The Sharing Telecommunication Information Resources Management System Based on B/S Model and GIS

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Abstract

In order to reduce the repeated construction between telecom operators and telecom facilities, improve the utilization rate of telecom infrastructure, the use efficiency of earth, the sources of energy and the consumption of raw materials, the protection of the natural environment and landscape, promote the sharing of telecom infrastructure. With the current telecom information highly integrated conditions, considering the current business models and business processes, establish centralized telecom infrastructure information platform, to strengthen the integration of resources monitoring and performance evaluation. On the analysis of the current situation and existing problems of domestic industry on the basis of this unit, combining with the management requirements, research and design based on B/S model and WebGIS the co-construction and sharing of information management system, this paper first demand analysis in this system, on the basis of the detailed design of the system are presented. The scheme is mainly includes: information release platform, basic information recorded: "base stations, utility, tower, computer room, room points, piping, rod way, transmission lines and stations nets" as the foundation object management, data query and statistics, the economic comparison, assessment rating, log monitoring, telecom infrastructure geographic information system (GIS) and other modules. The business management system will daily management works in network platform, solving day-to-day business management problems. Improve business processing efficiency, to change the current business processing mode, improving the business management level.

Keywords: telecommunications facilities, management information system, based on WEB telecom infrastructure, geographic information system (GIS)

1. Introduction

In order to reduce the repeated construction between telecom operators and telecom facilities, improve the utilization rate of telecom infrastructure, the use efficiency of earth, the sources of energy and the consumption of raw materials, the protection of the natural environment and landscape, promote the sharing of telecom infrastructure. With the current telecommunication information highly integrated conditions, considering the current business models and business processes, establishing centralized telecom infrastructure information platform,to strength the integration of resources monitoring and performance evaluation. The relation is the principle between the telecom sharing operators. The price should be based on the cost, some additional income, and the building fee should be charged for cost allocation. At the same time,the sharing operator management has formulated strict performance evaluation and implementation of security measures, in order to standardize the management, to avoid repeated construction.

The paper which utilizes Chongqing Mobile as an object of study, via a combination of theory and Practice, analyses the co-construction and sharing process of telecom infrastructure, especially the strategies and challenges existing under the present 3G development process. [1]

The papers introduce typical co-construction and sharing experiences in foreign countries, which will serve as a reference for the study [2] [3].

The papers give an illustration of co-construction and sharing progress started so far in some local cities or provinces, since the start of China's co-construction and sharing process. [3] [4].

2. The Concept
The demanded relational of the telecom infrastructures

2.1. Basic Telecommunications Facilities
The project is cover base station, the Eiffel-tower, engine-room, room-oints, piping, rod, transmission lines, local nets as the foundation object and a number of related objects mix into a node. Respectively starting construction and sharing process of which were divided into telecom and other operators launched.

The base station refers to the BTS and transmission equipment. It is covered scene, base station and affiliated stem road.

It refers to the base station Eiffel Tower, such as tower mast classification, tower mast concrete types, tower mast height (M).

Computer room refers to the base station subsidiary information: room types and the engine room area.

Stem road refers to the transmission rod road (km) like mileage (km) circuit and the rod of the road. Here does not contain C nets base station of subsidiary stem road.

Pipe refers to the transmission line (km), line and the remaining triangular aperture count tube. Here does not contain C nets base station pipeline subsidiary of pipe.

2.2 The Basic Business Process
2.2.1. The Process of Telecom Sharing
A telecom operator sends sharing files wherther share their telecom facilities to another telecom operator. other operator reply the files, if it agree to share their telecom infrastructure, they sign a cooperation agreement, then Determine schedule and start construcion of facilities (Figure 1).
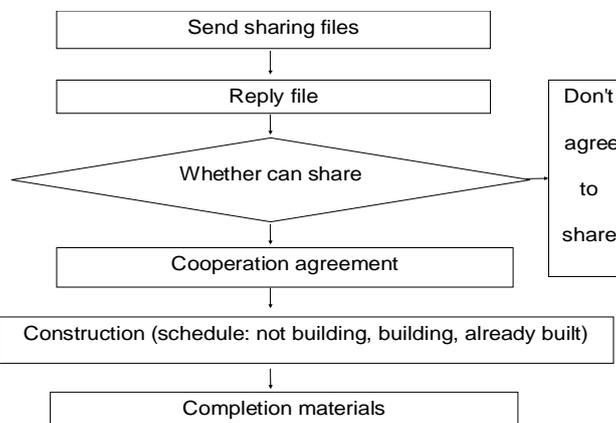

Figure 1. The Main Telecom Operator Request other Operator to Share Telecom Infrastructure

2.2.2. The Process of other Operators Sharing
A telecom operator recieves sharing files wherther share their telecom facilities to another telecom operator. Other operator reply the files, if it agree to share their telecom infrastructure, they signe a cooperation agreement, then Determine schedule and start construcion of facilities (Figure 2).
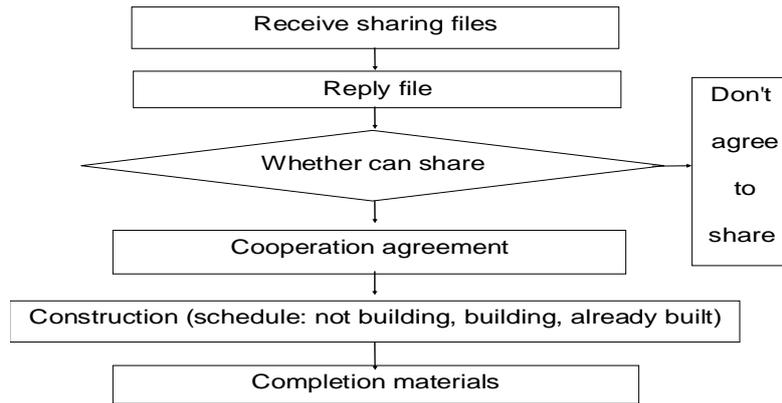
Figure 2. The Other Telecom Operator Request Main Operator to Share Telecom Infrastructure

3. Methodolgy and Design

Based on the above all associated carrier about telecommunication infrastructures sharing demand, it will make the following system design. The system includes the base station resource input query, transfer resource input query, the telecommunication infrastructure of geographic information system (GIS) based on the information management module, the co-construction and sharing of data statistics, economic comparison, the evaluation based query and statistical module, to access control, system locking, notification function module of system management. The Telecommunication Information Resources Sharing Management System module structure is as Figure 3.
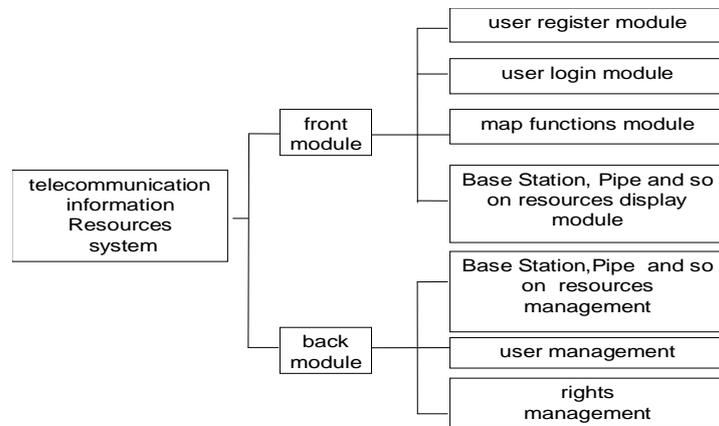

Figure 3. The Telecommunication Information Resources Sharing Management System Module Structure

3.1. Foundation Information Management
3.1.1. Basic Information Recorded and Inquiry

This system mainly contains nine class infrastructures: base station, the utility, the Eiffel Tower, the engine room, room points, piping, transmission lines, and local nets.

3.1.2. The Main Features Include

Support inquires the basic information, picture information resources and document information, to check and can participate in sharing resources, associated with the related agreement of contract information.
   a.   Support the single point entry and batch import.
   b.   Provides basic information resources of the single point of entry interface.

c.   Provides basic information resources of batch import interface and the download.
d.   Support the search results derived Excel.
e.   The results provide all inquires Excel output function.
f.   The results of the field support inquires choose the display.
g.   For the choice of the query field.

3.2. The Base Station and so on Resources Management

The query is in build and already built base station information, including a base station associated with the pipeline, the transmission, equipment, power supply, the computer room, ownership of property, the Eiffel Tower, the base station location name, GPS information, use (other operators for what the network, multiple choice). The query is in build and already built the room information. The basic information query conditions: for example the city of Nanchang, build/sharing.

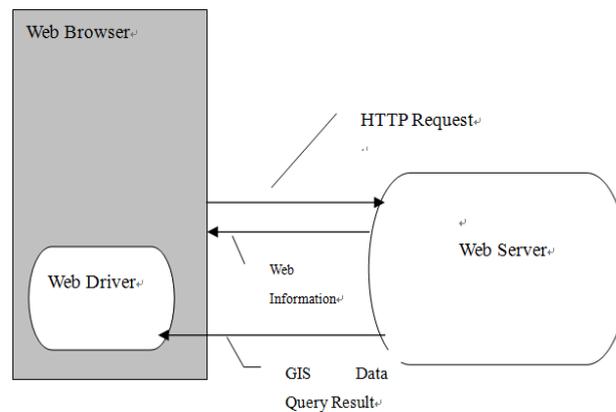The system architecture Based on B/S model and GIS is as Figure 4.

Figure 4. The System Architecture Based on B/S Model and GIS

4. Results
4.1. Application of Geographic Information

Figure 5. Show the Base Station's Position and its Number on the Map

Based on the WEBGIS map shared purpose is to realize the distributed map data sharing, realize the scientific infrastructure map data storage and management, infrastructure map data dissemination and browse two main function [5]. The system should provide the services map browsing operations, such as amplification, narrow, translation and other basic GIS operation [6].

a. Functions such as map viewing, map panning, map scaling, map types switching and the overview map.
b. Marking the kinds of telecommunication information resources' position on the map and filling its information in the information window, as shown in Figure 5 and Figure 6.
c. Displaying the positions and information of the kinds of telecommunication information resources marked, as shown in Figure 7.

Figure 6.   Show the Base Station's Position and its Name and other Information on the Map Results and Analysis

Figure 7. Mark the Position and other Information of Base Station on the Map

a. Data organization: the correct map sharing system of organization data source, require the data organization means to be able to provide the data and the position of the rapid inquires function.
b. Data upload: take the data transmission technology to the map of the distributed data source, unified upload to specified map data server, and detailed records of all the map data sources meta data information.
c. Data release: according to customer's request, the customer need more than the map layer map data release for a map service for customers to browse.
d. The data browsing: have the infrastructure to release map information through operations, including amplification, narrow, shift, and other basic GIS operation [7].

4.2. System Management Function

The main features include:

a. Safety control

To meet the demand of the system security, system mainly adopt the following methods: through the account and multi-level permissions system to control system permissions. System can access permissions, including functional unit authority, project access, professional competence and index authority. Part of the safety management way, and fully detailed consideration characters relations avoid the coincidence role.

b. Account management

Account management by account officer is responsibly, the account management compatible. Account support classification management can create and organizable of management under account. Account management including account creation account, modify, account deleted, account inquiry. All authorized account name need uniqueness, the account name can't be changed. Password is asked to consider encryption technology solutions.

c. Organization management

Organizational information system and organization structure in principle to enterprise users directory shall prevail. Organization management includes organization, organization, organization change delete, organization data maintenance access functions. Organization management mode should be and enterprise entity management way consistent.

d. Authorized management

Authorized management refers to the users to access application system applied objects, function module of reading, writing, modification and deletion of operation function.

5. Conclusion

Based on reducing telecom operators of telecommunications facilities between repetitive constructions, promote mutual build-up and sharing of telecom infrastructure requirements, this system has been designed which was based on B/S model and Web GIS information management system of telecommunication facilities. It can better solve the basis of association between telecom operators of daily business management between problems. Improve the business processing efficiency, to change the current business processing model, further enhance the business management level.

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