

Research on the Evaluation System of University Employment Quality Based on Factor Analysis

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Abstract

Because of the complex evaluation data of university employment quality, the accuracy of the calculation results is difficult to be guaranteed. And design based on the factor analysis of university employment quality evaluation system, not only can solve this problem, but also can improve the response speed of the system, after collecting sufficient data, can use the common factor. calculate the weight of the evaluation system model, and use the model, the evaluation results feedback to the user. The final experimental results also proved that the accuracy of the university employment quality evaluation system based on factor analysis is higher than that of other systems and has certain stability. The subsequent evaluation system research needs to focus on the safety and protection aspects of the system.

Keywords: Factor analysis; common factor; CPU occupancy rate

1 INTRODUCTION

The current employment environment is very tight, and the employment competition of college students is fierce. Data show that the employment rate and resignation rate of college students are high [1], which also shows that the employment quality of college students is not high. The employment quality of universities that can be understood from the employment report is very limited [2]. The study of the university employment quality evaluation system based on factor analysis is to show the employment quality level of college students more comprehensively and promote the healthy development of their employment quality [3].

2 MODEL OF COLLEGE EMPLOYMENT QUALITY EVALUATION SYSTEM BASED ON FACTOR ANALYSIS

2.1 Factor analysis suitability test

Twenty-five indicators were selected to test the suitability of factor analysis. The test results were the P value of the significance test of the index correlation coefficient, and the P value was <0.01 [4].

2.2 Common factor extraction

The index was reduced, and the six factors of eigenvalue ≥ 1 were determined as common factors. The 15 evaluation indexes extracted from the common factors are then analyzed [5], which are the evaluation factors, [6] and are expressed by X1, X2, X3, X4...X15. Common factors and evaluation factors are shown in Table 1.

Table 1: Common factors and Evaluation Factors

Graduate satisfaction F ₁	Employment structure F ₂
Fringe benefits X ₁	Working stability rate X ₅
Work environment X ₂	Work entrepreneurship rate X ₆
Working hours X ₃	Work development space X ₇
Salary level X ₄	
Supply demand ratio of graduates F ₃	Employer satisfaction F ₄

Specialty oriented supply and demand X_8	Working ability X_{10}
Post demand level X_9	Professionalism X_{11}
	Graduate quality X_{12}
Employment data F_5	Signing rate F_6

rate of employment X_{13}	Employment X_{15}
Examination rate X_{14}	

2.3 Factor score

Factor scores will reflect the level of university employment quality evaluation, while the factor score matrix is shown below, where F is the quality of college employment [7].

Table 2: Factor score matrix

Evaluating indicator	F_1	F_2	F_3	F_4	F_5	F_6
X_1	0.412	0.034	-0.233	-0.394	0.125	-0.269
X_2	0.317	-0.105	0.268	-0.342	0.014	0.332
X_3	0.406	-0.02	0.137	0.369	0.263	-0.052
...
X_{15}	0.596	-0.102	-0.384	0.112	0.125	0.176

The F_1 factor score expression is the addition of X_1 - X_{15} in the first row, as follows:

$$F_1 = 0.412X_1 + 0.317X_2 + 0.406X_3 + 0.545X_4 + 0.373X_5 + 0.347X_6 + 0.392X_7 + 0.469X_8 + 0.448X_9 + 0.698X_{10} + 0.375X_{11} + 0.420X_{12} + 0.695X_{13} + 0.694X_{14} + 0.596X_{15} \quad (1)$$

Table 3: Evaluates the weight of the main factor

Principal factor	Weight	Evaluating indicator	Weight
F_1	0.272	X_1	0.203
		X_2	0.188
F_2	0.157	X_3	0.199
		X_4	0.410
F_3	0.152	X_5	0.358
		X_6	0.326
F_4	0.131	X_7	0.316

		X_8	0.495
F_5	0.112	X_9	0.505
		X_{10}	0.308
F_6	0.176	X_{11}	0.338
		X_{12}	0.354
		X_{13}	0.542
		X_{14}	0.458
		X_{15}	1.000

Based to the quality above above, as shown in the following formula:

$$F = 0.272F_1 + 0.157F_2 + 0.152F_3 + 0.131F_4 + 0.112F_5 + 0.176F_6 \quad (2)$$

Build a quality evaluation model based on this, as shown in the following formula:

$$F_1 = 0.203X_1 + 0.188X_2 + 0.199X_3 + 0.410X_4 \quad (3)$$

3 ANALYSIS OF THE EXPERIMENTAL RESULTS

The test was performed by collecting 2000 experimental data in the programming environment of VC6.0. Among them, the experimental comparison system is the academic evaluation system for college students based on CIPP and CDIO model and the entrepreneurship education evaluation system of digital

badge technology [8]. These two systems are divided into literature one system and literature two system. Relevant experiments on the response delay, interruption probability [9], CPU occupancy and evaluation accuracy of these two systems can detect the performance level of these three systems in the application. For comparative experiments comparing the response delay in the above system, the results are shown in Fig [10].

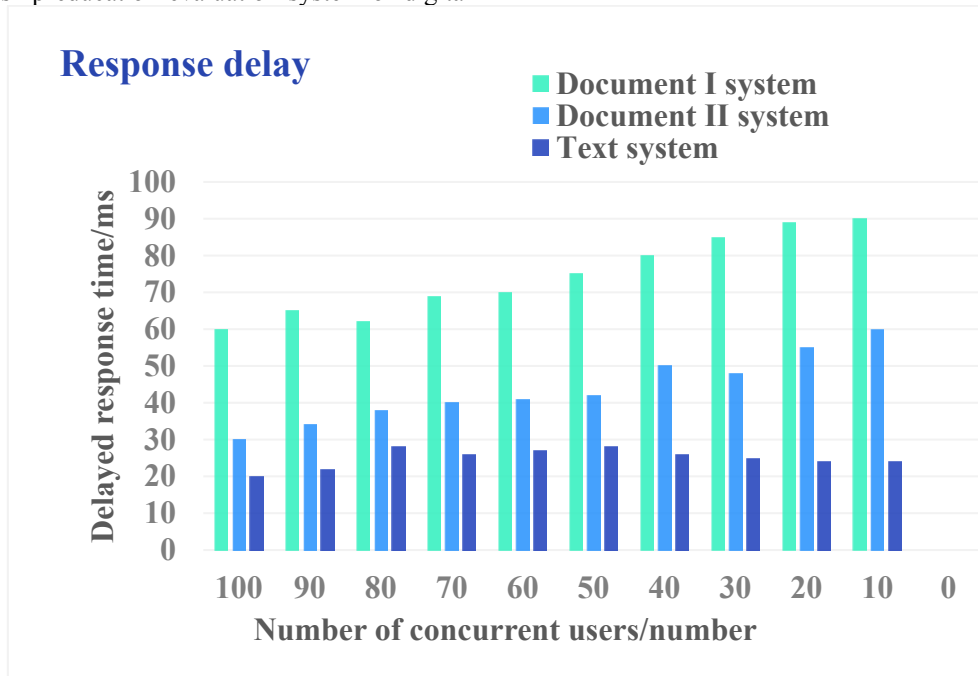


Figure 1. Response delay

As you can see in the figure above, when the number of concurrent users increases [12], the response delay increases, with all three systems exception. The difference between the system and the other two systems is that the response delay is generally lower than that of the other two systems [13], which means that the

response time of the system is shorter and the response is faster [14]. In addition, an experiment was conducted on the university employment quality evaluation to test the average interruption probability of the three systems under different SNR ratios. The results are shown in the following figure [15].

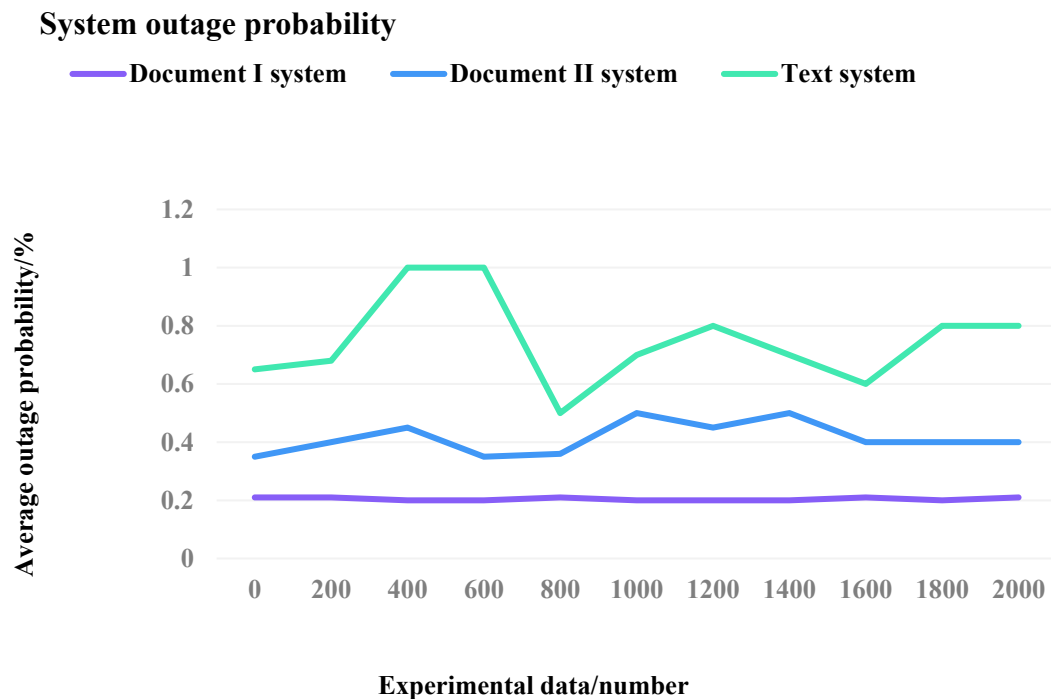


Figure 2. System outage probabilistic

As can be seen from the figure above, the interruption probability of the system is very different for the other two systems. The interruption probability of the system is lower and has almost no fluctuation, and the growth curve is very flat. This shows that the results of

employment quality evaluation are more reliable. Comparing the accuracy rate of university employment quality evaluation of the three systems, the following figure is obtained.

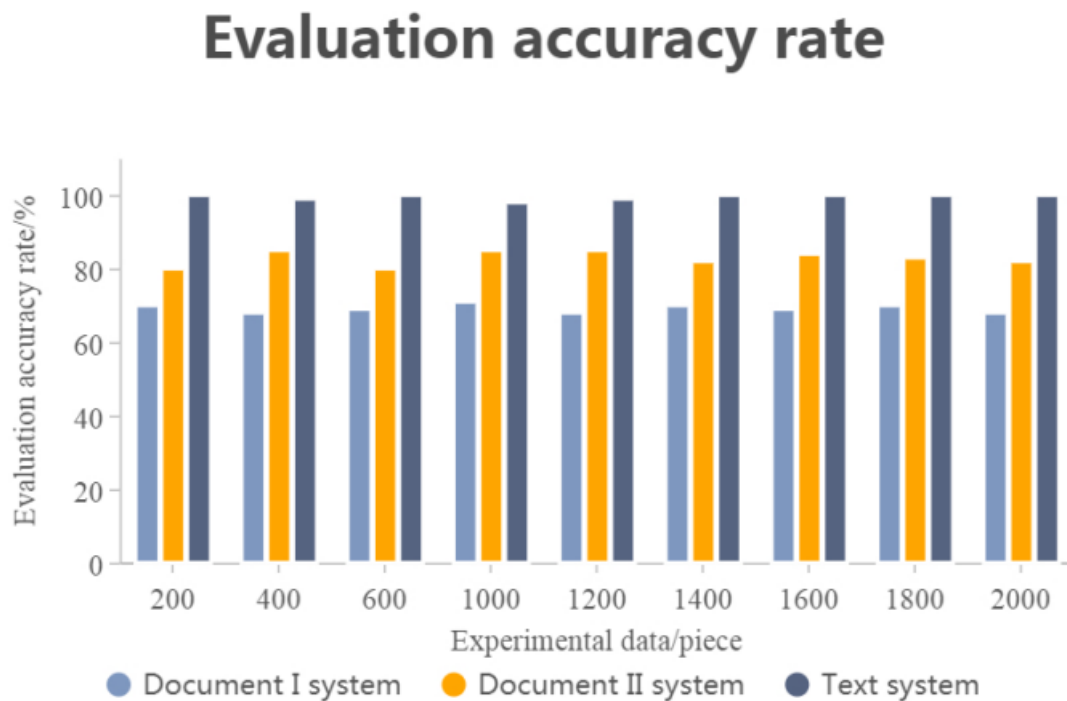


Figure 3. Evaluation accuracy rate

As shown in the figure above, compared with the accuracy of university employment quality evaluation, the system is much higher than the other two systems,

which shows that the system has certain advantages in quality evaluation, and can be effectively used in the employment quality evaluation of college students.

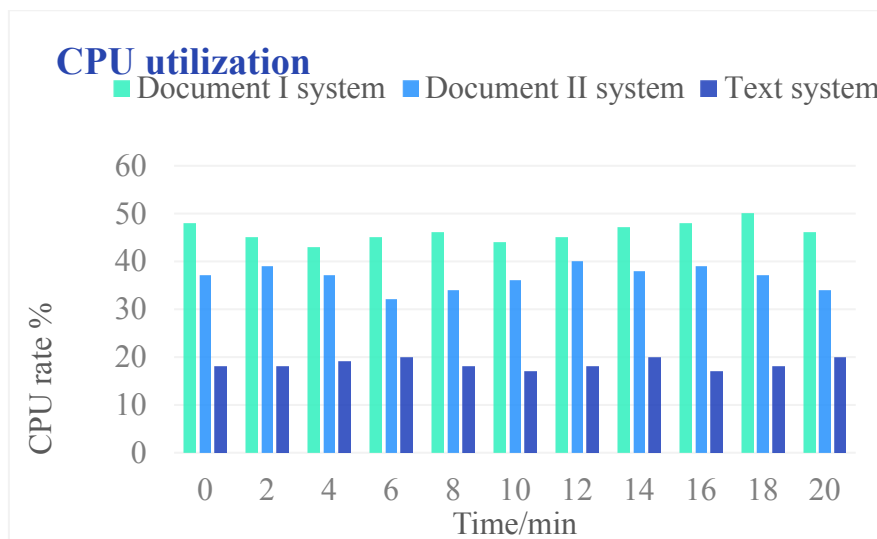


Figure 4. CPU occupancy rate

Compared with the cpu occupancy rate of the three systems, the occupancy rate of this system is lower than that of the other two systems, which also shows that the resource occupancy rate is low in implementing the employment quality evaluation [11].

4 CONCLUSION

When evaluating the quality of university employment, it is difficult to produce accurate evaluation results because of the complicated calculation process. The significance of designing and studying the evaluation system based on university employment quality by factor analysis method lies in this, which helps universities to solve the problem of inaccurate university employment quality evaluation results. The common factor extraction and factor weight calculation are simplified by the factor analysis method. And to ensure the accuracy of the operation, reduce the CPU occupancy rate, so that the system to maintain a fast response speed. However, because the employment data will involve the relevant privacy, so in the further research, in-depth research on the security protection of the employment quality evaluation system is also needed.

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Study on the impact of COVID-19 on employment of College graduates in Jiangxi Province and countermeasures

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