

A FUZZY AHP METHOD TO PRIORITIZE INDIVIDUAL ATTRIBUTES IN A PERFORMANCE APPRAISAL SYSTEM

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ABSTRACT

Companies that seek to gain competitive advantage through employees must be able to manage the behaviour and results of all employees. One of the most important parts of performance management, if not the most important one, is performance appraisal. Attribute-based performance methods are the most popular ones used in performance appraisal because of their ease of use. However, these methods usually have very vague performance standards that are open to different interpretations by different raters. In this paper, a fuzzy AHP method is used to prevent this shortcoming. To deal quantitatively with imprecision or uncertainty, fuzzy set theory is primarily concerned with vagueness in human thoughts and perceptions.

Key Words: Performance Appraisal System, Fuzzy AHP.

1. INTRODUCTION

Performance appraisal is a formal management system that makes a possibility for the evaluation of the quality of an individual's performance in an organization [1]. Performance appraisal has the means to assign a value to an employee's current and past performance relative to the employee's performance standards. The purpose of the performance management system is not only revealing the level of performance shown in the past, but also determining the performance potential for the future for the individuals or institutions, and thus increase the future performance with proper motivation and a proactive approach. Within such an important management system, performance appraisal is an operation used by companies, in order to evaluate the employees' efficiency and productivity, for planning their human resource policies.

2. METHODOLOGY

The Analytic Hierarchy Process (AHP) approach, developed by Saaty became very popular in assessing criteria weightings in various multi-criteria decision-making (MCDM) problems [2]. It involves decomposing a complex MCDM problem into a hierarchy, assessing the relative importance of decision criteria, comparing decision alternatives with respect to each criterion, and determining an overall priority for each decision alternative and an overall ranking for the decision alternatives [3]. However, when decision-makers' judgments are not crisp, and it is relatively difficult for them to provide exact numerical values, as in the example of performance appraisal process, the fuzzy logic that provides a mathematical strength to capture the uncertainties associated with human cognitive process can be used [4].

After taking the expert evaluations by the help of a survey questionnaire, the pair-wise comparison scores were calculated by using Chang's Extent Methodology [5, 6] since this method is relatively easier than other fuzzy AHP approaches.

3. HIERARCHICAL MODEL FOR PRIORITIZATION OF MEASUREMENT INDICATORS

Performance can be defined by three dimensions. These dimensions (criteria) and their sub-dimensions can best be illustrated in a hierarchical structure as in Figure 1. Three main criteria and their sub criteria within this structure can be explained as below.

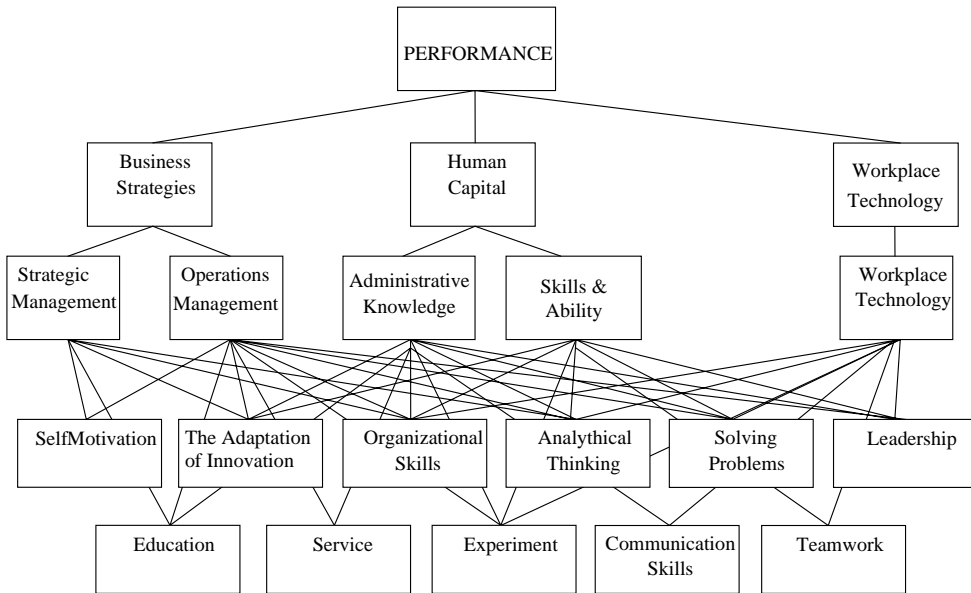


Figure 1. Hierarchical structure of criteria

3.1. Main and sub criteria of the performance appraisal

3.1.1. Business strategies

Strategy is the basis of the difference. Strategic choices constitute the basis of creating a difference and added-value in the institutions, and they create sustainable competitive advantage. During the definition of business strategies, companies should also define the goals and objectives needed to compete successfully. Performance management system focuses on strengthening the evaluation and the working behaviors of employees towards these goals. Together with the vital competition in the business world, only the businesses which identify and implement their mission, vision and strategies appropriately can succeed. Strategic management and operational management are defined as the sub-attributes of the business strategies.

Strategic Management: Strategic Management usually starts with a thorough analysis of the organization's environment and the organization itself. This analysis yields a good ground for giving better strategic decisions. The company must have clear goals and objectives (vision, mission, and strategic objectives) to allocate its resources effectively. After this phase, so called strategy formulation, comes strategy implementation. Strategy implementation includes building appropriate organizational structures and control systems to reach these goals. The system needs to have a feedback loop to learn from its experience, and this is called strategic learning.

Operations Management: Operations Management deals with the design and management of products, processes, services and supply chains. It considers the acquisition, development, and utilization of resources that firms need to deliver the goods and services their clients demand.

The area of operations management ranges from strategic to tactical and operational levels. Representative strategic issues include, but not limited to determining the size and location of manufacturing plants, deciding the structure of service or telecommunications networks, and designing technology supply chains.

3.1.2. Human capital

Basically, people in an organization create the organization's human capital. Human capital includes the knowledge, skills and ability of the workers and also the number of people who have the ability to solve business problems. It is directly related to the attributes gained by a worker through education and experience. Administrative knowledge and skills & ability are defined as the sub-attributes of the human capital.

3.1.3. Workplace technology

Workplace technology affects the performance management practices which are based on individual or group performance. If the business is a technology-intensive one, and the operation is designed for the groups, the performance management system must deal with the behaviors and achievements of the groups within the company. On the other hand, if the business is a workforce-intensive one where the operations are usually set for the individual jobs, goal setting, performance evaluation and reward systems must deal with individuals and their performance.

3.2. Indicators of the performance appraisal

At the lowest level of the hierarchy, there are 11 indicators. The evaluators are requested to evaluate the individuals or groups under focus against these indicators. These indicators are:

Ind1: Motivation, Ind2: The Adaptation of Innovation, Ind3: Organizational Skills, Ind4: Analytical Thinking, Ind5: Solving Problems, Ind6: Leadership, Ind7: Education, Ind8: Service, Ind9: Experiment, Ind10: Communication Skills, and Ind11: Teamwork.

4. RESULTS

Overall priority weights of the indicators were calculated by using Chang's Extent Methodology. The weights of the indicators are shown in Table 1.

Table 1. Priority weights of main and sub-attributes and indicators

	BS		HC		WT	
	0.267399267		0		0.732600732	
	SM	OM	AK	SA	WT	WEIGHTS
	0.5	0.5	1	0	1	
Ind1	0.06358	0.085681	0.13399	0.05521	0.08093	0.078318
Ind2	0.08474	0.100218	0.05541	0.10987	0.06638	0.072876
Ind3	0.10331	0.099832	0.13448	0.1333	0.06220	0.072351
Ind4	0.10983	0.096487	0.14371	0.13943	0.17188	0.152539
Ind5	0.11106	0.101247	0.099	0.12577	0	0.028302
Ind6	0.09704	0.04284	0.099	0.05884	0.18188	0.151048
Ind7	0.10269	0.12865	0.16202	0.11629	0.16915	0.154413
Ind8	0.06174	0.098288	0.00502	0	0.01527	0.032206
Ind9	0.12299	0.124019	0.15603	0.10764	0.12058	0.120681
Ind10	0.06826	0.051846	0.05881	0.0686	0.11531	0.100066
Ind11	0.07478	0.070886	0.05152	0.08505	0.01636	0.030936

5. CONCLUSION

Defining performance evaluation indicators and their priorities help companies by ensuring a guideline for their efforts towards success. Managers can draw their roadmap easily by using these priorities in using their scarce resources in potential investments. Executives, researchers and consultants have qualitative or uncertain approaches about the organizational problems. Since performance evaluation

system needs to consider intangibles, the prioritization of its sub dimensions could successfully be handled with fuzzy AHP. In this study, Chang's Extent Methodology is used for evaluating the performance criteria. A hierarchical model consisting of three main attributes, five sub-attributes, and eleven indicators is presented. The model is verbalized in a questionnaire form including pair-wise comparisons. The results calculated shows that education (Ind.7) is the most important component in the performance appraisals. The sequence of the rest of the indicators according to their importance weights is as follows: Ind.4 Analytical Thinking, Ind.6 Leadership, Ind.9 Experiment, Ind.10 Communication Skills, Ind.1 Self Motivation, Ind.2 The Adaptation of Innovation, Ind.3 Organization Skills, Ind.8 Service, Ind.11 Teamwork, and Ind.5 Solving Problems.

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