

Intelligent measurement and detection data analysis and application

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Abstract: In measuring technique is widely used, the measurement test data acquisition, processing, management is the most common operation link, because each link related to data information is relatively more, practice is more complex, so in order to ensure the accuracy of the calibration data and results, the current research scholars use intelligent technology to build a new platform for the collection and management system, It can effectively solve the problems existing in intelligent metering detection. Therefore, on the basis of understanding the current situation of measurement detection data collection and intelligent management, I deeply discuss how to use intelligent measurement detection reasonably according to the measurement detection management system of mobile Internet. The final results show that the intelligent measurement detection technology system can achieve comprehensive control of basic functions on the basis of obtaining more data information.

Keywords: Mobile Internet; Intelligent; Measurement and testing; Data; Management system

1. Introduction

In the new era, the development of measurement and testing market has the characteristics of openness, more and more measurement and testing institutions begin to pay attention to information management, and combined with their own business needs to carry out multi-angle practice research, finally found that information management will be an effective means to improve the core competitiveness in the future. [1.2.3]Based on information management, the measurement and testing process can become more standardized, improve the overall service level, and reduce unnecessary costs. However, at present, the information construction level of relevant testing institutions in China is not high, the overall development is not balanced, the management level is uneven, there is no unified technical standards, and the professional quality of managers is not strong. All these problems directly limit the sustainable development of measurement and testing information management. Although there are differences in the foundation and development direction of the informatization construction of testing institutions at present, there are commonalities in the basic functions, which are specifically reflected in the following two aspects: On the one hand, to the network as an effective platform for communication with customers, let customers can real-time understand all the information related to the inspection agencies, and inspection agencies also can through the platform, provides the function of the other service customers, truly achieve examination organization of two-way communication with customers, further improve the service level of quality inspection agencies; Should, on the other hand, in accordance with the general requirements, the job requirements of the integration of enterprises and institutions, business processes, system requirements, to the related measurement test procedures to conduct a comprehensive specification of the business, administration, market, quality, and effective control, etc., to check the business tracking and warning analysis for the distribution, to achieve full control processing. For example, at present, the arrangement and scheduling of on-site testing tasks of inspection institutions are still done manually, but they are often affected by environmental factors, which cannot guarantee the accuracy of the final inspection results. When the test result data is recorded into the system, there will be problems of imperfect and inaccurate information, and it will waste the working time and energy of field measurement personnel. Therefore, it is necessary to optimize and innovate the traditional measurement and testing data processing method. Combining intelligent management, can make use of the Internet platform to

complete the testing data of the measurement of online transmission, guarantee the accuracy and timeliness of practice data transmission, also can use intelligent management for field staff daily attendance, a thorough knowledge of the field staff work ability to intelligent management and measurement test data to get fully mix, To promote our country measurement testing level further to improve.[4.5]

Now, most of our quality detection system is still in the artificial way for inspection, the specific process involves the following: First, customer appointment. The staff should register the customer's appointment information systematically, and then arrange the points by email. The relevant staff and customers should communicate with each other according to the specific situation of quality inspection; Secondly, after confirming that there is no error in the basic information, the detection personnel should be arranged to provide door-to-door service. The staff should carefully record all measurement and detection data and fill in the form completely. Finally, remind the customer to pay the corresponding inspection fee. In the innovation and development of modern science and technology, intelligent terminal system has a wide range of applications in various fields, especially in the context of the comprehensive popularity of mobile phones and other equipment, gradually replaced the computer computer, become the office appliance of measurement personnel. Compared with traditional desktop computers, smart phones have smaller operation volume and more convenient practical functions, which can effectively adapt to the work needs under different conditions and fully demonstrate the advantages of intelligent management in measurement and detection. Therefore, this paper mainly studies the application system and basic functions of intelligent measurement detection data, so as to provide an effective basis for the development of modern measurement detection work.[6.7]

2. Method

2.1 System Overview

In the current measurement test work, there are a lot of traditional couldn't solve the problem of the Internet environment, the actual operation process still is given priority to with print media, daily care is difficult, and to spend a lot of manpower and material resources, office system is based on the traditional personal computer as the core for installation configuration, assessment of logistics management is more complicated. MIMMS, a prototype system of intelligent collection and intelligent management of measurement detection based on mobile network, can effectively solve the above problems by using the new characteristics and core capabilities of mobile Internet. In the context of the overall popularity of smart phones, the performance and processing power of mobile phones are getting higher and higher. At present, it has all the performance required by daily office, and can provide users with simple, convenient and powerful software under good software design. In the system studied in this paper, there are three ways to collect data: first, the manual way of measurement personnel, after reading the data will be manually input to the client; Second, image recognition, to use the smartphone camera to identify the specific value of the program; Finally, hardware communication, using smart phone and detection device communication to directly obtain the relevant values. Due to the difference of measuring equipment, manual operation is still the most important way, and the other two automation schemes have limitations in practice. At the same time, the reasonable introduction of GPS positioning can make the system quickly grasp the position information of all measurement personnel throughout the day, and compare with the detection task data of measurement personnel on the day, so as to facilitate the completion of field assessment of measurement personnel.[7.8]

2.2 System Architecture

The overall system design adopts the micro-service style, and each business module can exist independently, as shown in Figure 1 below:

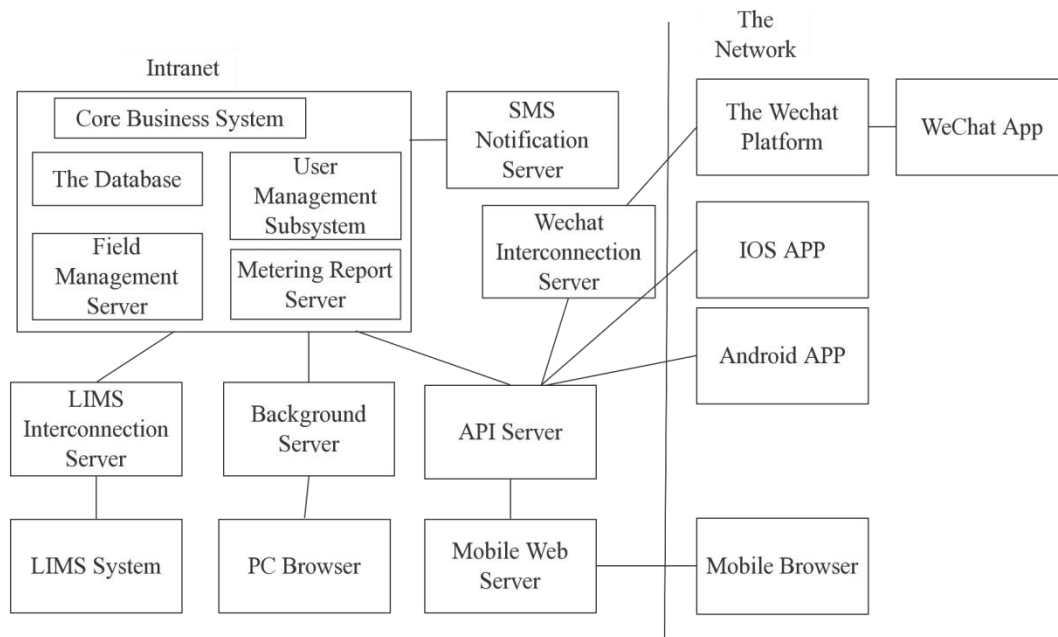


Figure 1 System architecture diagram

Based on the above analysis, HTTP communication protocol +JSON data format +RESTful API style standardized RPC is used between service servers and clients and between service servers and clients. This design not only facilitates independent deployment and system maintenance, but also provides a good structure for subsequent expansion. However, the disadvantage is that the overall cost of the system will gradually expand, but the system, as a model mainly for internal use of measurement and testing institutions, will not become the bottleneck of system innovation and development. The core services of the whole system include field management, quality report, user management and other servers, which cannot be directly accessed by the Internet. The API server is the external network entrance of the whole system, and all requests need to access other resources of the system through it. When saving system data, the database server will use the MySQL database to store field tasks, user information, measurement reports and other information. Due to the small scale of the current system, a single database is used, and all background servers access this database to obtain information. In order to ensure that the system can be modular operation, the API server is suitable for independent database users to ensure data isolation.[9.10]

2.3 Database Design

First, the user manages the server. The database contains four tables: user information, professional title, system permissions, and system permissions. The table of user information is as follows:

Table 1 User information Table

The field names	The field type	Field notes
The user id	The integer	A primary key
Login account	String	The only
Password	String	Stored encrypted
The name	String	The Ui layer identification
The title	The integer	Foreign key, associated title table
Birthday	The date of	
Gender	String	
Mobile phone no.	String	
Owning User Group	The integer	Foreign key, associated with system permission table
Account status	The integer	Activate, freeze, discard

Second, the metering report management server. This database contains three tables: measurement report, measurement report template and measurement object type. The measurement report table is as follows:

Table 2 Measurement report form

The field names	The field type	Field notes
The report id	The integer	A primary key
The report name	String	
The customer name	String	
Measurers through id	The integer	The foreign key associates the user information table
Object Type ID	The integer	A foreign key associates a measurement object table
The object length	Floating point	
Object width	Floating point	
The object height	Floating point	
The report data	String	Follow a specific format

Third, field management server. This database contains two tables: field duty and attendance, the field duty table is as follows:

Table 3 Field assignments

The field names	The field type	Field notes
Task id	The integer	A primary key
The name of the task	String	
Tasks address	String	
Mission Geographic location	String	Formatted latitude and longitude information
Measurers through id	The integer	The foreign key associates the user information table
Customer name	String	
Customer Contact Information	String	
Date of the task	The date of	
Task note	String	
Task Report ID	The integer	Foreign key association measurement report table
Task status	The integer	Unassigned, unfinished, completed, aborted

Finally, the message notifies the server. The database contains three tables: broadcast message, reminder message, and reminder message reception. The broadcast message table is as follows:

Table 4 Broadcast message table

The field names	The field type	Field notes
Message id	The integer	Primary key, increment value
The message content	String	
Message expiration time	The date of	

2.4 The management end

Backstage management refers to management and measurement personnel in unit internal office, using personal computer to function, of which can manage the system account managers, orderly arrangement to complete the task, query audit measurement report at any time, and allows the metering management background changes, calibration, export generate its own measurement report. After the user enters the M IMMS system management background website, the login interface of the management background will be displayed. After entering the corresponding account information and password, the system will jump directly to the background management homepage after passing the quick verification. Whole page is divided into the left, the navigation bar and the right operation area, in which the left navigation bar will be based on user permissions content, present different menu navigation area can choose the project by the report management, field management, examination management, backstage management user rights can be divided into three categories, first refers to the system management staff, the second is refers to the director, the last is refers to the measurement. Attendance management requires the authority above the supervisor to carry out functional operations. The operation area is the user list, and the items in the list are related to attendance, such as the number of staff being late, the number of field work, etc. Field task management also requires the authority above the supervisor to carry out functional operations. The operation area is the task list, and the list items are the characteristic information of the task, including measurement content, measurement personnel and Party A, etc. Click the field task item to edit it in the detailed information interface. After multiple tasks are selected in the task list interface, the item can be directly assigned to the designated measurement personnel.

Result analysis

In clear with the mobile Internet as the core of metrology management system, to cover server, client, management page for a full range of functions such as performance tests, the main judge whether its design function can run normally, whether software operating has stability and recoverability, practical work execution efficiency, meets the requirements, etc. The design function test covers user registration and login management, measurement report generation and approval, field task allocation and execution, etc.

In system testing, you can choose between automated unit testing in continuous integration and integration testing. System development should choose the continuous integration mode, and automatically compile and deploy the system in days. When automatic compilation is performed every day, unit test cases of all modules written synchronously in system development with automated unit test tools as the core will be executed. Developers are also required to ensure that code has passed automatic unit testing before uploading it. In the process of integration test, automatic test tools and robot tools should be selected to test the stability of the system. The final results show that the analysis and application of intelligent measurement test data are more in line with the technological innovation needs in the new era.

3. Conclusion

To sum up, the whole process of intelligent measurement and testing data can realize efficient information management, reduce human and material costs, improve practical work efficiency, and

provide convenient conditions for later data research and customer maintenance. Therefore, under the background of big data era, our country should continue to study the application system and specific functions of intelligent measurement testing data in depth, so as to optimize the working level of domestic measurement testing unit.

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