

Power of Analytical Hierarchy Process for Performance Appraisal in Promotion Selection

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ABSTRACT

Job promotion is usually encountered with very complex problems, such as unfairness, non-standard assessment criteria, mistaken strictness, and subjective emotion in the selection of candidate employees to be promoted. This study was conducted in PT XYZ, a small company which had problems in selecting and evaluating the candidate employees for some higher positions in an attempt of improving the effectiveness of their employees' performance. The respondents were nine employees with different positions. The Analytical Hierarchy Process (AHP) system, Expert Choice software, interview, and questionnaire were used to solve the problem. The results show: first, shift 3 supervisor is eligible to get promoted to line A supervisor. Second, shift 1 supervisor is eligible to be promoted to line B supervisor; and third, line B supervisor is more qualified to be promoted to a production manager than supervisor A. They are eligible to be promoted because they have met the criteria according to standard of the performance appraisal using AHP.

Keywords: AHP, performance appraisal, promotion selection

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INTRODUCTION

Performance appraisal is usually used in big capital companies for performance excellence of transformational leadership. It is not common to be used in small companies (Al-Salamin & Al-Baqshi, 2015; Caesar, 2016). Instead, small capital companies still use the traditional system,

so that it is undeniable that they make a lot of mistakes when they promote their employees to a higher position as a leader (Somerick, 1993). An appraiser usually conducts an assessment based on the close relationship between the superior and the subordinate without using clear and consistent assessment criteria. Thus, this judgement promotes an employee into the wrong position and hence s/he works ineffectively. The employee cannot run his/her duties, responsibilities, and authority, which are higher than those of the previous position.

In general, employee performance contributes to achieving organisational goals. In this regard, performance appraisal refers to identifying, evaluating, and developing work performance of an employee in an organization (Kavoo-Linge & Kiruri, 2013; McCarthy, 2000). On the other hand, the company gives benefits to its employees in the form of recognition and offering career guidance (Dessler, 2008). It should be clear which criteria can avoid subjective decision-making errors. This is so because sometimes the assessor provides an assessment to the employee based on the feelings and outcomes of the guesswork for this problem; hence, strong measurement capability is needed for calibrating the effectiveness (Shang, 2004). However, many authors argue that the measurement of performance is often challenging because an organization has multiple and frequently conflicting goals (Shang, 2004); however, AHP (Analytical Hierarchy Process) can be an advantageous method with criteria that fit the real-world problems (Erdoğmus et al., 2006).

This study was conducted at PT XYZ electric wire factory in Tangerang, Indonesia. The appraiser company promoted its employees with no clear standard criteria. So, the company found many flaws in the promoted employees' performance because they could not manage problems effectively. Hence, this company would like to change the promotion system. Hopefully, this AHP performance appraisal can avoid many mistakes in order to determine which employees are eligible for promotion. In terms of organizational structure, the production division consists of one production manager. The manager has two line supervisors, named A and B. Each line supervisor has three shift supervisors, called a, b and c. This study had three problems to be answered. First, which employee from the three shift supervisors (a, b, and c) should be promoted to line A supervisor. Second, which one from shift supervisors a, b, and c should be promoted to line B supervisor. Third, which one of both the previous line supervisors should be promoted to a production division manager. This input will give a lot of benefits for general manager decision.

LITERATURE REVIEW

Analytical Hierarchy Process (AHP)

AHP was developed by Saaty in 1976 (Saaty, 2000). So far, this method has been used successfully in various fields. The advantage of this method lies in its criteria, and these criteria fit the real-world problems (Erdoğmus et al., 2006). AHP can be done for more than one period, for decision-

making, and with a lot of criteria. Not only that, AHP also facilitates the involvement of decision-makers in the process of finding a solution, and enables them to reassess their judgment when it is necessary (Koç & Burhan, 2014). Thereby, a mutual agreement can be provided among decision-makers prior to their final decision after performance appraisal. AHP method has four general steps even if it is applied in various studies. First, the company has to determine the alternatives of criteria and sub-criteria. Second, the decision-making is modelled hierarchically by considering previously

selected criteria (Wind & Saaty, 1980). Third, the decision-makers' judgements are collected through pairwise comparisons. In the last step, the importance ranking of alternatives and criteria will be determined by analyzing these data which are obtained from the comparisons.

AHP has been used in many research areas. It is used for selection of the best alternative, planning, resource selection, conflict resolution, optimization, etc. There are several studies that focus on a review of AHP application in different fields (Table 1).

Table 1
Different fields using AHP approaches

Industries	Authors
1 Manufacturing	Bitici et al. (2001); Tahriri et al. (2008); Verma and Paeteriya (2013)
2 Marketing	Erbıyık et al. (2012); Eylem and Hasan (2015)
3 Logistics	Alberto (2000); Büyüközkan et al. (2008)
4 Engineering	Chan and Kumar (2007); Partovi (2006); Wu et al. (2009); Yu and Tsai (2008)
5 Commercial Tools	Cebi and Zeren (2008); Schoenherr et al. (2008)

Performance Appraisal for Promotion

Basically, performance appraisal is a formal interaction between employees and supervisors. The higher position in a management structure conducts performance appraisal periodically to identify the strengths and weaknesses of the employees. The objective is to improve performance of the employees and achieve optimum process quality (Aro-Gordon, 2015). Another argument said that performance appraisal is the evaluation of how well employees perform their work when their work is

compared to a set of standards (Mani, 2002). In other words, sometimes performance appraisal is also called employee rankings or employee evaluations or job reviews or performance evaluations or assessment results.

Employee performance appraisal has been practiced by numerous organizations for centuries. Until now, performance appraisal has been under debate, but overall, this kind of appraisal is an inseparable part of organizational life (Islam & Rasad, 2006). Longenecker and Fink (Bhattacharya, 2012)

believed there are several reasons why formal performance appraisal is needed in organizations.

Formal appraisal is required for creating standards of human resources, such as promotion decision, pay raising, motioning, terminating, and also employees' training needs. Islam and Rasad (2005) explained that a company has high organizational performance if it practices this performance appraisal. The method is successfully proven to be one of the top 10 vehicles in creating a competitive market. A worthless organization has ineffective and inconsistent appraisal. Such appraisal can bring many problems; for example, low morale, low employee productivity, and a lessening of an employee's enthusiasm and support for the organization (Somerick, 1993).

Performance appraisal is a very essential part for an organization to progress towards the company goals (Islam & Rasad, 2005; Simamora, Marcellius, & Hartono, 2016). To achieve the goals, a company needs effective performance management systems in measuring productivity. Productivity improvement is a great concern in numerous organizations, either private or public. All levels in organization should ensure their departments and units are doing more. In this context, leaders of departments use performance appraisal to measure and to suggest how to improve the productivity of employees (Vallance, 1999). Furthermore, Wu (2005) said performance measurement is a complex problem, and it includes various kinds of judgments and performance measurements. The evaluation needs a well-

defined set of criteria and strong values. His argument is based on the previous argument (Sidin et al., 2003). Sidin et al. stressed on identification of the relevant and important criteria for any kind of evaluation. In addition, Roberts (2003) highlighted the conceptual foundation of participation. Participation includes the intrinsic motivational value, the expansion of available information, and the opportunity to interject employee voice. Sidin et al. believed employees should be confident in the fairness of the appraisal process, so it will be easier for the employees to accept performance rating if they perceive fair decision-making process. In any case, if the employees perceive the process to be unfair, not systematic, and incomprehensive, they will reject the outcomes of the appraisal, and they will even look for another job (Sidin et al., 2003).

The benefits of performance appraisal include increased motivation of employees, improved performance, and increased self-ambition of employees. Furthermore, it encourages the value added development of employees' self-esteem because the appraisal is transparently done in the organizational system. Finally, it can justify the organizational goals (Mohrman et al., 2012).

MATERIALS AND METHODS

Data for this research was collected using several techniques, namely: 1) Observation in order to get an overview of the company's problems and the performance appraisal thus far done by this company; 2) Interviews

or two-way communication to explore the information pertaining to research objectives, such as organizational structure, previous employee performance appraisal system, and the sub-criteria and criteria for employee performance appraisal; 3) Questionnaires distributed to the appraisers (the production manager, line A supervisor, and line B supervisor) to obtain the initial criteria of promotion selection, and also to weigh each alternative; 4) The required

sample was only 3 appraisers who were in charge in every division from three divisions (see Figure 1); 5) Expert choice was used for AHP. The program of Expert Choice can be used as a tool for choosing from several alternative decision criteria. This software offers several facilities, ranging from data criteria, sub-criteria, and destination determination. Moreover, it can be applied easily with a simple interface.

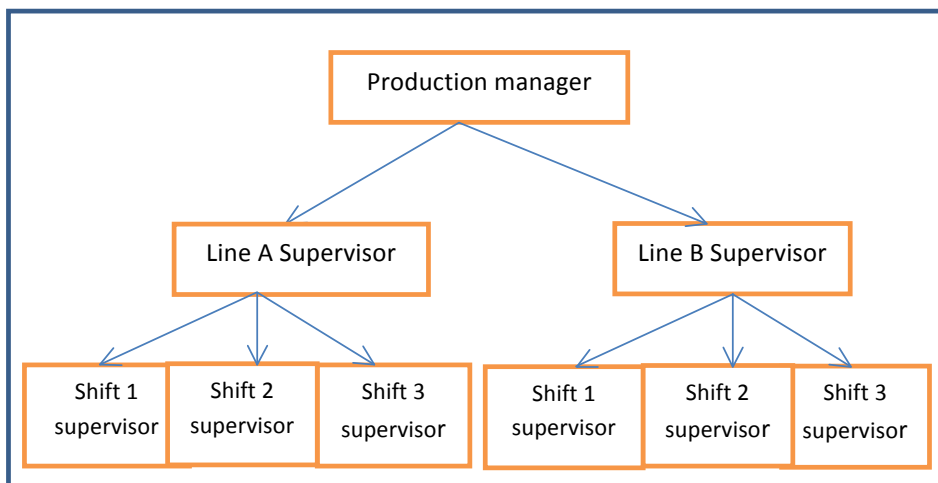


Figure 1. The hierarchical structure of the production department in PT XYZ

This study was conducted to examine problems among production manager, line A supervisor, and line B supervisor. Production manager supervises both line A and B supervisors, while each line supervisor has three shift supervisors. The decision makers would like to carry out performance appraisal for promotion based on six aspects or criteria, namely quality of work, initiative, discipline, responsibility, cooperativeness, and leadership. The

criterion of quality of work has sub criteria such as job satisfaction and knowledge and education in the field of work. Initiative has the sub-criteria of new ideas and quickly taking action in case of machine damage. Discipline has the sub-criteria of discipline in dress and discipline in time. Responsibility has the sub-criteria of responsibility to the subordinates and responsibility to the superior. Cooperativeness has the sub-criteria of being cooperative with

other employees and cooperative with the superior. Leadership has the sub-criteria of a fair attitude towards employee and providing clear directions in accordance with the established procedures. Therefore, this research was done using Analytical Hierarchy Process method. The AHP or Analytical Hierarchy Process method is a decision-making technique developed for cases that have various levels (hierarchical)

of analysis (Ho, 2008; Saaty & Vargas, 2001).

RESULTS AND DISCUSSIONS

In the first stage, data of the criteria and sub-criteria for performance appraisal were collected from three decision makers: shift supervisor, line supervisor, and production manager. They have the responsibility to select employees for promotion (see Table 2).

Table 2
Goal: Performance appraisal for position promotion under Line A supervisor

Criteria	Score	Sub criteria	Score
1 Work quality	0.148	Job satisfaction	0.9
		Knowledge and education in the field of work	0.1
2 Initiative	0.078	New ideas	0.875
		Quickly take action in case of machine damage	0.125
3 Discipline	0.252	Discipline in dressing	0.833
		Discipline in time	0.167
4 Responsibility	0.278	Responsibility to the subordinates	0.9
		Responsibility to the superior	0.1
5 Cooperativeness	0.121	Cooperative among employees	0.875
		Cooperative with the superior	0.125
6 Leadership	0.123	A fair attitude towards employees	0.9
		Clear directions in accordance with the established procedures	0.1
Inconsistency	0.09		

Source: Data Processing, 2016

Table 2 shows the criterion of responsibility has the highest score with 0.278, where the sub-criterion of responsibility to subordinates (0.9) is higher than that of the sub-criterion of responsibility to the superior (0.1). The criterion of discipline has the second highest score of 0.252, in which discipline in dress as its sub-criterion

(0.833) is greater than discipline in time (0.167). The criterion of work quality places the third with a score of 0.148, in which the sub-criterion of job satisfaction (0.9) scores higher than knowledge and education (0.1). The criterion of leadership is in the fourth place with the sub-criterion of a fair attitude towards employees (0.9) being

higher than the sub-criterion of providing clear directions (0.1). The criterion of cooperativeness is in the fifth place (0.121), where the sub-criterion of cooperation with other employees (0.875) is higher than cooperation with the superior (0.125). The criterion of initiative is in the sixth place (0.078) with the sub-criterion of quickly taking action in case of machine

damage (0.875) being higher than new ideas (0.125). All of the criteria of performance appraisal are supported by previous research (Mohrman et al., 2012). Inconsistency in all criteria and sub-criteria (0.09) is lower than 0.1 as the fault tolerance value (Aro-Gordon, 2015). The score can be categorised as good or consistent because it is less than 0.1 (Saaty & Vargas, 2001).

Table 3

Dynamic sensitivity for criteria performance of each supervisor in Shift A

The score of the criteria	The highest to lowest criteria	Percentage of being promoted
14.8 % Work quality	Shift supervisor 2, 3,1	40.2 % Shift supervisor 3
7.8 % Initiative	Shift supervisor 2, 1,3	33.6 % Shift supervisor 2
25.2 % Discipline	Shift supervisor 3,1,2	26.2% Shift supervisor 1
27.8 % Responsibility	Shift supervisor 2, 1,3	
12.1 % Cooperativeness	Shift supervisor 3,1,2	
12.3 % Leadership	Shift supervisor 3,1,2	

Source: Data Processing, 2016

In the second step, the results show that the employee who is in charge of shift 3 supervision has the highest score (40.2%). According to this result, this person is most eligible to get promoted to line A supervisor. In the second sequence, the person in charge of shift 2 supervision is placed in the middle rank (with a score of 33.6%), and the person

in charge of shift 1 supervision is in the lowest rank (26.2%). These ranks show how well employees perform according to a set of standards. It is very important information for decision makers to promote which one is eligible to be selected for a higher position (Mani, 2002).

Table 4

Goal: Performance appraisal for promotion under Line B Supervisor

Criteria	Score	Sub-criteria	Score
1 Work quality	0.271	Job satisfaction	0.500
		Knowledge and education in the field of work	0.500
2 Initiative	0.111	New ideas	0.500
		Quickly taking action in case of machine damage	0.500
3 Discipline	0.107	Discipline in dress	0.500
		Discipline in time	0.500
4 Responsibility	0.206	Responsibility to the subordinates	0.500
		Responsibility to the superior	0.500
5 Cooperativeness	0.131	Cooperative among employees	0.500
		Cooperative with superior	0.500
6 Leadership	0.173	A fair attitude towards employees	0.833
		Clear directions in accordance with established procedures	0.167
Inconsistency	0.08		

Source: Data Processing, 2016

In this part, we explain the sub-division in line B supervision with three shift supervisors. Table 3 indicates the criterion of work quality is in the first place with a score of 0.271, in which the sub-criterion of job satisfaction (0.5) scores the same as the sub-criterion of knowledge and education in the field (0.500). The criterion of responsibility is in the second place, with a score of 0.206, where responsibility to the subordinates as its sub-criterion (0.500) gains the same score as responsibility to the superior (0.500). The criterion of leadership is in the third place (0.173), in which a fair attitude towards employees as the sub-criterion (0.500) has the same score as a fair attitude towards employees (0.500). The criterion of cooperativeness gets the fourth place (0.131), with the sub-criterion

of a fair attitude towards employees (0.500) having the same scores as cooperation with other employees (0.500). The criterion of initiative is the fifth place (0.111), where the sub-criterion of new ideas (0.500) gains a score as big as that of quickly taking action in overcoming the damage of a machine (0.125). The criterion of initiative is in the sixth place (0.078), in which the sub-criterion of quickly taking action in machine damage (0.875) is higher than new ideas (0.125). All criteria of performance appraisal are supported by previous research (Mohrman et al., 2012). Inconsistency in all criteria and sub-criteria (with a score of 0.09) is lower than 0.1 as the fault tolerance value (Aro-Gordon, 2015); hence, the score means the criterion is good or consistent (Saaty & Vargas, 2001).

Table 5
Dynamic sensitivity for criteria performance of each supervisor in Shift B

The score of the criteria	The highest to lowest criteria	Being promoted
27.1% Work quality	Shift supervisor 1, 3,2	43.1% Shift supervisor 1
11.1% Initiative	Shift supervisor 3, 1,2	29.7% Shift supervisor 2
10.7% Discipline	Shift supervisor 1,2,3	27.2% Shift supervisor 3
20.6% Responsibility	Shift supervisor 2, 1,3	
13.1% Cooperative	Shift supervisor 3,1,2	
17.3% Leadership	Shift supervisor 1,2,3	

Source: Data Processing, 2016

According to the criteria and sub-criteria of selection, shift 1 supervisor has the highest score (43.1%). Thus, shift 1 supervisor is eligible to be promoted to line B supervisor. In the second sequence, shift 2 supervisor has a score of 29.7%, and shift 3 supervisor gets the lowest score of 27.2%. The evaluation is on how well employees perform their work when their work compared to a set of standards. The result can be made the basis for position promotion for employees (Mani, 2002)

Table 6
Goal: Performance appraisal for production manager position

Criteria	Score	Sub-criteria	Score
1 Work quality	0.189	Job satisfaction	0.875
		Knowledge and education in the field of work	0.125
2 Initiative	0.081	New ideas	0.8
		Quickly taking action in case of machine damage	0.1
3 Discipline	0.155	Discipline in dress	0.5
		Discipline in time	0.5
4 Responsibility	0.152	Responsibility to the subordinates	0.5
		Responsibility to the superior	0.5
5 Cooperativeness	0.248	Cooperative among employees	0.750
		Cooperative with superior	0.250
6 Leadership	0.176	A fair attitude towards employees	0.833
		Clear direction in accordance with established procedures	0.167
Inconsistency	0.10		

Source: Data Processing, 2016

Table 6 indicates the criterion with the highest score for a production manager is cooperativeness. This criterion is in the first place (0.248) with the sub-criterion of being cooperative with the subordinates (0.9) in the first place and the sub-criterion of being cooperative with the superior (0.1) second. The second place is occupied by the criterion of work quality with a score of 0.189, in which the sub-criterion of job satisfaction gains a score of 0.9. The third rank is the criterion of leadership with a score of 0.176, in which the sub-criteria of a fair attitude towards employees (0.833) is higher than the sub-criterion of clear direction in accordance with the established procedure (0.167). The fourth is the discipline criterion with a score of 0.155 with the sub-criterion of leadership, which is a fair attitude towards employees (0.9), higher than the sub-criterion of providing clear direction in accordance with the established procedures with a score of 0.100. The fifth is the criterion of responsibility (0.152), in which the sub-criterion of cooperativeness of being cooperative with employees places the first

with a score of 0.875 and the sub-criterion of being cooperative with the superior places second with a score of 0.125. The last one is the criterion of initiative with a score of 0.081, where the sub-criterion of quickly taking action in overcoming the damage of a machine gets a score of 0.875, followed by the sub-criterion of new idea with a score of 0.125. The fault tolerance value applied is 10%, corresponding to a consistent value of 0.10, which can be described as good result. This result means that all criteria, sub-criteria, and alternatives are good or consistent. This result means that all criteria, sub-criteria, and alternatives are good or consistent. The result of evaluating how well employees perform compared to a set of standards can be made the basis for promotion of employees (Aro-Gordon, 2015; Mani, 2002; Saaty & Vargas, 2001)

Finally, the sub-criterion of initiative to quickly take action in overcoming the damage of a machine is ranked first with a score of 0.875, followed by the sub-criterion of initiative to give new idea with a score of 0.125.

Table 7
Dynamic sensitivity for criteria performance of each supervised line

The score of the criteria	The score of the highest to lowest criteria	Shift supervisors being promoted
18.9 % Work quality	Line A, B supervisors	50.3 % Line A supervisor
8.1 % Initiative	Line B, A supervisors	48.7 % Line B supervisor
15.5 % Discipline	Same position	
15.2% Responsibility	Line B, A supervisors	
24.8 % Cooperative	Line A, B supervisors	
17.6 % Leadership	Line A, B supervisors	

Source: Data Processing, 2016

50.3%, greater than that of line B supervisor with a score of 48.7%. Line A supervisor is more eligible than line B supervisor to be a production manager according to their performance (Aro-Gordon, 2015; Mani, 2002; Saaty & Vargas, 2001). Nevertheless, the scores are not too different, so strong measurement capability is needed for calibrating the effectiveness (Shang, 2004). Many authors argue that the measurement of performance is often a challenge because organizations have multiple and frequently conflicting goals (Shang, 2004). The result still needs the involvement of decision-maker(s) to find the solution and enable reassessments of judgments (Koç & Burhan, 2014).

CONCLUSION

The results show that AHP method can be applied in all divisions of this company. Based on the collected data and the output produced by Expert Choice program for employee performance appraisal for promotion, it can be concluded as follows:

1. Shift 3 supervisor is the most eligible shift supervisor for promotion to the position of line A supervisor in this company.
2. Shift 1 supervisor is the best shift supervisor eligible to be promoted to the position of line B supervisor in this company.
3. Line A supervisor is the most eligible line supervisor to be promoted to production manager position in this company.

SUGGESTIONS

After drawing some conclusions, it can be suggested that:

1. AHP can minimize the subjectivity of performance appraisal. With this method, the company can measure the achievements and abilities of a person objectively. The elements such as honesty, discipline, work performance, cooperativeness, skills, loyalty, leadership, communicativeness, and education of an employee should be taken into consideration in the implementation of promotion.
2. The sub-criteria of the company can be used to perform more specific performance assessments to its employees. The company should look more broadly at the criteria in performance appraisal for promotional positions.
3. The heads of the company as line supervisors and production manager should perform their leadership duties effectively and motivate employees to be more enthusiastic in working, to have high discipline, and enhance productivity to gain the optimum profit for the company.

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