



Design and Application of Web-Based University Budget Internal Control Performance Integration System

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Abstract. This paper takes the performance management of internal control of university budget as the research object, builds an university budget internal control performance integration system based on Web technology and computer application technology in Java language environment. The whole system adopts B/S architecture, the front-end interactive page is built based on JSP technology, and the Web Server will adopt SSM framework to complete the development and deployment of various functions and data interfaces according to MVC mode. The function of the system will cover the whole process of budget and performance management in colleges and universities, especially in the performance evaluation stage. The system will give full play to the advantages of data analysis and processing, and can support various data models such as AHP, BSC, KPI and DEA to complete operations. It can improve the accuracy and applicability of the results of budget performance evaluation in colleges and universities, and at the same time realize the networking, digitalization and integration construction of internal control of budget performance in colleges and universities.

Keywords: budget management · performance management · integrated system · Web technology · Java · computer Application technology

1 Introduction

With the increasing enrollment scale of colleges and universities year by year, the gradual improvement of the teaching system, and the continuous improvement of the school-running level and teaching quality of colleges and universities, especially in the new development period, colleges and universities are not only faced with many rare opportunities, but also will face problems such as expanding business scope, increasing operating costs, and low efficiency of resource allocation [1].

Because the budget management of colleges and universities has been neglected for a long time, the focus of its work is on budget declaration and fund payment, so that the problem of “emphasizing distribution and neglecting management” has existed for a long time, which has greatly restricted the development of colleges and universities [2]. In addition, the performance management of colleges and universities presents a

certain independence, which is out of touch with and separated from the budget management. Although the budget preparation requires setting performance indicators and target achievement values, on the whole, the performance target setting of colleges and universities is more arbitrary, and the assessment and evaluation are mostly in the form, lacking the effectiveness of performance management [3]. In view of this, this paper holds that colleges and universities should take advantage of the application advantages of network information technology, take Web technology as the core, and match database technology, computer application technology and data analysis and processing technology to build a Web-based performance integration system of college budget internal control [4]. So as to complete the work of budgeting, execution and performance appraisal with convenient, efficient and visual interactive operation, and achieve the purpose of standardizing the decision-making and execution of projects, strengthening the control of operating costs and improving the efficiency of resource allocation [5].

2 System Development Process

The overall development of the system is based on Linux operating system, with CentOS as its version, Java as its basic development environment, JDK version 1.8.0_91 as its development kit, Tomcat 8.0 as its Web server, IntelliJ IDEA as its Java integrated development tool and Oracle 11g as its database. After the above software systems are installed and configured one by one, the system development environment is built [6]. This system uses Maven 3 to manage the project structure, splits the whole project into several engineering modules, and based on SSM architecture, completes the integration of Spring-Spring MVC-MyBatis. Detailed code is shown in Fig. 1 [7]. After the above settings are completed, deploy the configuration file to the project to complete the overall development environment. Through the introduction of the above key technical theories, the overall environment of the system development, the configuration of related software and tools are determined, and the technical feasibility of the overall project of the university budget internal control and performance integration system is also clarified [8].

```
<servlet>
  <servlet-name>DispatcherServlet</servlet-name>
  <servlet-class>org.springframework.web.servlet.DispatcherServlet
  </servlet-class>
  <init-param>
    <param-name>contextConfigLocation</param-name>
    <param-value>classpath:spring-mvc.xml</param-value>
  </init-param>
  <load-on-startup>1</load-on-startup>
</servlet>
```

Fig. 1. SSM framework structure setting key code (original)

3 Detailed Function Realization

3.1 Budget Performance

Under this function module, the system supports users to complete the input of budget performance objectives according to the organizational structure or project structure of colleges and universities. For example, colleges and universities can be divided into three levels according to the organizational structure: school level, department level and teacher level. Each level has a corresponding budget performance integration scheme [9].

3.2 Performance Evaluation

Performance evaluation is the core link of the system function realization. The system will complete the performance index selection, weight value setting, evaluation value management and other operations in turn according to the process of university budget performance evaluation. Under the performance indicator selection page, users can select and determine the budget performance indicators from the financial, customer, operation, growth and revenue dimensions according to the applicable requirements of the budget performance evaluation model. Some indicators are shown in Table 1.

After the performance indicators are published, users can complete the evaluation and consideration of performance indicators on the weight setting page. The weight of indicators comes from the preset fuzzy analytic hierarchy process algorithm in the system, that is, the normalized weight of performance indicators is calculated by combining the importance of performance indicators [10]. On the final index value management page, the system will automatically calculate the final overall strategic target evaluation value according to the performance index scores of different departments, different

Table 1. Part of the performance indicators under various performance evaluation models (original)

Performance evaluation model	Index classification	Index content
AHP, BSC, KPI	Financial index	Total income, total expenditure, project support
	Customer index	Number of students in school, number of graduates
	Operating index	System perfection degree and system implementation degree
	Growth index	Proportion of senior teachers, amount of scientific research investment and number of scientific research achievements
DEA	Income index	Income and expenditure ratio, budget execution rate

Table 2. Calculation results of budget performance evaluation (original)

Index content	Type	Type weight	Indicator weight	Standard value	Actual value	Evaluation value
Total income	A1	0.224	0.558	1.004	0.972	0.95
Overall expenditure			0.419	5.130	4.99	0.90
Number of students in school	A2	0.298	0.122	33	30.44	0.81
Number of graduates			0.167	37	25.39	0.691
System perfection degree	A3	0.176	0.153	11	3	0.13
Input for scientific research	A4	0.191	0.293	2.225	3.05	0.59
Number of scientific research achievements			0.277	3.711	1.17	0.89
Income and expenditure ratio	A5	0.111	0.109	22.53	11.03	0.50

positions and different employees. The calculation formula is shown in Formula 1. P_i represents the score of performance indicators, $d(C_i)$ represents the normalized weight value of performance indicators, and Q is the final evaluation value of overall strategic objectives. The final calculation results are shown in Table 2.

$$Q = \sum_{i=1}^n p_i \times d(C_i) \quad (1)$$

3.3 Internal Audit Management

Under this function module, users can view, count and analyze the results of college budget performance evaluation, and form evaluation reports, the specific effect are shown in Fig. 2.

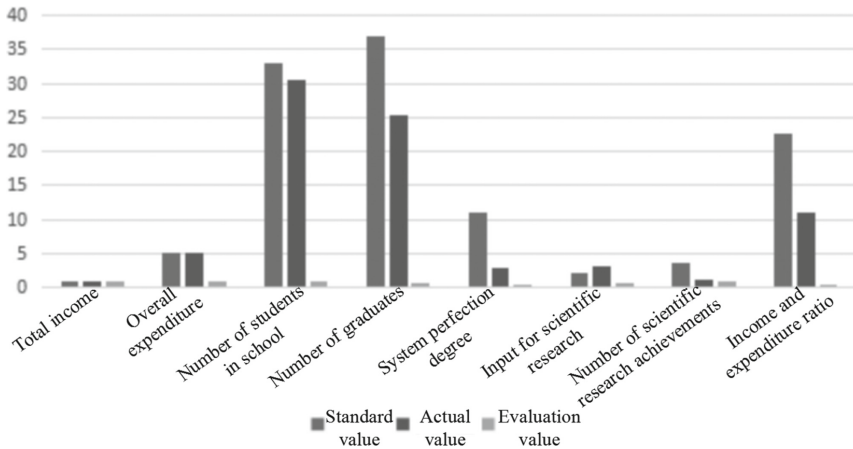


Fig. 2. Data visualization and chart presentation (original)

4 Conclusion

In order to achieve the goal of integrated management of budget performance in colleges and universities, this paper builds an integrated system of budget performance in colleges and universities with the help of Web technology, database technology and computer application technology from the perspective of improving internal control efficiency. It puts forward a set of practical implementation plans for the problems faced by colleges and universities in terms of project handling, business management and capital trends.

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