

Full Length Research Paper

Development of personnel internal benchmarking by 360° feedback approach with a case study in AT Pipe Company

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The main purpose of this study is to enhance internal benchmarking by the use of 360° feedback approach. Therefore, internal benchmarking has been developed for personnel's performance evaluation. The study has been conducted in AT Pipe Company. Statistical population includes personnel of the sales department and customers and data has been gathered by questionnaire. Descriptive and inferential statistics and radar diagrams have been used for data analysis based on 360° approach. Respectively, improvements have been made and then, similar analysis has been done. The results imply that the proposed approach can be applied effectively in evaluation and improvement of personnel performance. Also, according to the empirical results, job competency of the studied personnel has been improved.

Key words: Performance evaluation, 360° feedback, benchmarking, radar diagram, personnel.

INTRODUCTION

The German Military first began gathering feedback from multiple sources in order to evaluate performance during World War II (Fleenor and Prince, 1997). Also during this time period, others explored the use of multi-rater feedback via the concept of T-groups. One of the earliest recorded uses of surveys to gather information about employees occurred in the 1950s at Esso Research and Engineering Company (Bracken et al., 1997). Since then, the idea of 360° feedback gained momentum and by the 1990s, most human resources and organization development professionals understood the concept. The problem was that collecting the feedback demanded a paper-based effort including either complex manual calculations or lengthy delays. The first led to despair on the part of practitioners; the second to a gradual erosion of commitment by recipients. Multi-rater feedback use steadily increased in popularity, due largely to the use of the internet in conducting web-based surveys (Atkins and Wood,

2002). Today, studies suggest that over one-third of U.S. companies use some type of multi-source feedback (Bracken et al., 2001a, b). Others claim that this estimate is closer to 90% of all fortune firms (Edwards and Ewen, 1996). In recent years, internet-based services have become the norm, with a growing menu of useful features, for example, multi languages, comparative reporting and aggregate reporting (Bracken et al., 1998).

Performance evaluation is one of the elements of dynamic systems and in the systems theory, it is actually defined as feedback loop through which the information that is necessary for adjusting the systems is gathered and analyzed. One of the features of a dynamic system is that it interacts and exchanges the energy and data within its environs. But it is a long time that the classic feedback loop has become obsolete in industrial countries and that type of feedback can not merely present valid and reliable information and knowledge. In traditional systems, personnel usually receive feedback from their superiors; that is, in its most rudimentary and often worst type, such as punishment. Armstrong (2009) emphasized that in the 360° feedback approach, one, in addition of his/her superior, receives feedback from

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his/her subordinates and colleagues. Jones and Bearley (2009) claims that the most important point in using and characterizing the 360° evaluation approach is the existence of an appropriate and necessary culture and context for it. Many organizations request their employees and individuals to voluntarily use this approach. It means that they should understand the necessity of applying the 360° evaluation approach and receive feedback from superiors, subordinates, and colleagues, and also, its executive method to their employees; then they are asked to do it voluntarily. However, people who seek for their progress and promotion and are eager to present a high quality performance, do this self-evaluation in a proper manner. Particularly, if they do it once and find out its advantages, they will be motivated to continue their working. Therefore, by recognizing the importance of using 360° performance evaluation in personnel's benchmarking, this paper aims to find how the internal benchmarking by 360° feedback approach can be conducted. The proposed approach is also examined in AT Pipe Company.

Mason et al. (2009) tried to find how the 360° evaluation process is accomplished in the service and manufacturing firms. They examined the approach in a hospital and approximately 16000 questionnaires were completed by patients and their companions through the web. They concluded that evaluation of 360° performance is a simple practical solution that can provide valuable information for senior managers of the organization. McDowall and Mabey (2008) surveyed four different functions of growth evaluation, leadership, 360° feedback and central expansion. They concluded that categorizing of the evaluation approaches contains defect because the expansion form of such functions had shown dependency upon the relationship between their managers and authorities. Soni and Kodali (2010) emphasized that due to the fact that multinational companies and organizations have offices for supply in many countries which are usually alike in terms of economic, political and social conditions, and also these supply chains should be similar, therefore, by the use of internal benchmarking, one can model them for supply chains of organizations in other countries. They attempted to create a methodology for internal benchmarking in order to reduce the variability of supply chains in central institutions. They also suggested that by using two techniques of strength-weakness-opportunity-threat (SWOT) and performance value analysis (PVA) in internal benchmarking, managers would be able to take considerable advantage in developing supply chains.

It is important to note that the use of 360° feedback approach in internal benchmarking and particularly in evaluation of personnel's performance has not been addressed in the literature. Further, the subjects of 360° feedback approach and benchmarking are demonstrated. Then, the new methodology of the integration of the two approaches is described and examined in the sales

department of AT Pipe Company, the findings are discussed and major conclusions are made.

Benchmarking

Various definitions have been presented for benchmarking, while generally, it can be defined as a continuous and systematic process for identifying, analyzing and practicing the best actions which improve the performance of organizations. Many people know what the benchmarking is, but they do not know how to apply it. Cook (1995) believes that the time to do the benchmarking, without implementing its findings, would be more than nine months, but organizations have reduced it from two to three months by accelerating some stages of the process. It must be noted that benchmarking cannot be used alone as a tool for improving the performance of an organization. Benchmarking is a programmed and organized method for editing the best actions and Industrial procedures which can result in superior competitive performance. Organizations that start this process truly, are able to improve their performance indicators. Benchmarking is a long-term process and requires the senior managers' commitment. In this continuous improvement based process, what are emphasized are processes and actions. Most managers, see the benchmarking as a tool to compare the final result with the performance indicators of organization. Cook (1995) also claims that not only cost-benefit analysis of actions is enough, but also the method of organizing and performing actions should be noted, by which the root causes of problems together with factors of superior performance could be addressed.

History of benchmarking returns to 1980s, when American company Xerox concluded that they could not reach their strategic goals just by insisting on past deductions and forecasting the future events. This company used the benchmarking process for competitive recognition. Xerox performed benchmarking in all groundwork (fields) of company and with special emphasis on customers' need and the role of active partnership of personnel. Anderson and Moen (1999) believed that there are four approaches for performing benchmarking as internal, competitive, operational and general approaches. In this research, the internal approach is utilized.

360° feedback approach

Armstrong (2009) claims that 360° feedback approach is appropriate in the development of quality leadership and management. This process is a complete cycle which presents a summary of feedback of all the staff (supervisors, subordinates and colleagues) about different aspects of their leadership style, management and performance. Some organizations do the feedback systematically and just for one part of the organization.

Table 1. Structure of the questionnaire.

Subject of question	Variable	Number of question
Personality characteristics	Responsibility	1
	Honesty and veracity in doing tasks	2
	Adapting colleagues	3
	Statesmanship	4
	Personal discipline	5
	Ability to improve continuously	6
	Ability to work with team	7
	Marketing and sales knowledge	8
	Have information about competitors	9
Job competencies	Economizing in using the sources of organization	10
	Job interest rate	11
	Work Speed rate	12
	Accuracy in working	13
	Personal appearance	14
	Communicative skills	15
General attitude	Deciding skills	16
	Emotion Constancy	17
	Innovation at work	18
	Commitment work rate	19
	Try to gather new knowledge	20

Feedback helps the staff compare their understanding about their workplaces with the understanding of important evaluators. Multi-source feedback program and 360° feedback have been derived from advanced approaches of performance evaluation processes, organizational studies, and customer feedback (a part of comprehensive quality management). 360° feedback systems have developed because of propagation of wider group and organizational structures and also because of the response to the problems with traditional performance management systems. Various definitions have been presented for this process. Generally, 360° feedback or multi-source feedback is a performance evaluation approach which is based on the collected data from superiors, colleagues, subordinates, customers and suppliers (McCarty and Garavan, 2001). Lepsinger and Iosia (2009) expressed that 360° feedback approach is the collection of perceptions related to one's behavior. Therefore, 360° feedback approach is about to concentrate the personnel's attention on their behavior and on the way that they affect other members of organization whom they work with. 360° evaluation generalizes the feedback entering data from an up-to-down single-dimensional approach to a multi-dimensional approach (McCarty and Garavan, 2001).

METHODOLOGY

Here, the new methodology of the integration of 360° feedback

approach and internal benchmarking is described. According to the definition of the three domains of personality characteristics, job competencies and general attitude for the personnel's performance, a questionnaire is formed with regard to the variables of the three domains as addressed in Table 1.

The designed questionnaire seems relevant to the general information of personnel's performance evaluation and reveals the level of managers', colleagues' and experts' performance evaluation about the target staff. The variables are categorized based on a literature review and interview with experts using Delphi data collection technique.

In this research, radar diagram (spider chart) is used to analyze the 360° feedback within internal benchmarking and comparative analysis is made. Benchmarking process as a technique for improving personnel's performance is used and the 360° feedback approach is integrated with its observation phase as depicted in Figure 1.

In order to make a comparative analysis on the thematic domains of the questions of the questionnaire, the Kruskal-Wallis statistical test is used; in addition, for analyzing the results of performance evaluation, before and after the implementation of improvement projects, the Wilcoxon statistical test is used.

CASE STUDY AND FINDINGS

The AT Pipe Company is located in Isfahan and its mission is the production and distribution of polymer pipes in the world. Since in a 360° performance evaluation approach, people are usually evaluated by different individuals, in this research, multiple evaluators are contributed who are in touch with target personnel to evaluate the performance of the sales personnel. Their occupational title and educational levels are addressed in Table 2. As it is clear, the majority (68%) of evaluators has an educational level

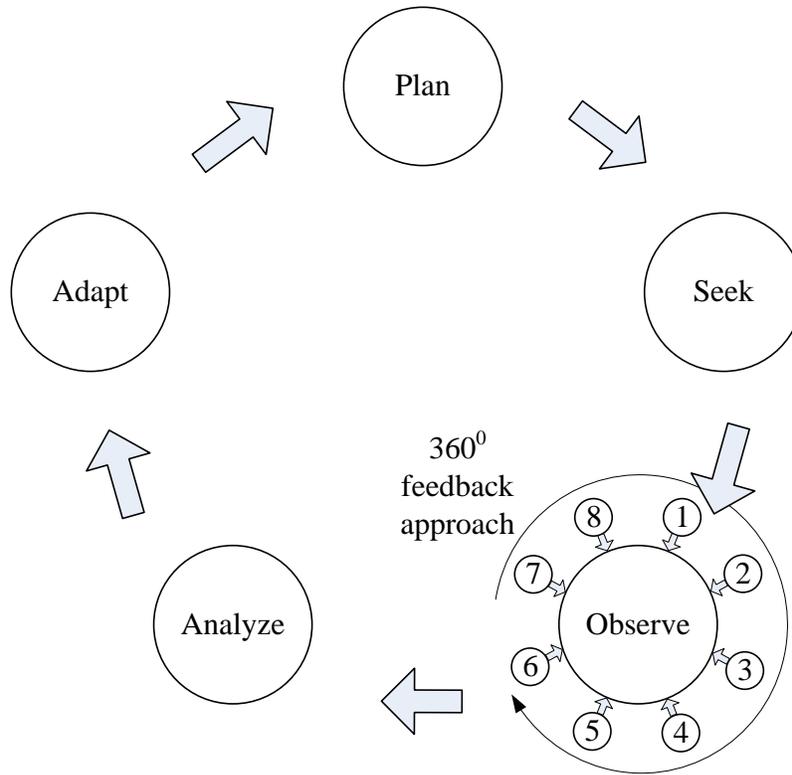


Figure 1. Proposed integrated approach.

Table 2. Frequency distribution and percentage of evaluators by their degree.

Evaluator	Number	Education	Percentage
President of company	1	MA	4
Head of store department	1	BA	4
Customers in touch	15	Diploma	60
Colleagues	3	BA	12
Head of accounting department	1	BA	4
Individual (himself)	1	BA	4
Head of sales department	1	MA	4
Warehouse department colleagues	2	Diploma	8
Total	25		100

MA: masters degree; BA: bachelors degree.

above the high school diploma, 24% have bachelor degree and 8% have master level of education. The whole population of this research includes 25 individuals and the research is conducted in 2009. All of the 25 filled questionnaires are returned for analysis.

Since the number of evaluators who have evaluated personnel as "customers in touch", "colleagues" and "warehouse department col-leagues" have been more than one person, therefore, the average value of the data provided by them has been used in drawing the radar diagram (Figure 2).

Considering the results in Figure 2, it can be concluded that the first staff has gained the highest acquisitive score from the company's president and also himself in the performance evaluation of the present condition. On the other hand, this staff's overall average

of performance evaluation indicates the value of 3.42. Second staff has gained the next highest acquisitive score. By surveying the obtained results of evaluation data and by scanning them, the total average of evaluation of 25 evaluators about this staff can be calculated. The average value is 3.16. The highest acquisitive score of the third staff is related to his colleagues. Also, his average value is 3.33. For the third staff, the highest acquisitive score has been given by the head of accounting department. The performance value from the point of colleagues of the fourth staff is similar to the values of the third staff.

According to Table 3, it is obvious that since the resulted numbers from Kruskal-Wallis's statistics are above 0.05 for all the three thematic domains, the present condition of all four staff seems

--- First Employee Second Employee
 ——— Third Employee — — — Fourth Employee

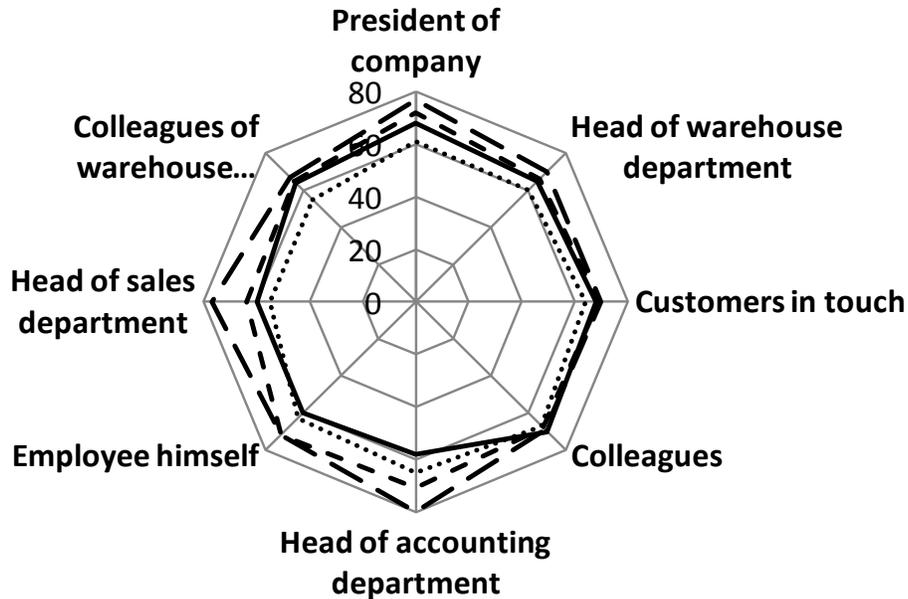


Figure 2. 360° performance evaluation – before improvement.

Table 3. The results of Kruskal-Wallis statistical analysis.

Subject of question	X ²	Degree of freedom	Significance level
Personality characteristics	3.283	3	0.350
Job competencies	5.472	3	0.140
General attitude	2.380	3	0.497

similar; in other words, their average values are equal.

Implementing improvement solutions

It is argued that based on the results of 360° performance evaluation, proceeding to internal benchmarking for improving personnel’s performance has four important and primary attractions as follow:

- i. Using benchmarking for this purpose helps the organization to choose a critical attitude toward its human resources development.
- ii. The use of benchmarking in staff performance development improves an active learning and teaching process in organization and provokes it to make change and improvement in its human resources domains.
- iii. Through internal benchmarking, the organization can find resources for improvement, and also would be able to find new methods and ways for doing tasks in other sections.
- iv. During the use of benchmarking, reference points for measuring the performance of human resources of organization will be created.

Therefore, according to aforesaid principals and advantages and especially in order to get the forth item, ideas and opinions of the chief executive officer (CEO) and his assistants and managers in different relevant sections are gathered. Respectively, performance of the four personnel is compared with those reference points and solutions are found to improve the cases which are far from reference points. Improvement projects that were defined for this purpose include:

- i. Establishing continuous daily meeting among the four personnel in order to inform other employees from tasks that are done at the sales department and in relation to representatives, so that team work thinking gradually is created among them.
- ii. Defining the group tasks and activities by the head of sales department for the four employees, so that they perform them with partnership and gradually become familiar with the team work methods.
- iii. Distributing the “fundamentals of team working” didactic booklet among the foresaid personnel and establishing a test based on the text (script) of that booklet in order to evaluate their realization level of those fundamentals.
- iv. Holding series of training courses of principles and knowledge of

Table 4. CEOs' desired reference points and the ideal reference points.

Thematic domain of questions	Ideal reference points	CEOs' desired reference points
Personality characteristics	30	28
Job competencies	35	31
General attitude	35	34

- - - First Employee Second Employee
 ——— Third Employee — — — Fourth Employee
 ——— Ideal Point

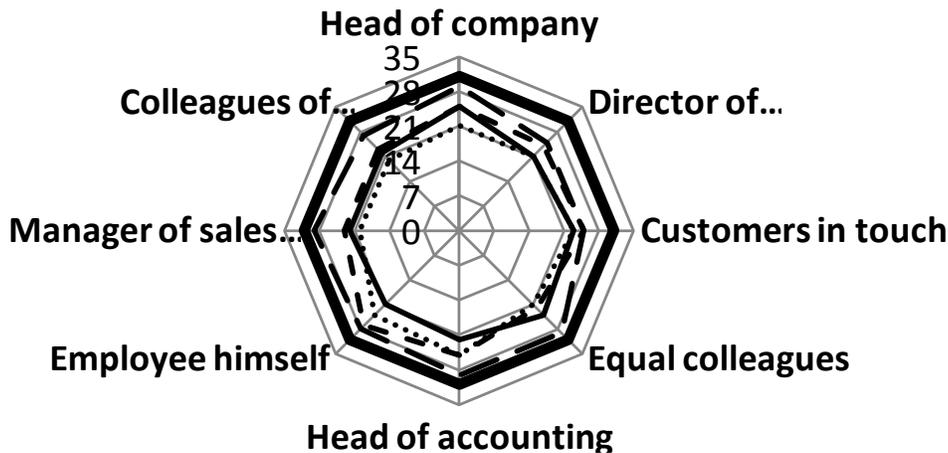


Figure 3. Comparing the staff's job competencies with the reference point.

marketing and also better ways of communication with customers for the personnel.

v. Establishing series of meetings by executive directors and the head of sales department of company with personnel in order to achieve a better and more comprehensive understanding of competitors and target markets.

vi. Holding series of daily meetings for 30 minutes with personnel by the head of sales department in order to introduce and explain their daily tasks and job descriptions in a better way.

vii. Classifying daily tasks which should be done by these personnel every day, and then consulting with the head of department for merging or elimination of some of the assigned tasks.

After defining these projects, and also choosing the head of the sales department as a supervisor for their effective implementation after 30 days from their approval, the implementation of all projects is successfully completed. However, prior to launching the projects, a comparison between ideal reference points and defined reference points by CEOs of organization is necessary (Table 4).

It should be noted that the value of the "ideal reference points" column has been computed through multiplying the number of questions of each thematic domain and the maximum assigned

score which is 5. For instance, for thematic domain of "personality characteristics" the number of questions is 6 and maximum value of the items is 5 (very good) and therefore, the ideal reference point would be 30.

FINDINGS

Figure 3 represents the difference values of evaluated items for first, second, third, and the fourth personnel from the reference point which is illustrated by thick black area. After comparing the results and also investigating the reasons in a meeting with the CEOs, it is decided that some projects should be defined for improving the personnel's performance of the sales department in the job competencies domain, and all four personnel are required to participate in the projects. A month after completion of those projects, the four personnel are evaluated again and the results are compared with previous

situation; the questionnaires are distributed among evaluators but with a little summarization in questions and also eliminating the two other thematic domains of questions and the results are analyzed. Table 5 and Figure 4 show the performance of first, second, third, and the fourth staff after implementation of the improvement projects.

As the radar diagram (Figure 3) represents, the highest distance for the first staff from is related to his colleagues' score which is totally 9 points. On the other hand, it is obvious that the highest distance for the second staff is related to the score of the head of the sales department and warehouse department colleagues which is totally 11 points. The highest distance for the third staff is related to the score of the staff himself and also the score of the head of warehouse department, which is totally 10 points. The fourth staff's condition in job competencies domain, regarding the distance to reference point seems much better than the other three staff. For this employee, the highest distance is related to the score of the head of warehouse department and the score of customers in touch, which is totally 6 points. On the other hand, the least distance for the fourth staff is related to the evaluation of the chief of company, colleagues, head of accounting department and the head of sales department, which is totally 2 points indicating that the fourth staff's performance is very close to the reference point.

DISCUSSION

In this research, performance of the personnel of sales department was evaluated and improved using an integrated approach of 360° feedback and internal benchmarking. The results were illustrated by radar diagram and relevant tables. In the same section, it was concluded by Kruskal-Wallis statistics that the results of all four employees' performance in three thematic domains of questionnaire questions before improvement is close to each other. In the first step through the internal benchmarking process, reference points for thematic domain of job competencies were determined by senior management team of the company and in the next step, after suggesting the improvement solutions and projects for enhancing personnel's performance, the solutions were implemented. After one month and completing almost all performed projects and solutions for improving the personnel's performance, their performance was re-evaluated via 360° feedback approach and the results were re-illustrated on radar diagram. Finally, Wilcoxon's statistics were computed to highlight the effectiveness of improvements.

According to statistics and data in Table 5, it can be seen that all scores of the first employee in job competencies domain are improved after implementing the improvement projects and the evaluators are more satisfied about the first employee's performance after

improvement. Also, statistics indicate that all of the scores of the second employee are improved after improvement and the evaluators' satisfaction about the performance of the second employee is increased after. The distance to reference point for some evaluators reduces to zero, implying that from some evaluators' viewpoint, the employee's performance raises to the acceptable level of reference point. Also, the results show that all scores of the third employee are improved after improvement in the internal benchmarking cycle, and the evaluators become more satisfied about the employee's performance after improvement. For the fourth employee, all scores of in thematic domain of job competencies are improved after improvement and the evaluators' satisfaction about this employee's performance is increased.

Reference point for thematic domain of job competencies was determined 31 by senior managers. The sum of performance distance of first employee was 54 units before implementing the improvement solutions, which was reduced to 24 units after implementing the improvement solutions. The sum of performance distance of second employee was 73 units before implementing the improvement solutions which was reduced to 22 units after improvement. The sum of performance distance of third employee was 68 before improvement which was reduced to 27 units after improvement. The sum of performance distance of the fourth employee was 27 before implementing the improvement solutions which was reduced to 13 units after improvement.

According to the significance level of Wilcoxon's test which is less than 0.05, it is argued that suggested solutions for improving the performance, can be operative in changing the present condition of employees in thematic domain of job competencies to an improved condition.

The results indicate that totally implementing the internal benchmarking process positively affected all four employee's performance and all of them did their defined activities with a higher performance than before.

The new approach provides an opportunity so that the target personnel became aware of the evaluators' opinions about their performance and could see them on the radar diagram. On the other hand, those personnel also could have possibility to rate their own performance and receive comments from their equal colleagues.

An important advantage of the new approach over the traditional approaches is that the internal benchmarking could become more comprehensive and hence, more realistic through its integration with 360° feedback. In fact, integration of 360° performance evaluation and internal benchmarking not only leads to determination of all performance improvement requirements of individual personnel, but also by performing internal benchmarking, such requirements could be fulfilled in order to improve personnel's performance. Clarifying the requirements of performance enhancement and personnel's task also made the management department conscious about the

Table 5. Comparing the staff's gained score with reference point and the sum of their distance to the reference point.

Evaluator	First employee		Second employee		Third employee		Fourth employee	
	Gained score	Distance to reference point	Gained score	Distance to reference point	Gained score	Distance to reference point	Gained score	Distance to reference point
Head of company	28	3	26	5	29	2	30	1
Head of warehouse department	31	0	27	4	27	4	30	1
Customers in touch	28	3	28	3	27	4	28	3
Colleagues	26	5	28	3	27	4	31	0
Head of accounting department	30	1	30	1	29	2	29	2
Employee himself	27	4	30	1	27	4	30	1
Head of sales department	26	5	31	0	26	5	29	2
Colleagues of warehouse department	28	3	27	5	29	2	29	3
Total distance value		24		22		27		13

- - - First Employee Second Employee ——— Third Employee
 ——— Fourth Employee ——— Ideal Point

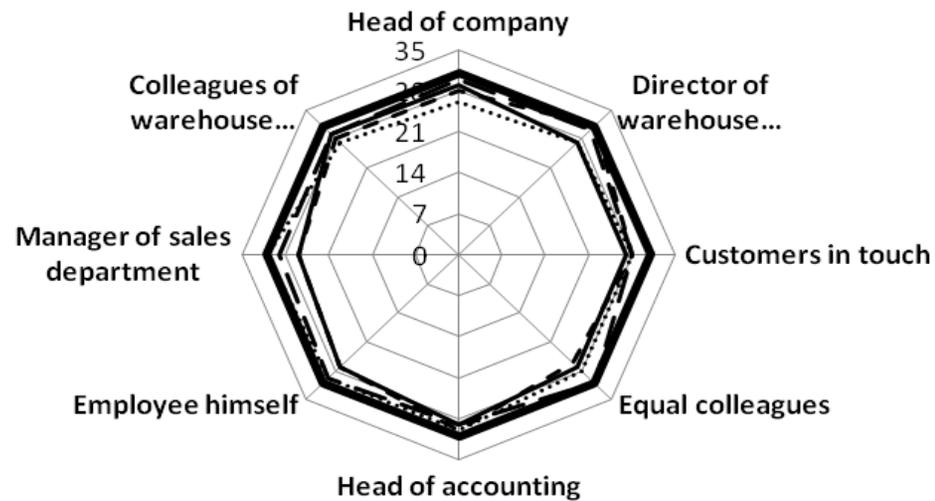


Figure 4. Comparing the staff's job competencies with the reference point after improvement.

requirements of each of foresaid personnel, separately.

RESEARCH LIMITATIONS

In this study, only one of the three domains of personality characteristics, that is, job competencies was fully investigated. Also, due to the conceptuality of evaluators' scores and considering their demographic differences, the use of average value of the evaluation scores should be taken with care and amount of data variance must be studied.

It is important to note that if internal benchmarking is performed for the first time in an organization, it might be difficult to use process benchmarking; and therefore, since the studied company was experiencing benchmarking for the first time, performance benchmarking was used in this research.

Another issue which seems statistically critical to realize is that in 360° approach, the number of contributors in groups of evaluators might not be equal (as this happened in this investigation), which leads to an increase of the probability of type 2 error due to unequal samples size, which in turn reduces the power of statistical test. This problem might be even more critical in comparing two units and more in an organization or external benchmarking.

MANAGERIAL IMPLICATIONS AND FUTURE STUDY SUGGESTIONS

It is suggested to the managers of the company to conduct a more complete research and include the other two domains of personality characteristics and compare the results of the three domains.

Since results of the new approach seem different compared to traditional approaches, it is recommended to the managers to revise their performance based rewards respectively. Similarly, the training department should revise its personnel training programs as a response to the 360° performance evaluation requirements and results.

Managers are encouraged to announce a determined reference point every month, so that every employee could actively attempt towards self evaluation and enhancement of his/her individual performance. Also, informing the employees about the results of 360° approach will empower their self assessment and makes them more committed and responsible for personal performance improvement.

It is clear that effective contribution of the groups of evaluators, including the individual person who is being

evaluated is vital to the success of the new approach, both before and after improvement. Therefore, culture development, employee awareness and team working seem important critical success factors for the utilization of the proposed integrated approach.

Future investigations can examine the subject of this research in service organizations. Providing effective solutions for reduction or elimination of the limitations and in particular, increasing data quality would be a valuable subject for future study. Development of the proposed approach by considering external benchmarking and process benchmarking in addition to internal benchmarking seems to enhance its applicability.

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