



Journal of Applied Sciences

ISSN 1812-5654

science
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Assessment of TQM Practices in a Malaysian Multinational Mobile Phone Manufacturing Company: Workers' Perspective

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Abstract: The main purpose of this research was to study the workers' perspective on TQM practices in a leading cell manufacturing company (Malaysia). Two hundred respondents were selected as samples from a mobile company. Descriptive study was done and the findings in general indicated that the workers did not have very strong positive opinion about the functioning of TQM in the company whereas the company has proved that TQM practices were very successful. If the company makes more effort, it is possible to improve the existing situation. TQM practices can have excellent results if the workers understand its practices with commitment and involvement.

Key words: TQM Practices, quality control, quality circle, TPM, cell phone company, Malaysia

INTRODUCTION

Quality is an integral element in our lives today and was in existence since 1911 itself. The central idea of any quality philosophy is, doing the right things right the very first time. Many quality philosophies like Total Quality Management (TQM), Just-In-Time (JIT), Supply chain management, Service Quality and more have been integrated into management processes these days in light to provide quality embedded goods and services to customers. TQM was developed in the mid 1940s by Dr. Edward Deming who convinced the Japanese to adopt this philosophy ahead of the Americans. Quality philosophy is based on the conception that every aspect of the organization can be improved. The Japanese on the other hand termed the process of never ending improvement as kaizen.

Progress and success of the TQM implementation depends on the extra mile walked by the company over and above competitors in providing customer satisfaction, employee satisfaction as well as colleague cum peer satisfaction^[1].

The Malcolm Baldrige National Quality Award and the ISO certifications are good measures of quality in any company and dictate phenomenal quality benchmarks. There are several other TQM key principles that are involved in ensuring that TQM succeeds when implemented. These key principles include (1) commitment to quality; (2) focus on customer satisfaction; (3)

assessment of the organizational culture; (4) empowerment of employees and teams and (5) measurement of quality. The key to quality management is to ensure that all employees are equipped with the right mix of knowledge, skill and competence to utilize TQM strategies in achieving the organizational goal as a whole. Various organizations implementing the TQM practices have in many ways achieved great success while some have failed in one way or another. Some of the factors involved in the devastating failure of TQM include: (1) shared vision, (2) application planning, (3) organizational commitment, (4) training, (5) reward systems, (6) empowerment, or (7) cross-functional integration. On the contrary, implementing TQM strategies in an organization can also bring about phenomenal successes if the factors mentioned above are managed and controlled in an efficient manner.

TQM involves producing quality service as defined by a customer. This philosophy has been utilized for decades by almost all industries including the mobile phone industry. The development of quality circles through the execution of TQM strategies in the company has managed to provide very positive results. It can also be said that TQM revolutionizes the way an organization thinks or behaves through a complete transformation. TQM has taught the Manufacturer how to achieve complete quality transformation through its long term planning perspective. Today, with the help of various quality control tools, adoption of quality circles and the

introduction of the total productive maintenance concept, the Manufacturer has managed to retain the leadership status as number one mobile phone company in the world.

McAtarsney^[2], on the other hand concluded that Britain based entities have for years ignored their customers although it is essential for these entities to improve their quality specifications based on their customer perception. Tersine^[3] reported that customers are insisting that they receive customized products, smaller orders, shorter lead times and extended services at lower prices. George^[4], Eckes^[5], Sahin^[6], Nicholas^[7] and Goldman *et al.*^[8] in unity agreed that TQM, JIT, Six sigma and other quality led approaches are beneficial if applied in the appropriate manner. Sahin^[6], concluded that the strategies as mentioned by the above scholars are only advantageous in the event where the element of continuous improvement is present. Swinehart *et al.*^[9] responded to this statement by adding that continuous improvement has in many ways become an ultimate test of a world-class organization.

Margavio *et al.*^[10] explained quality of design as the quality that relates to the functioning and physical characteristics of the product to satisfy customer expectations. Schmit and Allscheid^[11] on the other hand advocated the idea that the attitude of the employee at work, together with the perception of service quality amongst customers and employees themselves has been demonstrated to affect the profitability of an organization in one way or another. Crosby *et al.*^[12] on the contrary believe that customers' expectations can be managed by an organization providing either the goods or services to them. Wright and Snell^[13] defined acquisition as gaining new customers as the first step in creating customer loyalty. Hart and Schlesinger^[14] commented that Successful TQM implementation calls for a cultural shift in the organization with a change in values, organizational structure, the way people work together and the way people feel about participation and involvement. TQM clearly recognizes the importance of human factors in quality management.

The literatures show that the TQM practices by most of the companies have been successful in improving productivity, quality, customer's satisfaction and other areas. At the same time few studies have shown that it had failed. Estimates of the failure rate of TQM programs varies upward from some two thirds^[15], 70%^[16], 80%^[17] and as high as 90%^[9]. Many argue that to be fully successful and self-sustaining, TQM requires an extensive refashioning of HRM practices^[18]. The success or failure may be based on the process of implementation and more importantly the cooperation from all the people working in the organization. A positive co-operation between human factor and TQM can give new theoretical insights

and practical implications. Hence this study aims to study the perception of the workers on the TQM practices in Mobile Phone Company.

The primary objective of this study was to assess the TQM performance in the mobile phone manufacturing company from the perspective of the workers working in the organization. However the specific objectives were:

- To analyze the effectiveness of quality control tools in the company.
- To study the impact of total productive maintenance in the company
- To study the advantages of quality circles adopted by the company

MATERIALS AND METHODS

Variables: Based on the literature four variables have been identified and include for this study:

- The success of the TQM implementation in company
- Quality control tools utilized to identify potential problems
- The implications of TPM in company
- Extent of quality circles effectiveness within the company.

Development of the theoretical model: On the basis of the existing literature, the following theoretical model has been identified to study the taken objective and suggested to represent the relationship between the five identified variables.

Identification of hypotheses: On the basis of the development of the theoretical model in Fig. 1, three different hypotheses have been identified. This segment involves 2 sections which include the null hypotheses as well as the alternative hypotheses of the study.

Null hypotheses: The identified null hypotheses are as follows:

H0₁: The quality control tools are not effective in identifying the areas of problem and in measuring the quality of work in the company.

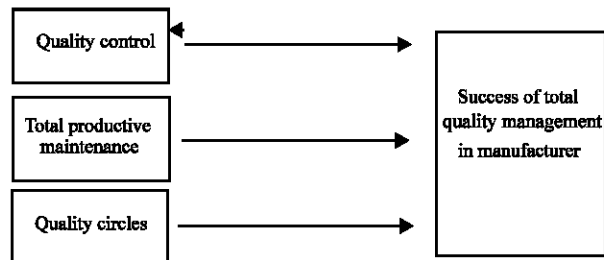


Fig. 1: Theoretical model

H0₂: There is no significant impact of TPM in the company.

H0₃: There is no significant benefit resulted from quality circles in the company.

Alternative hypotheses: H1₁: The quality control tools are effective in identifying the areas of the company.

H1₂: There is significant impact of TPM witnessed by the company.

H1₃: Quality circles have significantly benefited the company.

Sources of data: This study is primarily based on primary data and secondary data which were used to support this study. The population of the study consists of the workers working in the mobile phone industry; however, the targeted population of this study were the workers working in a well known Multinational mobile phone manufacturing unit in Malaysia. From this population, 200 samples were taken randomly for this study. Since, one of the authors of this paper is working in the organization, it was easier for us to get the email addresses of the employees and easy to assess them for the survey. A total of 500 questionnaires were sent through the email and follow-up mails were sent. Moreover, personal request were also made to considerable number of the respondents. The survey was carried out during July-August 2004. At the end of August, nearly 240 questionnaires were received. After a careful checking, 200 questions were found suitable for this study.

The data were collected through a pre-tested mailed questionnaire. The pre-test of the questionnaire was done with a help a pilot study. A total of 30 samples were taken through the convenience survey to test the questionnaire and test the validity of the questions. The questions were designed to assess and test the sentiments and knowledge of employees with respect to the various changes that were brought about by the elements of the TQM strategies. The employees who responded were from various hierarchical levels of the company. A number of scaling measures namely Likert scale, category scale and also the dichotomous Scale were used. The secondary resources were also collected from various journals, articles and books. The literature review incorporated the thoughts of various authors, whether positive or negative, on the subject matter.

RESULTS AND DISCUSSION

The descriptive research method was utilized to gain an insight which is expected to bridge the gap between the theory available with regards to the success of TQM

implementation through the various elements like quality control tools, TPM and also quality circles as opposed to the reality of practice in the company. The literature review had to a great extent provided information pertaining to the research problem and also in identifying the issues surrounding the success of TQM strategy implementation in an organization and also the factors involved in promoting this success. To test the hypotheses, one sample 't' test has been used.

Demographic and socio-economic profile of respondents:

It can be seen that majority of the respondents were from 20-30 years of age category and make up to 52% of the entire sample size. This was followed by employees belonging to other age groups with 28% falling in the 31-40 years age group and 8.5% belonging to the 41-50 years age group. Six percent of the respondents were more than 50 years in age while 5.5% of the respondents were to the less than 20 years of age (Table 1).

The gender distribution of sample respondents indicated that 59% of the respondents were female category while 41% of the employees surveyed were male (Table 2).

The qualification level of the respondents were divided into 6 categories: secondary level, diploma level, higher diploma level, degree level, postgraduate level and others. It is evident that 44% of the respondents were degree holders. This was followed very closely by higher diploma holders who represented 31% of the sample respondents. Respondents with a diploma amounted to 15.5% of the employees surveyed. Seven percent of the employees had postgraduate degree. Finally 2.5% of the respondents had secondary level education (Table 3).

Nearly, 25% of the respondents represent the management team of the company, 30% of the respondents were from the operations department while 20% were representing the administration department. The customer service division is represented by 20% of the respondents while 5% of the respondents belong to other divisions not mentioned in the questionnaire (Table 4).

Hypothesis testing

Hypothesis 1

H0₁: The quality control tools are not effective in identifying the areas of improvement and in measuring the quality of work within the company.

H1₂: The quality control tools are effective in identifying the areas of improvement and in measuring the quality of work within the company.

In this one-tailed test, a test value of 4 was decided based on the Likert Scale coding method of the questionnaire. Rank 1 to rank 5 were utilized where

Table 1: Employees' age distribution

	Frequency	Percent	Valid (%)	Cumulative (%)
Valid < 20 years	11	5.5	5.5	5.5
20-30 years	104	52.0	52.0	57.5
31-40 years	56	28.0	28.0	85.5
41-50 years	17	8.5	8.5	94.0
> 50 years	12	6.0	6.0	100.0
Total	200	100.0	100.0	

Source: Computed from survey data with SPSS 11.5

Table 2: Employees' gender distribution

	Frequency	Percent	Valid (%)	Cumulative (%)
Valid Female	118	59.0	59.0	59.0
Male	82	41.0	41.0	100.0
Total	200	100.0	100.0	

Source: Computed from survey data with SPSS 11.5

Table 3: Employees' qualifications

	Frequency	Percent	Valid (%)	Cumulative (%)
Valid Secondary level	5	2.5	2.5	2.5
Diploma level	31	15.5	15.5	18.0
Higher diploma level	62	31.0	31.0	49.0
Degree level	88	44.0	44.0	93.0
Postgraduate level	14	7.0	7.0	100.0
Total	200	100.0	100.0	

Source: Computed from survey data with SPSS 11.5

Table 4: Employees' job function

	Frequency	Percent	Valid (%)	Cumulative (%)
Valid Management	50	25.0	25.0	25.0
Operations	60	30.0	30.0	55.0
Administration	40	20.0	20.0	75.0
Customer service	40	20.0	20.0	95.0
Others	10	5.0	5.0	100.0
Total	200	100.0	100.0	100.0

Source: Computed from survey data with SPSS 11.5

1 = very ineffective; 2 = ineffective; 3 = neutral; 4 = effective; 5 = very effective. Hypothesis can now be written in a statistical equation as follows:

H0₁: $\mu < 4.0$ [Quality Control Tools are not effective]

H1₁: $\mu = 4.0$ [Quality Control Tools are effective]

It can be seen that there is a significant difference between the sample mean of 3.63 and the hypothesized value of 4.0. As the mean of 3.63 is less than the hypothesized value it has been decided that this hypothesis will not be tested further (Table 5). The mean derived above fulfills the conditions for the alternative hypothesis. As such, it can be said that the quality control tools utilized by the company are not effective in identifying the areas of improvement and in measuring the quality of work within the company. This may be due to lack of training in this area. If the company concentrates more on training and embrace it seriously, these techniques will help these companies to improve their operations. In order to make quality tools a success, the company should find something important to their

Table 5: One-sample statistics of the effectiveness of the quality control tools

	N	Mean	SD	SEM
Effectiveness of the quality control tools	200	3.63	1.282	.091

Source: Computed from survey data with SPSS 11.5

Table 6: One-sample statistics of the impact of TPM in the company One-sample statistics

	N	Mean	SD	SEM
Overall Impact of TPM on manufacturer	200	4.08	1.029	.073

Source: Computed from survey data with SPSS 11.5

operations, decide what the company wants to find out, identify all assignable cause of a variation and develop a timely monitoring system and the company should empower their employees to make it a real success. It requires commitment from top management and quality control should be integrated into TQM .

Hypothesis 2

H0₂: There is no significant impact of TPM in this company

H1₂: There is significant impact of TPM in this company

Table 7: One-sample test of the impact of TPM in the company

	Test value = 4					
	T	df	Sig. (2-tailed)	Mean difference	95% Confidence interval of the difference	
					Lower	Upper
Overall impact of TPM on manufacturer	1.099	199	0.273	0.08	-0.06	0.22

Source: Computed from survey data with SPSS 11.5

Table 8: One-sample statistics of the benefits of quality circles

	N	Mean	SD	SEM
Benefits of quality circles to manufacturer	200	4.11	1.072	0.076

Source: Computed from survey data with SPSS 11.5

Table 9: One-sample test of the benefits of quality circles in the company

	Test value = 4					
	T	df	Sig. (2-tailed)	Mean difference	95% Confidence interval of the difference	
					Lower	Upper
Benefits of quality circles to manufacturer	1.385	199	0.168	0.11	-0.04	0.25

Source: Computed from survey data with SPSS 11.5

In this one-tailed test, a test value of 4.0 was decided upon based on the Likert Scale coding method of the questionnaire. Rank 1 to rank 5 was utilized whereby 1 = Very Negative; 2 = Negative; 3 = Neutral; 4 = Positive; 5 = Very Positive. Hypothesis can now be written in a statistical equation as follows:

- HO₂: $\mu < 4.0$ [There is no significant impact of TPM in this company]
- H1₂: $\mu \geq 4.0$ [There is a significant impact of TPM in this company]

The estimated mean is higher than the required mean of 4 (Table 6). However, the estimated t value of 1.099 is less than the table 't' value of 1.657 (one-tailed test) (Table 7) at 5% level of significance, the null hypothesis is accepted, which states that there is no significant impact of TPM in the company. This is evident from Table 7 and this may be due to improper adoption of the technique without proper training. They should understand if TPM is adopted properly, its corrective action programme can take the endemic problems with immediate-hot-cure. The manufacturer should promote "Kaizen" as a way of life because it is a philosophy of continuous improvement activities which is the basis of the quality revolution.

Hypothesis 3

- HO₃: There is no significant benefit because of quality circles in the company.
- H1₃: There is significant benefit because of quality circles to the company.

In this one-tailed test, a test value of 4.0 was decided based on the Likert Scale coding method of the questionnaire. Rank 1 to rank 5 was utilized whereby

1 = Very Unbeneficial; 2 = Unbeneficial 3 = Neutral; 4 = Beneficial; 5 = Very Beneficial. Hypothesis 3 can now be written in a statistical equation as follows:

- HO₃: $\mu < 4.0$ [There is no benefit by adopting quality circles in this company]
- HO₃: $\mu = 4.0$ [There is significant benefit obtained by quality circles]

It is apparent that there is a trivial difference between the sample mean of 4.11 and the hypothesized value of 4.0. (Table 8) However, the estimated 't' value 1.385 is less than the 't' value of 1.645 at 5% level of significance, we should confidently reject the alternative hypothesis and accept the null hypothesis which states that quality circles are no advantage to the company (Table 9). The reason may be due to lack of employee empowerment. Employees should be trained in broader problem-solving methods including different management skills. Top management must unhook themselves from their functional moorings by delaying authority to lower-level cross functional teams who have decision rights to implement process changes using quality circles. Management's behavior and the organization's culture must become consistent over time with quality circles and TQM philosophy.

CONCLUSIONS

The implications of TQM at this company from various aspects have been the focal point of this study. Here three different spheres of TQM were studied and the repercussion of each sphere was observed. The above mentioned spheres include Quality Control, Total

Productive Maintenance and also Quality Circles. The described objectives and hypotheses were based on these spheres and created a foundation for the study.

In hypothesis 1, a mean of 3.63 was attained. As may be seen, this figure was far less than the hypothesized value of 4. This hypothesis was therefore not tested further. The mean computed met the second part of the identified statistical equation. This led to a conclusion that the Quality Control Tools are not effective in identifying the areas of improvement and in measuring the quality of work within the company. A mean of 4.08 and a p-value of 0.136 were determined for hypothesis two. Here again the null hypothesis was accepted and alternative hypothesis was rejected. It can therefore be concluded that there is no significant impact of Total Productive Maintenance on the company. The final hypothesis strived to evaluate the impact of Quality Circles on the company. The finally described null hypothesis was accepted and alternative hypothesis was rejected. This created a realization that Quality Circles did not have a significant impact on the company.

In this study, it has been proved that the current quality control tools utilized by the company were ineffective. As such, Nokia should concentrate more on improving these quality control tools to fulfill one of the basic requirements of TQM which may require a consistent statistical measurement of quality in order to monitor the performance within the company. All employees of the company should be encouraged to learn and understand these tools in a better way to a level required by their job. The manufacturer must therefore look further into better prospects of employee training involving the various quality tools. Quality circles are known to encourage the stimulation of ideas amongst employees. This further provides the employee with a sense of direction, achievement and commitment. New ideas and new thoughts can be profitable to the company not monetarily but morally as the morale of the employees is boosted where there is a sense of belonging. In order to make TQM program a success, the manufacturer should focus more on training programs to bring more awareness. Top management should also increase their commitment. All the relevant programs should be properly implemented, as poor implementation may make the program a failure. TQM should not be viewed as a passing fad and it should be adopted with deep commitment for successful implementation. In TQM, there is a quest for self improvement where cultural change, use of quality control and other concepts have a part to play^[19]. The concept of never having time to do something properly, but always having time to do it twice

is challenged^[20]. TQM should be looked as a system of interdependent components where even if one component is missed, the entire system will fail and the desired results will not be achieved. The manufacturer should understand the importance of TQM as a very powerful tool in achieving success within an organization. It is vital to carefully implement this philosophy in stages to ensure that it provides benefits to the company. The manufacturer should understand that implementation of TQM requires a redesigning of the way the organization works, the management must provide the support, appropriate level of training and personalized appraisal systems in order to boost the morale of the employees at all time.

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