

Performance measurement of employee using an integrated 360° feedback system and AHP method: A case study of municipality

Younos Vakil Alroaia* and Zahra Najafi

Department of Management, Semnan Branch, Islamic Azad University, Semnan, Iran, P.O.B: 35145-175

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ABSTRACT

Performance measurement plays an essential role on accelerating the efficiency of any organization. There are literally different methods for measuring the relative performance of a particular unit and many of them are involved considering various criteria. In this paper, we propose 360° feedback system for performance measurement of all employees who work for municipality of the city of Tabas located in east part of Iran. The proposed model of this paper also uses hierarchical method to cluster different attributes based on various characteristics and implements analytical hierarchy process to find the relative importance of all items. The survey uses five personal characteristics including cognitive, technical, personal and human skills and for each major item, the proposed model considers various sub-criteria. The results indicate that technical and cognitive skills are the most important personal characteristics followed by human and personal characteristics. The results of this survey show that responsibility and quality of work are the most important employee characteristics.

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1. Introduction

During the past few years, 360-degree feedback has been increasingly used and the implementation continues to rise. Applied with caution, the feedback process is able to provide meaningful feedback for both the organization and the individuals involved. Misuse of the 360-degree feedback, however, could lead to harm feelings, increased anxiety, and even key personnel leave. Carson (2006) in a case study investigated showcases key research findings on best practices for using the 360-degree feedback process, and reported aligning performance measures with organizational goals and selecting and training participants. There are many reasons for using 360-degree feedback programs but there are consequences with the use of this plan. However, some of the issues and risks associated with 360° feedback can be reduced by carefully explaining the question of why firms use such programs. Nevertheless, some companies spend more time to generate enthusiasm and to create operational plans for a 360° initiative than thinking on what they could realistically reach. The birth of a 360° initiative can basically be specified as a snowball championing game, where a particular

Corresponding author. Tel: +989122316247

E-mail addresses: younos.vakil@gmail.com (Y. VakilAlroaia)

manager learns about the concept by receiving 360° feedback as part of a training program and he/she can be an executive, a human resource manager or a general manager. If the idea starts to construct support and snowballs, the firm will more likely to implement a formal program (Waldman & Atwater, 1998). Antonioni and Park (2001) studied whether rater affect has a similar impact on the leniency of ratings from three of the sources of 360-degree feedback including downward, upward, and peer and whether there was an interaction between a rater's affect and the time a person spent observing the ratee. The results indicated that the influence of rater affect on the leniency of ratings was substantially bigger in upward and peer feedback than in downward feedback and that the impact increased as raters' observation time increased.

Williams and Lueke (1999) examined a framework with managers which examined the relationships between multi-source feedback rating consistency, individual attitudes and developmental behavior. They reported that perceived system knowledge and experience with the system were significantly important variables. They also reported that the consistency between self and subordinate feedback was particularly important in influencing managers' attitudes and reactions. The results implies that this model can be a useful technique to organize research which examines the outcomes and efficacy of multi-source feedback systems. Fecteau et al. (1998) studied different factors associated with leaders' reactions to 360-degree feedback using a sample of 220 supervising managers from a large public utility. They gathered data in three waves including pretest, performance rating, and posttest surveys and hypothesized that overall ratings, organizational support, and perceived rater ability could be positively associated with four reaction criteria. The results indicated that overall ratings were associated with acceptance of peer and subordinate feedback, but were less consistently associated with perceptions of feedback usefulness. For perceived usefulness of subordinate feedback, organizational support accounted for unique variance beyond overall ratings, and perceived rater ability was meaningful. However, none of the predictions for perceived usefulness of peer feedback were considered significant.

Ahangari and Amirzadeh (2011) implemented a database of 360 corrective feedback moves where two EFL teachers provided to their learners at three levels of proficiency. Eight types of corrective feedback were determined and their distribution in relation to proficiency levels of learners was detected. The results indicated that recast was the most frequently implemented type of corrective feedback by the teachers at all three levels of proficiency. Atwater and Brett (2005) studied the factors, which impact leaders' reactions to 360° feedback and the relationship of feedback reactions to subsequent development activities and changes in leader behavior. According to Atwater and Brett (2005), for leaders with relatively low ratings, the people who agreed with others about their ratings were less motivated than the people who received low ratings and over rated themselves. In addition, for leaders with high ratings, agreement between self and other did not impact their motivation.

Wood et al. (2004) examined the feasibility of a 360-degree evaluation to measure radiology resident competence in professionalism and interpersonal/communication skills. They used an evaluation form with 10 Likert-type items associated with professionalism and interpersonal/communication skills was completed by a resident, supervising radiologist and patient after resident-patient interactions associated with breast biopsy procedures. Residents were also evaluated by faculty, using an end-of-rotation global rating form. Fifty-six completed 360-degree data sets and seven rotational evaluations for seven residents were investigated and compared. The results of this pilot study recommended that self, faculty, and patient evaluations of resident performance constituted a reliable evaluation of resident competence. However, they reported that additional data were necessary to determine whether the 360-degree assessment could be incorporated into residency programs and how frequently the assessment could be performed.

Analytical hierarchy process (AHP), on the other hand, has been widely used for ranking different alternatives. Lin et al. (2011) used a hybrid data envelopment analysis (DEA) and analytic hierarchy

process (AHP) to evaluate the economic development obtained by local governments in China. They explained that many performance evaluation techniques are dealing with more than single objective and they proposed to use both DEA and AHP to handle their case study. The proposed integrated DEA/AHP technique was able to evaluate and rank various alternatives. In addition, a time-scale comparison of the economic performances of local governments in China was performed using the malmquist productivity index (MPI), which showed that there was a trend of economic growth.

Cohen et al. (2012) built an operational technique for assessing the financial viability of local municipalities in Greece. They proposed multicriteria methodology, which was a combining of simulation analysis approach with a disaggregation technique. An evaluation model was proposed on the basis of accrual financial data from 360 Greek municipalities during the year 2007. A set of customized to the local government context financial ratios was extracted, which rate municipalities and distinguished those with good financial condition from those experiencing financial problems. The model's results were analyzed on the 2007 data as well as on a subsample of 100 local governments in 2009. The model succeeded in correctly categorizing distressed municipalities based on a benchmark set by the central government in 2010. Chen (2010) evaluated the integrated efficiency of municipal solid waste (MSW) management, which was divided into three stages: MSW generation, sorting and collection by using the tools of DEA and AHP. The relative efficiency in proxy of performance at each stage for each decision making unit (DMU) was calculated by DEA and the weighting factor at each stage in affecting the integrated efficiency of MSW management was measured through the support of AHP. Chen compared MSW management performance between urban and rural regions in Taiwan and tried to find out factors influencing the efficiency variation, by using data of 23 cities/counties in 2008. The results indicated that urban regions had higher performance in sorting but lower in generation, collection and integrated efficiency than rural regions.

Zhang et al. (2011) performed an investigation on an evaluation system for the sustainability of urban land use (ESULU). The study was based on 13 indicators drawn from previous literatures in consultation with a group of experts in this field. They used Principal Component Analysis (PCA) to help in identifying the major factors for evaluating the sustainability of urban land use. Examination of the results provided a grouping analysis of the capital cities and municipalities, indicating a general disproportion between coastal and interior urban cities in China. They reported that it is necessary for central and local government to design relevant policy in achieving the sustainable development of urban land use and planning.

2. Problem statement

The proposed model of this paper considers the following hirarichal process shown in Fig. 1 for the proposed study of this paper.

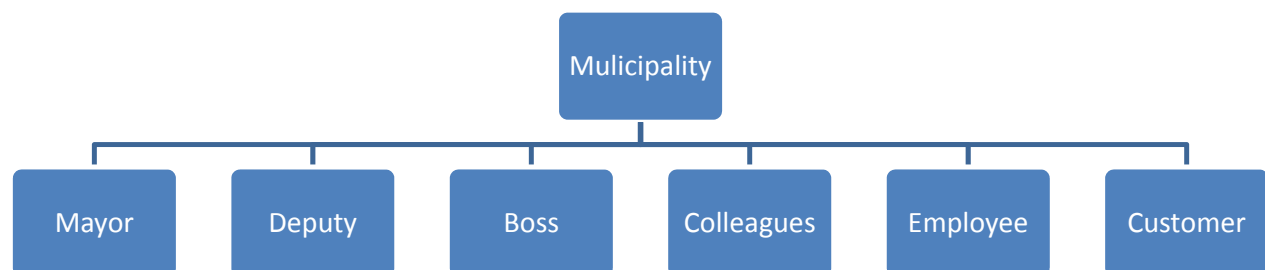


Fig. 1. The role of different people for performance evaluation

As we can observe, to have a fair point we need to get a feedback from different managers in the system. In order to find an appropriate weigh of these six people's opinions we perform pairwise comparison on all six people. Nexts step is to find the relative weights for the main criteria and sub criteria associated with the proposed study. In our study, there are four major criteria including cognitive, technical, personal an human skills. Each main criteria includes some sub-criteria. Table 1 shows details of our subcriteria.

Table 1
Four criteria and cub-criteria for 360 feedback study

Cognitive skills	Technical skills	Personal skills	Human skills
Saving resources	Expertise	Good appearance	Active in social activities
Overtime work commitment	Good experience	Honesty	Appropriate behavior with colleagues
Quality work	Quality of work	Interest and hardworking	Ability to transfer knowledge
Low expectations	Capability of accomplishing duties	Popular criticism	Ability to motivate
Responsible	Quantity of accomplished work	Good speaker	Coordination abilities
Punctuality	Update access to information	Flexibility	Obedience
Loyalty	Using advances of technology	Compliance with ethical issues	Active in participating in sessions
Keeping secrets		Reliability	Team building
Creativity and Innovation			
Decision making ability			

In our study, we have gathered the information from all 25 employees who worked for municipality of Tabas in east region of Iran. In our study, we made a pairwise comparison among six people shown in Fig. 1 and the results of our comparison are summarized in Fig 2.

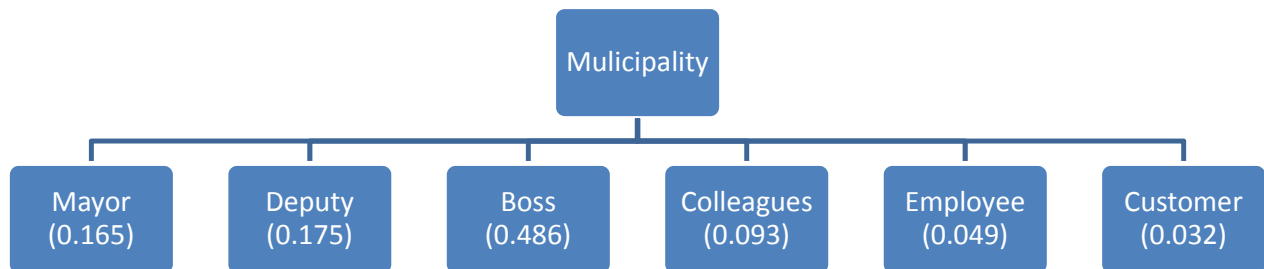


Fig. 2. The results of AHP score assignment for each six people

As we can observe from the results of Fig. 2, employee's boss is the most important person who has to take part in evaluating employee's performance assessment and it counts almost for half of evaluation. Deputy and mayor are the second important people with relative weights of 0.175 and 0.165, respectively. These two people account for one third of performance evaluation. Finally, colleagues, employee and customer are the other people who need to give their insight about someone's performances. We have measure the consistency ratio for these comparison and it remained less than the desirable level.

Next step is to find the relative importance of 360 questionnaire. Table 2 shows details of our comparison for all four major criteria as well as subcriteria. Note that we multiplied the relative weight of subcriter by the main criteria to find the overall weight. Again, the consistency ratio was calculated and the results were all consistent.

Table 2
The results of pairwise comparison

Major Criteria	Weight	Sub Criteria	Weight	Rank
Cognitive skills	0.426	Saving resources	0.047	8
		Overtime work commitment	0.036	10
		Quality work	0.104	3
		Low expectations	0.008	23
		Responsible	0.14	1
		Punctuality	0.074	5
		Loyalty	0.019	14
		Keeping secrets	0.017	15
		Creativity and Innovation	0.012	19
		Decision making ability	0.01	21
Technical skills	0.472	Expertise	0.048	7
		Good experience	0.014	18
		Quality of work	0.123	2
		Capability of accomplishing duties	0.083	4
		Quantity of accomplished work	0.033	11
		Update access to information	0.022	13
		Using advances of technology	0.01	22
Personal skills	0.151	Good appearance	0.006	26
		Honesty	0.049	6
		Interest and hardworking	0.015	17
		Popular criticism	0.012	20
		Good speaker	0.004	29
		Flexibility	0.008	24
		Compliance with ethical issues	0.026	12
		Reliability	0.039	9
Human skills	0.048	Active in social activities	0.001	32
		Appropriate behavior with colleagues	0.016	16
		Ability to transfer knowledge	0.008	25
		Ability to motivate	0.005	28
		Coordination abilities	0.002	31
		Obedience	0.003	30
		Active in participating in sessions	0.006	27
Team building	0.001	33		

3. Conclusion

In this paper, we have presented an empirical study using 360° feedback system for performance measurement of all employees who work for municipality of the city of Tabas located in east part of Iran. The proposed model of this paper also implemented hierarchical method to cluster different attributes based on different characteristics and implemented analytical hierarchy process to detect the relative importance of all items. The survey implemented five personal characteristics including cognitive, technical, personal and human skills and for each major item, the proposed model

considers various sub-criteria. The results indicated that technical and cognitive skills were the most important personal characteristics followed by human and personal characteristics. The results of this survey show that responsibility and quality of work are the most important employee characteristics.

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