The Impact of TQM Tools and Organisation Performance in Malaysia Small and Medium Enterprise (SMEs): A Survey Result

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***Abstract*— Total Quality Management (TQM) is an important management tool for continuous improvement in an organization for enhancing their performance. TQM tools are very essential in supporting TQM activities. However, small and medium enterprises (SMEs) have inadequate resources and awareness of motivation for implementing TQM tools in their companies. Hence, the purpose of this study is to identify the extent level of TQM tools and to examine the relationship between TQM tools and organisational performance. Hypotheses have been developed by identifying twenty TQM tools which considered vital in TQM implementation. 400 questionnaires have been distributed through random sampling in final study. Finally, 80 questionnaires were received or 25.0% response rate for final study. The study result shows that the extent level in TQM tools is in high and moderate level. Furthermore, there is a significant relationship between TQM tools and organisational performance in SMEs. However, the relationships are in moderate and low level. The study is important for SMEs to gain insight on the effect of TQM practices towards TQM tools in organizational performance and identify the most important tools and techniques for their companies in future implementation.**

***Keywords*—** *Total Quality Management, SMEs, organisation performance, TQM tools*

1. Introduction

Small and medium enterprises (SMEs) is are playing import role towards achieving sustainable economic growth in Malaysia [1]. SMEs helps Malaysia economy contributing to over 65% of employment and 50% of gross domestic product (GDP). SMEs have potential in contributing and generating economy by providing a support for new industries growth in Malaysia's future development [2]. However, global competition, technology advances, social changes, government trade changes, difference investment policies, and

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changing consumers markets brings difficulties to SMEs. Therefore, SMEs and the government must further adopt, formulate and implement new strategies that will help them to face these new challenges. The most effective way to achieve top lead in SMEs is implementing high quality of practices and using specific tools and techniques to conduct their daily production process. In recent decades, SMEs in all sectors have done breakthrough by creating and ensuring their product quality or service quality in every complexion of daily operations because quality is a key to gain competitive advantage. Hence, total quality management (TQM) had become a widespread practice in SMEs. According to Ahmad [3], a successful TQM implementation can create sustainable quality and productivity in long term by developing continuous improvement. TQM practices included top management, customer satisfaction, employee improvement, continuous improvement, supplier partnership and performance measures. Moreover, continuous improvement is important when an organisations begin to start implement TQM in organizations [4][5]. TQM tools and techniques are important to maintain SMEs' quality and productivity performance. Furthermore, TQM tools and techniques defined by the Deming Prize Committee of the Union of Japanese Scientists and Engineers [6] as: "a set of systematic activities carried out by the entire organization to effectively and efficiently achieve the organization's objectives so as to provide products and services with a level of quality that satisfies customers at the appropriate time and price. Both TQM practices and TQM tools and techniques are playing important role in maintaining a required quality and productivity performance in SMEs.

In fast-speeding global era, TQM tools and techniques are commonly implementing in SMEs. TQM is a multidimensional approach [7][8]. It integrates fundamental approach can lead to a dynamic capability in SMEs. The purpose of implementing TQM is to provide quality products or services to customers, which will, in turn, increase productivity and decrease costs. SMEs use the basic tools like check sheet, flow chart and control chart which is simple and easy to carry out in order to operate their daily process for the past decade. SMEs are using most basic tools because implement new tools in their daily processing need some professional knowledge, skills and training nowadays [9]. However, SMEs required some investment such as man power, skill and financial to implement TQM tools and techniques [10]. In this situation, limited TQM tools and techniques usage had affected poor quality and productivity performance of SMEs [5]. Hence, this research helps to investigate the most related tools and techniques in TQM implementation by analysing the extent level and the relationship to TQM. SMEs implement TQM tools and techniques to enhance their quality and productivity performance and maintain close relationship with supplier and customer [7][3]. Hence, SMEs should focus more on TQM practices, as this will support both quality practices and performance of the firms.

The hypothesis is set to test the relationship between TQM practices with TQM tools. Quality tools act as an important role for product development process from commence phase until the very hindmost phase of production process [11]. The tools divided into basic tools and new basic tools. The basic tools which most implement by previous organization are flow chart, check sheet, histogram, Ishikawa diagram, scatter diagram and control chart. TQM practices as basis for implementing tools and techniques. By implementing quality tools, it can enhance business performance [11]. Based on the theoretical framework, the research hypotheses are formulated by:

H1*: There is significant relationship between TQM tools and organisational performance.*

The Objectives of this study are:

i. What is the extent level of TQM tools and techniques?
ii. What is the relationship between TQM tools and organisational performance?

2. Methodology

First, research problem has been identified as the basis for identifying the solutions. Secondly, literature related to the research topic was reviewed for better understanding according to research objectives. Then, based on literature review, conceptual framework and several hypotheses were developed. The population is observed from small and medium enterprise (SMEs). The unit of analysis is organisation. There are total of 400 samples have been selected for this study. Random sampling is used for this research. Survey method was used in this research. Finally, 80

questionnaires were received for final study. It represented 20.0% of response rate. Statistical Package for Science Social (SPSS) was used to analyse the data being collected. Descriptive and correlation test have been carried out to answer the research questions. Pearson and Spearman test have been used for correlation test.

3. Result

Demographic analysis section explains the demographic background of the companies and respondents. Table 1 shows that the demographic analysis which consists of seven aspects; operation years, company award and department. A total of 400 questionnaires have been distributed to SMEs as respondents. The results obtained were analyzed as shown in Table 1.

Table 1. Summary Results of Demographic Analysis

	Frequency	Percentage (%)
Operation Years		
5 years below	22	27.5
5-10 years	32	40.0
10-15 years	20	25.0
15 and above	6	7.5
Total	**80**	**100.0**
Company Award		
Industrial Excellent Award	17	21.3
State Award	16	20.0
National Award	14	17.5
International Award	4	5.0
None	29	36.3
Total	**80**	**100.0**
Department		
Production Department	17	21.3
Quality Assurance Department	7	8.8
Engineering Department	18	22.5
Logistic Department	2	2.5
Sales Department	10	12.5
Human Resource Department	9	11.3
Top Management Department	5	6.3
Others	12	15.0
Total	**80**	**100.0**

Descriptive analysis is a technique which is used in describing the extent of TQM practices. The data is computed into means and standard deviation. Mean value obtained provides the average of respondents answered based on questionnaire [12][13]. While standard deviation is used to measure the dispersion of the data in which how close the entire set of data is to the average value. The lower the value of standard deviation, the closer is the data to the average value. Table 2 shows the level of mean measurement which is ranked by the central tendency level.

Table 2. Level of Mean Measurement

Mean Range	Central Tendency Level
High	5.00-7.00
Moderate	3.00-4.99
Low	1.00-3.00

A. Descriptive analysis: TQM Factors and Business Sustainable Factors

Table 3 shows Ishikawa diagram is the most welcomed by SMES and score the highest mean which is 5.31 among the rest of TQM tools and techniques. However, bottom five TQM tools and techniques which less practiced by SMEs are design for manufacturability (DFM), matrix data analysis, mass customization, relation diagram and matrix diagram. Design for manufacturability is the least conducted by Small and Medium Enterprise (SME) and score the lowest mean which is 3.1750 in between scale 1 to scale 7 among the rest of TQM tools and techniques. [4]

Table 3. Extent level of TQM tools and techniques

Tools	Mean	Interpretation	Rank
Flow Chart	4.837	High	4
Check Sheet	4.912	High	2
Histogram	4.887	High	3
Pareto Diagram	4.150	Moderate	10
Ishikawa Diagram	5.312	High	1
Scatter Diagram	3.875	Moderate	12
Control Chart	4.162	Moderate	11
Affinity Diagram	3.562	Moderate	15
Tree Diagram	4.825	High	5
Progress Decision Program Chart	3.787	Moderate	13

Tools	Mean	Interpretation	Rank
Matrix Diagram	3.425	Moderate	16
Relation Diagram	3.287	Moderate	17
Matrix Data Analysis	3.212	Moderate	19
Arrow Diagram	3.594	Moderate	14
FMEA	4.587	High	7
QFD	4.287	Moderate	9
SPC	4.762	High	6
Mass Customization	3.287	Moderate	18
Design For Manufacturability	3.175	Moderate	20
DOE	4.350	Moderate	8
Mean:		4.1141	Moderate

Spearmen correlation are used in analysing data from respondents to identify relationship between TQM tools and organisational performance. Significance value in this study is 0.05. From the Table 4, there is positive correlation (r=0.554) between TQM factors and business sustainable factors at significant level 0.01. Table 5 shows all TQM tools are significant relationship with organisational performance. Table 5 shows SPC is the highest by SMES and score the highest mean which is r=0.659 among the rest of TQM tools. It is followed by DOE and Histogram, r=0.568 and 0.552 respectively. However, bottom five TQM tools which less practiced by SMEs are design for relationship diagram, matrix diagram, arrow diagram, matric data analysis and affinity diagram [14].

Table 4: Correlation Analysis between Factors and Organisational performance

		Organisational performance	Result
H1	TQM tools	0.554**	Positive
	Sig (2-tailed)	0.000	Significant

Table 5: Correlation analysis between TQM tools and organizational performance

Hypothesis (H)	TQM tools and techniques	TQM tools and organizational performance (r)	Correlation	Result	Rank
H1a	Flow Chart	.499**	Low	Sig	6
H1b	Check Sheet	.516**	Moderate	Sig	5
H1c	Histogram	.552**	Moderate	Sig	3
H1d	Pareto Diagram	.382**	Low	Sig	11
H1e	Ishikawa Diagram	.540**	Moderate	Significan	4
H1f	Scatter Diagram	.378**	Low	Sig	12
H1g	Control Chart	.445**	Low	Sig	8
H1h	Affinity Diagram	.309**	Low	Sig	16
H1i	Tree Diagram	.441**	Low	Sig	9
H1j	Progress Decision Program Chart	.323*	Low	Sig	14
H1k	Matrix Diagram	.242**	Low	Sig	19
H1l	Relation Diagram	.217**	Low	Sig	20
H1m	Matrix Data Analysis	.305**	Low	Sig	17
H2n	Arrow Diagram	.292**	Low	Sig	18
H2o	FMEA	.461**	Low	Sig	7
H2p	QFD	.411**	Low	Sig	10
H2q	SPC	.659**	Moderate	Sig	1
H2r	Mass Customization	.347**	Low	Sig	13
H2s	Design For Manufacturali-ty	.314**	Low	Sig	15
H2t	DOE	.568**	Moderate	Sig	2

**** p<0.01, * p<0.05**

4. Discussion

Research Objective 1: To determine the extent level of TQM tools in SMEs.
Based on the data analysis, it showed that all TQM tools were high interpretation with high and moderate level. It indicates that TQM tools are

important in SMEs because it can lead to the organizational improvements and organizational performance.

Research Objective 2: To determine the relationship between TQM tools and organizational performance in SMEs.
Correlation analysis was used in this study to analyze the effects of TQM tools on organizational performance in SMEs. It shows that there was a positive significant relationship between TQM tools and organizational performance which was 0.554 with the significance of 0.001.

4. Conclusion

This study proved that TQM tools are very important for organizational performance in SMEs. TQM practices will lead to the different level of organisational performance. Top management should show responsibility for quality improvement activities and provide active leadership through providing resources for quality improvement. TQM can be seen as a potential source of sustainable competitive advantage. According to the study, TQM tools contributes to organisational which was providing a framework that helps the company or organizations understood and acquired these tools as a part of an integrated business management. However, there were still many SMEs companies did not well apply TQM tools which lead them poor organisational performance. Therefore, the management of TQM tools must be much concerned in SMEs.

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