Metadata-Based Urban Information Management Design

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Abstract—The metadata information of city and thematic modules applied to the study of information system, on the basis of running information on city, according to the actual needs of the city, establishing the thematic application exhibition, providing statistics and analysis of the data, and exploring a new Urban Information Management system, achieving management standardization of city, refinement and timely.

Index Terms—Information management of city, metadata-based, running information of city.

I. INTRODUCTION

With the rapidly expanding city size and the development of information technology, the traditional document management, artificial notification and delayed feedback has been unable to meet the increasingly urgent urban operation and management needs. Timely, accurate, scientific, moderate understanding of the dynamic of the city to run and analyze the regulation, has become the hot spot of the current information.

Most city-management is still relatively vague, researchers have put forward the idea of information technology on city management. For instance, Cheng Jicheng in [1] mentioned that the informatization of city needs further development and use. Cheng Wenbin digitized city community service platform design and implementation in [2], etc. However, most of the study of management focus on the lack of access to information and circulation , another hot topic is online services and improved methods as mentioned in [3], while less with this aspect of the monitoring and analysis of the actual operation, the integrated municipal management of metadata.

This article designs an urban information management system, based on the metadata of infrastructure, proposing a way of the rational use of city-running metadata architecture and of information technology to improve the quality of management as in [4] and make the management of city standardized, refined and timely.

II. DEMAND ANALYSIS

The use case diagram of administrative-approval data analysis system, economic data analysis system as well as the characteristics of the city information in Fig. 1 shows that the management system needs to meet the following requirements:
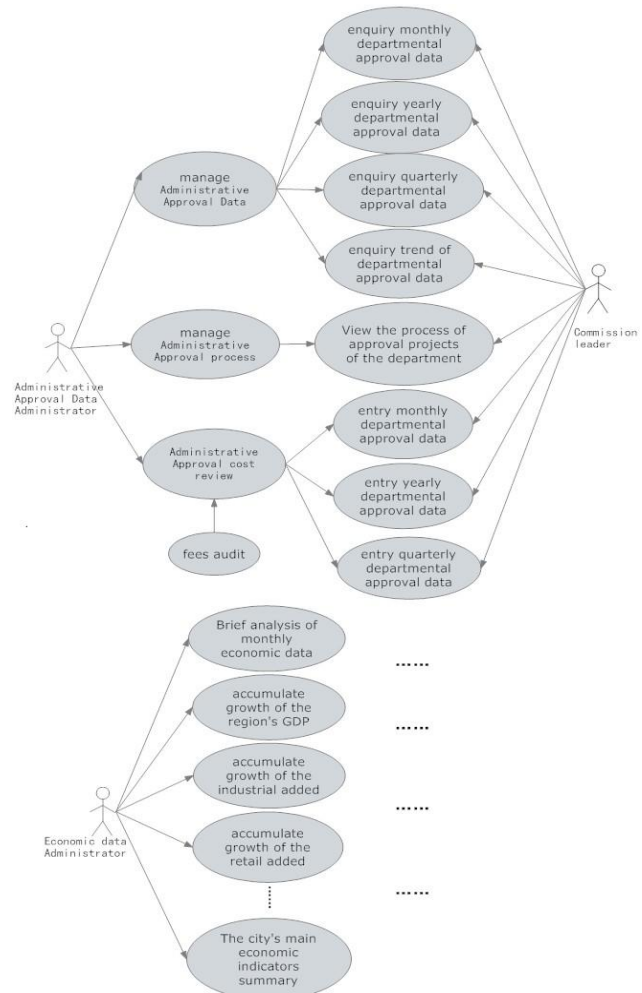
Fig. 1. Administrative approval/economic analysis system use case diagram.

A. Reliable Information

monitoring and management of city-running basic data (water, electricity, gas, heat, road, etc.) as the basis of the data analysis.

B. Specific Role

A wide audience of municipal information need to be specifically access control, and need to determine sources units of data and where the information goes under specific permissions.

C. Flexible Process

According to the needs of administrative approval service, the user can self-track information, surveys and display.

D. Integrated Information

Various business units focus fragmented information but cross-cutting as mentioned in [5], needs to include all the monitoring and thematic in the system, and go through comprehensive data investigation and analysis.

E. Information Presentation

Establishing the urban running monitoring portal, and the corresponding information part, publishing the city's information in the system.

F. Analysis and Monitoring

Based on the running basic data of city, combined with the industrial economic statistics module for network monitoring, providing a long-term stable and dynamic economic operation monitoring platform.

G. Prospective Guide

On the basis of the economic operation monitoring, understanding the dynamics and trends of the key enterprises in economic development, and improving the prospectiveness and effectiveness of the operational work.

H. Scalability

Provide the processing interface to meet future expansion needs.

III. SYSTEM ARCHITECTURE

Collecting the flow of data in order to meet the system requirements, the application uses a layered architecture of object-oriented design as shown in Fig. 2. The system consists of a presentation layer, business logic layer, and a data layer as well. And in order to improve the maintainability, each layer is divided by smaller level of the public assembly.
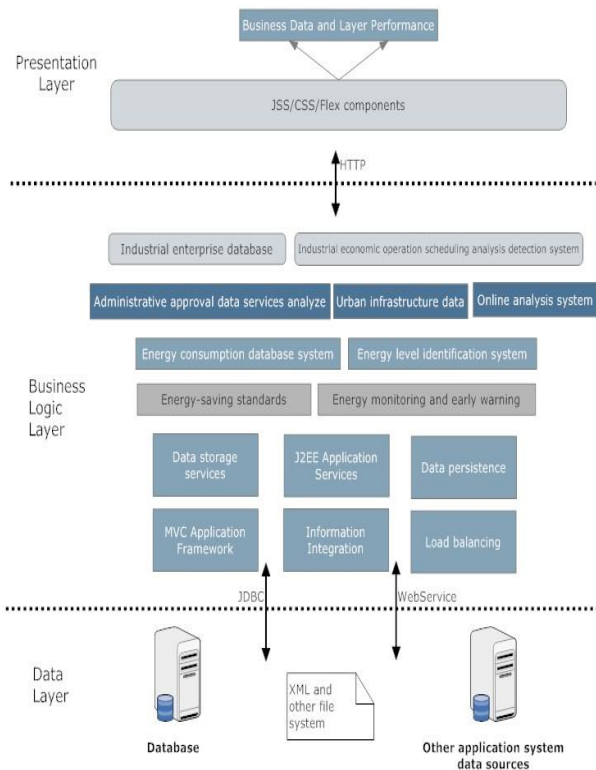

Fig. 2. System layered design.

Based on hierarchical design, the system firstly defined urban running information as signs standard, to determine the elements affecting the operation, such as the industrial economic operation, statistics, prices, environmental protection, public security, municipal and administrative

examination and approval service indicators mentioned in [6] and [7]. Based on external data and share information, establishing the exchange flow, monitoring the log, from the relevant departments to collect the unit acquisition signs of the underlying data and metadata management platform, and real-time acquisition of dynamic data, establishing the authority effective real-time updates center designed in [8].

According to the needs of the per-system data, system forms various modules of every specific system which called thematic data centers. Based on huge thematic data, the urban running monitoring system can monitor the operation and municipal management applications.

After summrizing the running monitoring data given by system, based on urban infrastructure, industrial economic operation, the administrative approval service statistics, running monitoring thematic applications, the system gives analysis and feedback as mentioned in [9]. The thematic application released in the flow of information portal to provide monitoring data and dynamic queries, to form data statistics and guide information. Urban information management system designed and built based on the overall structure shown in Fig. 3.
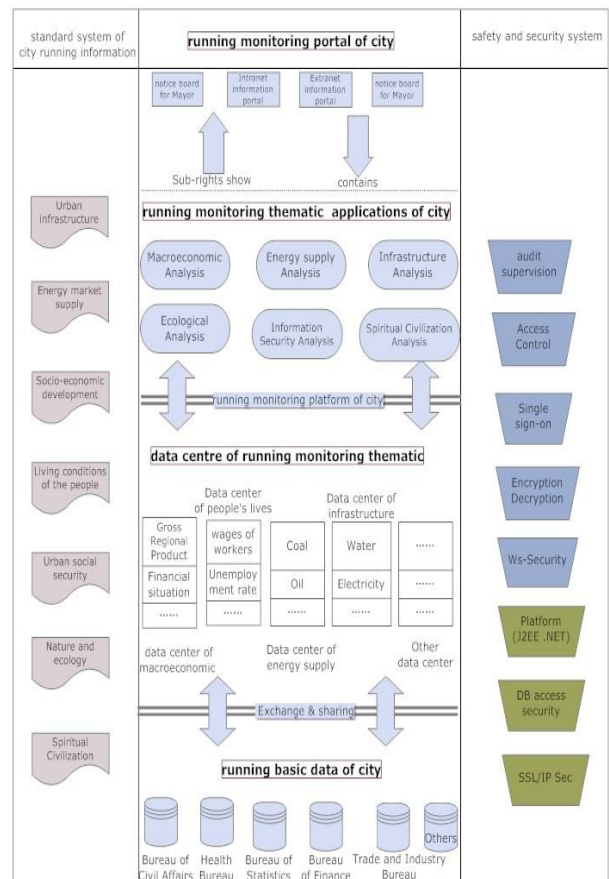

Fig. 3. System function charts.

IV. CONCLUSION

This article designs a basic model to support the monitoring of information on city-informatization, builds an urban information management system based on the information metadata, and gives a concrete realization of the program. The establishment of the system provides an effective solution for the city-running dynamic monitoring and for the efficient processing of municipal work, exploring

the urban information management seriously according to [10].

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