Design of Three-Rimensional Point System Evaluation System for Enterprises Based on AHP

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Abstract. Starting from the management idea of the point system, based on the three dimensions of "fixed points-behavior points-task points", the paper constructs the evaluation system of enterprise points, and designs specific assessment indicators according to the five aspects of "morality, ability, diligence, performance and creation" according to its core daily behavior points, and finally adopts the AHP method to determine the points value. It is hoped that through this study, the labor efforts of employees in the work will be reflected in the form of points, mobilize employees' enthusiasm, and help the healthy development of enterprises.

Keywords: Points system; Daily behavior; Employee evaluation; Human resources.

1. Introduction

The point system refers to the use of reward points and deduction points in enterprise management to conduct all-round assessment of employees' personal value, behavior ethics and comprehensive performance, quantify the points data of employees through the point system, and link the points with the salary and benefits, position promotion, etc. obtained by individuals in the enterprise, so as to mobilize people's enthusiasm for work in an all-round way and improve the economic and social benefits of the enterprise.

Li Rong (2015) proposed that the points-based management evaluates the daily performance, work ability and comprehensive quality of employees in the form of rewards and deductions, and uses differentiated incentives to enhance employees' work enthusiasm and initiative, thereby promoting the overall improvement of organizational performance. Cheng Xuxian(2017) proposed that the points-based management evaluates employee performance through a comprehensive quantitative assessment of employee behavior and employee performance, and links points with job promotion, salary and welfare, etc., to guide employees to improve their work ability and drive enterprises to achieve common development. Zhan Shana (2019) pointed out that the key to the management thinking of the points system is to achieve scientific control in human resources with the point system, stimulate the motivation of employees in the form of open and transparent rewards and punishments, and mobilize employees' enthusiasm for work.

2. Index Design of Points System

The implementation measures for the management of the points system shall be carried out in accordance with the steps of point standard formulation, point issuance, point ranking, point application, assessment feedback, and assessment system optimization. The design of the points system indicators is the basis for the implementation of the points system, the paper believes that employee points can be divided into three categories: one is fixed points, according to the position, education, specialties, titles, etc. fixed points every month; the second is behavior points, including daily events, behaviors, work performance, etc. to reward and deduct points, according to the content of "morality, ability, diligence, performance, creation" combined with the strategic goals of the enterprise, the culture of the enterprise and the needs of enterprise development to design assessment indicators; the third is task points, including temporary tasks and reward tasks two parts.

2.1 Section Headings

Fixed points can be developed from five aspects: employee education level, skills, title, position, and length of service. Refer to the objective situation of different indicators, determine the range of intervals and assign values at the same time. This is shown in Table 1.

Table 1. Fixed integral index table

Order numble	Project	Classify	Integral value
1	Degree	doctor	
		Master	
		undergraduate course	
		junior college	
		Technical secondary school and below	
2	technical ability	senior	
		intermediate	
		junior	
3	professional ranks and titles	Positive advanced	
		senior	
		intermediate	
		junior	
4	professional certificate	senior	
		intermediate	
		junior	
5	length of service	For every 1 full year, the points will increase by XX points	

2.2 Behavioral Points

According to the functions of employees in the enterprise, behavior points are designed into five aspects: "morality, ability, diligence, performance, and creation", as shown in Table 2.

① "morality" focuses on the degree of contribution of employees to the enterprise outside of their job responsibilities; it is used to praise and reward employees for their extra efforts, special contributions. The setting of the project should fully reflect what the company advocates and encourages, and these matters should be transformed into points projects, and important special work can also be institutionalized and linked to points.

② The management scope of "ability" mainly targets the employees' business technical level, management ability, professional knowledge and other content.

③ "Diligent" refers to the management of employees' compliance with the company's rules, notices, systems and processes by integrating positive and negative incentives, mainly focusing on employees' compliance with relevant company systems.

④ "Performance" is mainly set for employees' monthly performance appraisal results, monthly work plans, learning and growth, monthly performance is to measure the value of employees' contribution to the company, is an important way to obtain points; because different personnel groups, job types, responsibilities and authorities will bring changes to the performance of the point method.

⑤ "Creation" focuses on conforming to the current concept of "innovation-driven development" of enterprises, and employees are encouraged to continue to carry out innovative work and

continuously improve the quality of work in addition to completing their own prescribed work performance.

Table 2 Behavioral points indicators

Level 1 indicators		Secondary indicators	Level 3 indicators	Bonus points	Points deducted
morality	Political, ideological, and professional ethics performance	professional ethics	Actively participate in the urgent, difficult, dangerous and serious work	√	
			Prevent or eliminate accidents	√	
			Give a complaint		√
			……		
		academic morality	More than a draft		√
			plagiarize		√
		good personalities and good deeds	Department secondment	√	
			Do good people in the society	√	
			Social organizations will give commendations	√	
			To fight against violations of discipline and law	√	
			……		
ability	Business technology level, management ability, professional knowledge and so on	paper publishing	core journal	√	
			General Journal (with ISSN required)	√	
			Group headquarters internal magazine	√	
			Company internal magazine	√	
		subject study	national level	√	
			provincial level	√	
			city level	√	
			Group headquarters	√	
			company	√	
		certificate of award	national level	√	
			provincial level	√	
			city level	√	
			Group headquarters	√	
			company	√	
		rationalization proposal	Adopted by the government	√	
			Adopted by the group headquarters	√	
			Adopted by the company	√	
diligent	Work attitude to comply with	System provisions	Attendance management regulations	√	√
			violate discipline	√	√

	the rules and regulations		……		
Performance	Job performance	work obligation	Target task completion	√	√
			Work style innovation	√	√
			……		
		work performance	Work results	√	√
			Work expansion	√	√
			……		
		Special contribution	Complete unconventional, unexpected, and personalized tasks	√	
Creation	Innovation and efficiency	Improvement and development	Practical patent	√	
			patent of invention	√	
			Software copyright	√	
			QC achievement	√	
			Organize training	√	

2.3 Task Points

Tasks can be divided into temporary tasks and reward tasks. ① Temporary tasks are some temporary work tasks that appear in the operation process of the company or department, and this part of the work is often not in the planned tasks at the beginning of the month, nor in the scope of daily work, which is sudden and unpredictable, but this part of the work is sometimes more important than the target work tasks and daily work tasks. ② Bounty tasks are tasks that the company or department does not have a special person responsible for, and when these jobs occur, in the past, the tasks were forcibly assigned to an employee or team through the way of leadership apportionment, and the result was often that employees were not highly motivated and the quality of task completion was not good. Through the point system assessment, the task is released in the form of a reward within the department or within the company, and a certain number of points are given, and employees participate voluntarily, and when the task is completed according to the requirements and time nodes, the corresponding points are rewarded.

3. Determination of the Value of Points

This paper adopts the AHP method to determine the points of various types, that is, the indicators in the hierarchical model of the evaluation index system are compiled by level, and then the N enterprise executives are consulted in the form of questionnaires, and experts are asked to rank the importance of each indicator to the index of the next level, and finally calculate the weight of each index in the same level index according to the comparison results provided by the senior management of the enterprise.

(1) Construct a two-by-two comparison judgment matrix

According to the above-mentioned evaluation index hierarchy, the importance of indicators is quantified by various experts and a judgment matrix is constructed. The value of the judgment matrix reflects the decision-maker's awareness of the relative importance of each indicator, and generally uses the scale value method of 1-9 and its reciprocal. Then, according to the Delphi method, experts are consulted, and the relative importance of the selected evaluation indicators is scored, and the average value is obtained to obtain the final judgment matrix.

(2) Hierarchical single sorting

Calculate and compare the eigenvectors W and the maximum eigenvalue λmax of the judgment matrix. The value of the comparison and judgment matrix feature vector represents the relative importance ranking weight of several elements in the same level to an element of the adjacent previous level, and the calculation steps are as follows:

a) Calculate the product Ni： $\prod_{j=1}^{n} a_{ij}$ of each row element of the judgment matrix, Where i=1,2,3,... n

b) Calculate the n-power of the Ni: $\overline{W_i}$： $\overline{W_i} = \sqrt[n]{N_i}$

c) Pair vector $\overline{W} = (\overline{W_1},\ \overline{W_2},\ \overline{W_3},\ ,\ \ldots\ldots,\ \overline{W_n})$ for normalization: $W_i = \overline{W_i}\ /\ \sum_{i=1}^{n} \overline{W_i}$, then W=(W$_1$， W$_2$， ......， W$_n$)is the desired feature vector.

d) Calculate the maximum feature root λmax of the judgment matrix:
$$\sum_{i=1}^{n} \left[(AW)_i \Big/ nW_i \right]$$

e) Calculate the consistency index CI=(λmax -n)/(n-1), where n is the order of the judgment matrix.

f) According to the comparison to judge the order of the matrix, the average random consistency index RI is obtained by looking up the table, see Table 3.

Table 3. Stochastic consistency index RI values

Matrix order	1	2	3	4	5	6	7	8	9
RI	0	0	0.58	0.90	1.12	1.24	1.32	1.41	1.45

g) Calculate the consistency ratio CR=CI/RI

If CR<0.10, the judgment matrix is considered to satisfy the consistency test; otherwise, the judgment matrix needs to be reconstructed until the consistency test is passed.

(3) Overall hierarchy ranking

Calculating the ranking value of the relative importance of all factors within the same level to the highest level (the overall goal) is called the total ranking of the hierarchy. Proceed from highest to lowest layer by layer. One of the layers A consists of m factors, A$_1$， A$_2$， ....， A$_m$, the next level B package n factors, namely B$_1$， B$_2$， ....， B$_n$， Then they will affect the factor A$_j$， The weights of the hierarchical single order are respectively B$_{1j}$， B$_{2j}$， ....， B$_{nj}$.

Test of the consistency of the hierarchical total ranking: from the top to the bottom, if the random consistency ratio of the lower total ranking is:

$$CR = \frac{\sum_{j=1}^{m} a_j CI_j}{\sum_{j=1}^{m} a_j RI_j}$$

If CR<0.10 can be considered to have consistency in the hierarchical sorting results, otherwise the element values of the judgment matrix should be adjusted.

Determine the weight values for each level of metrics. According to the above layer-by-layer sorting and consistency test results, the weight value of each index of each layer can be obtained, when CR<0.10, W is the weight value of each index sought, that is, the proportion of each behavior score.

4. Conclusions and Revelations

The competition between modern enterprises is ultimately reflected in the competition of human capital, point system management is based on the relevant incentive theory to develop a set of incentive management system, enterprises implement point system management, is conducive to breaking the equilibrium, in a differentiated way to motivate people's initiative and enthusiasm, to achieve the purpose of improving enterprise efficiency.

The performance appraisal of the points system can realize real-time statistics. The performance results of the traditional performance appraisal method are basically summarized at the end of the appraisal cycle. No matter the examiner or the respondent, it is difficult to grasp the current performance during the appraisal period, especially the appraisal method of using the compulsory distribution method to calculate the performance results.

References

[1] Li Rong. Addition and subtraction of points system management [J]. The Business community (Commentary), 2015 (09).

[2] Ni Ze, Ni Siyu, etc. Innovative management mode on integral system management [J]. Management observation, 2016 (30).

[3] Cheng Xu Xian. The application of points system management in enterprise performance evaluation [J]. Shopping Mall Modernization, 2017 (15).

[4] Li Rong, Chen Guohai. Points system management theory and practice [M]. Beijing: Tsinghua University Press, 2020.

[5] Adams J S．Inequity in social exchange[M].Advances in experimental social psychology.Academic Press, 1965, 2: 267～299．