Research on Electronic Finance Comprehensive Experimental System Platform Based on Information Technology

Haiping Yu(✉)

Anhui Institute of International Business, Hefei 231100, Anhui, China

Abstract. In this paper, for the information technology e-finance comprehensive experimental system platform research, for the practical courses of information technology finance, students have no way, and almost impossible to carry out classroom learning and practice in the real social business system. At the same time, due to the relevance of the financial system and society, students can not complete in a concentrated period of time, in fact, it needs a lot of time it takes a long time to experience the operation practice, and these actual business transactions themselves are completed through the network. Therefore, for online banking and other financial courses, it is more suitable for the practice teaching through the virtual experimental system.

Keywords: Spring framework · Experimental system platform · Information technology · e-finance

1 Introduction

With the rapid development of computer technology, the Internet has become the information network with the largest coverage, the largest scale and the richest information resources in the world, which has greatly promoted the development of world scientific research and demonstrated the great role of information network in promoting the development of teaching and scientific research. In the modern information society, scientific research projects are becoming more and more complex and the scale is expanding, and many projects need large-scale interdisciplinary cooperation to be effectively solved; modern scientific research activities cost a lot, and the experimental equipment is large-scale and expensive, so it is urgent to share the experimental equipment to reduce the research cost; The globalization of information network and the new achievements of communication and computer technology have greatly enhanced the ability of interaction, cooperation and resource sharing of scientific researchers, provided more effective means for scientific researchers in different fields to carry out cooperative research, and better faced the challenges brought by the surge of information. In this context, the concept of "virtual experiment" came into being, showing the development trend of teaching and research environment and methods in information society [1].

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Electronic finance and traditional finance have different forms. It is a financial activity existing in the electronic space. It has the characteristics of virtual form and network operation mode. It is the product of the combination of information technology and modern finance. “From the perspective of financial service audience, e-finance provides financial related services. In order to improve the quality of personnel training, many colleges and universities in China have built financial or e-finance laboratories, which can be divided into two types according to the laboratory functions, namely, professional or on-the-job training oriented laboratories and financial analysis oriented laboratories. The financial teaching simulation software, which is mainly based on training, carries out transactional and operational training for students. In this way, the students can only become ordinary operators, and can not undertake the background research work with high skills and high quality requirements; P financial analysis laboratory is located in financial data analysis and decision support, It is mainly used in the courses and research of investment analysis, risk prediction and income prediction, and basically ignores the cultivation of financial practice skills, which will also bring some problems. Students can not understand the business process of financial practice and the related content of financial products. It can be seen that the current financial laboratory in Colleges and universities has a single function, which can not fully meet the needs of personnel training.

2 Design of Electronic Finance Comprehensive Experiment System Platform

2.1 Struts Framework Structure

Experimental teaching is based on the whole talent training system, with the cultivation of practical ability and innovation ability as the core, deepening the reform of experimental teaching content system, introducing teaching and scientific research achievements at home and abroad, constructing an experimental teaching system suitable for the cultivation of students’ exploration spirit, scientific thinking, practical ability and innovation ability, and providing high-quality services for the learning and scientific research activities of teachers and students [2].

The experiment is convenient and interactive. We should overcome the shortcomings of the traditional practice teaching, such as large investment, limited space and insufficient staffing. Students can carry out experimental activities through the computer terminal at any time. Effectively meet the needs of students to improve their professional practice ability.

The experimental content is comprehensive and extensible. Due to the wide range of teaching contents in the field of economy and finance, including banking, insurance, financial management, accounting, trade finance, logistics, finance, financial information, etc., the system can not only integrate the commonly used economic and financial models, According to the teaching needs, we can further develop new economic and financial models, integrate them into the system, expand the experimental teaching content, and make it a virtual experimental teaching system with wider coverage and higher technical content.

There should be a database for experiment and it is easy to access. The purpose of the economic and financial experiment is to process and integrate the data on the basis of a large number of business data, economic and financial data and other aspects of data, transform them into thematic information resources, and provide them to the majority of teachers and students for experimental analysis, as the basis for analysis, prediction and decision-making of economic and financial activities. Therefore, there must be a rich database of data resources for the experimenters Call.

2.2 Spring Technology

Spring framework is a lightweight framework based on J2EE, which includes AOP, IOC/Di, MVC and other applications, and can be flexibly chosen according to the actual situation of the project. The framework is a layered application development framework, unlike struts, hibernate and other open source frameworks dedicated to a certain layer. Spring is committed to the whole application level architecture program, so that all levels of the program can be coordinated, so as to maximize efficiency. In addition, spring can integrate other excellent open source frameworks to form a coherent and unified architecture.

Spring provides a lightweight solution for application development. It includes the core mechanism of dependency injection, the integration of AOP's declarative transaction management and various persistence layer technologies, and the excellent webmvc framework. Spring provides an excellent solution for the presentation layer [3], business logic layer and data persistence layer of J2EE application. In addition, POJO management is also supported, and the objects of each layer of J2EE application are "welded" together. The framework consists of 7 modules, as shown in Fig. 1.

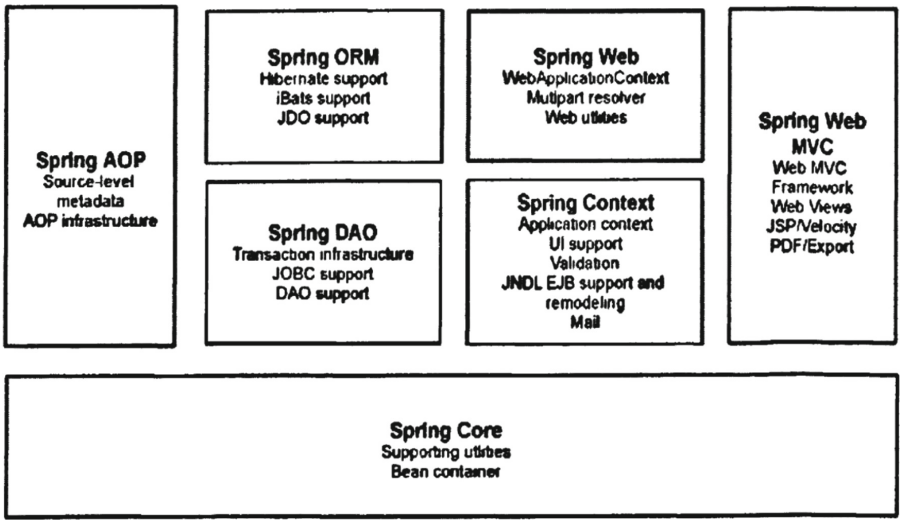

Fig. 1. Struts frame structure

3 Data Structure of Electronic Finance Experiment System

The system adopts a typical J2EE three-tier structure (Fig. 2), namely presentation layer, persistence layer and business logic layer. The three-tier system puts business rules, data access and validity verification in the persistence layer. The client does not directly interact with the database, but establishes a connection with the persistence layer through components, and then the middle layer interacts with the database.

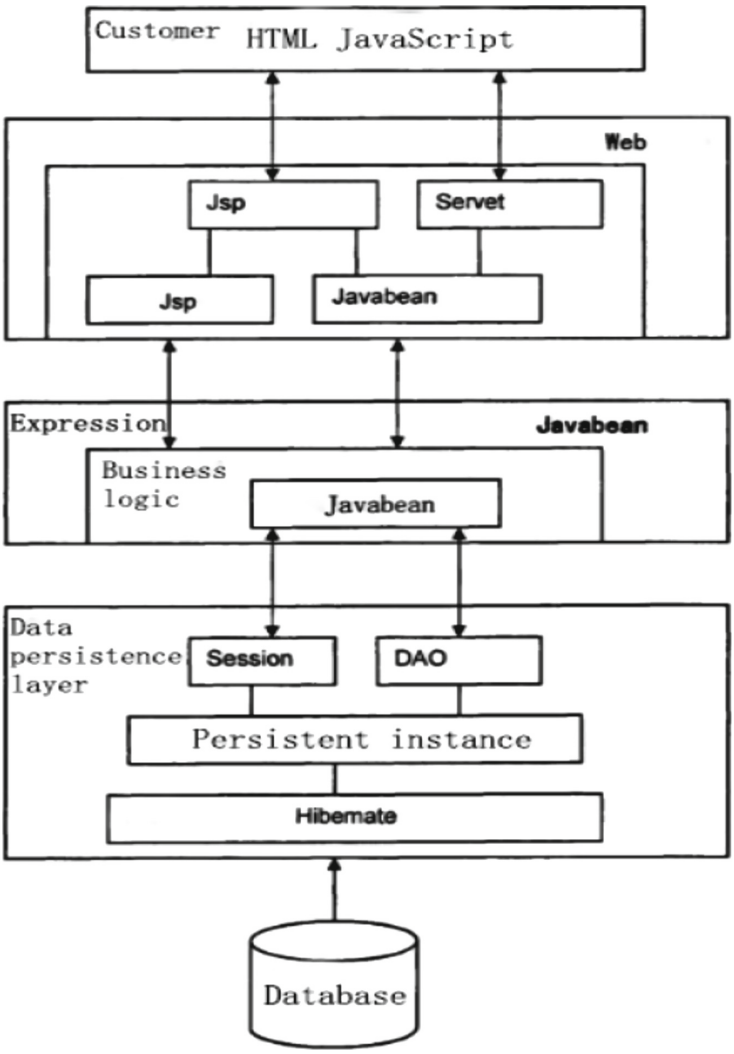

Fig. 2. Structural frame drawing

The reflection function of Java allows programs to dynamically call methods in instances by passing information such as class object instances, method names and

parameter sequences. The following is the system to achieve dynamic call program structure [4].

```
public Object invokeMethod(Object owner, String methodName, Object[] args)throws Exception{
Class ownerClass = owner.getClass();
Class[]argsClass = new Class[args.length];
for(int i = 0, j-args.length: isj; i++)
{argsClass[i] = args[i].getClass();
}
Method method = ownerClass.getMethod(methodName,argsClass);
return method.invoke(owner,args);
}
```

4 Network Structure Design

The design of the experimental platform is divided into two parts, which are network structure and soft resource configuration. The school laboratory can not be allowed to use the financial private network, so through the use of LAN technology, routing technology, three-layer switching technology, wireless local area network technology to build a simulated financial network, and according to the needs of teaching and scientific research, the network interconnection is designed as a dual connection mode, supporting users to access the simulated financial network and the Internet at the same time.

(1) To prevent information leakage and ensure the security of data transmission between the bank and its customers through the public network; (2) to prevent illegal access and restrict the access of illegal users to the internal network of the bank; (3) to protect the integrity of information and to protect the integrity of data by using technical means such as digital certificate; (4) To prevent fake users and provide authentication and authorization methods; (5) to ensure the availability of the system, the client can reduce the possibility of attacking the intranet system by authorizing the use of open services; (6) customer experience of financial services and products to meet the access needs of various clients to financial services, reflecting the characteristics of Internet-based and mobile financial services.

At present, the development of financial services and products and the application of management information lag behind the speed of information infrastructure construction and business development. Financial information technology software investment is obviously insufficient compared with hardware construction investment. F in the future, the demand for intelligent management talents of financial system development and system operation will increase greatly. The soft resource allocation of the platform should highlight the dual functions of talent training and social service, and support experimental teaching and financial research. Therefore, the soft resource allocation of the platform should be considered from two aspects: one is software resources, simulation financial simulation system, data management and analysis software, system development software and system operation intelligent management software; the other is data resources, financial database and data warehouse. The choice of the two kinds of resources should be advanced and redeveloping.

5 Conclusion

At present, the experimental teaching is basically carried out in the laboratory, which has the disadvantages of large investment, large loss, low efficiency, long cycle, difficult maintenance, slow equipment update and so on. The e-finance experimental teaching integrated platform designed and constructed by this research institute is for the development of e-finance system. With the development and popularization of network technology, virtual experiment emerges as the times require. Compared with traditional experimental teaching, virtual experiment has many advantages, such as easy to use, low cost, easy to realize repeated experiments under the same conditions, good sharing under the network environment, wide range of benefits and so on.

Acknowledgements. Provincial Quality Engineering——Financial Management Specialty Group of Anhui institute of International Business, 2020zyq20.

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