# Research on Intelligent Personnel Compensation and Performance Based on Database and KPI Index System Management Platform

Rui Lan *

*Tianjin University of Technology and Education*
*\* Corresponding author e-mail: tg667788@xzcstudio.com*

**Abstract**

Faced with the current Chinese personnel compensation system and performance management assessment rate is too unified, poor fault tolerance, low query performance. The intelligent system management of personnel compensation and performance appraisal based on database and KPI index system is designed. The overall modular structure of intelligent compensation and performance system is summarized, the hardware and software of the system are designed, and the framework and function of each module are analyzed in detail. In the establishment of job evaluation indicators, job evaluation indicators are calculated, and according to the calculation results, the correlation analysis between job evaluation results and salary is completed. Experimental results show that the designed intelligent compensation and performance management system has high query performance and fault tolerance. The query error rate is only 0.2%, and the system response time can be controlled within 1.5 seconds at any time in the daytime.

***Keywords-***database; KPI index system; management platform; intelligence; personnel compensation; performance

## 1. INTRODUCTION

Performance appraisal is the baton of an enterprise, and compensation is related to the vital interests of employees. How to coordinate and formulate performance and compensation policies that meet the real needs of enterprises and employees is a recognized management problem for enterprises. The corporate world also forms the core of the proposition of business management. The essence of performance evaluation and salary management system based on value creation is to solve the problems of value evaluation and value distribution. The employee is the carrier and source of enterprise value creation. The talent team of scientific research institutes are generally young and have received good education consciousness and value recognition, and pay attention to psychological feelings. Whether the evaluation of company value is reasonable and whether the value distribution is fair is related to the enthusiasm of employees and the long-term development of the company. Taking a certain research institute as an example, the author elaborates on the performance evaluation and salary management system based on value creation, which effectively promotes the longevity of the company and provides effective service to its peers in the industry by reforming performance indicators, strengthening bone incentive, activating system and mechanism, and stimulating the vitality of employees [1].

Compensation is a major determinant of a company's employees' status and success, and has a great impact on employees' attitudes and behaviors. Wage expenditure is an important cost item of enterprise, and salary system is the main link between labor and capital. On the one hand, compensation management can maintain the normal operation of enterprises, and at the same time, it is also an effective tool to promote the normal operation of enterprises. Decision making and compensation management have a huge impact on staffing, operation and management of a company and maintaining its competitive advantage. Only a scientific and reasonable salary system and a fair and Geffective distribution mechanism can help recruit the right talents, retain the needed talents and truly deploy the talents to the right positions. Only by understanding and using talents can talented employees be encouraged to give full play to their talents, pursue their personal value, and create valuable results for the company. Performance pay management system is to use human resource management to ensure

that companies or enterprises implement the best ways and methods to achieve specific tasks and goals. The essence of the system is to deal with human problems in the actual operation of the company or enterprise. On a technical level, it means processing efficiency. On an economic level, it means processing efficiency, which is good for stakeholders. For an excellent organization to achieve excellent results, it is necessary to implement effective people-centered management.

## 2. PROBLEMS WITH THE PAY FOR-PERFORMANCE SYSTEM

While the idea of performance appraisals aimed at improving employee productivity is not new, managers now value the process more than in the past, treating it as a comprehensive concept. This process includes goal setting, employee training, evaluation and reward. Performance management can be defined as an independent overall system, which integrates goal setting, performance evaluation and development to ensure that employee performance is fully consistent with the company's strategic objectives. Performance management is a process in which managers set work objectives and work content for employees, improve their working ability, evaluate and reward their achievements, and effectively support the company to achieve macro goals. Well-designed performance management does not simply take the form of asking employees to review their performance once or twice a year. When setting work goals, it needs to consider whether it is practical to achieve the strategic goals of the company and whether daily or weekly interaction with employees is needed to ensure continuous improvement of employees' abilities and performance to receive appropriate training and development. Performance management as a necessary procedure, in today's global competitive industry environment, the work of every company employee must be focused like a laser to help the company achieve strategic goals. From this point of view, the use of overall performance management to guide, develop and evaluate employees will also contribute to the continuous improvement of employee performance [2]. Continuous improvement refers to the management concept that requires enterprises to constantly set and achieve higher quality, lower cost, faster delivery and more realistic goals. Improving continuity means eliminating any unnecessary waste of resources such as overproduction, defective products, unnecessary downtime, transportation costs, processing costs, increased operating costs and redundancy in inventory taking. The key to the whole process is performance management, as it integrates goal setting, performance evaluation and development into a system designed to ensure that employee performance is fully aligned with the company's strategic requirements [3].

The institute implements the performance salary management mechanism of two-level assessment subdivision. The institute is responsible for department assessment and department salary distribution. The department is responsible for the assessment of employees and the distribution of employees' wages. Department assessment is composed of key performance indicators (KPI) and comprehensive performance indicators (CPI). Staff assessment includes work performance, party members and cadres, party conduct and integrity, security and confidentiality and other indicators. It is composed of position, bonus and preventive pay, among which position and preventive pay are relatively fixed, and performance pay is dominant.

Under the guidance of valuing creator orientation, how to focus on evaluation indicators and reasonably distribute income is an important subject that needs to be explored and implemented. The current staff appraisal and salary system of the institute is related to the following three problems [4].

## 2.1. Evaluation Metrics do not Effectively Focus on Value Creation

KPI is the improvement and implementation of organizational strategy. At present, the KPI is mainly about model development, model quality and end-to-end management. All projects are planned, and scoring is taken as the implementation degree of the plan, which includes the strategic elements of the enterprise and overcomes strategic issues. CPI index is an index that affects the basic management of organizations. At present, there are too many evaluation indexes of functional institutions in the institute.

## 2.2. Insufficient Performance Feedback and Coaching

Research shows that performance feedback and guidance have much more incentive effect on employees than performance reward alone. At present, a research institute spends a lot of energy on performance appraisal, but ignores the link of performance feedback and guidance, which leads to the staff unable to improve according to the standard, and the ability to identify staff is also poor. According to statistics, since the establishment of the institute, only 4 people are competent and 0 people are incompetent, hindering high-value creators.

## 2.3. Wages are not in Line with Employees' Expectations

The institute's employees are paid competitively in the industry, but their profitability is relatively low due to years of overtime work. Compared with the compensation system of market-oriented enterprises with high rewards,

high fines and strong incentives, the compensation system is relatively simple and lacks mid - and long-term incentive policies such as capital incentive, external equity and marketization, and has no significant positive incentive effect on employees. In addition, rule 28 shows that 20% of employees create 80% of the value, but there is a phenomenon of high or low value distribution, and there is no negative supervision for low-performance employees.

## 3. INTELLIGENT SYSTEM DESIGN OF COMPENSATION AND EMPLOYEE EFFICIENCY

Under the current system reform policy, how to further improve employee compensation and employee performance management is one of the key work that Chinese enterprises pay attention to. Throughout China personnel pay and performance management model at present, mainly based on the comprehensive target management method, it is a good way to add cost accounting. It is difficult to arouse the enthusiasm of employees, and there are local inequality, associated with the current system for performance management method is not perfect, the evaluation index is too unified, overall evaluation of the effect not effective. In order to solve the current challenges in the process of employee compensation and performance appraisal, this paper designs a new intelligent index rating framework that can improve the overall performance management of the department.

### 3.1. Overall System Design

According to the characteristics of the current Chinese enterprise management system and the characteristics of the department organization, the design of an intelligent system module, so that the personnel salary management and performance management in the overall operation of the enterprise management to play a more important role. The overall design framework is shown in figure 1.

### 3.2. System Hardware Design

As can be seen from the above overall system structure, the hardware part of the system is composed of three modules, including employee information management module, salary management module and performance management module [5].

Employee information management module is the basic structure of the module in a system that comprehensively manages employee compensation and performance of various departments of the enterprise, mainly including the number of employees, names and other basic information.

Salary management module is the main functions of intelligent personnel salary management module include salary check, salary distribution and generating statements. The composition of the whole compensation management module is shown in figure 2 [6].
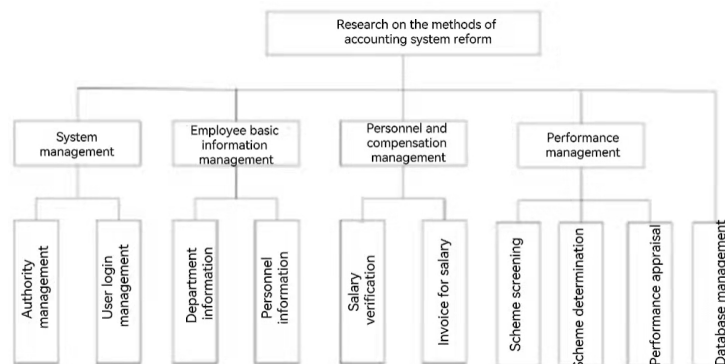


**Figure 1.** The overall framework chart of intelligent personnel compensation and performance management
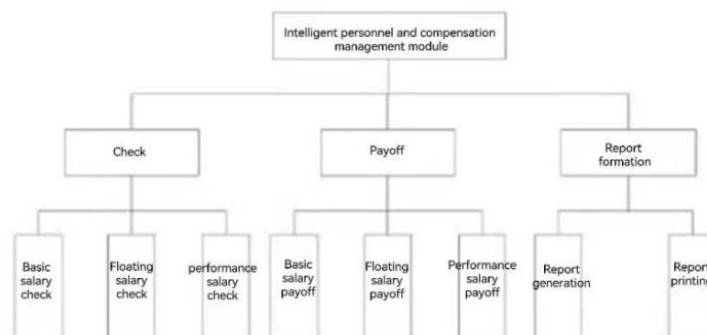


**Figure 2.** Intelligent personnel and compensation management module framework diagram

Performance management module, the core module of intelligent personnel compensation and performance system management is the performance appraisal module. The establishment of employee compensation standard and the payment of salary need a set of indicators management system and performance appraisal system based on the complete KPI. The functional module composition of the intelligent performance management system is shown in figure 3.
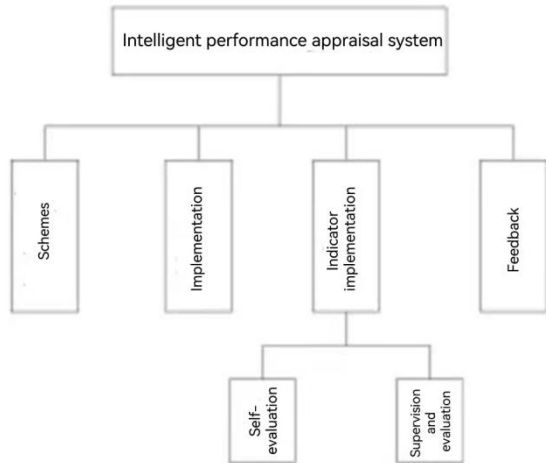


**Figure 3.** Composition diagram of the intelligent personnel and salary performance assessment module

### 3.3. System Software Design

The database system is the information center of the intelligent performance appraisal system. The information of each system module is summarized in the database module. Based on the database module, the system administrator inputs the basic files, evaluation indicators and the completion of evaluation information of employees, and can directly calculate the achievement of related indicators of employees, as shown in figure 4 below.
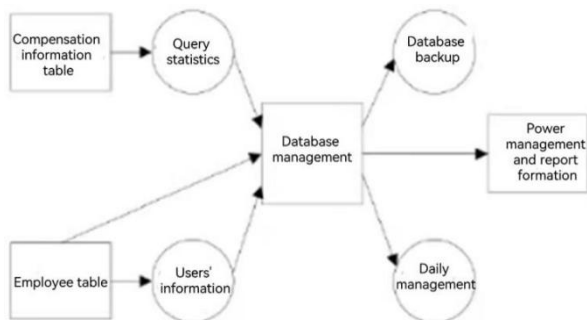


**Figure 4.** Database system diagram

Based on the database system, the specific process of analyzing intelligent employee salary and performance management is given. It can analyze the correlation between performance indicators and salary, and complete the intelligent management of employee salary and performance.

In the analysis of the correlation between the result of job evaluation and salary, it can firstly calculate the overall job evaluation, and analyze the correlation between the result of job evaluation and salary, as well as the correlation between the result of job evaluation and salary [7].

The model mainly evaluates three complex characteristics of employees, namely, organizational discipline, work attitude and coordination ability. The results of these three projects are respectively represented by Q1, Q2 and Q3, and their value range also meets the requirements from 0 to 100. They are the overall performance evaluation scores, which can be described by equation (1). Each of these points is worth 10% of the total weight of the system. The system also enables users to further develop and test more comprehensive quality elements and employee skills.

$$P_{Au} = 10\%Q_1 + 10\%Q_2 + 10\%Q_3 = \frac{\sum_{k=1}^{3} Q_k}{10} \quad (1)$$

This paper realizes the inspection items by formulating the way of performance appraisal.

The objective is flexible. When initiating performance appraisal, the department head will decide the employee's salary according to the overall performance appraisal result.

Correlation between performance appraisal results and compensation PSUM can be replaced by (2).

$$P_{SUM} = \omega P_{Au} \quad (2)$$

To sum up, the correlation between performance appraisal results and compensation can be obtained, and the design of intelligent personnel compensation and performance system can be completed [8].

## 4. SYSTEM APPLICATION INSTANCES

### 4.1. Application Case Analysis

To test in this paper, the design of performance management system in the intelligent personnel salary management and employee performance management, the application of the actual effect, the system startup of more than 300 people in a simulated emission scenarios, and query the employee's compensation and performance, and a random sample of 1000 a query (divided into 10 groups), and the ability to resist damage of observation system, data statistics as shown in table 1.

**TABLE 1.** INTELLIGENT PERSONNEL COMPENSATION AND PERFORMANCE MANAGEMENT QUERY FAULT TOLERANCE ABILITY

| Query the experimental group | The number of times the performance system queries errors | |
|---|---|---|
| | Integrated objective management system | System designed in the text |
| 1 | 2 | 0 |
| 2 | 1 | 0 |
| 3 | 5 | 0 |
| 4 | 1 | 1 |
| 5 | 6 | 0 |
| 6 | 8 | 0 |
| 7 | 2 | 1 |
| 8 | 3 | 0 |
| 9 | 2 | 0 |
| 10 | 9 | 0 |
| Total | 39 | 2 |

From 10 groups of statistical data, it can be concluded that the query error rate of traditional end-to-end target management system reaches 3.9%. In this paper, there are only 2 query errors, and the query error rate is only 0.2%. It can randomly select different time periods of workdays to observe the response time of the system to the query. The selected times are 9:00 a.m., 11:00 a.m., 1:30 p.m., 2:30 p.m., 3:20 p.m. and 4:30 p.m. The response time of the intelligent employee compensation and performance management system designed in this paper is observed across six time frames. In order to increase the comparability of simulation experiments, a traditional performance management system is added under the same conditions for comparison. The specific changes of response time to queries are shown in figure 5 below [9].
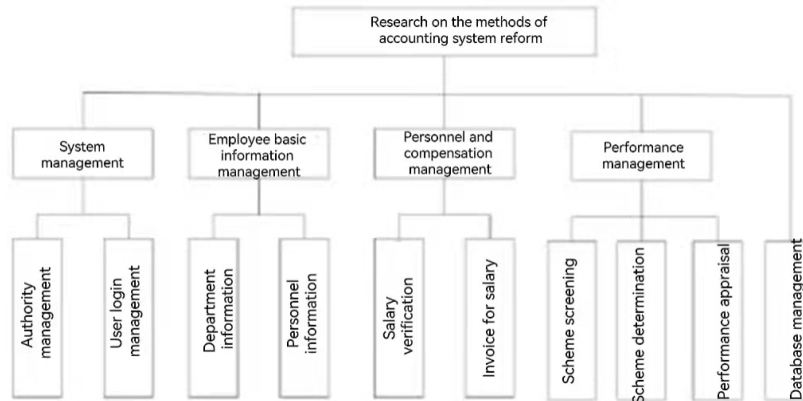


**Figure 5.** Intelligent personnel compensation and performance query system response time

In the same simulation scenario, the response time of two systems to query is compared respectively. There is little difference in response time between the two systems during the no-system phase, such as at 9:00, 11:00, and 16:30, and when the number of users on the system increases. The maximum response time of the traditional design is more than 2.5s, but the system response time of the development design can still be controlled within 1.5s, which greatly improves the system load efficiency. To sum up, the experimental data show that the intelligent employee compensation and performance management system designed in this paper has certain advantages [10].

## 4.2. Effectiveness of the Pay For-performance System

- Improve employee satisfaction

- Through scientific and prudent assessment of compensation management results, it can improve employees' enthusiasm, let employees have a better space for development, and expand the field of personal improvement of employees. Key performance appraisal enables employees to make their own development plans according to their personal situation and the needs of the company,

and at the same time, they are more confident about their future efforts. Employees' satisfaction with the enterprise is significantly improved, and the realization of self-value is more clearly linked to the development of the enterprise, which is actually reflected in the work process. In the company, the working atmosphere of the employees is more harmonious. The work efficiency is greatly improved, the employees are more positive to work, and the company also benefits the employees. To protect the interests of employees, further standardize the working hours, it can implement the paid vacation system, pay wages on time, pay various insurance, improve the assessment system of work-related accidents, strengthen the security of work-related accidents [11]. It needs to adjust the wage distribution plan accordingly, increase the front-line tendency, adjust post wages, social welfare and retirement wages, and raise the star line and annual reward and salary standards in accordance with the principle of working more and getting more. It will increase winter heating subsidies for employees by fully paying their social insurance premiums. It can provide employees with additional summer

cooling fees, purchase cooling drinks, and upgrade Christmas meals and breakfast supplements during winter sports, speed up the standardization of station construction and actively improve the working and leisure environment for employees. New winter gear was distributed to front-line workers such as drivers, field dispatchers and security guards, and regular holiday benefits were distributed to maintenance personnel and retirees, and birthday cakes were distributed to employees, assign work as needed to address the practical difficulties of some workers, care about employee health, organize employee physical examination [12].

- Improve the internal management efficiency of enterprises

- Management has become more scientific and effective, and operations and management have been strengthened. The implementation of internal market action improves the assessment system. The implementation of comprehensive budget management, cost control achieves good results. Changes in the enterprise management system further standardize the scope of responsibility and workflow. The organizational structure has been constantly improved, individual positions have been optimized and adapted. The bottom-up team management talent has been enriched, and inventory managers have been more management positions, so that the management is more effective. High-quality talents were assessed and employed, and some of them were selected and employed through examinations, further opening up channels for talent growth. The management space of different business units is larger, and the awareness of market and efficiency is further enhanced. The innovation ability has been constantly improved, and new ideas and methods of management optimization have been actively explored to improve research and transformation opportunities [13].

- The company's operating effect has been improved

- The recruitment of employees is fair, and training efforts are intensified according to their merits, including training for drivers, field dispatchers, captains, lieutenants, and the five of the fleet. The quality of all staff is constantly improved, the rights and interests of employees are guaranteed, and the permanent employment relationship is more harmonious and stable, so that employees actively share the achievements and progress of the company. The staff canteen organizes meals actively and scientifically, so that the staff are satiated, well-fed and satiated, retired comrades, actively do good deeds to help and save the work,

solve the difficulties of the staff worries. Performance management is not mainly retrospective and post-evaluation, but through effective performance feedback to promote the sustainable development of the organization, and create better results indefinitely. Based on the basic concept of employee respect and exciting goals, it constantly stimulates the spirit of individual participation in collective knowledge creation and collective innovation, forming a dynamic mechanism that is never satisfied and survival of the fittest. The performance pay management system establishes a high performance work system and incentive mechanism for the sustainable development of the organization and creates a positive atmosphere in the whole company. It can select the right talent. Team members have more independent entrepreneurial spirit. Employees continue to pursue excellence, core values-oriented, and constantly motivate employees to achieve better performance. A positive work atmosphere is also good for the company, benefiting both the employees and the company [14].

- Avoid the problem of reduced motivation effectiveness

- The appraisal system should allow employees to have clear work goals and a strong sense of accomplishment, and do their work well. Only in this way can intelligent and effective performance improvement be truly achieved. Employees learn about personal relationship with the company strategy and goal, willing to take on more responsibility, willing to sacrifice their own knowledge and potential, and make greater contribution to efforts to guide employees, make them the performance appraisal as a way to improve performance rather than just a way of allocation of bonus, really focus on the performance of the whole company, healthy growth in effective work [15].

- Assessment should be fair, otherwise the effectiveness of work assessment cannot be guaranteed and the purpose of motivating employees cannot be achieved. The so-called fairness is mainly reflected in the purpose of evaluation. The content and standard of evaluation should be open and clear, treat everyone equally and be accepted by the majority of people. Evaluations follow specific procedures, and the results are published and monitored. As long as this is done, it can be considered fair and does not satisfy everyone.

- Reasonable and effective communication can improve the efficiency and effectiveness of management, because the so-called management

and communication are closely related. Management communication helps to maintain the normal operation of the organization, smooth the transfer of information between different departments, and also plays a role in departmental coordination and resource optimization [16]. Communication management helps to establish a good working relationship, strengthen internal communication within the organization, promote close coordination and collaboration among members, and make continuous efforts to achieve the vision of the company, departmental goals and personal career development. Management communication helps to stimulate the enthusiasm of employees, promote the creation of an equal and open working atmosphere within the organization, make employees feel the sense of ownership and participation, and effectively stimulate the morale and potential of employees. Through communication, employees will take the initiative to find problems and timely find solutions. How to communicate effectively in an interview can explain problems to employees and make them aware of the areas they need to improve, without putting them off. This is the art of communication. Communication is a necessary link. Managers should understand the purpose of performance feedback, the principles of communication and the basic methods of communication. Communication is an important part of performance management, which cannot be ignored, but needs to be strengthened and emphasized.

## 5. Conclusion

Based on the research of KPI performance index system, this paper designs an intelligent system of salary management and employee performance appraisal based on database management. The performance management system includes many function modules, which can simulate the scenario of multi-user query at the same time. The addition of database management improves the system performance, and also increases the network load of the whole system. The query performance, accuracy and fault tolerance of intelligent employee compensation and performance management system can be improved by optimizing system functions, shortening system response time and user query cycle.

## References

[1] Wu Weibo. Research on the construction and implementation of compensation performance management System based on the concept of relative competitiveness.

[2] Tan Hao, Ma Junying, Bai Jinze. Research on performance appraisal and compensation management based on value creation [J]. Aerospace Industry Management, 2019(5):3.

[3] Gou Zhiyong. Research on Employee Compensation System of Western Management Department Based on Performance Appraisal [D]. Xidian University, 2017.

[4] Jin Kecun. Research on Performance-based Salary Management System [D]. Shandong Normal University, 2013.

[5] Sun Lu. Design and Development of School Personnel Performance Appraisal Management System [D]. Jilin University, 2015.

[6] Lou Rongrong. Design and Implementation of Enterprise Intelligent Personnel Management System Based on.net [D]. Xi 'an University of Science and Technology, 2015.

[7] Sea gull. Design and Implementation of Performance Management System for Human Resource Management [D]. Beijing University of Technology, 2016.

[8] Li Ping. Research and Development of Personnel and Salary Management System based on SSH [D]. Ocean University of China.

[9] Yi Xiaowen. Research on the integration method of enterprise human resource performance evaluation and compensation management based on strategic perspective [J]. 2020.

[10] Yin Huiwei. Management and Technology for Small and Medium-sized Enterprises, 2018, 000(020):31-32.

[11] Wang Hailong. Integration analysis of performance evaluation and compensation system based on strategy [J]. 2022(24).

[12] Luo Guo-kai. Improvement of LD(China) Core employee compensation system based on KPI Performance Appraisal.

[13] Guo Lihua. Research on performance appraisal and salary management based on public institutions [J]. Economy, 2016(10):00202-00202.

[14] Li Yan, ZHAO Ruimei, Chen Xi. Research on the integration method of human resource performance evaluation and compensation management based on strategic perspective [J]. Enterprise Reform and Management, 2019(8):2.

[15] Fan Honggang. China Science and Technology Investment, 2014(A19):2.

[16] FuYing. Design and implementation of personnel salary management system based on C++ [D]. Xiamen university, 2013.