An Implementation Framework for Municipal “Internet + Government Service”

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Abstract. The way to promote "Internet + government services" is to build an Internet-based e-government service platform, which can overcome the encountered bottlenecks, such as heterogeneous system, data barriers and standards are not unified. In view of the above situation, the objective of this paper is to propose an implementation framework for municipal e-government service platform to provide services in a model based on unified standards, unified access and scheduling, unified data sharing and unified identity authentication. The framework consists of user layer, application layer, service support layer, resource layer and infrastructure layer. As a national "Internet + government service" demonstration project, the framework is being implemented in Foshan city.

1. Introduction

In the developed countries, e-government has experienced three stages: sector type, integrated type and platform type [1, 2]. After years of development, many Chinese cities have already had the necessary conditions of constructing the E-government service platform based on internet [3, 4]. But because of historical reasons, they commonly encountered technology and service bottlenecks in the process of promoting this construction, such as heterogeneous system, data barriers and standards are not unified [5-8], etc. Po-Ling Sun et al. proposed a technical framework for E-Government 2.0 based on stakeholder-oriented [9]. We present an implementation framework for municipal e-government service platform on improving service-ability-oriented.

2. Framework Technology

For platform framework planning and design, the first thing is to choice the framework technology that will be employed. The framework proposed in this paper is based on SOA and Web service Technology.

2.1. SOA

Service-Oriented Architecture (SOA) is coarse-grained and loosely coupled service architecture thinking [10]. It has the characteristics of loose coupling, flexible support for business process reengineering, and extensive application standard. Its services communicate by simple and accurate defined interface and not related to the underlying programming interface and communication model. For the construction through the interface to achieve business interoperability between systems and integration of the E-government service platform based on Internet, SOA is an ideal architecture mode.

2.2. Web Service

Web Service is currently the most suitable implementation of SOA based architecture technology. According to W3C definition, Web Service based on XML technology. It provides a unified interface encapsulation method to make the application system without depending on the specific system running platform. For a distributed application system, Web service technology makes it easy to develop and deploy and has good interoperability and integration, while reducing the complexity of the system. These features make it particularly suitable for the application environment of
government services, which has a huge amount of users, a wide range of services and heterogeneous systems.

3. Framework Composition Analysis

The organizational structure of the municipal government and the characteristics of the government service determine that the framework consists of the following functional part: the government service portal, the government service management Platform, all levels of service processing system and the government service data resource center. The info flow between the components is shown in Fig. 1. As the interface between the government and the public, the government service portal is to achieve a unified display and release of government service information, receive and send user application info to the e-government service management platform. To login in this portal, the applicant can get the info of their application process and processing results. The main roles of the government service management platform are to send the application information that comes from the government service portal to government service data resource center, inform the relevant service processing system to read the user application information from government service data resource center and send the result of processing to the government service portal. All levels of service processing system processes the application information that read from government service data resource center, then return the results to government service data resource center, and notify government service management platform at the same time. The government service data resource center brings together data of population, legal person, electronic license and other basic data, as well as the information that come from government service Portal, government service management platform and service processing system.

4. Service Process Analysis

The government service processes based on the above platform composition is shown in Fig. 2. The internet government services portal achieves functions, such as user registration, user space information maintenance, government service location, service guidance, appointment, service process management, feedback and interactive consulting. Application acceptance, service scheduling, service process and result processing are achieved in government service management platform. Service processing systems pull the data of application from the government service data resource center, and return the data of service process and result after processing. All of the government services processes rely on the support of Government Service Data Resource Center.

![Figure 1. Info flow between the components.](image)
5. Framework Design

5.1 Technical framework

The traditional e-government platform includes application layer, platform layer and infrastructure layer logically. The E-government service platform based on internet requires layers of the user service layer, application layer, service support layer, resource layer and infrastructure layer, and consists of government service portal, government service management platform, government service support platform, data resource pool, data sharing and exchange platform, e-government cloud platform. Its technical framework is shown in Fig. 3.
5.2 Government service portal

Government service portal is a unified information portal of government services under Internet environment. It implements the following functions:

(1) Multi-channel Access. The applicant can access the government services portal through PC, mobile APP, self-service terminals and WeChat platform.

(2) User registration. Before conducting an online service, the applicant must first register as an individual user of government service portal. The registration should fill in the applicant's personal identity information, and online or on-site personal identification.

(3) Information service. The government service portal releases the government services items, service guide and other information to user through above channels. And according to the results of big data mining of user behavior habits, push information that users pay attention to.

(4) Accept the application. As the only online entrance, The Government service portal provides application services for the applicant. The detail operations include: invoking forms and reference materials that are ready in "my space"; applying electronic license information; submitting application and its associated materials; informing the application number; providing SMS, mobile terminals and other ways to remind; examining the application materials according to the standard of items; feeding the result to applicant; selecting the starting point of the scheduling process for the application according to different strategies; writing the data of application into to-do database; pushing the process and result information to the applicant's personal space; providing guidance services, etc.

(5) Appointment service. After log on, user can make an appointment by the PC or the mobile APP, the appointment content includes: the window, dates and time periods, etc. After the appointment is successful, the user can view the queue through SMS or mobile APP.

(6) View the information of the application progress. After the completion of the application, the user can view the service process and the results through the above channels.

(7) Supervision and evaluation. After the user logs in the government service portal, the service evaluation can be carried out through the above channels. One IP or account can evaluate once. The evaluation uses quantitative indicators.

(8) User space. In user's space, user can subscribe information, track application progress, view feedback information, manage electronic licenses, and call related form template and retrieval information.

(9) User assistance. User assistance achieves training, consulting and guidance function.

5.3 Government Service Management Platform

(1) Administrative items management. To sort out the administrative items on the principle of unified standard, effective, easy to apply and dynamic management, and standardize management and release of all government service guidelines, elements, application materials, processes and results.

(2) Electronic license management. To achieve directory management, implementation management, supervision and inspection, security management and license management, provide an interface for the use of electronic licenses, and interconnect with the higher-level electronic license management system.

(3) Running management. This function module is for the entities at all levels of the Office of the window staff, applications handling staff and management staff, and implements the management of online reservation, admissibility, review, approval, charging, material transfer, evaluation supervision and so on.

(4) Monitoring and performance management. It implements the online monitoring of the entire process. Features include monitoring rule settings, running monitoring, complaint handling, performance evaluation, statistical analysis and monitoring log.

(5) Resource management. The function of resource management is to manage the resources of the government service resource pool, such as natural person database, juristic person database, items standard database, service processing database, shared databases, resource catalog, process template and electronic form template.
(6) Operation and maintenance management. Operation and maintenance management provide support services for all of the e-government systems.

(7) Service scheduling. In view of the government service processing involved in different levels of different management system, the service scheduling system plays the role of information exchange between the government service portal, the government service management platform and the data resource pool.

(8) Big data service system. Relying on government cloud computing platform, the construction of big data technology service system for the various departments of large data applications to provide technical and resource support to meet the government fine social management, personalized government services, scientific decision support, data open, information disclosure and other needs.

5.4 Government service support platform

The government service support platform includes identity authentication, electronic seal, workflow, electronic form and other general component services, as well as payment platform, logistics platform, SMS platform and other third-party service support. In order to fully and accurately monitor the process and results of the government service processing, the government service support platform set a unified service number for each service application, timestamp service, to ensure that the service number of each application comes from the unified numbering system, and verify the integrity of data collection, effectiveness by the time stamp of all process nodes.

5.5 Data exchange and sharing platform

The data exchange and sharing platform establishes the channel between the information demand side and the information provider, and realizes the sharing and exchanging of the government information. On the one hand, the information provider pushes the shared information to the information sharing area, and provides the information demand side with the shared information through the shared directory service and the shared directory management. On the other hand, the information demand side makes an information exchange request through the information exchange area, the request is transmitted to the information provider and, upon examination and approval, the information provider extracts the information to the information exchange area. The data exchange and sharing platform also to assume the exchange of data between government cloud computing platform and data resource pool, data resource pool and government services application.

Data exchange performance should meet the specific requirements: to adapt to a variety of hardware and OS platform; Internet-related standard protocol and standard interface; to ensure the transmission of data on the public channel security; and database loosely coupled; high-performance data replication technology to achieve or close to 100,000 data per minute.

5.6 Infrastructure

Infrastructure, including the network, servers, security equipment and other hardware and software infrastructure, government service platform priority to rely on government cloud platform for intensive deployment. On the network side, the handling, supervision and management of government services, in principle, relies on the e-government network, and the consultation, appointment, application, reception and feedback of government services depend on the public Internet.

6. Conclusions

In view of many technical and business bottlenecks that cities have encountered in the construction of promoting the "Internet + government services". This paper presents an "Internet + government service" implementation framework, which consists of user layer, application layer, service support layer, resource layer and infrastructure layer. On the basis of consideration of the balance of advanced technology, cost and efficiency, this framework gives an effective solution to the construction of municipal Internet plus government service. As a national Internet plus government service demonstration project, the framework is being implemented in Foshan city.
7. References


