Human Factor Issue in Quality Management

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Abstract

Quality management is very important in every business to ensure success of the business. As promoted by many quality experts, people are the most important factor in assuring quality of products and services. Managing human factors has significant impact on the quality performance of an organization. In this study, deterioration human factors management was identified as main contribution of the high number of customer complaints in a electronic packaging company. A survey was conducted among the target departments to determine the reasons of the deterioration in human factors and to identify the area for improvement. Pareto chart was used to prioritize the area for improvement. Human factors are important elements of quality management, therefore regular assessment, review and continuous improvement are required.

Keywords: Quality management; human factor; Pareto

Abstrak

Pengurusan kualiti adalah sangat penting dalam setiap bidang perniagaan bagi memastikan kejayaan perniagaan tersebut. Seperti yang disarankan oleh ramai pakar kualiti, kemanusiaan merupakan faktor terpenting dalam jaminan menghasilkan produk atau servis yang berkualiti. Pengurusan faktor kemanusiaan mempunyai impak yang signifikan terhadap prestasi kualiti bagi suatu organisasi. Dalam kajian ini, kecacatan dalam pengurusan faktor kemanusiaan telah dikenalpasti sebagai penyumbang utama peningkatan komplain daripada pengguna dalam sebuah syarikat pemasangan produk elektronik. Kajian dijalankan dalam jabatan berkenaan bagi menentukan sebab berlakunya kecacatan pengurusan faktor kemanusiaan dan menentukan bahagian yang perlu penambahbaikan. Carta Pareto digunakan bagi mendapatkan keutamaan untuk penambahbaikan. Faktor kemanusiaan didapati sebagai elemen penting dalam pengurusan kualiti, justeru penilaian berkala, penyemakan dan penambahbaikan berterusan diperlukan.

Kata kunci: Pengurusan kualiti; faktor kemanusiaan; Pareto

■1.0 INTRODUCTION

Total Quality Management (TQM) is one of the most popular quality model adopted by many organizations world-wide. The importance of the TQM culture is enhanced through its impact on employee morale and work attitudes [1]. Consequently, job satisfaction and employees' performance at work are likely to be influenced by aspects of TQM. In recent years, the emphasis on human issues and involvement of employees has increased within the field of TQM [2]. According to Ooi et al. [3] many commentators in previous studies believed that in order to be fully successful and self-sustaining, TQM needs an extensive refashioning of "softer" practices, whose elements consist of essentially dimensions of human resource management (HRM) as suggested by Wilkinson et al. [4] and Dale et al. [5]. Many of the previous literature also reveal that a number of TQM proponents believed that the soft aspects of TQM are essential to its success [2, 6, 7, 8, 9, 10]. Powell [10] stated that "*organizations that acquire the soft elements of TQM can outperform competitors without the accompanying TQM ideology*". Based on previous literature, it was also noted most organizations were claimed to have failed in TQM due to the neglected "soft" side of quality management whereby the Human Resources (HR) and organizational behavioral aspects of quality management were not given sufficient emphasis [2, 11]. Many basic elements of TQM related to people have been researched in many of the previous studies which includes teamwork, reward and recognition, customer focus, organizational trust, extensive training, high level of communication, management commitment at all levels, employee involvement, empowerment and oganizational culture [12, 13].

TQM practiced in automotive industries are most often aligned to other quality requirements such as ISO/TS 16949. The overlapping elements are mostly human related factors which are important contributors to quality performance level in organizations. Based on thorough analysis of references and

current situation in the case study company, four elements were selected, the focus of this study is to determine reasons for deterioration in product quality and company performance caused by human. These elements are leadership, involvement and motivation, training and communication, and behavior. Another key element in steps of TQM implementation which is Policies and Procedures is also selected as the fifth element to be evaluated in this study.

■2.0 METHODOLOGY

Quantitative method for this study was established using a set of survey questionnaire with five Likert's scale, designed and deployed to the randomly selected internal employees of the case study company based on the sampling plan. Three major groups in the case study company were selected as target respondents for the survey, namely, Manufacturing, Maintenance, and Engineering & QA departments. These are the groups of people who are in closest contact with the products and equipment during manufacturing process. Although the involvement of Engineering and QA in this aspect is lower than Manufacturing or Maintenance, they still do contribute to some of the processes such as new product introduction, process improvement and changes in process, equipment and/or products which have direct impact on product quality. These two support groups were combined under one department for the purpose of this study. The target respondents from within each Department will be selected on random sampling basis. Target respondents will comprise of 40 respondents from Manufacturing; 10 respondents from Maintenance and 10 respondents from Engineering & QA. This gives a total of 60 respondents for the survey. This sampling plan is close to the sampling plan of 10% to 20% as recommended by Henry [14].

The questionnaire was designed to focus on five elements of human related factors that are critical to the quality performance in the organization. These factors were derived based on analysis of TQM, Deming's principles and ISO/TS 16949. The variables of the questionnaires are:

1. Leadership
2. Policies and Procedures
3. Involvement and Motivation
4. Training and Communication
5. Behavior

The questionnaire includes information on demographics and the actual questions of the survey with 2 sections; one on multiple choice questions and another on open-ended questions. Total of 18 questions were included in the questionnaire. Questions 1 to 3 are related to leadership in the organization with focus on enforcement, setting expectations and role models in the company. Questions 4 to 6 are related to involvement and motivation focusing on employee involvement in quality initiatives, employee development plan and reward and recognition system. Questions 7 to 10 are related to policies and procedures focusing structure and format, updating and correctness, clarity and conciseness, and details. Questions 11 to 14 are related to Training and Communication focusing on training procedure, structure and approach, training duration and management of changes. Questions 15 to 17 are related to behavior of employees with focus on awareness of quality requirements, tolerance to deviations and cross functional teamwork. Last question was an open ended question requesting for any other opinions of the respondent as to the most important

areas or factors that can contribute to improved quality management in the organization.

■3.0 RESULTS AND DISCUSSION

Since the respondents are the in-house staff of the case study company, authors managed to receive 100% respond rate. The respondent's answer to the questionnaire is shown in Table 1. The percentage indicates the respondents who chosen the scale, from the very poor (1) to very good (5).

Table 1 Overall data by Likert's scale

No.	Criteria	5	4	3	2	1	Total
1	Training and Communication	4.2%	27.9%	47.9%	17.5%	2.5%	100%
2	Involvement and Motivation	5.0%	36.3%	41.7%	16.7%	0.4%	100%
3	Policies and Procedures	2.8%	37.2%	45.0%	10.6%	4.4%	100%
4	Behaviour	5.0%	36.7%	46.7%	10.6%	1.1%	100%
5	Leadership	5.0%	41.7%	51.1%	2.2%	0.0%	100%

Result in Table 1 shows that 97.8% (combination of 3, 4 and 5) of the respondents indicated that there were no issues with leadership which gives a margin of error of +/- 2.1%. About 85% of respondents showed there are no issues with involvement and motivation, giving a margin of error of +/- 5.4%. At the mean time, 83% shows no problems in policies and procedures with margin of error of +/- 5.5%. Another 80% of the respondents responded positively on training and communication with margin of error of +/- 5.6% while 88% of the respondents stated there were no issues in behavior with margin of error of +/- 5.3%. Overall the quantitative survey revealed that there are no major issues with the human factors in quality management in the case study company. Confidence level of this survey is 90%, therefore the validity and reliability of the data is acceptable [1, 2].

Scale 1 and 2 indicates that the criterion is at poor and very poor level respectively, therefore requires improvement. Scale 3, 4 and 5 indicates that these criteria are under good control at very good, good or fair level respectively.

Table 2 Responses with scale 1 and 2

No.	Criteria	Poor (2)	Very Poor (1)	Total
1	Training and Communication	17.5%	2.5%	20.0%
2	Involvement and Motivation	16.7%	0.4%	17.1%
3	Policies and Procedures	10.6%	4.4%	15.0%
4	Behaviour	10.6%	1.1%	11.7%
5	Leadership	2.2%	0.0%	2.2%

In order to distinguish the degree to which improvement is required in each criterion, the scale 1 and 2 has been combined per criteria as shown in Table 2. Similarly scale 3, 4 and 5 for each criterion were also combined to reflect how good the perceived controls in each area.

Only a minority of the respondents, consisting of 2.2% responded that the leadership in the case study company needs improvement especially in portraying themselves as the role models to the employees. 15% of them responded that improvement is required in the aspects of involvement in quality, development plan and reward and recognition system for employees who are currently viewed as poor or very poor. 17.1% of respondents stated that the policies and procedures are either poor or very poor in terms of structure, updating and correctness of documents and level of documented details in the procedures. 20% of survey respondents stated that the Training and Communication procedure, structure, approach, training duration and change deployment in the case study company can be enhanced through improvement in this area. 11.7% of respondents stated that behavior with regards to quality management is either poor or very poor in aspects such as awareness of quality requirements, responsiveness to deviations from quality and cross-functional teamwork across sections and departments.

The responses from the survey that were rated 1 and 2 were taken as the areas to be improved via the study. These are the specific areas highlighted through the quantitative and qualitative questionnaire by all three department employees who responded to the survey. As there were total of five criteria are studied by authors and many improvements opportunities were highlighted by the respondents, Pareto Analysis tool was used to prioritize and select the criteria with highest problems based on the survey feedback. Pareto's 80/20 rule will be applied to focus the work on 20% of the causes to gain 80% of advantage that the work can generate.

Data from Table 2 where quantitative responses with rating of 1 and 2 were already combined was used to establish a Pareto Chart as shown in Fig. 1. The Pareto Analysis showed that the opportunity for improvement is in the area of training and communication as well as policies and procedures which form close to 80% of the problems.

The Pareto analysis was pointing towards training and communication as the major area for improvement followed by policies and procedures. This should be the focus for the study to work on, to gain the advantage of solving majority of the issues in the company as suggested by the 80/20 Pareto principles.

In order to improve quality management with regards to human factors, the root causes will be further analyzed and action plans will be derived for implementation using total mapping of training & communication process which also includes the policies and procedures problems.

■4.0 CONCLUSION

The survey conducted in the current case showed that the employees have the issues that they have not satisfied the training provided by the company, communication process among the peers and superiors and current the policies and procedures they need to follow. These human factors issue in the company seem to be the main factor to contribute the customer complaints which subsequently affected the quality management in the company. The survey also suggested that the area need to be improved are training and communication process, policies and procedures and

the involvement of all level staff in quality management and improve employee motivation. This inputs helped to determine and execute improvement actions for benefiting the employees and the company.
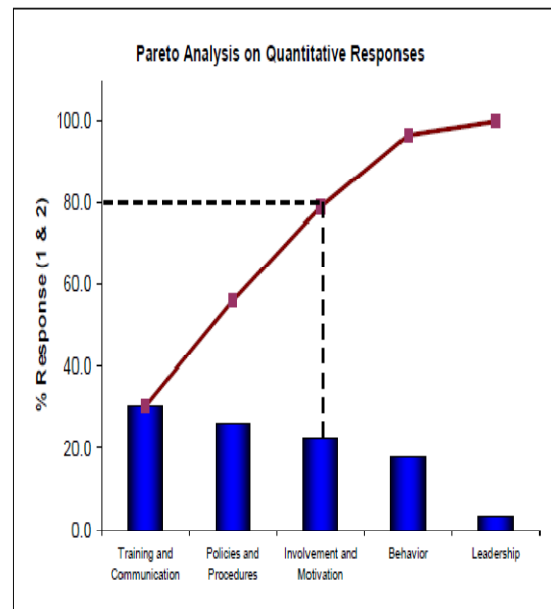

Figure 1 Quantitative responses–areas for improvement

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