

# An Integrated Information Service Platform for Managing Urban District

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## Abstract

We study on an integrated information service platform for the urban district by considering the requirements in urban informationization construction. The integrated service management system can be used to expand urban core service functions and urban auxiliary service system, as such to form an integrative service alliance. Taking Shanghai Hongqiao District as an example, we design its integrated information service platform. Through the platform, we can realize the effective reconfiguration and real-time sharing of the information resources, offer information services and application windows for government, enterprises, community and the public.

**Keywords:** Urban informationization, Urban district, Integrated service, Service alliance.

## 1. Introduction

Economic globalization fastens the speed of urban internationalization, so improving urban international competitiveness is becoming the key of the next round of development. The urban informationization construction is significant to healthy. And, as the core of “digital city”, it is being carried on all over the world [1]. Many cities have made a breakthrough in construction of fundamental information facilities, exploitation of information resources, application of information technology and so on [2-4]. Considering that the whole services of the city are distributed, using system integration technology and strategy to construct urban informationization is significant to reconfigure the existing information resources and realize the effective sharing in services [5,6].

However, the study on the integrated information service platform for the urban district is just beginning. The existing information service platforms are developed and realized only for several applications [7].

In this paper, we study on the integrated information service platform for the urban district by considering the requirements in constructing urban

informationization. We take Shanghai Hongqiao District as an example to design the integrated information service platform. Through the platform, we can realize the effective reconfiguration and real-time sharing of the information resources, offer information services and application windows for government, enterprises, community and the public.

## 2. Integrated Service Management System

To strengthen the serving ability of the city, it is necessary for us to build an urban integrated service management system. The system can be used to expand urban core service functions, and improve urban auxiliary service system, as such form an integrative service alliance, as shown in Fig. 1.

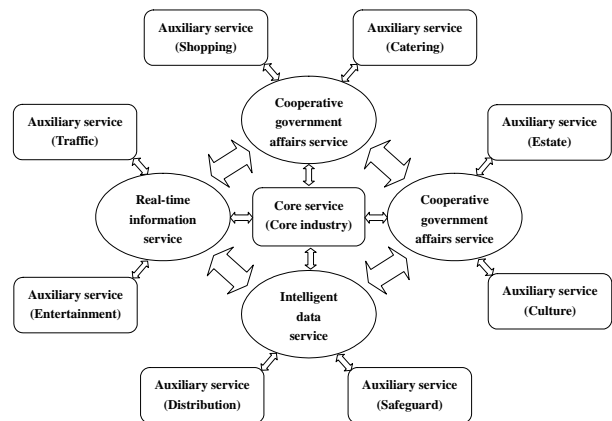


Fig. 1: Integrated service management system.

### 2.1. Real-time information service

Real-Time Information Service can reflect in time what the city is happening. It supports convenient information input and timely information issuing. Through browsing all kinds of dynamic information, government, enterprises or individuals can obtain real-time traffic information, environmental quality

evaluation, etc. Furthermore, it supports mutual information services.

## 2.2. Intelligent data service

Intelligent Data Service equals to offer a data warehouse storing various data, which can be original data without processing, or statistic data, analytic data after data mining. So it can not only realize simple information query, but also offer abundant background information to help government, enterprises or individuals make decision. It supports open intelligent terminals, such as touch-sensitive screen, mobile phone, PDA, etc.

## 2.3. Cooperative government affairs service

As the developmental orientation of future electronic government affairs, Cooperative Government Affairs Service can lessen the foreign reception burden and improve the whole working efficiency. After enterprises or individuals fill in an electronic table and hand in, it can distribute the table to relevant departments to deal with cooperatively, and then sign the corresponding certificate. To encourage foreign enterprises to invest in China, “foreign green channel” can be added to the coordinated government affairs service. Besides offering multi-language, multi-currency, and full-deputy service, it can fasten the speed of handling by simplifying relevant procedure.

## 2.4. Joint business affairs service

The high-speed information exchange is both the urgent demand of enterprises’ sustainable development and the necessary means to strengthen the regional core competitiveness of the city. Joint Business Affairs Service offers a kind of universal interface to connect the information systems of various enterprises. Through the interface, enterprises can not only issue their own commercial information, but also read others’ demand-supply information to seek the chance of cooperation with each other. At the same time, government can obtain detailed market information, thereby make the right judgment on the rationality of urban industrial structure, and make the timely, reasonable decision to adjust urban industrial pattern.

## 3. Application to Shanghai Hongqiao District

Based on the integrated service management system of the urban district in Fig. 1., we design an integrative information service platform for Shanghai Hongqiao

District, as shown in Fig. 2.. The platform is composed of core service platform and auxiliary service platform. The core service platform serves urban core economic industry chain, while the auxiliary service platform surround the core service, offer all-directional auxiliary service. The construction of the integrative service platform adopts Web Service technology, encapsulates application in the form of service and release, offers government, enterprises or individual to transfer, thereby reaches the maximization of resource efficiency.



Fig. 2: Integrative service platform.

## 3.1. Core service platform

A city or a district must ensure its regional competitiveness by developing core economic industry chain energetically. Foreign trade and convention and exhibition industry are core industries in Hongqiao District. Through effective resource combination, it can provide full information support, technology support, and environment support for enterprises’ cooperation and high-speed, sustainable development.

### 3.1.1 Business

Based on such information technology as electronic data exchange, electronic commerce, electronic finance, etc., we can build an electronic central business district (E-CBD) composed of entity business and virtual business for Hongqiao District.

(1) **Joint business platform.** Government associates with enterprises to build the platform. Through the platform, enterprises can issue or broadcast their demand-supply information to select the best collaborator, while government can reconfigure enterprises’ resources and harmonize enterprises’ business behavior.

(2) **Enterprise informationization common platform.** For informationization demand of small enterprises, it offers little-investing, low-cost information service to reduce informationization cost of small enterprises effectively.

(3) **Enterprise innovation risk system.** On one hand, it protects enterprises’ innovation product and

encourages enterprises to throw themselves into innovation. On the other hand, it helps enterprises attract investment and transform innovation product into real profit.

**(4) International business information service system.** In line with international practice, it offers timely and detailed international business information to improve operation efficiency of foreign trade.

### 3.1.2 Convention and exhibition

By powerful informationization tools, we can create high-grade convention and exhibition environment, offer high-quality convention and exhibition service, and build an international convention and exhibition brand of Hongqiao District.

**(1) Convention and exhibition service platform.** Combining with the feature of Hongqiao District, we organize the sales promotion of convention and exhibition industry, namely make all convention & exhibition elements an integrated superiority to propagandize and popularize.

**(2) Virtual convention and exhibition system.** It uses virtual reality technology to display the whole exhibition from lighting design to exhibits display through Internet. As an effective complement, it can provide all-weather service for bargaining between exhibitors and audience to break through the restriction of time and zone. In case of sudden events, it can show special application value with features as high-efficiency and agility. For instance, during SARS spreading period, virtual convention & exhibition can realize normal business affairs without direct contact.

**(3) Convention & exhibition joint transaction system.** Support cross cooperation of multi-exhibition and different exhibition center, support communication of real-time and multimedia information. Through holding a synchronous exhibition in different places, we can enlarge the influence, promote the standard, and build an international convention & exhibition brand.

**(4) Long-distance identification system.** Utilizing Radio Frequency Identification (RFID) technology, we can offer long-distance identification to avoid crowd caused by traditional ticket-buying and queuing to entrance. And through registering information of each exhibitor, we can not only make analysis and statistics to firmly seize the market demands of convention & exhibition, but also improve the security factor of convention & exhibition.

## 3.2. Auxiliary service platform

In order to develop the potential of foreign trade, convention & exhibition industry in Hongqiao District, and to strengthen service function of core service

platform, we should reconfigure the resources, such as traffic, safeguard, estate, catering, entertainment, into auxiliary service platform, and establish an integrative service alliance. Integrative business and convention & exhibition services can improve the quality of service, optimize the function of service, thereby further expand business and convention & exhibition function of Shanghai Hongqiao District.

### 3.2.1 Intelligent transportation

Using intelligent technology and space technology, we implement an intelligent transportation system (ITS) to guarantee vehicles run smoothly in Shanghai Hongqiao District. ITS chooses passenger-vehicle-road coordination as a cut-in point to offer a safe, smooth, and low-pollution transportation environment and a high-quality transportation service.

**(1) Transportation information service system.** It offers the public complete transportation information for going out, such as real-time road conditions, electronic station board, and electronic map. According to real-time road conditions, drivers can choose the best route, while passengers can make the best going-out plan.

**(2) Intelligent transportation dispatch system.** It is used by transportation supervision department to monitor running conditions of road network in real time, confirm “dark-point of accident”, “mess-point of order”, and “blocked-point of traffic”, and take corresponding measures, such as signal control, road restriction, inductive information issuance, accident handling and rescues, and so on.

**(3) Electronic inductive parking system.** Setting up electronic inductive parking system can reduce additional traffic in Hongqiao District caused by parking difficulty. Relevant statistics show that the utilization ratio of the parking stall in the public garages, which have added electronic inductive parking system, rises by 15% equally. Finally, electronic inductive parking system will build a unified data gathering, handling, and issuance platform.

### 3.2.2 Safeguard digitization

We can utilize advanced technology to offer a safe, reassurance working and living environment, and ensure the security of people’s life and property.

**(1) Green guard system.** It is a distributed monitoring system that made up of a monitor center and several monitor nodes. Each monitor node equips with several sensing devices and warning devices against theft, fire, gas, and a help button.

**(2) Individual security protection system.** Individual emergency instrument, which adopts GPS

technology, can help people solve all kinds of dangerous situation whenever and wherever possible.

**(3) Against vehicle robbery and theft system.**

When the vehicle is stolen or robbed, the alarm in the vehicle can be activated and send out an alarm in time. According to the general strategy “prevent, alarm, pursue, and intercept”, police will make different measures.

### 3.2.3 Top-grade residence

In order to develop the superiority industry of Hongqiao District, we must construct top-grade residence. Through disposing advanced public service facilities, establishing perfect community service system, offering intelligent community service, we can guarantee people at home and abroad who live in Hongqiao District a healthy, beautiful, comfortable living environment.

**(1) Intelligent community information service system.** Sit at home, click the mouse, and then enjoy rich and colorful community information service, such as online shopping, online entertainment, online medical treatment, commonweal information including traffic, weather, etc.

**(2) Intelligent estate management service system.** Realize automatically payment such expenses as water, electricity, gas, VOD order programme, parking lots management, etc. Offer online booking service of installing, repairing, and refitting house equipment.

**(3) Intelligent house security monitoring system.** Telemonitor and supervise all household electric equipment through computer, cell-phone or PDA, etc. Intelligent warning devices against theft, fire, gas can automatically alarm in case of emergency.

### 3.2.4 Hotel, catering, entertainment integration

Through integrative service platform, we can integrate such auxiliary service as hotel, catering, entertainment, etc., and strengthen the consciousness of commercial alliance, and offer integrative business and convention & exhibition services function of Hongqiao District. In fact, while improving the serving ability of the core service, the serving ability of the auxiliary service can be improved to the same extent; while developing foreign trade, convention & exhibition industry, hotel, catering, entertainment industry can grow even vigorously under the driving of the core industry. So through integrating services and setting up integrative service alliance, we can really form the situations of “two-win”, “multi-win”.

## 4. Conclusions

Urban informationization is the important behavior of urban internationalization. It should follow the principle “Aiming at features, Standing out superiority, Combining resources, Integrating services”. Namely, surrounding core industry, we should reconfigure regional resources, integrate relevant services, and build an information integrated service platform. The platform is used to form the service alliance and offer integrative service. Through integrating services, under the driving of core industry, we can promote urban economy develop forward steadily by improving service quality and optimizing service functions.

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## References

- [1] J. P. Firmeza and F. Fontes, Aveiro digital city: A case study for a multi-services community network, *Journal of the Institution of British Telecommunications Engineers*, 2000, 1(3): 153-158.
- [2] P. R. Devadoss, S. L. Pan, and J. C. Huang, Structural analysis of e-government initiatives: A case study of SCO, *Decision Support Systems*, 2003, 34(3): 253-269.
- [3] Y. Takada, M. Kishimoto, N. Kawamura, N. Komoda, H. Oiso, T. Yamasaki, and T. Masanari, An information service system using Bluetooth in an exhibition hall, *Annales des Telecommunications/Annals of Telecommunications*, 2003, 58(3-4): 507-530.
- [4] D.A. Roozmond, Using intelligent agents for pro-active, real-time urban intersection control, *European Journal of Operational Research*, 2001, 131(2): 293-301.
- [5] K. Sakamura and N. Koshizuka, The eTRON wide-district distributed-system architecture for e-commerce, *IEEE Micro*, 2001, 21(6): 7-12.
- [6] Y. Sano, S. Furukawa, F. Takamura, and K. Yamane, Travel-time measuring system for efficient traffic information service, *Hitachi Review*, 2000, 49(3).
- [7] F. A. Rabhi and B. Benatallah, An integrated service architecture for managing capital market systems, *IEEE Network*, 2002, 16(1): 15-19.