ERP Virtual Simulation Practice Platform Based on Cloud Computing

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Abstract. The rapid development of cloud computing technology enormous has an impact on the enterprise management and development, ERP practice platform of virtual simulation in virtual simulation technology and cloud computing technology should make its design fit in the enterprise management and development of the status quo. The purpose of this paper is to implement ERP cloud virtual simulation experiment platform. And its principle is to help people to quickly understand the enterprise management mode, to achieve the management convenience and intelligence so as to improving the quality of enterprise management.

Preface

With the rapid development of modern computer technology and the global economy, enterprise management covering all aspects of the business have been deep into all levels of society, people generally concentrate on business management theoretical knowledge, but lack full understanding of the business process in the business aspects [1]. The rapid development of today's virtual simulation technology, through a combination of cloud computing and remote experiment technology, virtual simulation through virtual cloud platform currently experimental approach can effectively help those who start early, but inexperienced young people quickly grasp the essentials of business, important processes and operations. Analysis and in-depth study of cloud-based ERP platform virtual simulation practice, give full play to the powerful advantages of cloud computing to improve people's ability to grasp the business management, which has a very broad vision.

Virtual Simulation Technology

About Virtual reality technology and simulation technology, first of all, the main principle of simulation technology is to make full use of physical model experiment [2], in the process of using simulation software and other tools to realize the reality or the environment simulated and computer processing simulation of real experiment results [3]. Through the establishment of a specialized system of model and computer simulation technology is able to connect environmental conditions for accurate analysis, in-depth study and accurate test method. At present, each stage of the virtual simulation system apply the virtual simulation technology, including the object system and the application of the basic components to build, preliminary design, scheme demonstration, the detailed structure and test phase system [4]. The three basic characteristics of interactive, immersive design and simulation technology, virtual reality technology can be through the use of network technology,
artificial intelligence and other related sensing, the full realization of advanced human-computer interaction. In practice teaching, virtual instrument panel and virtual instrument are applied to virtual reality technology, simulation of the real world using specific material virtual software and virtual software. The effect of deepening the development of virtual reality technology is a symbol of simulation technology to enter into a new development level, and simulator system gradually develops into the advanced virtual environment system [5]. By combining virtual reality technology and simulation technology, virtual simulation technology for accurate simulation of the real world, try various devices and powerful computing ability, as far as possible to reproduce the real world accurately [6]. No matter in the domestic or foreign academic research, technology or actual production can be used wisely, and virtual Simulation technology plays a key role in.

**The Design of ERP Virtual Simulation Practice Platform Based on Cloud Computing**

In combination with the actual demand and referring to the cloud computing architecture based on, this paper aims to better application of cloud computing technology, to build a more optimal intelligent ERP virtual simulation platform system. Overall, the technical architecture includes four levels, and the hierarchical structure is shown in Fig. 1.

![Hierarchical Structure of Virtual Simulation Practice Platform.](image)

In the service access layer, cloud computing provides Platform-as-a-Service called PaaS, Software-as-a-Service called SaaS and Infrastructure as a Service called IaaS and other services to help meet the needs of different users in different application level. The SaaS supports system software and the independent demand in platform test in the performance of PaaS using less IT into the case, which can be optimized with software interactive professional services available, providing efficient runtime environment for basic users so as to improve the adaptability of a platform. IaaS, to meet the actual needs in infrastructure at the same time, improve the hardware resources. However, the ERP virtual practice platform covers the disciplines of knowledge in many aspects, so in the process of practice, it should be fully combined with the characteristics of business processes, taking into account the actual needs in the design.

Application layer, a collection of application software in the virtual practice platform of the ERP, basically needs production control, enterprise management, enterprise marketing and logistics business software, also relates to business operation of intelligent operation, intelligent
decision-making and operation analysis, intelligent control and management of intelligent processing analysis software.

Cloud computing platform layer, together with general and reusable software resources and applications to the cloud, provides application programming interface (API) and software development kit (SDK), construction management and monitoring, application server, database server and web server cluster environment. Optimization of Cloud computing on middleware, helps to improve the degree of ERP curriculum teaching in the practice and the degree of flexibility.

Cloud computing infrastructure, including infrastructure including load management, resource deployment, security management, data management, and other aspects of management of computer network facilities and storage devices and other hardware resources for application of virtual simulation technology, do help better realize the optimization of internal process automation and resource management program. In addition to provide a flexible, dynamic quality of cloud infrastructure services, we set the virtualization of the hardware resources and efficient management functions, the success of the user management, image management, security management, monitoring management and system management functions which are all better connected, thus forming a perfect whole.

Implementation of ERP Virtual Simulation Practice Platform Based on Cloud

Cloud Computing Infrastructure

Open source cloud computing platform project management OpenStack can effectively solve the problems of infrastructure. The cooperation of mirroring service platform, identity authentication service and object storage controller contributes to the realization of the operation and management of the platform. The mirror service for real-time dynamic simulation of the processing capacity, provides strong demand for online simulation, through integration the system simulation model to realize the image placement to the cluster storage, query, management and deployment of the landing. In addition to provide services to the user authentication, identity authentication service is responsible for providing secure access control, and conducive to the management of cloud computing resources. Through object storage, high fault tolerance mechanism can realize the underlying object at the same time allowing for storage, retrieval and storage files. The virtual machine cluster configuration, in order to adapt to the requirements based on the realization of the system simulation to run dynamic migration of virtual machines, can realize the virtual computing resources, timely and flexible deployment of the virtual machine to make adjustments to facilitate centralized management of resources.

Using the platform of distributed system based on the Hadoop framework help to achieve data platform computing and storage. As a platform of data storage, HDFS shows its great concern to ensure that the storage safety. At the same time, the MapReduce computing framework’s computing capability can be powerful enough to meet the real-time, online simulation in computing power requirements. In addition, Hadoop can be stored, and be the experimental system in the simulation process of data analysis, including the calculated data, the parameters of the simulation model as well as some non-relational data.

Virtual Simulation Operation

The three technology, including business modeling system, real-time simulation and digital simulation system, are the key technology of intelligent ERP system. Virtual business modeling technology attaches great importance to the modeling method, as well as for the construction and application of the practicability of the model. The modeling method can get through the parameters of the model to build model and mechanism analysis method the measured model. In order to achieve efficient real-time control data, we are in the detection model of the system model, as well as in the acquisition of ERP virtual simulation platform for practice related parameter data during the operation, giving the priority application of open source data mining software Rapid Miner.
corresponding signal. Marketing, logistics management, enterprise management and production the control system model, these four aspects is the focus in the research model. In order to meet the diverse requirements of simulation, we need to use different models to carry out the corresponding treatment on different simulation tasks. The storage capacity of the massive data, which shows its strong computing ability, makes the system digital simulation technology can ensure the accuracy of document data calculation. Its function is used to calculate the balance sheet, income statement and other important basis, at the same time, including the procurement of raw materials, material feeding virtual simulation of single and single product storage, the relevant accounting entries for a high precision. The real-time simulation system, including the production and operation process related guidelines, the digital simulation can meet the development and expansion of the scale of the fine granularity of shockproof high requirements, and it also has higher requirements for storage and the computing capability of the system, which can meet the needs of the development of the system. In combination with the rapid and efficient analysis of real-time data, through the simulation platform to meet the need from the integration of business operations sales, procurement, inventory, finance, production, human resource management and other business process resources, and to carry out the whole process of efficient dynamic and flexible analysis according to these.

**Implementation of Platform Information Resource Scheduling Based on Cloud**

In fact, the needs of users is the diverse, which means ERP virtual practice platform must provide high degree of diversified information resource scheduling, and can improve the efficiency and reduce the load level at the same time to adjust and improve the layout of the virtual resource scheduling method. In order to build good the platform of good sound virtual resource scheduling model, through the guidance of the scheduling process, improved particle swarm optimization algorithm to achieve the optimal allocation of the virtual information resources.

According to the above characteristics on ERP system resource virtualization operation, the connection with the cloud service platform is not as tight as before, which means cloud platform services reduces its depending on a fixed physical resources. Under the ERP virtual simulation experiment cloud platform, thanks to the physical resources of the cloud service invocation transparency, the specific physical resource management become simple and efficient means in the face of the user is virtual ERP curriculum resources.

Cloud curriculum virtual resource pool is by massive curriculum resources through virtualization technology for packaging classification and, users according to the needs of the resource pool to request and transfer with the corresponding transfer target resource efficiency requirements of the command set. In addition, virtual resource task debugging process in the resource pool, first of mapping the physical resources of the load status of evaluation and calculation, at the same time, of resources for the future utilization of forecast evaluation, meet the inherent requirements of the user load on the efficiency of resources and physical resources. In user resource allocation in the process, the ERP virtual simulation platform for experimental cloud resource scheduling model can achieve the requirements of the user.

ERP virtual simulation cloud platform, receiving the service requester, will request the resources of the target set, in response to the current user resource collection, platform for the user request form this scheduling model, according to the optimal scheduling strategy for optimal selection, which provides the best resources for users. In general, the allocation of resources is one of the most complex processes, and service cloud simulation experiment platform is provided by the object model, such as the hardware platform, the process of Ethernet connection PLC and other control system and control model and control simulation package service, friends of the virtual machine equipped with various models. Because of the complicated simulation resources, there are big differences between the various models the efficiency and the amount of physical resources, coupled with a variety of user requests, so it is easy to cause the slow response speed of resource allocation. According to the above inequality characteristics and problems, this paper aims to put forward the particle swarm optimization algorithm to improve and to guide the allocation of virtual resource.
scheduling an efficient scheduling method, to establish a virtual resource optimization of multiple instructions scheduling model. The overall virtual resource scheduling method is shown in Fig. 2.

![Virtual Resource Scheduling Method](image)

Figure 2. Virtual Resource Scheduling Method.

According to the requirement of their input demand of instruction, backstage platform automatically calculated according to the user instruction, obtains the resources load balance and resources to perform the weight ratio of both efficiency, scheduling method which design parameters and arguments. It can also be passed to the improved particle swarm optimization algorithm, fully integrated application in the virtual resource scheduling model, resource scheduling method for scheduling model, to be mapped and obtains the scheduling strategy, repeatedly iteration to draw the best virtual resource scheduling strategy as well as guiding the allocation of virtualized resources.

**Concluding Remarks**

ERP virtual simulation practice cloud platform is proposed to break through the time, place, and the use of network to improve the ability of management, help people to start their own business with advantageous condition provided, and improve the people of ERP knowledge and application ability. At the same time, people can use and share better of virtual simulation resources to grasp the main points of enterprise management, laying a solid foundation for a successful venture.

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