified Planning: Systematic Blueprint for the <i>Intelligent City</i> .....	25
7. Investment Benefits: A New Operating Model for the <i>Intelligent City</i> .....	29
8. The <i>Intelligent City</i> Journey Starts Here.....	33
<i>Intelligent City–ing</i> (1): Smart Digital City Administration Application Services.....	35
<i>Intelligent City–ing</i> (2): Intelligent Service-Oriented Government: Efficient and Convenient Citizen Card Services.....	39
<i>Intelligent City–ing</i> (3): Intelligent Service-Oriented Government: Efficient and Convenient One-Stop Management Services for Enterprises.....	41
<i>Intelligent City–ing</i> (4): Intelligent City Operation: Make Information A New Resource.....	45
<i>Intelligent City–ing</i> (5): Intelligent Collaboration, Achieving Win-Win for Drug Safety Supervision.....	49
About Insigma.....	52

Prelude:

# A City Manager's Challenges and Historical Opportunities

Industrialization and urbanization will become the two main trends in China's future growth over the next 20 years. By 2013, for the first time ever, China's urban population will exceed that of its rural population. In the next 40 to 50 years, China's total net increase of its urban population will reach 600 million. China is experiencing an unprecedented urbanization process which brings Chinese cities tremendous development opportunities yet the same time poses severe challenges to city planners and managers in areas such as social stability, safety, and sustainable development.

China's urbanization process continues to develop fast. However, at the same time it is still facing unprecedented economic challenges of all kinds coming with the financial crisis: the decrease of urban revenue, the increase of urban living and working cost, the call for building a green city, the integration renovation of industrialization and informatization, the pressure of job hunting, livelihood problems, and the urgent need for the improvement of city operations and service management etc.

● The Focus of One City's 12 Five-Year Plan in China

1. Major economic and social development indicators	12. To enhance the public products and services supply competence
2. The influence of regional economic integration and relative strategies	13. To upgrade residents' consumption structure and to expand the consumption
3. The harmonious economic and social development in the cities	14. Innovative house security system planning
4. To balance the urban and rural development	15. To develop low-carbon economy and construct low-carbon city
5. To accelerate the industrial transformation and upgrading	16. Construct cultural metropolitans
6. Developing blueprint, objectives and routes for Hi-Tech industry	17. To propel the synthetic reform
7. To establish modern service centers	18. To establish regional innovation system
8. To optimize the territorial layout	19. To evaluate the advantages of and re-build the institutional mechanism
9. To keep resource of all kinds in balance	20. To impel the private economy to "start a new undertaking"
10. Modern logistics distribution	21. To promote opening-up capability
11. The vital social infrastructure construction planning	

For years, all sectors of the city management department have been using information technology to improve city management and service application levels. Yet, such informatization initiatives are activated by individual sectors with the purpose of serving their own silos. Hence, such vertical centric initiatives has limited effectiveness either in supporting cities' industrial transformation, sustained development, or governmental services improvement, and are unable to meet the operation and service challenges brought forth by the rapid city expansion in the near future.

It is therefore urgent for city managers to find a new and more intelligent way to empower themselves with solutions to leap from the current role of managing to servicing, from governing to operating, from initiating sporadic informatization campaigns to building an integrated platform for collaborative services.

Smart+Connected+Collaborated intelligent city is built on our digital city deployment experience. It is a big step forward towards the integration of advanced information technology with innovated city operation, aiming to bring city planning and public service level to a new echelon. The concept of *Intelligent City* is not designed to merely fix existing issues, but to support cities' sustainable development and operation, which focuses on the city's infrastructure planning, strategic investment in advanced technology and talent, creation of job opportunities in service industry, nurturing advanced information service industry, and achieving a harmonious balance between economic development and natural environment.



# Intelligent City

## Intelligent City: Smart + Connected + Collaborated

*Intelligent city* is far more than a simple upgrade of a city's informatization initiatives, or of the digital city initiative.

*Intelligent city* centers on urbanization development, sustainable city growth and core demands of urban residents. *Intelligent city* requires effective integration of advanced information technology with advanced operating and service philosophy. An intelligent city will manage components such as geography, resources, environment, economy, and other societal components using web-based digital technologies. Information about a city's infrastructure, environmental foundations, industries and facilities related to inhabitants' living and manufacturing activities are processed and utilized in real time to create a platform for interaction among governmental functions, enterprises and residents, and data sharing. This platform provides a convenient, efficient, and flexible tool for generating and implementing decisions related to the city management and operation, as well as for the provisioning and management of innovative public services, with an ultimate goal of achieving harmonious development of safer, greener, more efficient and more convenient urbanization.

*Intelligent city* utilizes spatial information bearing applications for the city's refined management in an effort to boost the city's managerial and service levels as well as coordinated urbanization development.

**Intelligent city can be simply put as a “Smart + Connected + Collaborated” city with the following features:**

### Smart: an in-depth level of intelligence

A city has a multitude of information resources that can be collected and stored in real time through a connected network of information covering a city's infrastructure, public environment, automated monitoring systems as well as personal, organizational and governmental information. As such, a city's four basic data bases can be formed, namely personal, legal, GIS, and statistical information data bases. In addition, application data bases, such as smart infrastructure monitoring, real time security and traffic monitoring data bases can be built to serve as an indispensable foundation of the information system for the cities' refined management and operation.



Connected: more comprehensive interconnection and interoperability

High bandwidth capacity of wired and wireless communication networks provides real time connectivity of various databases to enable users to analyze and resolve issues in a holistic manner, and therefore makes it possible for users to remotely implement collaborative tasks and activities involving multiple parties, thus fundamentally changing the cities' management and operation system.

Collaborated: more efficient data exchange and sharing

With an innovative management mechanism in place, deployment of technology platforms such as identity authentication, directory exchange, clearance settlement, credit assessment, etc, will constitute various layers of the information systems. Hence, these platforms will help the flow, exchange, sharing and comparison of such tons of data scattered in different parts of the city, thus providing a sound collaborative working environment for various applications. Data exchange and sharing will drastically improve the positive cycles of city operation.



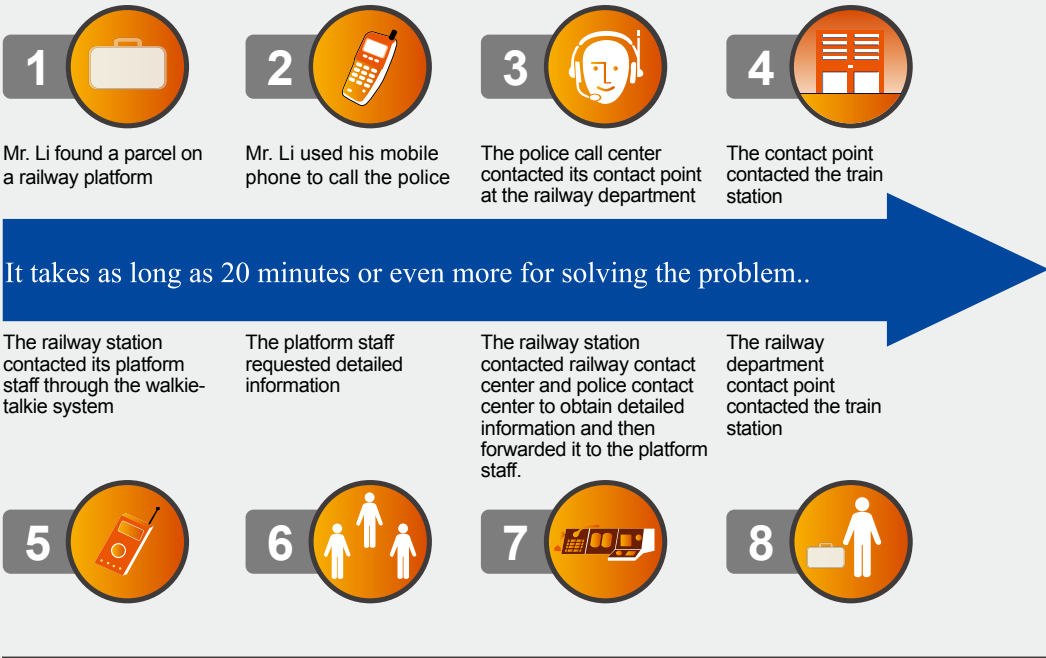
Collaborated: more coordinated interrelated applications

In a connected network where data is exchanged and shared, public management and service platforms focusing on the interaction among government, urban residents, and enterprises can provide users with governmental services, city governance, urban residents services, and enterprises management, which will result in more intelligent, efficient, and responsive decision supporting systems, management and service approaches, and innovative application models.

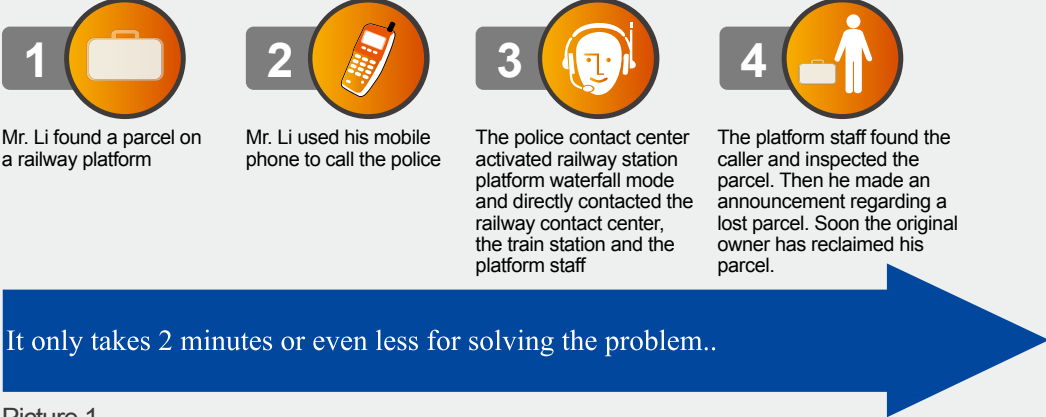
In general, *Intelligent City* is a new ecosystem with the interaction among government, urban residents and enterprises as its core, and backed by multiple advanced information technologies. The objective of cultivating an intelligent city is to provide city managers and operators with holistic planning and systematic solutions, public management approaches, and more intelligent, efficient, highly responsive and flexible decision supporting systems, thus improving the city's living quality, overall competitiveness, and achieving greater investment attractions.

Case 1  
Smart + Connected + Collaborated Safe City

Before: a parcel on the platform




Now: a parcel on the platform




Picture 1


Security monitoring




- Identification of hazardous items, unidentified parcels



- Automatic target tracking



- Security line setup
- Auto alert of entrants into a guarded area



- Time activated area search, and skip static screens automatically

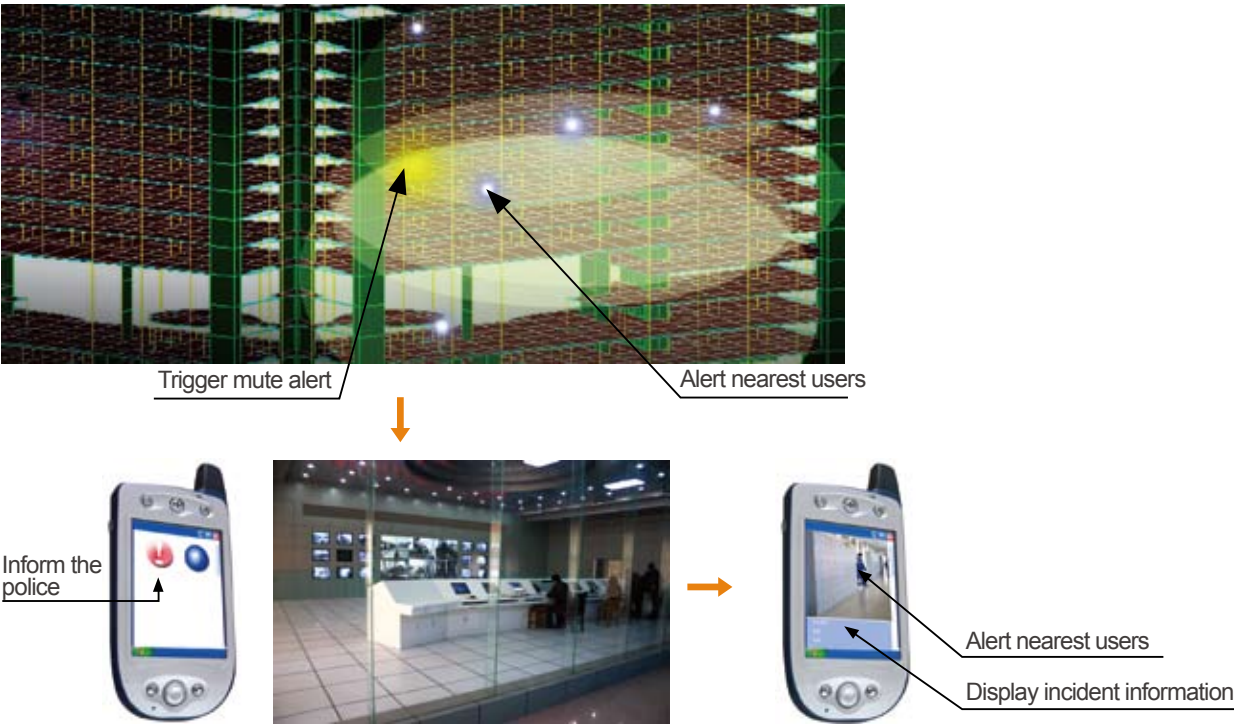
Picture 2

Location tracking of people and asset based on wireless technology

Outdoor auto movement probe using wireless tags  
Detailed check using network video devices



Picture 3



Picture 4

Security service

- Inform the police
- Alert
- Display incident, picture and coordinates
- Display map and pictures
- Take actions

Public security dispatch center

- Deploy digital video solutions
- Provide alert triggered video solutions
- Set up security structure
- Equip policeman and patrollers with laptops and PDAs to access video information
- Equip bank, retail stores, schools, hospitals, etc with solutions to connect security guards with police departments.

Case 2

An Intelligent and Green City with an Automated Environment Monitoring System

Can we have bluer skies, cleaner water, and fresher air? Smart + Connected + Collaborated environment monitoring system provides integrated online monitoring of environment quality, main gas and water pollutant sources, radioactive sources, emergency response to pollution incidents, comprehensive environment management, and web based offices. Chinese cities such as Zhuhai, Shenyang and Qian'an have already benefited greatly from deployments of this Smart + Connected + Collaborated model in environment monitoring and city operation.

Smart: an in-depth level of intelligence

Advanced sensor and auto detection technology make online monitoring of a city's water sources, air, noise, soil, and radioactive source possible, and it collects real time information and data such as the total volume of pollutants discharged by target enterprises. Online monitoring systems help tackling pollution risks. The data collected automatically include surface water quality, drinking water protection, pollutant source discharge, on site water pollution incident emergency response, manufacturing process control, treated sewage quality detection, air quality detection, and pollutant gas emission.

Connected: more comprehensive interconnection and interoperability

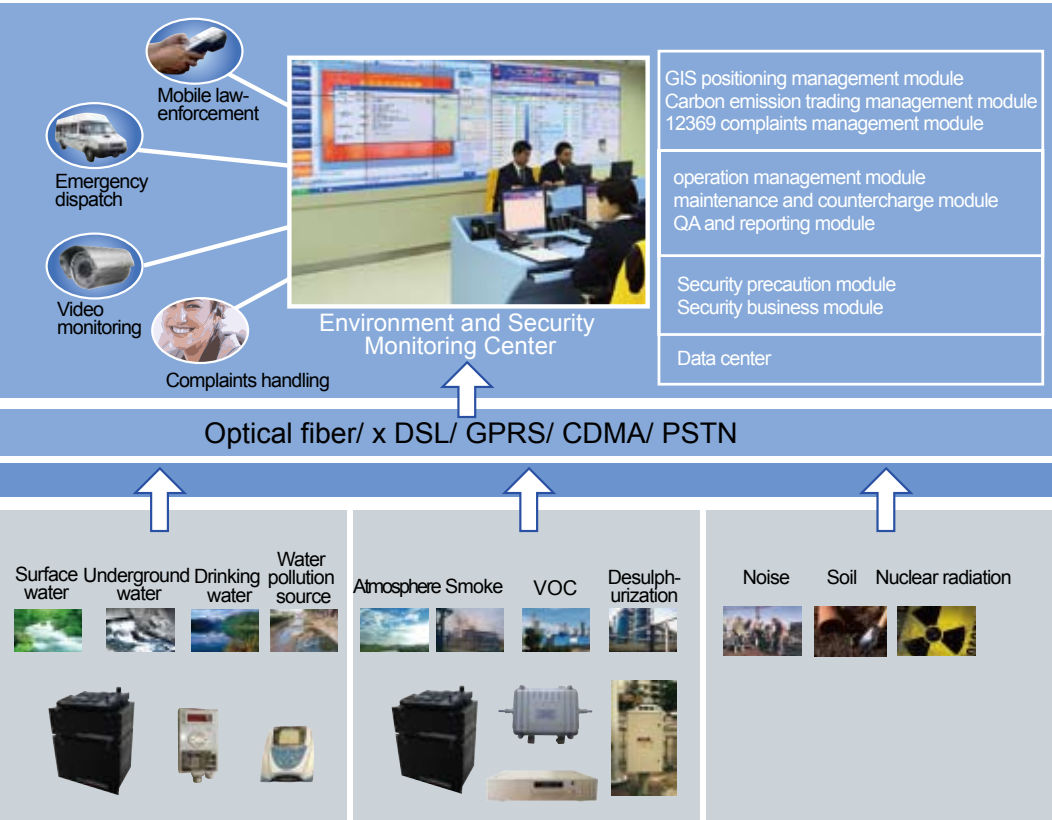
Using rich and flexible forms of communication tools, detected data can be transmitted to different levels of the environment monitoring centers or security monitoring centers located at the county, city, provincial, or national level.

Collaborated: more efficient data exchange and sharing

With collected information of the various pollutant sources and environment data, integrated statistical and spatial analysis of environmental data can be conducted to understand the status quo of pollutant sources and discharge volume, as well as the correlation between them. Environmental protection departments and relevant governmental officials can utilize such analysis for decision making purposes.

Collaborated: more coordinated and interconnected applications

Incidents forwarded by the environment protection hotline center can be further pinned down to a specific location using GPS technology. Patrolling vehicles mounted with GPS devices can then be dispatched to handle incidents using mobile devices, enabling emergency incident response and enhancing a government's supervisory function. In addition, environment protection information can be issued through related websites to increase public awareness, public monitoring, and public participation.



Picture 5

With the development of urbanization, our future *Intelligent City* centering on the philosophy of smart + connected + collaborated will be able to expand its functions to enable intelligent detection of hazardous targets such as pesticide remains, veterinary drug remains, hazardous heavy metals, and microbial sources of disease. For the safety of public infrastructure, subways, tunnels, bridges, dams, and buildings will be intelligently detected. For homeland security, drugs, explosives, chemical weapons, viruses, etc. will be intelligently detected and analyzed. In industries, security status of large size machinery and equipment will be intelligently monitored. *Intelligent City* of such aims to build a safer, greener and more harmonious city.



# Intelligent City

## An Innovative Approach towards A Harmonious City

**What is harmony? The harmony of a city involves multiple dimensions:**

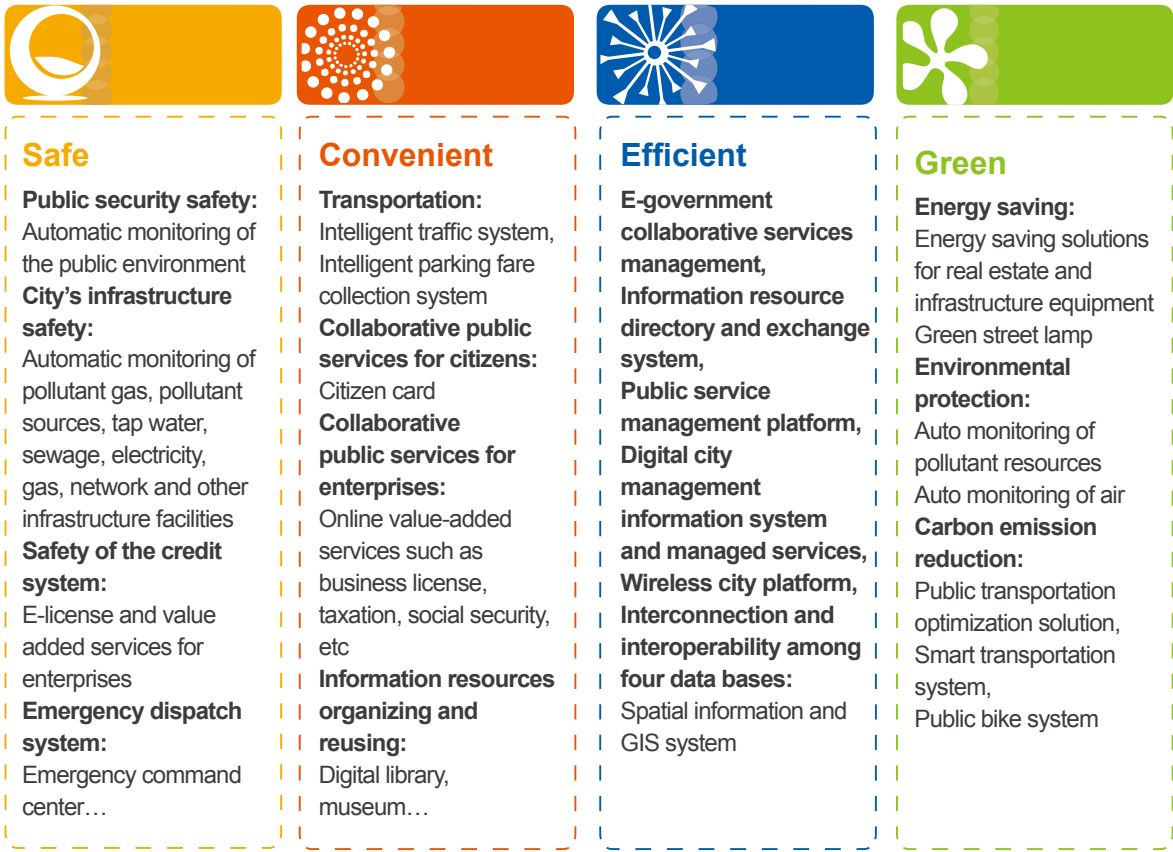
- Natural conditions
- Living environment
- City's potentials
- Dominant industries
- Job creation
- Natural scenery
- Cultural landscape
- City culture

**From a city's operational perspective, harmony means safe, convenient, efficient and green.**

The mission of an intelligent city is to integrate advanced information technology with the operation of a city to help achieve harmony between the city, its residents, and nature.

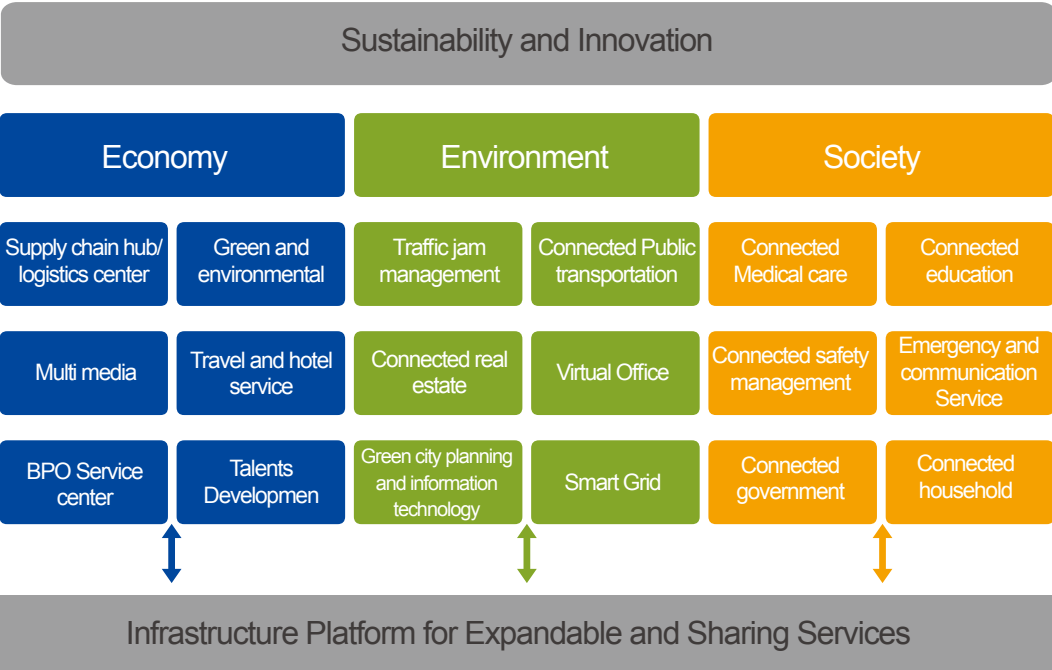
The vision of an intelligent city is to operate a city in a safer, more convenient, more efficient and greener way, a way leading to the operational harmony of a city.





Picture 6

Intelligent City: to realize cities' sustainable development



Picture 7

### Case 3

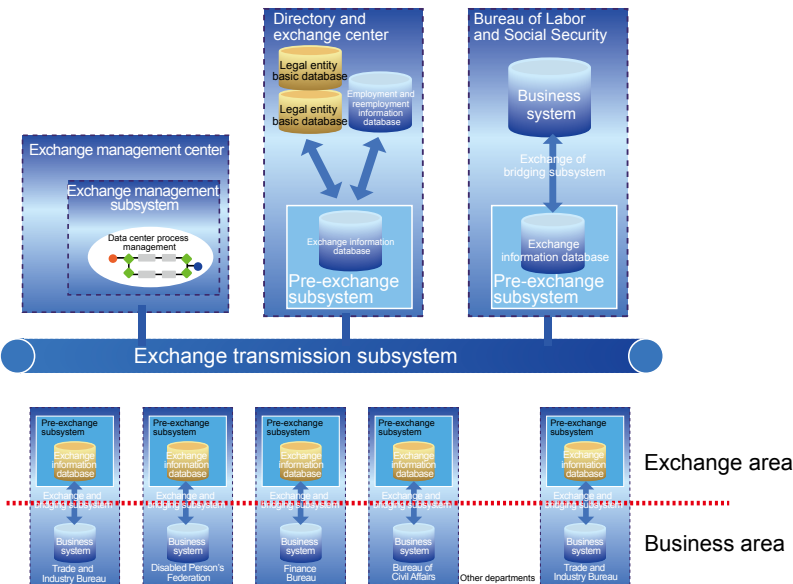
## Intelligent City: Collaborative Service to Support Employment and Reemployment

“The collaborative employment and reemployment checking system provides real time data exchange for the collaboration of information and services among departments (such as labor, industrial and commerce, local taxation, state taxation, quality supervision, civil administration, disabled person’s federation, education, and human resource departments). This solution helps resolve existing issues remained in the implementation process of the governmental policies related to employment and reemployment of city residents and helps prevent loss of state taxation and unemployment insurance fund.”

Employment is the foundation of residents’ livelihood. To reduce unemployment, the Chinese government has issued a series of incentive policies covering a broad range of industries. How can these policies be put into effect? The following is an episode of the experience of a resident in an Intelligent City.

Ms. Zhang is an employee at an industrial company. She has a 6 year old boy. Zhang’s husband works in another city in China. Her company’s business has been affected by the recent economic crisis. As a downsizing effort, Ms. Zhang will be laid off. Ms. Zhang talked to her husband over the phone about the layoff and the alternatives for the future. In the meantime, her husband’s company plans to recruit more seasoned people, but he does not know where and how to make himself experienced and knowledgeable. Two days went by. While Ms. Zhang is worried about her future life, Madam Wang, the director of Zhang’s ward district came to Ms Zhang’s and brought her three pieces of wonderful news:

1. After conducting proactive checking in the employment and reemployment information system of the Labor and Social Security Department, Ms. Zhang meets the basic requirement for claiming for unemployment insurance compensation. The labor and social security department will process Ms. Zhang’s application in the nearest labor and social security office located in her ward.
2. Per the employment record of Ms. Zhang with her former employer, Ms Zhang will be issued free employment training coupon along with a list of the training courses and names of the delivering training agencies available in the next 3 months.
3. Per her employment record, Ms. Zhang is included in a preferred candidate list for reemployment and will be recommended for employment. On the third day after Zhang is unemployed, Zhang collected unemployment insurance compensation. A week later, Zhang participated in an employment training program and was reemployed three months later.



Picture 8: Backstage management of labor and social security service collaboration

### Traditional Approach

An individual must go to several relevant government agencies for necessary documentation to be obtained and then presented to the labor department in order to qualify for reemployment benefit application. Such a process involves cumbersome procedures and creates extra workloads to the front line staff of each government agency. An individual may incur delays in his application due to loss of certificates, fraudulent proof, incomplete information, or may be able to repetitively collect reemployment packages etc.

### The New Collaborative Approach

The collaborative approach allows sharing and exchange of information among different government agencies. Hence, employment and reemployment information can be searched online to support the collaboration among the government’s unemployment insurance program, the minimum living security program, and employment promotion initiatives. This new collaborative approach has greatly enhanced the effectiveness and efficiency of government services.

- Establish a co-sharing platform

The employment and reemployment information exchange and checking system provides a co-sharing platform across various government agencies for information exchange and sharing. This platform provides timely information about the targeted individual’s employment status; reemployment related monetary subsidy, as well as various favorable policies including tax cuts, low income assistance, etc. As a result, delays or negligence in service caused by time differences or incomplete information is mitigated.

- Protect civilian’s benefits

Through real time checking and comparison of various procedures, including an unemployed individual’s registration information, issuance of reemployment assistance certificate, and release of unemployment subsidies, this collaborative system ensures accuracy of the relevant individual’s personal identification, as well as the effectiveness in issuing reemployment certificates. As such, the system helps reduce business flows and protects civilian’s benefits by providing the civilian with timely policy support.

- Protect government fund

This collaborative system provides connections among various government agencies, such as the industry and commerce administrative bureau, civil administrative office, and taxation bureau. Unemployment information is shared among such bureaus, and consequently the system has fundamentally protected government levied taxes and abuse of unemployment insurance funds.

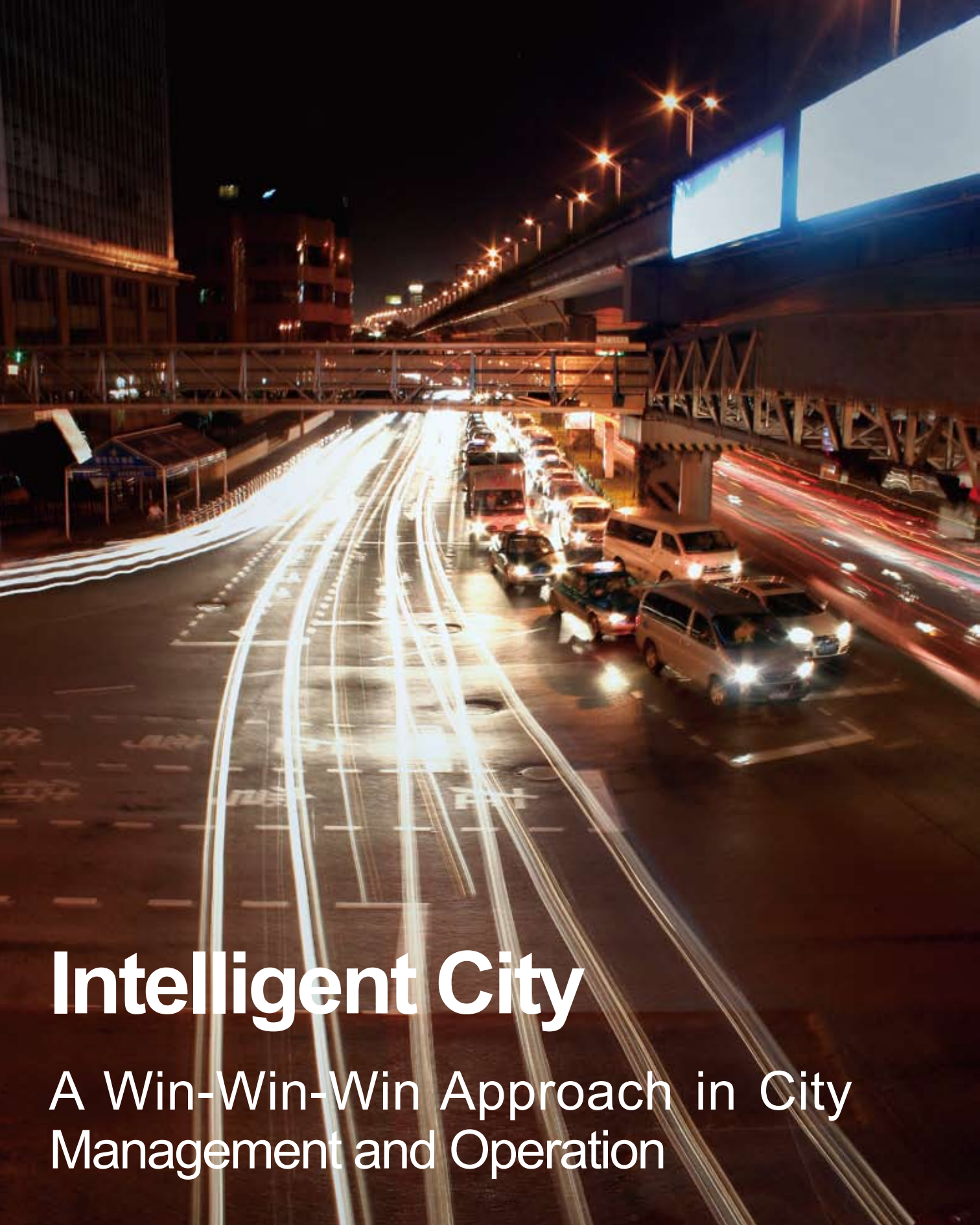
- Regulate monetary management

As the system enables collaboration among departments, such as the administrative bureau of industry and commerce, civil administration, and taxation, etc, a resident’s employment status can be accessed by different departments concerned. As such the system provides an effective solution to minimize the number of illegitimate beneficiaries of relevant favorable policies and benefit packages provided by the government. Consequently, government taxes and unemployment insurance fund can thus be protected.

- Explore inter-department collaboration

This employment and reemployment checking system not only supports inter-departmental information sharing among departments (such as the labor department, administrative bureau of industry and commerce, local taxation department, state taxation department, quality supervisory department, civil administration department, disabled person’s federation, education department, human resource department, etc.) but also serves as a catalyst for the establishment of an inter-departmental business collaboration mechanism. Such mechanisms ensure that from a system level the efficiency and continuity of collaboration among departments and provides an innovative approach to enable collaboration supported by an inter-department working team mechanism powered by real time exchange of information.





# Intelligent City

## A Win-Win-Win Approach in City Management and Operation

*Intelligent City* is designed to achieve successes in city management, city services and city operation by integrating advanced information technology with managerial concepts.

The key to the successful implementation of intelligent city projects requires the government to take a leading and coordinated role in making sure that an intelligent city is built in a healthy and phased approach so as to achieve the following purposes:

### Make information the new resource for city operation

The primary task is to develop information resources to support a city's operation. The key project shall be the digital city public service platform, which provides cohesive integration of data, information, knowledge, capabilities, applications, and services between the government and society. Such a platform will enable a city to take a proactive role and have the first mover advantage in the intelligent city initiatives.

### Invest in the city's future strategies

Strategic investment should be made in a phased approach in selected areas concerning residents' livelihood and the sustainable development of a city. City management shall tackle opportunities to operate the "city company" by establishing well planned resource platforms to address issues such as transportation, employment, public health care and medical service, energy conservation, and reduction of carbon emission in a managerial and systematic way.

### Cohesive integration between information technology and city operation

To build an intelligent city, it is important to connect governmental information with social, enterprise, and household information. When building such connections, multiple aspects should be taken into consideration, such as the positioning of various governmental functions in the city, city's overall industrial planning, historical heritage and cultural characteristics, so as to cohesively integrate the city's digitization initiatives with the management and operation of a city.

### Cultivate new service business growth points for a city

Substantial efforts need to be made in developing a city's application service system based on the city's informatization initiatives. Effort shall be focused on low cost, high return projects as well as on the city's public service platform and value-added services so as to establish a healthy interaction between healthy industrial value chains and recyclable economy, and between building an intelligent city with established modern information services.

Case 4

Intelligent Hangzhou: The Rise of Collaborative Applications and New Service Industry Value Chain

The city of Hangzhou has made outstanding achievements in the city's informatization initiatives, with all departments (such as the public security bureau, the labor bureau, the civil administration bureau, the transportation bureau, the social welfare fund agency, the quality surveillance bureau) all equipped with a business information system. Most importantly, such information systems have been transformed from serving its own departmental needs to serving the residents' need, from only supporting traditional desktop terminals to supporting multiple access media. The systems have now become an irreplaceable component of governmental portals. With these systems in place, the city's service functions and managerial level in all departments have been significantly improved.

Although these systems are well connected vertically, they still lack connection for communication horizontally. City managers have a stronger need for information system standardization and synthesized data analysis and usage. They believe it is of paramount importance to build a city wide data resource and exchange platform in an effort to proactively take down interdepartmental barriers.



Under the philosophy of smart + connected + collaborated, the city of Hangzhou is in the process of building a brand new integrated application platform featured with shared government information and business collaboration. Applications built on this shared and collaborative platform include digital city, credit city, and joint examination and review process enabled by connection to and exchange of basic enterprise information. With the citizen card as a catalyst, Hangzhou's public services have been expanding to include services such as public bikes, car parking systems, self aided tour guide systems, food safety, and health care.

Hangzhou has adopted a market approach in operating public services so as to create a modern service industry value chain. The city government has been zealously pushing telecommunication service providers, e-commerce operators, software service companies, and innovative information service companies to participate in the construction and operation of Hangzhou's intelligent city initiatives. The result is positive — a number of high value added modern service companies have been developed.





# Intelligent City

## Cultivate A People-Oriented System

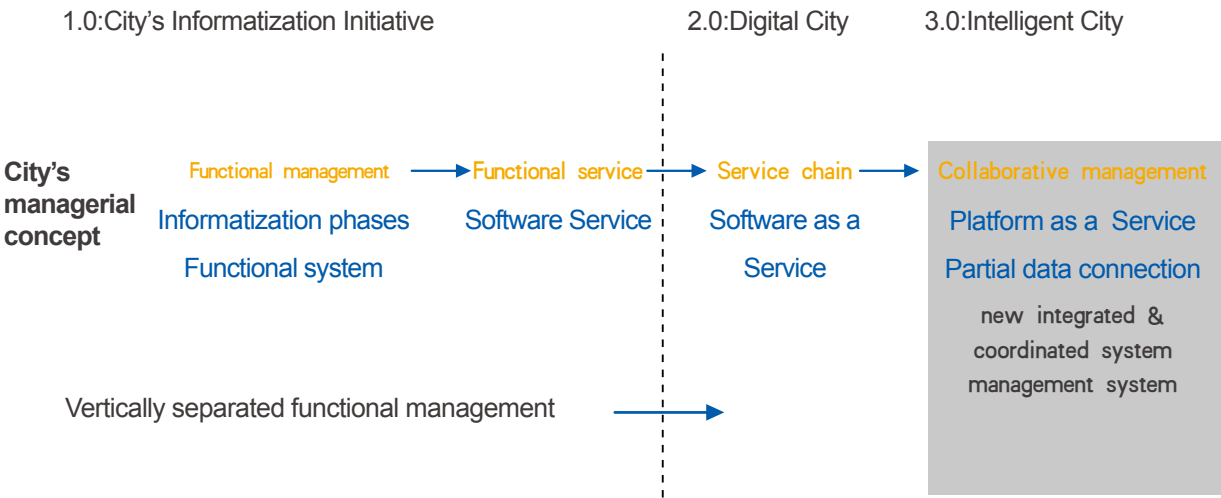
Behind the philosophy of *Intelligent City* is the transformational concept of managing a city with advanced information technology as its core pillar.

Modern city management concepts are evolving from providing functional management to functional services and service chains. Such evolution exhibits a conceptual change from a management-oriented to a people-oriented service. Correspondingly, city management has evolved from providing separated functional services to providing synthesized service chains, represented by emergency collaborative command, moral aid chain, etc. Behind such innovative government collaborative management and service is continuous innovation in comprehensive city management systems.



With the evolution of city management philosophy, the city’s informatization focus has evolved from initially building a single department information system to providing web-based network and software management service. In this era, ordinary users only need to care about the service itself, instead of the supporting backend information system. The drastic development of information technology has resulted in the emergence of a variety of rich access media. Users can access such web-based real time informatization service via multiple means, including via computer, mobile handset, specialized terminal device, and call center. Today, the concept of intelligent city has pushed the one-stop service model to a new echelon of collaboration.

Diagram 9: Evolution from a City’s Informatization Initiatives to Intelligent City Initiatives.



In the past, local governments in various cities in China were actively engaged in digital city initiatives. As a result, governmental management systems have migrated from vertically isolated functional management to synthesized and coordinated mechanisms. Partial data connections and communication to support city management were achieved. Service contents were integrated at a preliminary level. The digital city focus evolved from being technology centric to service centric. The concept of *Intelligent City* is to integrate advanced information technology with advanced city management philosophy and migrate from a digital city to a higher echelon of platform as a service. By leveraging smart and connected technologies, the final objective is to move towards a safer, more convenient, and greener path of harmony.

# Case 5

## Jiaxing: Behind the “One-Stop” Service

The city of Jiaxing in Zhejiang Province has launched one-stop public services through the city’s community based social affairs stations and social security and public service bureau. This one-stop service model is a brand new government service model in comparison with the traditional model, under which various government departments would set up their own isolated offices in the local communities, resulting in resident inconvenience and duplicated investment from the government. The Jiaxing approach is designed to combine the various agencies that interface with residents in areas such as human resources and facilities. This way, residents only need to contact a single community based service agency — the community affairs station for matters related with government public affairs and services.

To avoid duplicated investment in informatization initiatives and coordinate both vertically within a department and horizontally among the various departments with the purpose of sharing information resources, the Jiaxing municipal government issued the “Jiaxing public affairs information system project implementation plan”, centering on the philosophy of tracking, serving, and managing residents’ entire lives. The core of this plan involves shifting the focus of social security management services to wards and communities so as to transform the function of government from management to service.

With an innovated management system in place to support the city’s smart + connected + collaborated initiative, Jiaxing established a unified information exchange center and public affairs information sharing data base. The city issued a unified multi-purpose digital application citizen card to power government in the sunshine initiatives and highly efficient administrative services. This citizen card allows residents to have convenient access to various public services provided by the government in their working and living areas.



# Unified Planning

## Systematic Blueprint for an *Intelligent City*

In an intelligent city with an innovative management system in place, we need to provide information systems for the city in multiple layers and address the correlation among the different kinds of application services. To make this happen, it is important that we have a unified plan to implement in phases. The full architecture of an intelligent city is composed of a basic data base + application data base, four platforms, and three systems.

### Basic data base + application data base

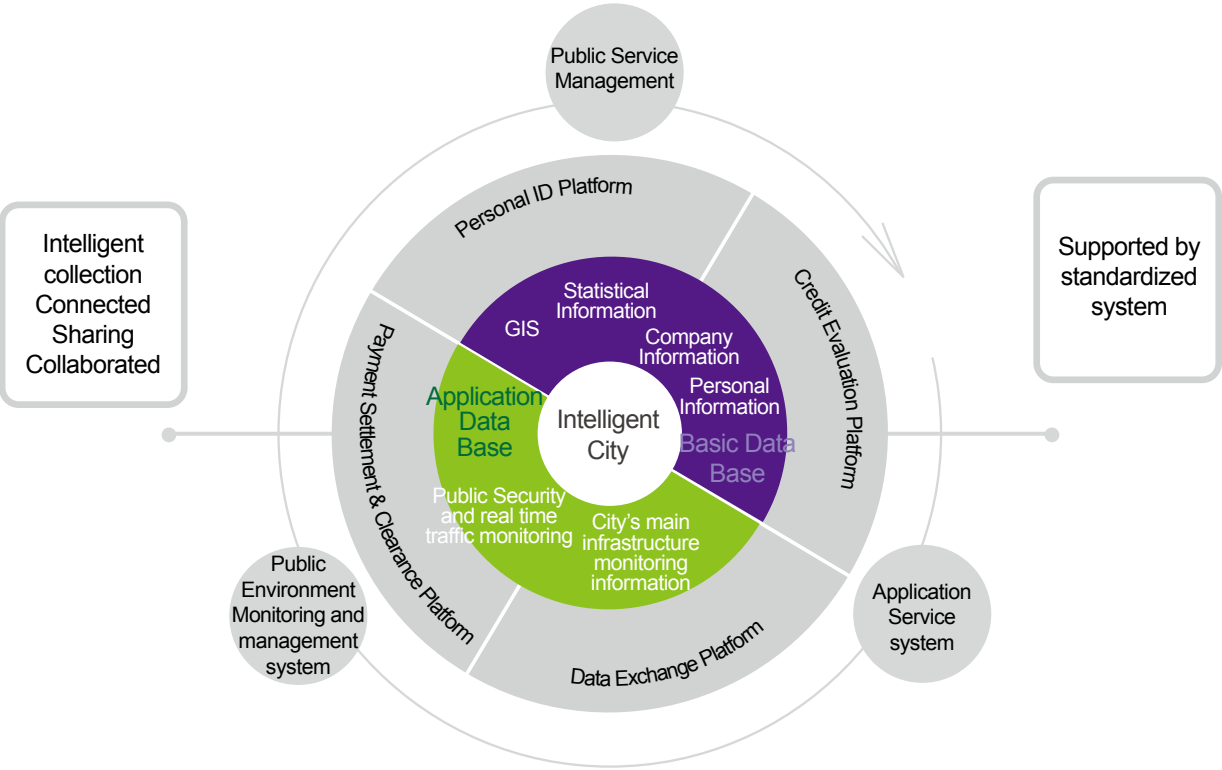
Personal information, legal person information, geographical information, and statistical information  
City's major infrastructure facilities monitoring information, public security and road monitoring information...

### Four platforms

Identity authentication, directory exchange, settlement and clearance, creditability assessment

### Three application system

City's public environment monitoring and management system  
City's public management service system  
City's application management service system



Picture 10

Intelligent City Public Service Platform Architecture

Government's supervision on security	Application Layer	Three People-oriented application systems centering on the resident's daily life and life cycle, smart transportation, health care, public safety, education services...	Unified standards
	Service process layer	Information integration, data comparison, information restructuring, data mining, information directory and exchange, four basic information data bases, information carrying and storage, information service interface	
	Data collection layer	Government agency business information, publicly information collection (finance, commercial, corporate, public sector, educational agency)	
	Public security layer	Network security, CA center, internal and external network secured information exchange, supervise privacy and secrecy related information	
	Infrastructure layer	Integration among e-government, MAN, wireless city, science and education network and 3G network	

Table 1

An Intelligent Path

Intelligent collaborative solutions	Multiple access means anywhere anytime for cross department and cross company flow of information and connected government, connected logistics applications					
	Connected healthcare	digital transportation	digital security check	emergency dispatch	digital city manager	digital environmental protection
	Shared network backbone platform	shared data center	shared call center	intelligent industrial park and building	virtual office	unified communication
Intelligent industrial solutions						
Intelligent infrastructure platform						

Table 2

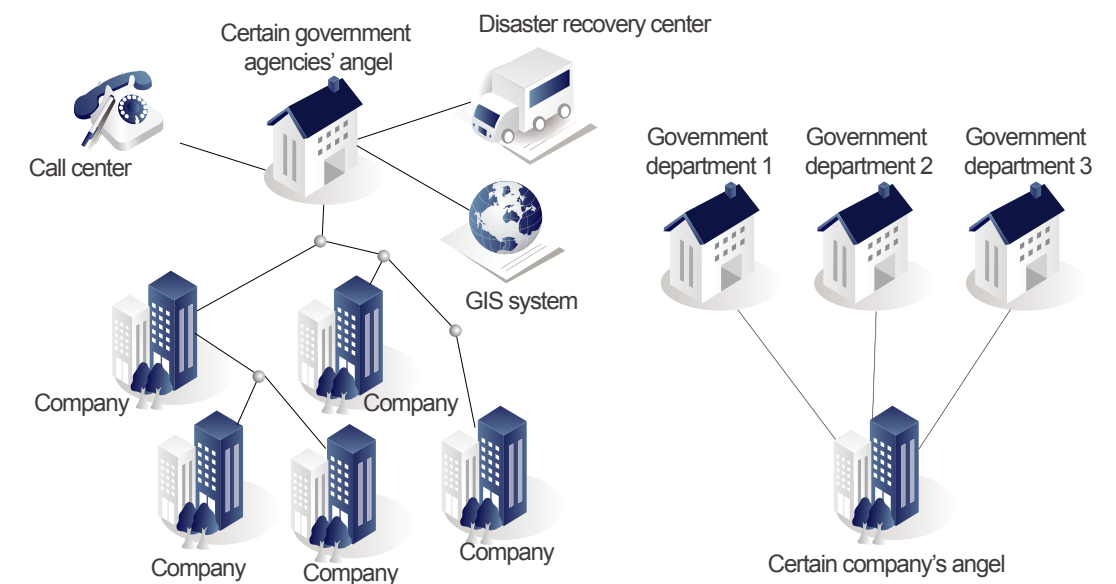


# Investment Benefits:

## a New Operating Model for the *Intelligent City*

In the development of an intelligent city, it is important to integrate all three components of smart + connected + collaborated for its synergies. As far as legacy city information systems are concerned, we need to integrate and reconstruct such systems under the principle that such systems shall be logically integrated as one while being physically segregated. For green field system projects, they should be built to achieve information exchange and sharing and be implemented through unified resource planning so as to achieve optimal investment benefits for the government.

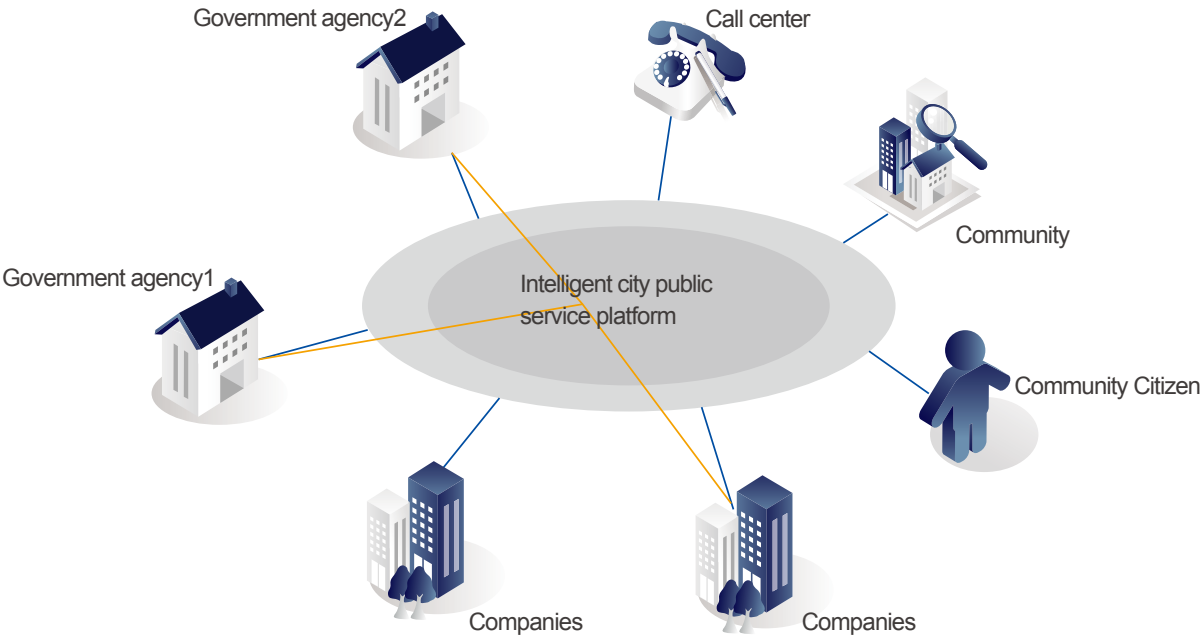
### Traditional Construction Model



Picture 11



Integrated Solution

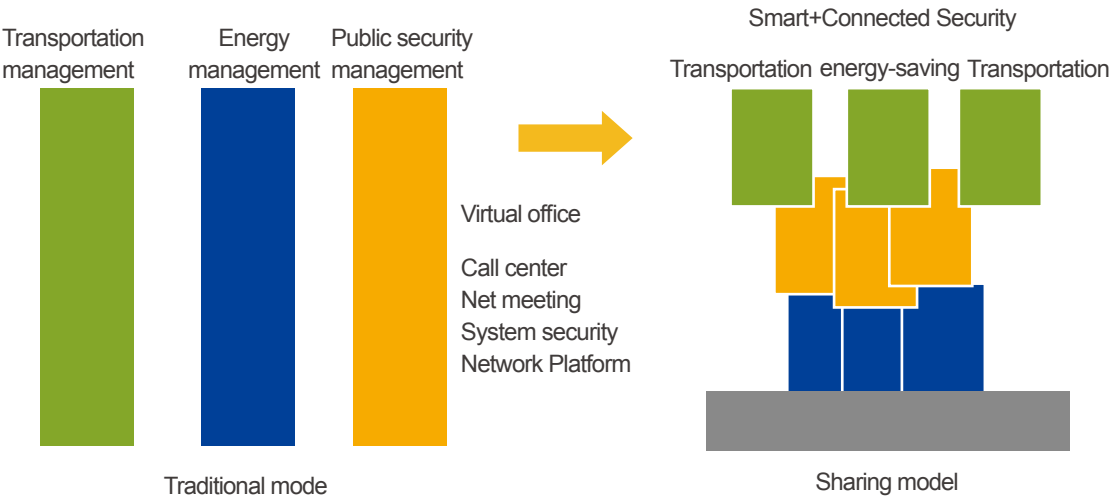


Picture 12

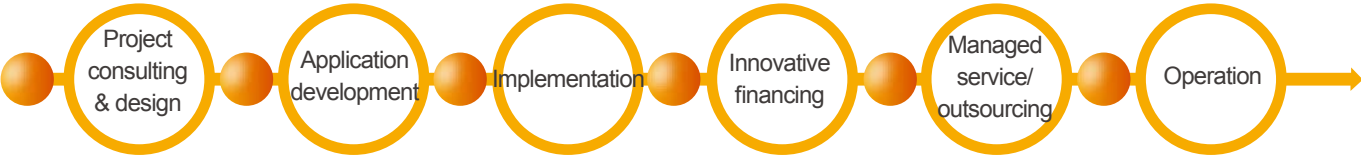
In a must-have information system project for public services, it is of paramount importance that planning is conducted in advance in an effort to achieve higher public platform sharing, lower capital expenditure and higher efficiency.

In the intelligent urbanization process, a government's role should be more service-oriented and small in size to serve a large society. Government's expenditures should be made to procure and maintain services rather than human resources. As far as the business model is concerned, the current EPC (Engineer-Procure-Construct) model shall be changed to BOT (Building-Operation-Transition), BT (Building-Transition), consolidated operating services, leased services, etc. Capital expenditure should be planned in a unified way and in conjunction with future returns. Social resources should be utilized for establishing joint operations or project exchanges. Options such as service outsourcing or government business outsourcing may be considered as well to reduce capital expenditure by the government, increase service efficiency, and create a win-win-win business model.

Effective Government Investments



Picture 13



Picture 14

# The *Intelligent City* Journey Starts Here







Intelligent City-ing(1)

# Smart Digital City Administration Application Services

By outsourcing information collection jobs for digital city administration, the government is able to save 20% of its operating cost and create hundreds of service jobs. Small or medium level cities may lease such digital city administration services to achieve cost-effectiveness.

## Case Study Background Information

In 2005, the Ministry of Housing and Urban-Rural Development launched a nation wide digital city administration trial project. The digital city administration initiative has greatly enhanced the city management level and city images of trial cities and achieved positive social and economic benefits. Taking the city of Hangzhou as an example, after the project is in operation, the daily problem handling capabilities has increased 30 fold, while public complaints have decreased by 50%. As a result, public satisfaction rate has increased by 2.3%.

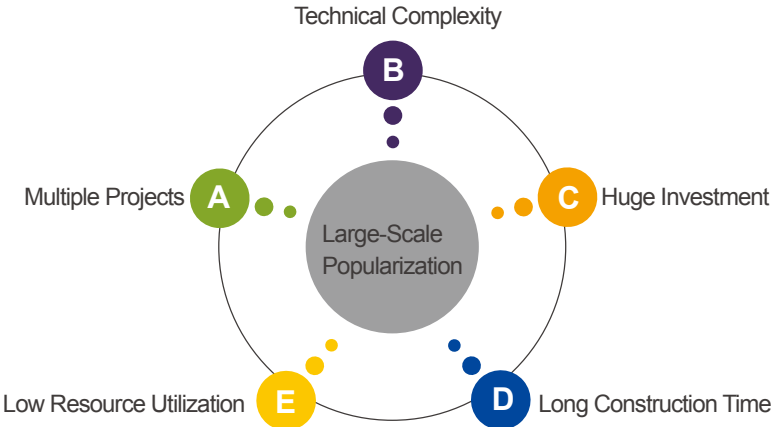
Table of Comparison:  
the status quo before and after Hangzhou digital city  
administration trial project is launched

	Before the system is in operation	After the system is in operation
Problem detection rate	Approx 30%	Above 90%
Average time of closing a problem	One week	10 hours
Problem volume	600 problems/day	1800 problems/day
handled	Several weeks	Approx. 2 hours
Special Survey Others		Case creation rate: 70% Case closing rate 83% Number of complaints dropped by 30%

Table 3



Picture 15



Disadvantages of Traditional Construction Mode

According to the requirements of the Ministry of Construction, in addition to building organizational system and institutional systems, each local government shall build basic data systems including software, hardware and network facilities. City's basic geographic information databases shall be built as well to include components such as large-scale vector map or orthophoto map, division of grids, and management data bases. The local government also needs to create teams of information collectors, call center personnel and command center dispatchers.

- The construction and application system is mainly applied in large and medium-sized cities with better economic conditions.
- Underdeveloped medium and small-sized cities and counties cannot afford construction costs due to the limitation of economic conditions, talents and management ability.
- The gap between developed cities and underdeveloped cities has been widened.

New Intelligent Concept: Digital City Service Center

Easy and efficient “digital city” application service managed by hosted digital city application service platform and professional outsourcing service provider.

Based on the philosophy of enabling “Smart + Connected + Collaborated”, Insigma provides cities with complete digital city management application systems with its unified and hosted digital city service platform. Insigma’s hosted services enables cities to implement digital city management initiatives simply by creating required organizational systems, developing related management processes and specifications, coordinating relevant government sectors, and identifying responsibilities. The city government can outsource activities, such as information collection and call centers.

The above approach enables the local government to:

- Significantly reduce the construction time and cost through speedy implementation of the digital city service platform.
- Simplify the organizational system and reduce administrative costs, which therefore helps to greatly improve administrative efficiency and management ability of the local government.
- Liberate from detailed city management affairs and improve management efficiency. The local government then could avoid being both as the player and the referee at the same time. Instead, it will be able to focus on high-level supervision and coordination and assessing the performance of relevant departments of the city management.

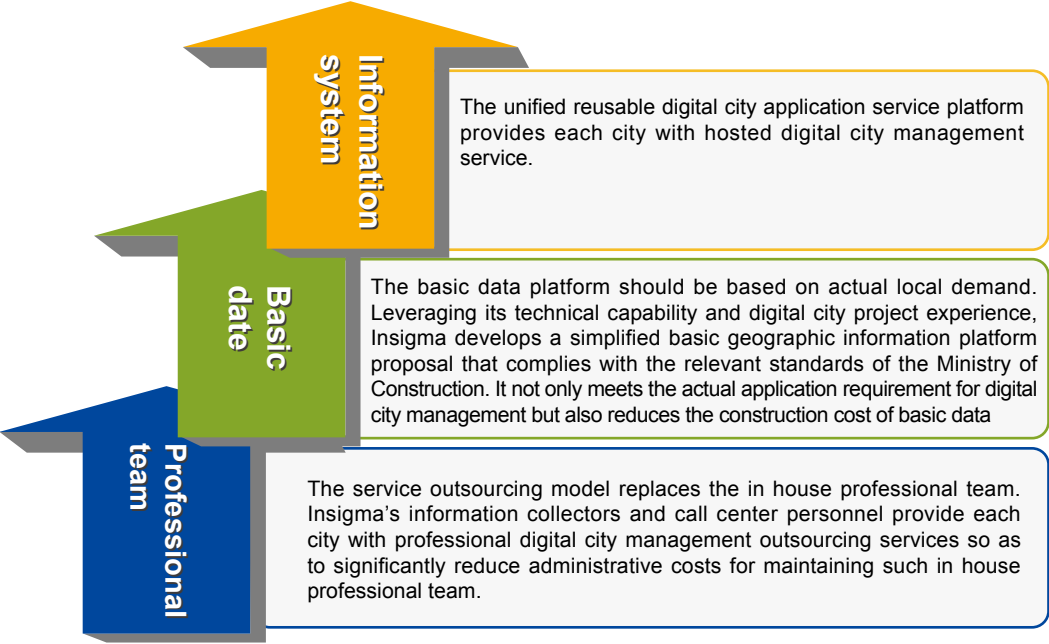
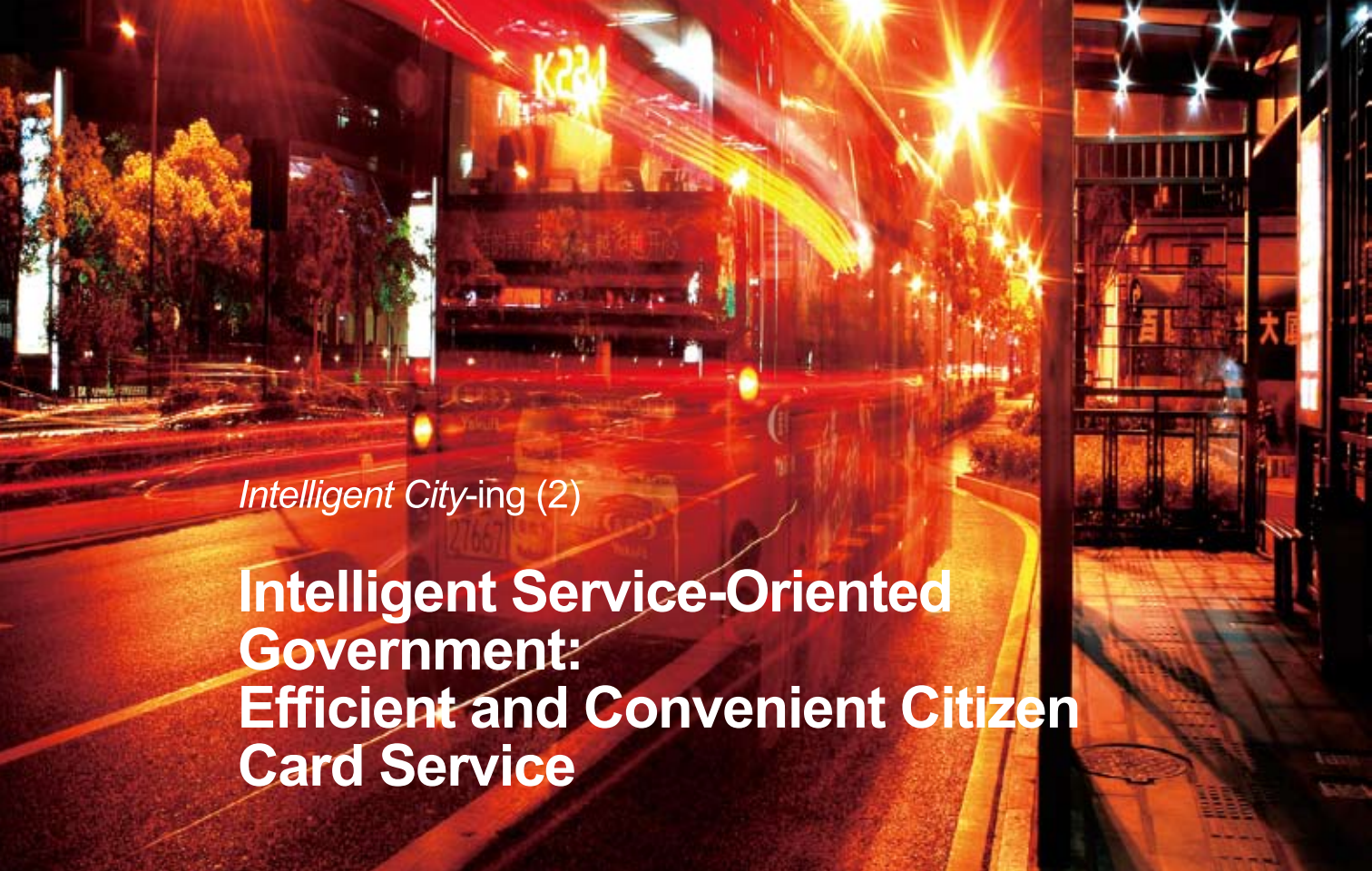


Table 4

The information acquisition service outsourcing model in digital city management helps the government save more than 20% of the cost and create hundreds of modern service jobs for the city. According to performance data from cities all over the country, the information acquisition service outsourcing model can save approximately 20% of the cost compared with the in house model. Zhengzhou digital city management covers an area of 320 square kilometers. It is estimated to cost the government 20 million RMB per year under the traditional in house management model. After adopting the information acquisition service outsourcing model, the cost for the government is only 13 million RMB per year, at a cost reduction of 35%. With two information collectors for each square kilometer, this outsourcing model not only significantly saved costs but also introduced more than 600 modern service jobs for Zhengzhou.



Intelligent City-ing (2)

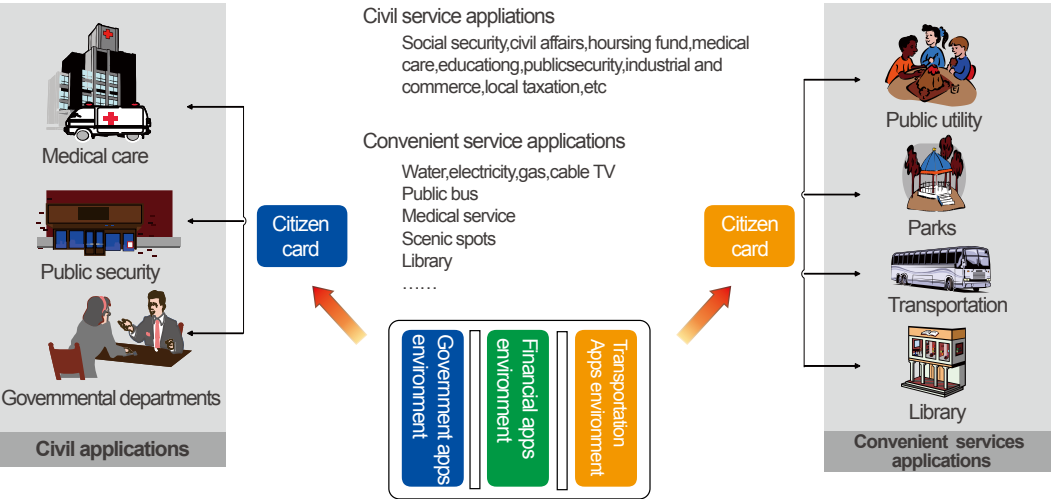
# Intelligent Service-Oriented Government: Efficient and Convenient Citizen Card Service

The “Smart + Connected + Collaborated” Citizen Card Solution provides city managers with a safer, greener, more convenient and efficient collaborative tool for better serving the citizens.

Hangzhou is the first city in China to implement the Insigma Citizen Card Solution, based on the *Intelligent City* concept of “Smart + Connected + Collaborated”. This solution earned favorable reviews from all sectors of the society and was gradually introduced to other provinces and cities in China. The Citizen Card Solutions integrates the modern smart card, communication, and computer technologies. With features of multifunctionality, safety, convenience, and efficiency, it can be applied in the areas of public-affair service, government service, electronic ID, daily payment and other commercial functions. The Citizen Card has now become one of the most important system tools for providing comprehensive services and management to the public.

## The Citizen Card project includes:

- Integrated management information system (MIS): card management system, data exchange, payment clearance and settlement system and comprehensive service system
- Software and hardware environment for supporting the operation of the integrated MIS
- Application environment of citizen card: cards and utilization environment
- Relevant systems for citizen card application service
- Value-added systems based on the citizen card application service
- Work flow system



Picture 16

The backend support of the citizen card management system mainly relies on the inter-departmental data exchange and sharing, as well as integration of the public information resources. Hangzhou municipal government established a “Public Information Resource Management Center” to manage the maintenance and utilization of the city wide shared information resources databases as well as the sharing, exchange and service of inter-departmental information. The citizen information center uses the data exchange front end server to realize the “logically unified but geographically distributed” data exchange and sharing so as to improve the automatic acquisition and interaction as well as centralized storage and management of citizen information data.

The use of the citizen card in Hangzhou has improved the interconnection between the local municipal government and relevant government agencies and will soon be expanded to approximately 30 citizen service-related departments. The citizen card service network has covered more than 30 wards and communities, offering management services related directly to the citizen card, such as card issuance, replacement and loss-reporting. These wards and communities will gradually offer enquiry services about government policies and regulations, government affairs procedures, application information, and general services. This system has laid a solid foundation for continuous improvement of service-oriented government and urban lean management.

The personal data exchange platform with Citizen Card as its core also makes the exchange and interaction with other city's basic databases and application databases possible, and it provides support for more urban public value-added services.



## Intelligent City-ing(3)

# Intelligent Service-Oriented Government: Efficient and Convenient One Stop Management Services for Enterprises

How can city managers provide enterprises with efficient one-stop service using advanced information technology?

The online government public service platform has established a unified e-government security platform and a safe and reliable application support platform. The public platform offers support for inter-departmental approvals and provides internet service access and support for intermediary agencies of auditing, appraisal, inspection and testing. Enterprises can access to the online government self-service center with any computer for obtaining one-stop government e-services including administrative application and approval, license annual inspection and examination, and handling of administrative penalties. The public platform also provides enterprises and the public with services of approval enquiry, public information enquiry, credit information enquiry and rights protection.

## One-Stop Public Service

The online government service center is an integration of online service systems of all departments.

**Industry and Commerce:** The industry and commerce online service system offers online enterprise lifecycle management services, including online processing of registration, change, annual inspection, and cancellation. It is also responsible for the supervision of an enterprise's web-based performance and offers credit and supervision services for e- businesses.

**Social Security:** It provides enterprises and the public with services of online reemployment, training certification, labor relationship, wages and welfare, insurances, labor disputes handling and labor security supervision.

**Finance:** It is designed with the online bidding system for bidders, tenderers, agencies and professionals to complete all bidding procedures easily.

**Statistics:** The enterprises can periodically submit all kinds of statistical data through the online data submission system.

**Taxation:** It provides taxpayers with tax declaration service through an online taxation system. The taxpayers can declare the payable tax to the tax authorities on the web. The tax authorities then levy the tax based on the submitted data and deduct payments.

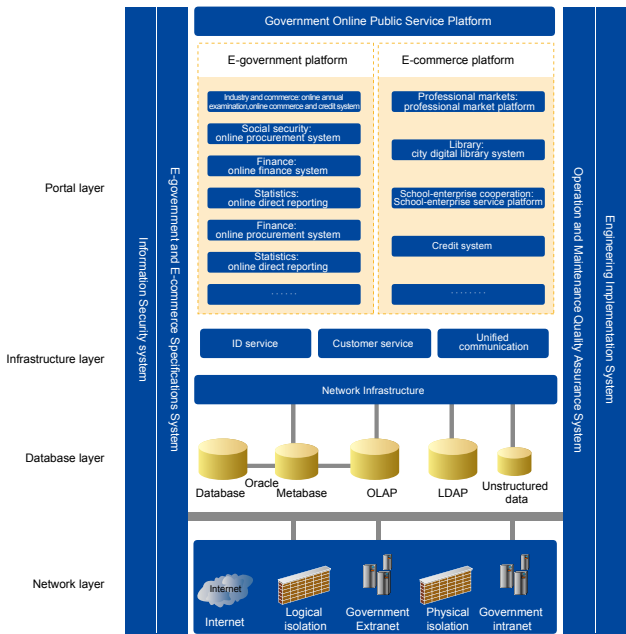
**Parallel Approval:** The parallel approval system changes the traditional sequential approval model. For issues that need to be jointly approved by two or more departments, the system can assign a center (department or office) to coordinate and organize all relevant departments for parallel processing. As such the system realizes "One office submission, parallel approval, unified charge and time-limited closure".

**E-Business Access:** It offers all kinds of e-business websites access services for the citizens. The enterprises and public institutions can obtain access to enterprise and university resources and effectively use the university's "intelligent" resources such as books, research achievements and high-tech project cooperation etc. This system also integrates libraries in the city and provides a digital library system for all citizens.

**Specialized Market Public Service:** The specialized market public service platform provides market organizers and dealers with hosted self-services, and offers a unified service platform for the organizers' various authentication services, thus achieving public resources sharing, improved work efficiency and management level, increased trading volume, and reduced operation costs.







Government Online Public Service Platform (a logic diagram)

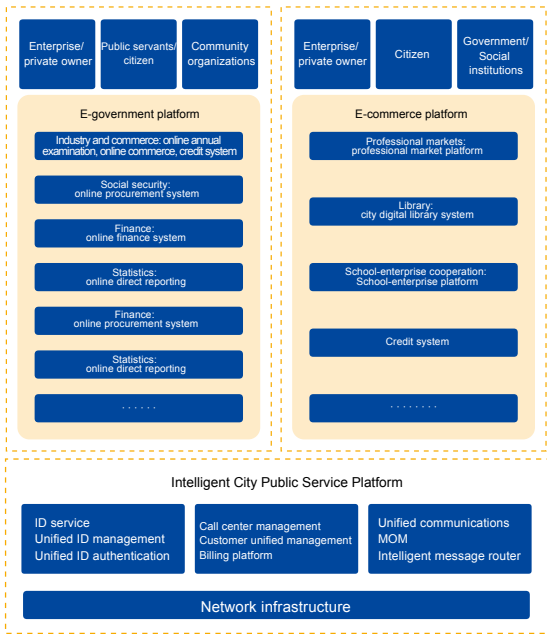
Picture 17

Innovative Construction and Operation Model

Innovative Construction and Operation Model aims to help the city managers to achieve the objective of being an efficient and service-oriented government. Regarding the building of a government public electronic service platform, Insignia has developed a 3rd party service provider model for the government public e-service platform construction. In this model, the enterprise will invest and build the platform, and then the government will outsource the service job to the enterprise. The member enterprises can then enjoy the services provided by the “government public self-service platform” and pay relevant charges for value-added services. By doing so, the government, member enterprises and outsourcing service provider can all achieve win-win-win results.

This information technology-based service outsourcing model has been implemented in many provincial and municipal governments in Zhejiang, Jiangsu and Jiangxi provinces for comprehensive services to the industry and commerce, taxation, and social security, covering more than 200,000 Insignia member enterprises.

In addition to the construction of unified ID management and internet ID authentication platform, the outsourcing public platform service providers also provide the government and member enterprises with unified call center support, technical support, online service, remote assistance, user training, expert consultation services, complaints/complaint processing enquiry and local counter services.



Government Online Public Service Platform (a functional diagram)

City Managers

Effectively improve work efficiency

According to statistical data from regions with an online declaration system, the success rate of online declaration reaches 99%, with over 60% of all declarations submitted online. This greatly improves the efficiency of government work.

Reduce administrative cost, enhance social image

The traditional governmental administrative service model requires employment of huge numbers of personnel to work in various districts, wards, and communities. With the implementation of online declaration, fewer employees will be required and thus costs will be reduced. Under the traditional information system model, local governments experience a lot of pressure from high volumes of telephone enquiries. If these enquiries cannot be handled properly, complaints will soon follow and tarnish the public image of government departments. By outsourcing these services, the government can reduce its administrative cost and at the same time improve its efficiency.

Increase service satisfaction

Take Keqiao County of Shaoxing, a city in Zhejiang Province for example. At the end of 2008, Keqiao local government carried out a service satisfaction survey. The “Online Reporting System” was voted as the most satisfactory government service project.

Member Enterprises

Instead of going through all the complicated procedures, the applicants now only need to click on the web pages and fill in the necessary forms to get their job done.

Effectively reduce government-enterprise communication cost

Significantly reduce enterprise's labor and financial costs.

In the traditional model, every enterprise needs to deploy a dedicated personnel to process all procedures related to industry, commerce, taxation, and social security etc. which may cost the enterprise approximately 70,000 RMB per year in developed regions. After using the online service, the service cost drops to only several thousand RMB.



Intelligent City-ing (4)

# Intelligent City Operation: Make Information A New Resource

Applying the concept of “Smart + Connected + Collaborated”, the government of Hangzhou can monitor the legal person’s information database with an accuracy rate of over 90%, an increase of more than 10%. With the smart alert function supported by the software, the government increased real estate tax collection by 100 million RMB per month in the first 3 months after the system was put into use.

The cross-departmental personal and enterprise information database can increase governmental departments’ capabilities to provide service and supervision. Take the legal person information analysis as an example legal person’s data is normally scattered in different departmental databases, such as small private business information, legal registration information, tax registration information, medical insurance information, and statistic bureau legal person information databases. Through horizontal analysis of all the above information databases, government managers can easily cross-check, compare, analyze and predict information such as production output, sales volume, profit and tax income.It therefore provides the government with a better decision-making analysis tool and improves the government’s enterprise public management ability.

Let’s use the real estate tax of one local tax bureau as an example, to illustrate how information becomes the new resource for the city’s operation.

## Information Sharing and Collaboration of Urban Real Estate Government Information

Through the data interaction among the tax bureau, bureau of land management, construction bureau, housing bureau, industry and commerce bureau and ministry of public security, all data is interconnected so the government can analyze cross departments of source data and create cross departmental correlations of specific items to build a tax source analysis and prediction model to calculate the price of unsold houses, and then carry out scientific predictive analysis and assessment of the real estate enterprise’s taxation conditions. Using a 3rd party’s basic data, the accuracy of tax source prediction reaches more than 95%. The government can also obtain a clearer understanding of the current situation and future development trend of real estate industry from different perspectives, and makes related decisions accordingly .

## Data Exchange and Sharing

### Tax Department

The computer system automatically collects real time information, which is then integrated with the relevant local taxation data and automatically distributed to tax authorities and personnel.

### Land and Resources Department

Through communication and coordination among tax department, land and resources department and housing department, the government can enhance the interconnection and sharing of real estate trading information and realize sharing of real estate transaction information. Every land sales contract signed by the land and resources department can be checked using this system. Moreover, the total area and amount of land sold per month can be automatically calculated. Thus, taxable income can be estimated.

### Housing Department

By connecting with the housing department, data regarding the developer’s presale house information, contract file information, and trading registration information are all shared.

### Industry and Commerce Department

The system can exchange real estate enterprises’ information about change of equity ownership and monitor the individual’s income tax.

### Public Security Department

The house rental data concerning migrating population can be exchanged and thus achieving better transparency of the real estate rental market.

Construct Accurate Tax Source Prediction Models

With a complete tax source supervision system for real estate enterprises covering the entire cycle of a project, including project kickoff, completion, and presales, and through comparing and calculating the data from relevant departments, actual presale information reports can be automatically generated, thus improving tax collection and management level in the real estate industry. The government can sort out the collected real estate companies' presale information and then track and manage it according to the project registered information provided on the website of Transparent House Sales.

- The system can:
- a) Generate reports on the total land tax predictions, auctioned land tax predictions, and non-auctioned land tax predictions based on the land conditions and its adjacent house selling price.
  - b) Predict the construction sales tax and additional tax based on the construction companies' projects starting data and completion data. The taxation personnel can then track these projects accordingly.
  - c) Generate reports for sold houses, unsold houses, tax predictions, and payment differences between projected tax and paid tax.
  - d) Enhance supervision through analysis and comparison and conduct tax assessment and focused supervision of enterprises with significant differences between predicted taxes and actual payment.

By distributing centralized tax source information collected from departments such as the housing management and land and resources department, to its respective authorities, the government can expand tax source information to real estate development and management and provide local taxation authorities with information for levying real estate enterprise business tax, corporate income tax, and housing tax. Take Hangzhou city as an example: after implementing the intelligent system, the accuracy rate of enterprise supervision surpassed 90%, at a 10% improvement from before. The enterprises' awareness of taxpaying has been improved. During the first 3 months, the government increased its real estate tax income by more than 100 million RMB per month.

Local Taxation Bureau Real Estate Tax Resource Active Management Monitoring System

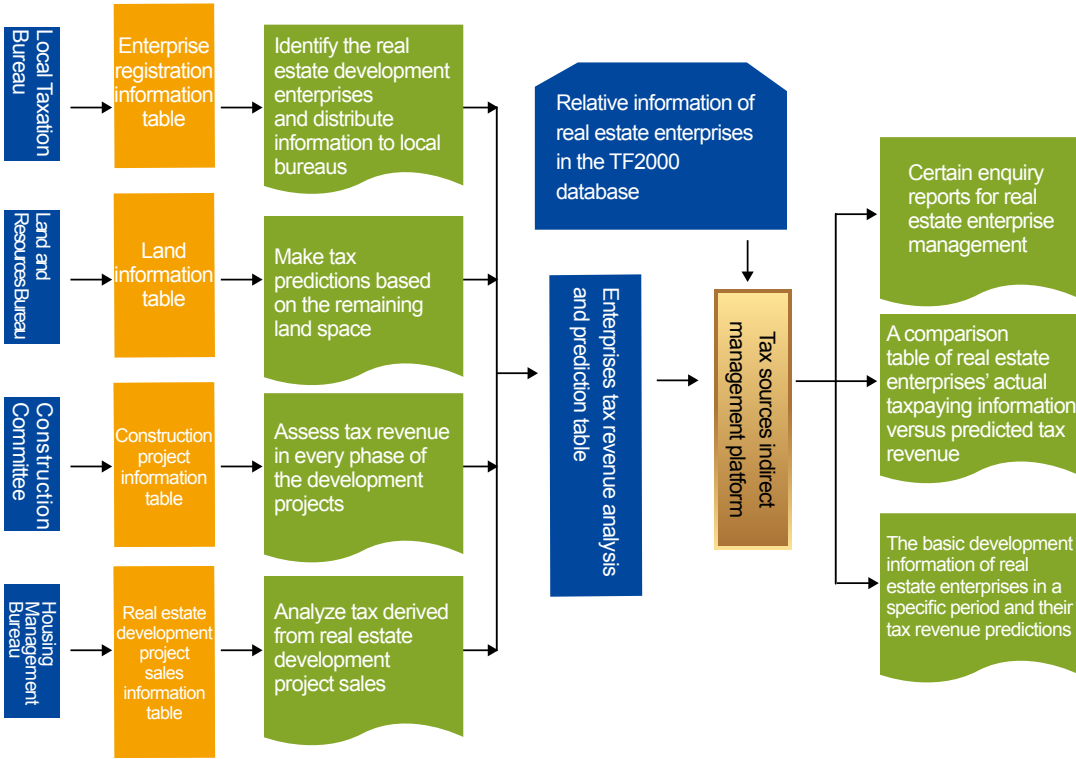


Table 5



Intelligent City-ing (5)

Intelligent Collaboration, Achieving Win-Win for Drug Safety Supervision

Using the new application model, drug safety can be effectively supervised and achieving Win-Win results for drug-related enterprises.

As drug safety is closely related to the national economy and people's livelihood, the Central Committee of the Party, the State Council and local governments have always attached great importance to drug safety. However, statistics of drug safety related incidents in China suggest that we do not yet have sufficient technology to supervise drug safety throughout its production, circulation and usage. Insigma's drug safety remote supervision platform provides supervisory departments with real-time management of a drug's comprehensive information in each process, realizing effective supervision of drug safety. The new operation model is also able to achieve social and economic benefits.

Win-Win Application Model

The drug safety remote supervision platform is designed for supervision departments and drug-related enterprises. Based on State Food and Drug Administration Regulations and industry standards, the platform supports various functions related to drug usage security, including standardization of drug basic information, production supervision, real-time remote supervision of drug circulation, real-time supervision of counterfeit and inferior drugs, sales management of prescription drugs, management of on duty licensed pharmacists, and GSP action supervision. The platform also provides standard and unified support for drug data from drug-related enterprises. The platform helps improve the management and service effectiveness of supervisory sections and changes their management model to effectively prevent drug safety incidents and reduce social costs caused by an incident, such as inspection costs, medical care costs, and compensation costs, etc. This platform is already put into use in several sub-provincial cities like Ningbo, Shenyang, Xiamen, and Hangzhou.

The government supervisory departments and drug-related enterprises are able to achieve win-win relationships under the new application model. The daily business management data of all drug-related enterprises are reported per the unified standards. As such the drug supervisory departments have significantly reduced their daily supervision costs, and resolves human resource shortage and cost issue. At the same time, their supervision level has been enhanced. Drug-related enterprises are able to solve the logistics, financial and GSP management problems, thus greatly improving the enterprise management level and production efficiency.

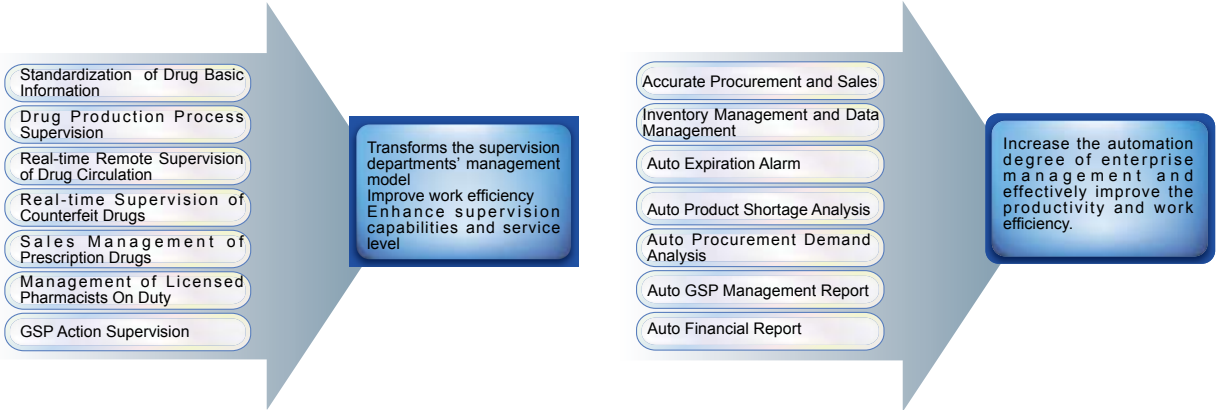


Table 6

	<div><div></div><div>Ningbo Drug Administration – Implemented this system in all 11 subordinate bureaus with real-time remote online supervision of the drug safety of the drug related enterprises, including 2103 drug dealers and 335 town level and above medical institutions</div></div>
	<div><div></div><div>Shenyang Drug Administration – Implemented this system in all 17 subordinate bureaus with real-time remote online supervision of the drug safety of the drug related enterprises, including 1500 individual drug stores, 183 drug wholesaler and 23 chain stores</div></div>
	<div><div></div><div>Xiamen Drug Administration – Implemented the pilot supervision business system in 5 subordinate bureaus, and conducted standardization and unification of drug data from drug-related enterprises in the city as well as remote supervision of drug safety of drug related enterprises</div></div>
	<div><div></div><div>Hangzhou Drug Administration – Constructed “Drug Circulation Remote Supervision System” and completed standardization and unification initiatives of the drug data as well as supervision of drug store environment temperature and humidity.</div></div>

Table 7

Innovative Construction and Operation Mode

The drug safety remote supervision system works on the internet through the effective combination of government investment, public (drug-related enterprises) participation, and social supervision. It is featured as a service with reasonable investment, quick construction, and convenient application. Based on the unified data center and information sharing mechanism of supervisory departments, the system can be hosted on servers and accessed through the internet. Drug-related enterprises only need to install the user program on their PCs and communicate directly with the supervisory departments through the online service platform. All supervisory departments and drug-related enterprises in the drug safety remote supervision system can also be supervised by the public.

About Insigma

Insigma Technology (Shanghai Stock Exchange 600797), is one of the top IT service providers in China with strong back up by Zhejiang University, one of the top three destinations for computer science in China. With more than 4,000 staff and over 500 billion RMB in revenue, Insigma ranks in the forefront among Top 100 Chinese software companies and No. 2 among Top 25 Chinese companies in software outsourcing businesses. Headquartered in Hangzhou, China, Insigma has operations in 31 cities globally including Hangzhou, Beijing, Shanghai, Tokyo and New York.

For years, Insigma is committed to providing various collaborative services for urban information construction and has become a leading IT solution provider in the areas of e-government, social security, citizen card, digital city management, city information resource directory and exchange system, and intelligent transportation systems etc. By integrating the advanced information technologies and advanced city management concepts, Insigma aims to provide the city managers with:

- Safe, convenient, efficient and green intelligent city planning and systematic solutions;
- Intelligent, efficient and flexible decision-making support systems and public management approaches;
- Innovative applications and operation model for convenient, efficient and flexible public services.





## A Harmonious Way To An Intelligent City

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