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Study on the Simulative Financial Management System in ERP Education

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Abstract

The problems of ERP simulative financial management system are that it has rigidified software architecture and have not comprehensive functions. The thesis has analyzed the functions and designed the business processes of the financial management system based on the ERP simulation instructional environment. It has designed the system's architecture of the financial system based on the SOA, which has realized the business processes layer, service layer and data layer of multilayer reuse. It makes the system with loose coupling and flexibility, which is better adapt to college teaching needs.

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Keywords: ERP; simulation instructional system; financial management system; SOA

1. Introduction

With the rapid development of enterprise informatization, the application of the ERP software in the enterprise is more and more extensive. In the teaching process of universities, ERP teaching simulation instruction system plays a decisive role. The system brings great convenience to teaching process. As a core subsystem of ERP teaching simulation instruction system—financial management system still exists many problems that cannot be neglected in: (1) the system is too complex, therefore, it is not suitable for non-financial

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professional teaching; (2) the functions of the system is not comprehensive and involve only the financial accounting also pay attention to the accounting but ignore the management accounting. Under the condition of changing in teaching requirements, it is difficult to make corresponding configuration to meet the needs teaching. ERP teaching simulation instruction environment of financial management system and other system combined tightly which requires a high flexibility of system structure. In view of the above problem, this thesis will design related functions according to the characteristics of ERP teaching simulation instruction system and integrated with other system under environment of ERP teaching simulation instruction system.

2. The business process analysis based on SOA

2.1. ERP teaching simulation instruction environment of financial management business analysis

ERP sand table simulation instruction teaching system concentrated the overall process of enterprise operating in the system, it relates to the enterprise strategic planning product development, equipment investment and renovation, production capacity planning and scheduling, material requirements planning, capital demand planning, marketing and sales, financial analysis, capital operation, team communication and construction and other aspects^[1]. In the process of ERP sand table simulation instruction teaching system of operating of manufacturing enterprises, financial management is in key position. Financial management carried out to entire process of enterprise operation and every link is indispensable to the participation of financial sector. The financial management activities of ERP teaching simulation instruction environment are mainly include daily financial accounting, taxation department providing financial statements, the daily cash management, enterprise financing strategy, capital operation and risk management, financial system and risk management, financial analysis and assist in the decision-making and other activities.

2.2. Business process modeling

To analysis business process of financial management system of ERP teaching simulation instruction environment, we can obtain basis analysis for building a flexible ERP teaching simulation instruction platform. The main business processes of financial management simulation system includes general ledger management, accounts receivable management, cash management, fixed asset management, financial budget, cost management, etc. in order to make system of business process more flexible, this paper adopted SOA to conduct business process modeling^{[2][3]}, so that the system function and business can be closely complied with each other. On the basis of coarse granularity service we undergo business process modeling, which will produce more concise business. On the basis of service we realize system function that would be more flexible. On the basis of service through the explicit definition, description, realization and coarse granularity services of the business management level, providing a better “traceability” between business model and the realization of relevant system function making the business changes to transfer to system function more easily. In this thesis we only focus on the financial budget management process modeling. The modeling method is IBM’s SOMA modeling method^[4], and SOMA combined the method of top-down, bottom-up and meet-in-the-middle. Through analysis of business field and business function field we work out business model. And based on this we found services and construct service model and through the combination of services to build a business process model.

- The business process analysis

The use of business process of financial budget preparation and audit presented by cases, as is shown in Table 1.

- Service model

According to the SOMA business process modeling method and the basis of the business process analysis. We establish service model. Using the method of top-down to analyze the business process and get the related services. For the business process, this thesis will take budget preparation and audit business as first level of

Table 1. Case of budget preparation and audit business process

Business event	Each department budget financial departments to summarize each department budget CEO on budget audit
Use case overview	This case is use to describe budgeting in a high-level Budget and audit business process
Business rules	Financial budget begin from each department Each department's budget should consolidate and balance in financial sector The preparation of financial budgets are subject to CEO's review
Event list	Each department will put its budget into the budget preparation and audit business process Budget preparation and audit business process will undertake the budget summary of all departments and make concerned calculation, preparation and balance to do dynamic adjustment by resettling method Auditing after the completion of budget preparation If the budget audit approved by the CEO enter into the seventh step If the budget audit not approved by the CEO inform all departments to adjust their budget Budget preparation and audit business process summarize all adjusted budget Budget preparation and audit business process is accomplished

business activities to analyze it to the low level, until every business activity can be clearly described. The budget preparation and audit process can be analyzed as follows. First we divided the process into three major sub-processes, which are the preparation of the budget, budget audit and confirm budget. Budget preparation also can be divided as follows: obtaining each department's budget, budget summary, balance the budget and budget preparation. Among them, the accessing of each department budget process is a design of multiple system process and the further division of the process can produce the following processes: access to all department budget information and access to all sectors of the annual operation history of the last year. Through the above similar analysis, we can identify new candidate service. And according to its business department to classify them so as to understand these services that provided by what kinds of functional module. The results are shown in Table 2.

- The establishment of business process

According to the above analysis of financial budget process through case and SOMA method to establish the service model of the process, the model of financial budget preparation and audit business process which shown in Fig. 1. In accordance with the thought of SOMA business process model, the business process is more flexible.

3. Financial management simulation instruction system design of ERP teaching simulation instruction environment

Table 2. Top-down analysis of the candidate service sets

Number	Candidate service name	System
0	Budget preparation and audit business	Financial system
1.1	Budget preparation	Financial system
1.1.1	Access to each department's budget	Sales system Production system Procurement system Inventory system
1.1.1.1	Access to all department's budget information	Sales system Production system Procurement system Inventory system
1.1.1.2	Access to all department's budget information	Sales system Production system Procurement system Inventory system
1.1.2	Budget summary	Financial system
1.1.3	Balance budget	Financial system
1.1.4	Budget preparation	Financial system
1.2	Budget audit	Manager information system
1.3	Confirm budget	Financial system

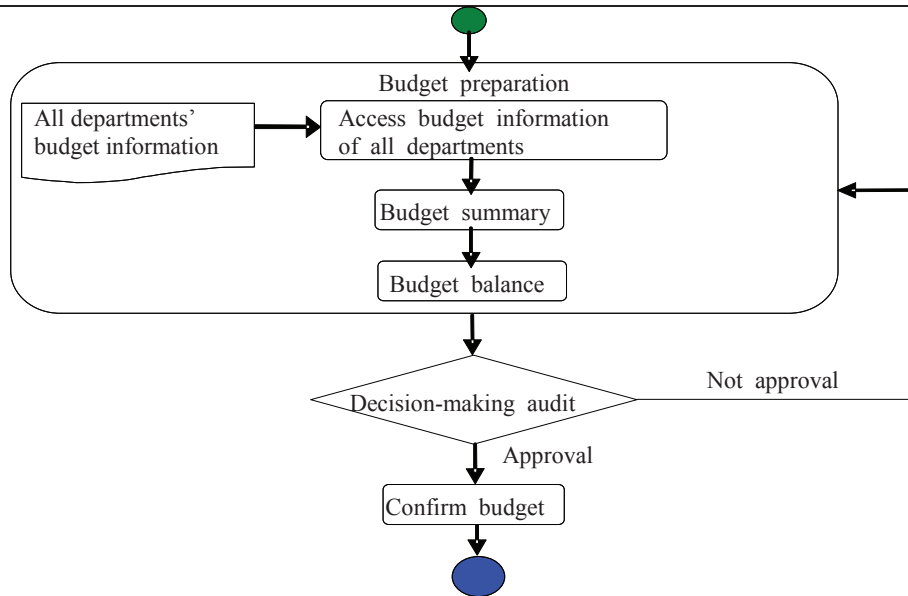


Fig. 1. Financial budget audit business process

3.1. Functional design of financial management simulation system

The financial management system of ERP teaching simulation instruction environment is a key subsystem. That plays an important role in simulation teaching process. According to above analysis of financial management system of ERP teaching simulation and current financial management activities in the process of ERP sand table teaching we designed the basic function of this financial management simulation system. Financial management simulation instruction system make up for the functional deficiencies in current system, which mainly divided into financial accounting subsystem and the management accounting subsystem. Financial accounting subsystem includes five modules such as general ledger module, account receivable management module, account payable management module, financial management module and fixed asset management module. These functions basically contained the functions of accounting. Management accounting subsystem mainly contains: cost management module, financial analysis module, financial budget module and financial decision making module. The function provided by above functional module integrated into one service, through access service and service portfolio to realize specific functions which enable financial management system of ERP simulation environment to be more flexible, adapt to the changes in the business demand and satisfy the need of teaching.

3.2. System structure design

In the organizational framework design, we adopted the application of the current system to form effective service, which can simulate financial management process in different industries and construct the flexible and correspondent application program and business processes. By using of the SOA system framework, we can reduce coupling between systems and improve the reusability. By using of the business process management, we can realize automation of work process in financial management simulation instruction system and seamlessly integrated with ERP teaching simulation environment of other system. The core of service oriented financial management simulation system is service and its core integration technology is business process management. With the changing in the teaching process of different businesses in financial management of different industries, the goal of financial management simulation system is to made corresponding amendment according to the different requirements of different teaching, which made system to be more flexible. This thesis adopted Net platform in the logic system which divided into the following four levels.

- Presentation Layer

Designing by ASP.NET, we can use SOAP to adjust business process layer. In this layer, service requester are directly accessed to web applied program, which will offer standard access port in the course of service, meanwhile provide service of authorization competence and information for business process layer.

- Business Process Layer

Business Process Layer is used to manage all of logic business of financial management simulation system on unified standards. This layer focuses on supporting the service aspect, and defines the corresponding business process of web service with general and standard object and service model. Through BPEL engine we can call business process and corresponding function module which is described by WE-BPEL.

- Service Layer

Service Layer affords a good platform for business process layer, undertaking abstract and encapsulate function and mission which are supplied by information system in service way, and offers international visit service in services description form. Service layer combines with web service which is provided by every system. And web service describes some special operation port. Basing on method of SOA, this layer

encapsulates every model into web service which includes finance budget service, cost management service, finance analysis service, and etc. After that, enterprise service bus could exchange data with next layer^{[5][6]}.

- Service Application Layer

The Service Applied Layer is constituted by data base and applied integration facing towards service. In finance management analog system, data base is made up with SQL Service 2000 of Microsoft Company. Finance management data base is the core data in this layer. What's more, this layer includes some sub-database, such as sales and production data bases. The system separated every function as components, and then combined these components into a unified service, finally sent to service registry base for showing in contents service center. Through fundamental core service of service bus, we could realize data exchanging among systems.

4. Service Design of Finance management

During the time of service design, we follow the principle including business and system function aligning, reusability, and stateless. In module of finance budget, we design budgeting service, budget adjustment service and budget audit service. Considering from the whole EPR teaching analog system, in order to enhance information platform resource sharing, and reduce type-in repeating data, we divide systematic data into shared data and private data, and package processing procedure of shared data employ into independent data. At same time, these services are coarse grain services which combine with small stuff services. Taking budget formation service for example, it need purchase budget, sales budget, and production budget, and then summarize all of them, finally finish balanced budget^{[7][8]}. Fig. 2 shows the service design.

The Article adopts four layers of architecture of system, which separates these services in independent areas. They response the request of the customer in port, and then searches corresponding services in web service, finally sent it back to customers to realize exchange. Because of statelessness of service, they have been list into several information teams to execute business process in system. Service arrangement realized a business process and offered it to customers, which makes a flexibility situation between modules in system and modules.

5. Conclusions

Through analyzing the shortage of finance management system in aspects of function and frame of software under the EPR teaching simulation environment, we applied the method of SOMA to establish business process module. Depending on above all, we also designed four layers of architecture of system to improve a more comprehensive function and flexibility system. Finally, we propose service design frame of this system, and laid a solid foundation for finance management analog system which based on SOA.

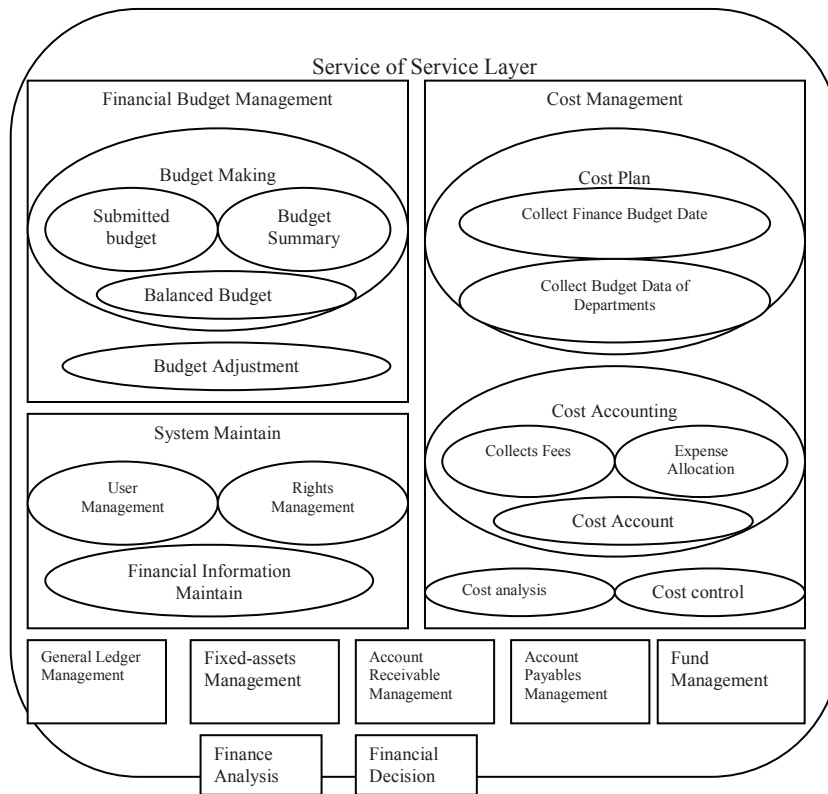


Fig. 2. Service design frame of finance management analog system

References

- [1] Deng Jie, Sun Ying, Fang Meiqi. The Construction and Practice of ERP Educational Simulative System[J]. Journal of Jiaying College. 2005; 17(S1): 34-39.
- [2] Yu hao, Zhu Cheng, Ding Peng. SOA Practice-Construction's Enterprises' Application Based on Java Web Service and BPEL[M]. Beijing: Electronic Industry Press; 2011.
- [3] Thomas Erl. SOA definition, technology and design [M]. Beijing: Machinery Industry Press; 2011.
- [4] ARSANJANI A, GHOSH S, ALLAM A, et al. SOMA: A method for developing service-oriented solutions [J]. IBM SYSTEMS JOURNAL. 2008; 47(3): 337-338.
- [5] PPAZOGLOU M P, HEUVEL W J. Service oriented architectures: approaches, technologies and research issues [J]. The VLDB Journal. 2007; 16: 389.
- [6] KIM J.W, LIM K.J. An approach to service-oriented architecture using web service and BPM in the telecom-OSS domain [J]. Internet Research. 2007; 17(1): 99-107.
- [7] APOSTOLOS M, ABOLGHASEM A, TIMOTHY B, et al. A service-oriented architecture for building services integration [J]. Journal of Facilities Management. 2008; 6(2):132-151.
- [8] THOMAS G, GREG D. Service-oriented concepts: bridging between managers and technologists [J]. Industrial Management & Data Systems. 2009; 109(1): 5-15.