Design and Implementation of a Web Services-Based Business Administration Computer System

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Abstract. With the advent of the information age and the popularity of computers, computer technology has been greatly developed in this era. So many people began to use computers and develop computer performance, so a variety of algorithms were proposed. This is a great help for us to build a variety of network services and facilities. Because of the time and complexity, web service was put forward a long time ago, and after years of application, it has become very simple and convenient. Even without systematic computer learning, you can simply start to deal with things. Therefore, the purpose of this paper is to use web service to design business management computer system. On the premise of protecting user data security and computer firewall network security, we use web services to build a platform for the computer system we need to build. Therefore, after consulting the literature at home and abroad and comparing the construction methods of others, we use the cluster analysis algorithm to run the system construction, and analyze and process the experiment. Finally, the experimental results are obtained. The experimental results show that the business management computer system based on clustering analysis algorithm can be used.

Keywords: Business Administration, Web Services, Computer Systems, System Design

1. Introduction
Because in the current era, the rapid development of information technology [1], More and more transactions begin to be processed by computers [2]. Therefore, in the course study, we can also use web services to build business management computer system to facilitate students to better study and facilitate business management professionals to deal with affairs [3]. Because the construction method of web service is mature, we use it to build the platform carrying the system [4].

With the development of computer technology and the change of business management system requirements, the traditional business management system has been unable to match with the gradual improvement of business requirements such as the annual expansion of industrial scale and the gradual upgrading of management work [5]. Specific performance in the data sharing, compatibility, security,
system function improvement and many other aspects \cite{6}. Based on the above reasons, this paper studies and designs a framework of business management system based on Web services. It combines web services with business management system, effectively realizes data interaction and integration between different businesses, solves the problem of data redundancy, ensures data security, supports cross-platform data sharing, and expands the functions of business management system, improve the efficiency of Business Administration \cite{7}.

To sum up, in the process of business administration, it is fully combined with web services technology to form a new business management workflow combination model \cite{8}. The work efficiency and management level of this business management workflow management system have been well improved in this new combination mode, and the application management work in the aspects of achievement transformation and scientific and technological development has also been strengthened \cite{9}. Although there are still some problems in the practical application process, with the in-depth development of research work, the business management computer system will be further improved \cite{10}.

2. Cluster analysis algorithm

2.1 Cluster analysis data filtering

Data mining algorithm for power marketing clustering analysis, data filtering by clustering algorithm, assumes that data classes in clustering space are segmented by low-density regions, and their low-density object regions are represented as:

$$n_d = (v - b_1)n_r$$

$v$ represents the number of spaces to which a given value belongs; $b$ represents the number of sub-regions of low-density objects; Represents the value domain of the current node property. When the data classes in the cluster space are divided by low-density regions, their high-density regions are presented to some extent, and the property values of the high-density areas are set to $p$, and the high-density object areas are represented as:

$$n_i = p(n_d + n_g) \times i$$

$p$ indicates the number of sub-regions divided; $i$ represents the sample density of the property value. The filtering value of power marketing clustering data is obtained to filter out the sample density with the highest frequency in the property value, and the higher the frequency, the higher the sample density of the property value. It is important to note that the filter results need to meet special conditions for the dataset to perform the next step.

2.2 Cluster analysis data type difference calculation

According to the principle of clustering analysis, the data of power marketing system is filtered. In order to obtain the distance of clustered data, the data objects should be clustered to calculate the degree of difference between the distances between the data objects.

The clustering algorithm is used to calculate the degree of difference in data types. The calculation process, which converts the original measure to a unitless value, and gives a measure of a variable, uses formula (4) for standardized processing:

$$s_f = \frac{1}{n_i} \left( | x_{1f} - m_f | + | x_{2f} - m_f | \right)$$

Indicates the absolute deviation value; Represents the absolute average of f. Because the absolute deviation of the average has good robustness, it can reduce the effect of abnormal $s_{f}m_{f}$ data.

After standardizing measures, calculate the differences in data types, as shown in Formula (5):
\[ d(i, j) = \sqrt{|x_{i1} - x_{j1}|^2 + |x_{i2} - x_{j2}|^2} \]  

(5)

Represents the distance between objects. If the value is less than or equal to 0, the clustering between objects is a non-negative number. If the value of is equal to 0, the distance between one of the objects and itself is 0; Based on the data mining algorithm of power marketing clustering analysis, the distance function between objects is \( d(i, j) \) symmetrical. To some extent, clustering analysis data types are of the opposite nature and are calculated as shown in Formula (6):

\[ W = d(i, j) \times k_1 \]  

(6)

Represents the amount of clustering data obtained from the scan. This results in the clustering analysis data type difference calculation. Based on the cluster analysis of power marketing, the process design of its data mining algorithm is needed \( k_1 \).

3. Experiment

3.1 Two group-controlled trials were established

We can select a class from a school's Business School and accept several projects at the same time, and then set up two groups to analyze the rationality and operability of each project using traditional computer technology and Web Services-based business administration computer system technology to identify the merits of the methods we use. Of course, due to differences in individual abilities, the results can be slightly errory, so we need to analyze the case more to get the general situation. So, we selected 10 cases from each of the two sets of cases and each set of cases with consistent characteristics was randomly assigned to two groups for experimentation.

3.2 Get experimental feedback

We end up with a general experiment, then analyze all the statistics, get what we need, and then take the second step: let the two groups of members exchange systems to deal with the problem. The final step: The questionnaire analyzes the attitudes of members and arrives at statistical results.

4. Evaluation results

4.1 With regard to experimental data derived from two methods

![Graph](image)

**Figure 1.** A comparison of the effects of the application of a new management system on business administration

As can be seen from Figure 1, the success rate of the new management system in the business
administration application is much higher than the first two cases, because the characteristics of one and two are classic financial fraud and insurance fraud problems, and the third feature is the emerging computer system and big data era and the introduction of hidden scams, so the new technology for the new scam has a higher detection rate and success rate, so in this respect the new management system is better.

**Table 1. The impact of different uses of algorithms on comprehensive business administration analysis**

| Algorithm        | Expected planning funds | The number of local errors | The number of modifications is automatically adjusted | Manually adjusts the number of modifications | Success |
|------------------|-------------------------|----------------------------|-----------------------------------------------------|---------------------------------------------|---------|
| BP algorithm     | 100%                    | 12.0                      | 11.0                                                | 1.0                                         | 85%     |
| Data mining      | 100%                    | 15.0                      | 13.0                                                | 2.0                                         | 92%     |
| Clustering       | 100%                    | 6.0                       | 6.0                                                 | 0.0                                         | 94%     |

**Figure 2. The effect of different algorithms on the success rate**

As can be known from Table 1 and Figure 2, BP algorithm and data mining calculation will have more errors and the method can not completely automatically modify all errors, there will be unknown errors prompt manual modification, and clustering analysis algorithm will not, so we can choose cluster analysis algorithm to build the system.

**4.2 Survey results**

**Table 2. Survey results on the use of different systems**

| Evaluation attitude | Number of copies / servings |
|---------------------|----------------------------|
|                     | A traditional computer management system | An optimized computer management system | Total number of copies/servings |
| Praise.             | 12.0                         | 24.0                         | 36.0                         |
| Mid-review          | 23.0                         | 13.0                         | 36.0                         |
| Poor reviews        | 5.0                          | 3.0                          | 8.0                          |
Through the statistical analysis of data in Table 2, we find that the use of a new management system has a high rate of praise and a low rate of poor evaluation, which is the statistical result of small sample data, which can only indicate a certain experimental situation, so we can only take as a basic consideration.

4.3 Web Service Technical Support

The Web Service platform requires a set of protocols for the creation of distributed applications. Any platform has its data representing methods and type systems. To achieve interoperability, the Web Service platform must provide a standard set of type systems for communicating different types of systems across platforms, programming languages, and component models. These agreements are:

- XML and XSD.
- SOAP.
- WSDL.
- UDDI.

XML is a good basic data format in Web service platform. Besides being easy to build and process different data, the main advantage of XML is that it has nothing to do with not only the platform but also the supplier. XML was created by the World Wide Web Association (W3C). The XML schema developed by W3C defines a set of common data types that can't be nonstandard, and uses a language to expand this set of data types. Web services platform uses XSD as the system of data usage and processing. When creating a web service in a language such as VC, transformation is required, which is a protocol.

SOAP is the Simple Object Access Protocol, a lightweight protocol for exchanging information encoded by XML, a subset under the standard common markup language. It has three main aspects: XML-envelope defines a framework for describing and handling information, encoding program objects into rules for XML objects, and executing the convention of Remote Procedure Call (RPC). SOAP can run on any other transport protocol. For example, you can use SMTP, the Internet e-mail protocol, to deliver SOAP messages, which can be tempting. The headers between the transport layers are different, but the XML payload remains the same.

Web Service wants to enable "software-software dialogue" between different systems to call each other, breaking the gap between software applications, websites, and various devices, and achieving the goal of "seamless Web-based integration."

WSDL.

Web Service Description Language WSDL is a formal description document provided in a way that a machine can read and based on XML (a subset under the standard common markup language) that describes Web Service and its functions, parameters, and return values. Because it is XML-based, WSDL is both machine-readable and human-readable.

UDDI.

The purpose of UDDI is to establish standards for e-commerce; UDDI is a web-based, distributed, Web Service-provided, information registry implementation standard that also includes a set of implementation standards that enable enterprises to register their own Web Services so that other enterprises can discover access protocols.

Call RPC with messaging

Web service itself is a dialogue between different apps. When using RPC, our main purpose is to mask the user's own IP address, apply virtual and untraceable IP address to process information, and forward it after transformation. Because the IP address of forwarding information is the virtual IP address established by servers all over the world, it will not be tracked.

5. Conclusion

To sum up, we found that the use of web service can be more convenient to establish business management computer system. And because Web service has become mature after years of
development, we can borrow the experience of predecessors to establish a suitable computer system for business administration to serve our life and work. Therefore, we made an experiment based on this, and analyzed it to get the results. It is found that the processing efficiency of business management computer system based on Web service is better than that of the original non dedicated computer system, and the system constructed by clustering analysis algorithm has the best advantages. With the development of economy and information technology, business administration is playing an increasingly important role. On the one hand, it is to avoid financial crime and to find financial loopholes, on the other hand, it is to deal with the flow of funds more efficiently. So, we need to use a unique computer system to handle finance in a separate and secure manner. To this end, we have come up with a proven way to build, and that's what we're doing. Although it may not be very standardized at present, but we believe that with the development of the times, technology will be more and more perfect and mature. Then our system should be more efficient.

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