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Total Quality Management (TQM) Practices and Operational Performance in Manufacturing Company

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Abstract: Manufacturing industry is facing challenges to deal with poor quality products, lack of customer satisfaction and supplier issues. In an effort to improve operational performance hence dealing with the challenges in manufacturing company, one approach currently adopted in many organizations is the concept of Total Quality Management (TQM) practices. Despite the claim of substantial benefits of implementing TQM, operational performance of some companies remains unsatisfying. Therefore, this study seeks to examine the relationship between TQM practices and operational performance in manufacturing industry in Malaysia. Five dimensions of TQM practices were studied which are organizational leadership, customer satisfaction and relationships, human resources focus, strategic planning and development, and supplier quality management. This research employed a quantitative research method. Survey questionnaire were randomly distributed to 364 manufacturers in Johor. The final response rate of 13.74% was achieved. The Statistical Package Social Science (SPSS) was used to run the descriptive analysis, normality test and Spearman correlation analysis. The findings showed that the level of TQM practices and operational performance is at high level. Furthermore, the results indicated that, all five dimensions of TQM practices had a significant and positive relationships with operational performance. It is suggested that the implementation of TQM practices is important in ensuring that the operational performance increases in manufacturing companies.

Keywords: Total quality management, Operational performance, Manufacturing

1. Introduction

1.1 Research Background

Throughout today's competitive environment, companies are focused on two key goals regardless of their industry: providing value and productivity to the consumer. It has become extremely important

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to provide reasonable value to customers since the competitive business world gives consumers massive options, and it will not be easy for customers to gain back on the low value they provide (Gupta & Singh, 2017). In the competitive operating environment, reliability has become a tactical weapon in all areas of organizational success. As a result of increasing levels of competition, current and potential consumers' demands for high-quality products and services, companies are constantly strategizing to overcome competition (Al-Rfou, 2012). Deming (1995) emphasized the importance of ensuring that all management subsystems are incorporated in order to achieve quality management success. Commonly the quality is important in any part of product or services. The customer usually chooses the product or services that have high quality. Same as in TQM, when the TQM is appropriately implemented in the organization, it could bring to the quality of performance in terms of financial, operational, organizational and employees. TQM is one of the business management strategy which play an important role to gain awareness of the quality in all organization processes (Abdul, 2018). Every product or services have their own desired quality that should be achieve by the organization through the cooperation of employees and employer. Study by Alsaidi (2014) highlighted the challenges to implement TQM could be come from the top management commitment.

1.2 Problem Statements

As the world becomes more competitive and dynamic, manufacturers continue to realize the importance of performance management as a means of increasing market share. Increasing competition and difficulties in globalization of the manufacturing industry, adversely shifting climatic conditions and shrinking margins between sales and expenditure would be expected to pressure manufacturing companies as well as to adopt quality management practices as purpose to remain in business. Responsibility for resources, effective communication and improved productivity would also be driven by factors that embrace performance measurement. However, manufacturing firms nowadays are facing challenges in the practice of performance measurement (Al-Dhaafri, Al-Swidi, & Yusoff, 2016). Global competition continues to grow and companies have come to realize with the rising demand for quality product and services from customers and the only way to survive in business is with high-quality services and products that meet consumer expectations (Khadka & Maharjan, 2017). There are many complaints from the purchasers, where the product's quality produced by the manufacturing company is low because the manufacturing company neglects the quality element of the products. The reason for the difficulty of validating quality control in the manufacturing company is traditional quality assurance processes. The company tends to take care and discard more finished products (Industry Week, 2017). Each time this happens, the firm actually put their production goals at risk and cut their profits even further.

As a result, a number of organizations expend considerable amounts of their funds on activities aimed at improving procedures, products and services. More organizations also acknowledge and accept complete quality management as one of the main methods of quality improvement through the implementation of total quality management (Psomas & Kafetzopoulos, 2015). TQM practices contributes to improve customer satisfaction through the involvement of all staff, productivity and customer satisfaction are central themes to organizational success. In order to create this value, organizations are created to produce value and operational performance (Kim, Vogt, & Knutson, 2015). Operational performance improvements also lead to lower costs and greater customer satisfaction. Each business therefore requires its operational success when determining its survival in a competitive world (Pradhan, 2017) . Furthermore, Arjun (2016) stated that there a few issues in manufacturing industry involving the suppliers. One of the issues is improper quality control that leads to disruptive the operations performance. This happen when the quality of products is malfunction when it arrived at the customer. The manufacturer must make a suitable choice and decision in terms of supply chain (Jagtap, Teli, Raikar, & Deshmukh, 2017). Therefore, the aim of this study is to identify the level of operational

performance and level of TQM practices implemented in manufacturing company. Then, this study also focusing on the relationship between TQM practices and operational performance.

1.3 Research Questions

(i) What is the level of operational performance in manufacturing company?
(ii) What is the level of Total Quality Management (TQM) practice implemented in manufacturing company?
(iii) What is the relationship between TQM practices and operational performance?

1.4 Research Objectives

(i) To determine the level of operational performance in manufacturing company.
(ii) To determine the level of Total Quality Management (TQM) practice implemented in manufacturing company.
(iii) To investigate the relationship between TQM practices and operational performance.

1.5 Significance of the Study

With this study, the manufacturing industry will begin to understand and looking for alternatives to promote the implementation of TQM practices to achieve good operational performance. In fact, the workers will also begin to understand that maintaining good operational performance is not an easy task. Furthermore, the managerial personnel will be looking for the right opportunity by doing the right activities in improving the operational performance inside its manufacturing company. In fact, they are also able to practice the TQM concept like the other workers in other branches. The results and findings of this study are expected to provide contribution in the field of knowledge studied and can contribute opinion to strengthen the performance of an organization, especially in manufacturing sector. An understanding of operational performance is studied as well hopefully will contribute fresh ideas to the departments in manufacturing company to overcome and minimize the level of failure in quality performance. To increase understanding of operational performance in manufacturing company through TQM practices, every individual needs to be involved and responsible. Individual ability to cope the operational performance will contribute to their success. Otherwise, the manufacturing company will be facing problems and eventually affect their performance.

1.6 Scope of the Study

This study is focusing on the TQM practices and operational performance in manufacturing companies located in Johor. The study examined empirically the organizations' perceptions on TQM activities relating to the different operational performances. The critical TQM practices are organizational leadership, customer satisfaction and relationships, human resources focus, strategic planning and development, and lastly supplier quality management. The operational performance that were measured are product quality, reliability and delivery time. The questionnaires are distributed to the managerial personnel that their feedback will represent their company's opinion.

2. Literature Review

Operational performance and manufacturing strategy are critical to productivity and business success overall, and it is important for manufacturing firms to understand the impact on business performance of complex product offers such as time, expense, quality and delivery. The performance of manufacturing processes shall be calculated and identified as operational efficiency in manufacture as expense, time, quality and reliability measures related to operations of the manufacturing companies (Trattner, Hvam, Forza, & Herbert-Hansen, 2019). Product quality means integrating features that are

able to meet consumer needs (wants) and satisfy consumers by enhancing products (goods) and freeing them from any deficiencies or defects (Chavez, Yu, Jacobs, & Feng, 2017). Quality represents the total number of features of an organization that can meet its defined and implied needs. This concept clearly demonstrates the customer's (or market) need for a product quality initiative. The specifications of the product will be defined by the customer's requirements and the design, material or parts, processes and services will be defined in accordance with specific standards, technical and financial resources. All these factors affect the quality of a commodity (Ke & Hwang, 1997). Reliability describes an item's ability to perform its necessary functions for a specified period under specified conditions (Wu, Neale, Williamson, & Hornby, 2010). Reliability is the most important product performance measurement during the operating period. The quality assurance activities carried on by manufacturers must be expanded to include environmental assessment and maintenance for performance assurance applications with reliability as a key criterion (Ke & Hwang, 1997). Reliability refers to the ability to deliver orders on agreed dates correctly (Chavez *et al.*, 2017). Delivery ensures that goods can be shipped efficiently at the specified time (Chavez *et al.*, 2017). According to Business Dictionary (2019) the delivery time also known as delivery period is defined as average or normal time between placing an order and receiving the delivery. In general, the term of delivery period is the time when actual delivery takes place. The time of delivery lowers costs and generates profit for these businesses. Among other things, on-time delivery is a very important part of a product's success in today's highly competitive market of technological innovation and growth (Karim, Samaranayake, Smith, & Halgamuge, 2010). The delivery of time means that the company completes the production tasks it has allocated to its client on time according to the delivery criteria. Time delivery is a process based on four sub-processes, namely the customer order, product distribution and logistics of the service provider, and sub-process receipt of the customer's products (Bask, Spens, Forslund, Jonsson, & Mattsson, 2009).

The previous research had analyzed the performance-related approaches to Total Quality Management (TQM). TQM combines all processes and roles in a company to improve the quality of its products continuously (Valmohammadi & Roshanzamir, 2015). Quality is a crucial product factor, but consumers have their own quality taste. Mass production problems underline the value of quality in the product production process. It needs consistent supervision to ensure that products meet the required standard (Alkelani, Hasnan, Mohammad, Ahmad, & Ataalah, 2006). Constant development and innovation strategic planning, human resources management, supply chain management, process management, employee involvement, customer awareness and leadership are all aspects of management practices (Barros, Sampaio, & Saraiva, 2014). In general, the direct association between TQM practice and performance has been studied by many researchers. Singh, Kumar, and Singh (2018) for example, addressing the effect of TQM on organizational performance in their research in the context of Indian manufacturing and service industry. This research focuses crucially on five practices including organizational leadership, customer satisfaction and relationship, emphasis on human resources, strategic planning and development, and quality management of suppliers. Based on the findings, it revealed that there is a significant positive relationship between all the functional measurement of TQM practices. TQM is essential for manufacturing business performance. Different quality awards like Malcolm Baldrige National Quality Award, the Deming Award, European Quality Award and the Kanji Business Excellence Modelle combined the practice of TQM in their study. According to Sadikoglu and Olcay (2014), the organizational performance of TQM activities was investigated. Product quality, product reliability and product time were used to measure operational performance. The regression results showed that TQM practices have a strong impact on the operational performance.

The TQM system's manager views the organization as an instrument that can help employee development by creating multi-point connections between staff, managers and clients and use knowledge efficiently and effectively. Therefore, managers foster employee's engagement and engage workers in decision-making. The main factors for the effectiveness of TQM practices are high management engagement and involvement in TQM practices. In order to make the workers more

conscious of quality TQM practices and techniques, managers should show more leadership than conventional management practices. Previous studies have shown that leadership improves operational performance (Sadikoglu & Olcay, 2014). The empirical TQM study shows that the company's leadership is a key factor in TQM (Xiong, He, Deng, Zhang, & Zhang, 2017). Top management leadership, whereas, the coordination and development of strategic goals should actively be involved (Sabella, Kashou, & Omran, 2014). Leadership in management provides significant means or resources to improve performance and sustainability (Basu & Bhola, 2016). Top management finds performance more important than output and takes quality as its engagement. Research eventually assessed that loyalty to top management has a direct impact on the quality of the business (Ebrahimi & Rad, 2017; Herzallah, Gutiérrez-Gutiérrez, & Munoz Rosas, 2014; Keinan & Karugu, 2018; Mehralian, Nazari, Nooriparto, & Rasekh, 2017; Patyal & Koilakuntla, 2017). It is therefore suggested that:

H1: There is a significant relationship between organizational leadership with operational performance.

Customer satisfaction and partnerships are the most important factor for any company, while the core issue for better business performance is considered in TQM (Keinan & Karugu, 2018). In this TQM model, main consumer criteria and customer-oriented solutions for further changes are developed and revised (Sweis, Saleh, Al-Etayyem, Qasrawi, & Mahmoud, 2016). Customer satisfaction feedback will be collected after a regular interval, and customers' feedback will be correctly reported and reviewed to maintain the company's quality standards (Ebrahimi & Rad, 2017; Farish, Anil, & Satish, 2017; Sinha, Garg, Dhall, & Douglas, 2016). In addition, collaborations with consumers are promoted to strengthen relationships (Mehralian *et al.*, 2017; Pradhan, 2017). Customer satisfaction and partnerships are therefore an important element of TQM's development and help to improve business performance. Therefore, the second hypothesis proposed is:

H2: There is a significant relationship between customer satisfaction and relationship with operational performance.

Human resources are one of the key assets of any company and play a vital role in quality and income growth (Aquilani, Silvestri, Ruggieri, & Gatti, 2017; Ebrahimi & Rad, 2017). Humans resources are a critical factor for building TQM which includes a variety of organizational development practices such as effective training, recruiting, procedures for health and safety, involvement, encouragement, appreciation, teamwork, etc. In reality, the organizational performance is improved by well trained, happy and dedicated people (Singh *et al.*, 2018). Omar et al. (2018), Pradhan (2017), Mehralian *et al.* (2017), and Farish *et al.* (2017) suggested that the emphasis on human resources was strongly and positively associated with the success of organizations. Accordingly, the next theory concerns the focus on human resources and the success of organizations. The suggested hypothesis is:

H3: There is a significant relationship between human resources focus with operational performance.

As researchers have pointed out, TQM also plays a key role in achieving a satisfactory interest and increasing performance in strategic planning and development (Al-Dhaafri *et al.*, 2016; Almahamid & Qasrawi, 2017; Pradhan, 2017). It includes quality strategy, principles of goals, change practices, the use of quality control and other management approaches. Strategic planning and development are important in order to determine how an enterprise evolves, executes and strengthens its strategy and policies to achieve better results (Singh *et al.*, 2018). Past research has shown an important impact on corporate effectiveness of strategic planning and development (Aquilani *et al.*, 2017; Ebrahimi & Rad, 2017; Farish *et al.*, 2017; Mehralian *et al.*, 2017; Omar *et al.*, 2018; Parvadavardini, Vivek, & Devadasan, 2016). Hence the hypothesis proposed for this item is:

H4: There is a significant relationship between strategic planning and development with operational performance.

The supply chain management in TQM includes reducing and simplifying the supplier base to help supplier relationship management, establishing strategic alliances with suppliers, partnering with suppliers to meet requirements and mobilizing suppliers to use their know-how and experience in early product development. Good quality management for a great supplier facilitates a constructive and long-term relationship with suppliers and allows them to participate in product design and production processes in order to improve the quality of their goods or services (Singh *et al.*, 2018). Input from suppliers is the first step towards goods or services production in a company. Inputs of high quality provide high-quality products or services. Therefore, suppliers will track and be involved in TQM. Good supply management practices enable suppliers to deliver consistent, high-quality goods and services on a timely basis. Previous studies i.e. (Basu & Bhola, 2016; Mehralian *et al.*, 2017; Omar *et al.*, 2018; Sadikoglu & Olcay, 2014) have shown that supplier quality management has a positive impact on operational performance. Thus, the hypothesis proposed for this item is:

H5: There is a significant relationship between supplier quality management and operational performance.

The research framework is the explanation for independent variables and dependent variables. The explanation is briefly by visually or narratively written. The focus is on concepts, key terms and the assumptions of the relationship between independent and dependent variables. The research framework depicted in Figure 1 will describe on how Total Quality Management (TQM) practices relate to the operational performance in manufacturing industry. This conceptual framework is adapted from Singh *et al.* (2018) and Sadikoglu and Olcay (2014).

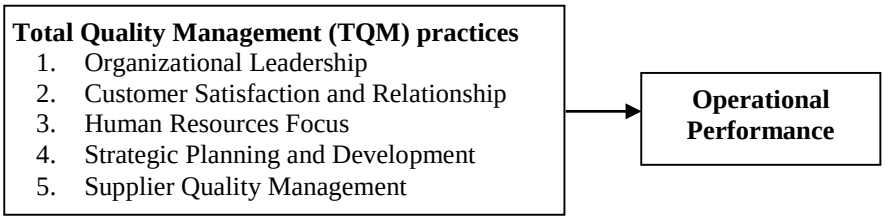

Figure 1: Research framework

3. Research Methodology

3.1 Research Design

This study used a quantitative method in achieving the research objectives. The research focuses on TQM practices and operational performance of manufacturing companies. Managerial level personnel of manufacturing firm in Batu Pahat, Johor were selected as respondent. The total population of manufacturing firms in Johor identified by the Department of Statistics Malaysia (2018) is 7787. Since the study is interested in generalizing the findings to the entire population, the appropriate design for this study is the probability sampling. Survey data are collected using a simple random sampling technique. The respondents will be randomly selected. Simple random sampling is a probability sampling technique, which is easy to use and accurate that represents a large population. The technique was chosen because it is easy accessibility and proximity to researchers. Based on the population size, 364 companies will be selected as samples (Krejcie & Morgan, 1970). The instrument employed in this study were adapted from Singh *et al.* (2018) for organizational leadership with 7 items, customer satisfaction and relationship with 7 items, human resources focus with 4 items, strategic planning and development with 4 items, and supplier quality management with 5 items. Operational performance items were adapted from Sadikoglu and Olcay (2014) with 3 items. All of the items were measured

using 5-points Likert scale of; 1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, and 5 = strongly agree.

3.2 Data Collection

Both primary and secondary data were used throughout the research. The primary data comes from the survey questionnaire collected which was obtained direct from the respondents. The printed materials i.e. research journals and theses in the library of Universiti Tun Hussein Onn Malaysia were used as the secondary data besides digital sources from the internet i.e. journal articles and government reports and statistics. For the purpose of this study, survey questionnaire was distributed to the managerial personnel in manufacturing sector. The respondents were contacted via telephone and setting up a meeting or directly distributed the questionnaire through email upon request. The researcher had explained the purpose of the survey to the respondents during the distribution of the survey. It took about 15 minutes to complete the questionnaire and the respondents were asked to return the questionnaire after it was completed. The data were collected for two months. 50 out of 364 respondents responded towards the questionnaires. This gives response rate of 13.64%. The summary of the respondents' profiles is presented in Table 1.

Table 1: Demographic profiles of respondents

Respondent profile	**F (N=50)**	**P (%)**	**Company profile**	**F (N=50)**	**P (%)**
Gender			**Type of manufacturing sector**		
Male	20	40	Food products	5	10
Female	30	60	Beverages	1	2
Education level			Chemicals and chemical products	2	4
O-level/ SPM	16	32	Rubber and plastics products	3	6
Certificate/ STPM	3	6	Basic of metals	8	16
Diploma	8	16	Electrical equipment	5	10
Degree/ Master	23	46	Computer, electronics and optical equipment	10	20
Department			Furniture	5	10
Human resource	10	20	Motor vehicles, trailers and semi-trailers	1	2
Production	11	22	Repair and installation of machinery and equipment	1	2
Operation	14	28	Others	6	12
Financial	2	4	**Number of full-time workers**		
Marketing	3	6	5 to 75 (Small)	16	32
R&D	2	4	76 to 200 (Medium)	12	24
Others	8	16	More than 200 (Large)	22	44
Position			**Quality system of the company**		
Head of department	5	10	ISO 9001	6	12
Section head	11	22	ISO 9002	2	4
Supervisor	34	68	ISO 9001: 2000	2	4
Working experience			ISO 9001: 2008	17	34
Less than 5 years	28	56	ISO 9001: 2015	12	24
5 to 10 years	14	28	ISO/TS: 16949	2	4
11 years and above	8	16	None	9	18

Company ownership		
Malaysian	43	86
Foreign	7	14

Note: F = Frequency, P = Percentage

Most of the respondents were female with total 30 (60%) and the remaining 20 (40%) respondents were male. It indicates that, female respondents are higher than male respondents. O-level or SPM recorded 32% (16), whereas 6% (3) of the respondents has Certificate or STPM, while 16% (8) of the respondents had studies Diploma. There are 46% (23) of the respondents were Degree or Master holder. There are 10 (20%) of the respondent work in human resource department, 11 (22%) of the respondents responsible in production department, then 14 (28%) of the respondents comes from operation department. Financial department respondents were 2 (4%), marketing department respondents was 3 (6%), while R&D department respondents was 2 (4%). Most of the respondents are supervisor which recorded at 68% (34) whereas 22% (11) of the respondents are section head and 10% (5) of the respondents are head of department. It is recorded that majority of the respondents had less than 5 years of working experience in manufacturing firm which is 28 (56%), followed by 14 (28%) respondents who have experience in manufacturing industry from 5 to 10 years, then 8 (16%) respondents had works 11 years and above. Minority of the employee have been with the organization 11 years and above. Majority of the respondents come from computer, electronics and optical equipment factories which recorded 20% (10). Most of the companies have more than 200 full time workers (large) which recorded at 44% (22), whereas 32% (16) of the respondents has 5 to 75 full time workers while 24% (12) companies are medium sized with 76 to 200 workers. It indicates that 86% (43) of the respondent's firm are Malaysian ownership whereas 14% (7) of companies are foreign ownership. It is recorded that majority of the companies get certification of ISO at 41 (82%) companies while the remaining 9 (18)% companies have not implemented any quality system in their company.

3.3 Data Analysis

Data analysis includes the reduction of accumulated data to a manageable level, the development of summaries, patterns and the use of statistical techniques (Cooper & Schindler, 2014). The data collected were statistically analyzed to verify whether either hypothesis has been supported (Sekaran, 2016). The collected primary data from respondents were analyzed using Statistical Package for Social Science (SPSS) version 25. A few analyses took place for data analysis, which are reliability analysis, descriptive analysis method, normality test, and correlation analysis.

4. Data Analysis and Results

There are 30 items were tested which each variable consists of 3 to 7 questions. The Cronbach's Alpha value presented in Table 2 showed reliability range from 0.702 to 0.789. This shows that the instruments used in the research were reliably valid and acceptable.

Table 2: Reliability analysis

Variables	No. of item	Cronbach's Alpha
Organizational leadership	7	0.745
Customer satisfaction and relationships	7	0.776
Human resource focus	4	0.702
Strategic planning and development	4	0.786
Supplier quality management	5	0.789
Operational Performance	3	0.759

Table 3 shows the central tendency level for all the variables. There are seven items that have been used to measure the level of organizational leadership. The central tendency level of seven items is at high level because of its mean score, which are ranged from 4.02 to 4.32. items of 'Top management actively involved in communication and planning of organizational goals' is at the highest mean score in the organizational leadership scale while the item of 'Top leadership anticipate changes and make plan to accommodate it' is at the lowest average value. The overall result for the organizational leadership is at high level with the mean score of 4.20. The level of central tendency for overall items of customer satisfaction and relationships is high level with the favorable score of mean score 4.09. There are seven items used to determine the level of customer satisfaction and relationships. The mean score for seven items has ranged from 4.24 as maximum value for item of 'Design development and delivery of products is according to the requirements of the customers' to minimum value of 3.94 for item of 'Concessions are provided for defective parts or products.

The level of human resources focuses shows that each item is at the high level. It includes that mean score is ranged between 4.06 to 4.24. Based on the employees' opinion, the highest satisfaction toward the item of 'Recruitment procedure is such that, "right person is selected for right job" ' whereas, employees feel not much satisfied to the item of 'Proper and efficient training is provided to newly selected personnel' as least significant statement. In overall, human resources focus has an average value of 4.15. It can be concluded that human resources focus is at the high level. The descriptive analysis of strategic planning and development shows that the level of central tendency for overall items is high level with the favorable mean score 4.11. There are four items used to determine the level of strategic planning and development. The mean score for four items of has ranged from 4.24 as maximum value for item of 'The company encourages study and planning for improvement of all its products and processes' to minimum value of 3.98 for item of 'The company employs seven tools of quality to plan, control and improvement of processes.

Table 3: Descriptive analysis for

Code	Items	Mean	SD	Level
	Organizational Leadership			
OL1	Top management actively involved in communication and planning of organizational goals	4.32	0.59	High
OL2	Top leadership provides significance means (resources) to improve and maintain quality	4.20	0.54	High
OL3	Top leadership views quality more important than production (means quality has more importance than production schedules)	4.24	0.74	High
OL4	Management at the top takes quality as their responsibility	4.26	0.66	High
OL5	Top executives routinely interact with their concerned departments (Quality as well as the other)	4.20	0.81	High
OL6	Top management is evaluated on quality performance	4.18	0.69	High
OL7	Top leadership anticipate changes and make plan to accommodate it	4.02	0.71	High
	Average of mean	**4.20**		**High**
	Customer Satisfaction and Relationship			
CSR1	The key customer requirements are identified (product specifications detected and fulfilled)	4.12	0.66	High
CSR2	Customer oriented strategies are built and reviewed for further improvements	4.12	0.72	High
CSR3	Encouragement provided to partnerships with customers to make relations better	4.16	0.87	High
CSR4	Design development and delivery of products is according to the requirements of the customers	4.24	0.77	High

CSR5	Customer satisfaction feedbacks are taken after a regular interval	4.04	0.76	High
CSR6	Customer complaints are properly recorded and reviewed to maintain our quality standards	4.04	0.76	High
CSR7	Concessions are provided for defective parts/products	3.94	0.71	High
	Average of mean	**4.09**		**High**
	Human Resources Focus			
HRF1	Recruitment procedure is such that, "right person is selected for right job"	4.24	0.56	High
HRF2	Proper and efficient training is provided to newly selected personnel	4.06	0.71	High
HRF3	Health and safety practices are excellent	4.12	0.72	High
HRF4	Career development training to employees is provided by the company (both inside and outside of the company)	4.16	0.74	High
	Average of mean	**4.15**		**High**
	Strategic Planning and Development			
SPD1	The company encourages study and planning for improvement of all its products and processes	4.24	0.56	High
SPD2	There is frequent inspection of product tools quality and process takes place	4.16	0.77	High
SPD3	The company employs seven tools of quality to plan, control and improvement of processes	3.98	0.82	High
SPD4	We collect data first and then we make decisions for the improvement of process, after reviewing it	4.06	0.79	High
	Average of mean	**4.11**		**High**
	Supplier Quality Management			
SQM1	The company regards quality of products more important than price for selecting a supplier	4.12	0.72	High
SQM2	The company has provided certification to our suppliers and routine audits take place to maintain the quality standards	4.02	0.89	High
SQM3	The company's employees periodically visit our suppliers to inspect and evaluate the products for improving quality	4.08	0.75	High
SQM4	Our company has the detailed information about our suppliers and their performances	4.18	0.77	High
SQM5	Our suppliers regularly take feedback from us, so as to maintain quality standards	3.92	0.80	High
	Average of mean	**4.06**		**High**
	Operational Performance			
OP1	Quality of our products/services is high	4.44	0.73	High
OP2	Reliability of our products/services is high	4.32	0.62	High
OP3	We deliver our products/services on time to customers	4.34	0.69	High
	Average of mean	**4.37**		**High**

The central tendency level of supplier quality management with five items are all at high level ranged from 3.92 to 4.12. The item of 'The company regards quality of products more important than price for selecting a supplier' is at the highest mean score in the organizational leadership scale while the item of 'Our suppliers regularly take feedback from us, so as to maintain quality standards' is at the lowest average value. The overall result for the organizational leadership is at high level with the mean score of 4.06. The total mean value of operational performance is stated at 4.37 which have been determined by total sum of the mean value of three items. Respondents major agree when answering the questions of 'Quality of our products or services is high' with the mean score of 4.44. Employee feel least agree to the statement of 'Reliability of our products or services is high' with the mean score of 4.32. The overall mean for operational performance is 4.37 which is high.

Kolmogorov-Smirnov and Shapiro-Wilk statistics were used where the significance value represents by more than 0.05 ($P \geq 0.05$) means the data is normally distributed but if the significance level is less than 0.05 ($P < 0.05$), thus the data is not normally distributed. The normality test was conducted, and the results revealed that the data is not normally distributed. Since the data is not normally distributed, Spearman correlation analysis is used to analyze the relationships between dependent variable and independent variables. The correlation analysis results can be referred to statistics presented in Table 4. The analysis shows that all variables are significantly positively related to one another, thus supporting all the hypotheses.

Table 4: Correlation analysis

	1	2	3	4	5	6
1. Organizational Leadership	1.000					
2. Customer Satisfaction and Relationship	.592**	1.000				
3. Human Resource Focus	.604**	.510**	1.000			
4. Strategic Planning and Development	.567**	.660**	.624**	1.000		
5. Supplier Quality Management	.462**	.569**	.685**	.629**	1.000	
6. Operational Performance	.540**	.571**	.516**	.443**	.423**	1.000

Note: **. Correlation is significant at the 0.01 level (2-tailed).

5. Discussion and Conclusion

All total quality management practices and operational performance's mean score were reliable with Cronbach's Alpha values, which are more than 0.7. Based on the result obtained in normality test, it shows that the distribution sample is not normal which leads to Spearman correlation analysis. Generally, total significance values of total quality management practices and operational performance are less than 0.01. The level of operational performance is at higher level which is 4.37. It means that the operational performance in manufacturing firm is at high level. The result show that quality of products, reliability of products and the delivery time of products to customer are strong factors in the manufacturing firm. Most of the respondents agreed that their company have produced high quality of products and the reliability of their products also high. Most of them also believe that they deliver the products on time to the customers. Overall, this study shows that the manufacturing firm have a great operational performance.

The result obtained from the descriptive analysis on TQM practices, the higher level is 4.20 which is organizational leadership while the lowest level quality practices in manufacturing company is supplier quality management with average of mean 4.06. Based on the perception of the top management, it can be explain that five total quality management practices (organizational leadership, customer satisfaction and relationships, human resource focus, strategic planning and development, and supplier quality management) had been consistently and highly practiced in the manufacturing company. The organizations had consistently focused on the role of leader, provide satisfaction to customers, hiring the right person, having excellent planning towards development of the company, and as well as having great relationship with suppliers since these five dimension of total quality management practices might be the basic practices other than other practices in the manufacturing company. It can be explained that the managers have fairly contributed their effort to the implementation of these five dimensions of total quality management practices.

The result of correlation analysis indicates that there was a significant and positive relationship between four dimensions of total quality management practices and operational performance. Hence, it implies that all hypotheses were supported in this study. It is hypothesized that organizational leadership positively related to operational performance. The result provided a strong indication that organizational leadership was positively and significantly related to operational performance in manufacturing company (r_s = 0.540, $p < 0.01$). Specifically, the study found a positive relationship

between organizational leadership and operational performance. This positive significant relationship is aligned with the findings where leader should give full commitment to the firm for the improvements and maintaining the quality (Anil & Satish, 2016). Leadership is largely responsible for setting the strategic direction and setting up processes to promote high performance in the company. The leadership aspect has multiple dimensions in which having a cohesive purpose, encouraging progress, managing the climate, and developing a collaborative approach to improving performance (Sabella *et al.*, 2014). Top management leadership that 'actually seen in companies will enhance product quality by creating a plan that focuses on quality enhancement, concentrating on quality and embracing quality responsibilities (Sweis *et al.*, 2016). A strategic objective is needed for quality leadership, meaning that the leader provides the right environment to improve performance and productivity for the group members. One of the key drivers for the successful implementation of TQM was the top management commitment (Keinan & Karugu, 2018).

It is found out that customer satisfaction and relationships was significantly and positively related to operational performance which $r_s = 0.571$ and $p<0.01$. Empirical findings of previous studies indicate that there is significant positive relationship between customer satisfaction and relationships with operational performance. The positive relationship between customer satisfaction and relationships is an important TQM practice that effects the operational performance in most manufacturing firm. The current result thus aligned with previous findings (Keinan & Karugu, 2018). Improving product quality ensures customer satisfaction that increases demand for the customers. Affecting customer demand may influence purchase material stock turnover and overall inventory management turnover (Sweis *et al.*, 2016). Numerous empirical studies indicate that businesses that have implemented a quality-oriented approach have achieved improved productivity, increased customer satisfaction, increased employee morale, improved labor relations management and increased overall operational performance (Almahamid & Qasrawi, 2017; Keinan & Karugu, 2018; Omar *et al.*, 2018).

The present study hypothesized that human resource focus practice positively related to operational performance. The result of this research provided a strong indication that human resources focus was positively and significantly related to operational performance in manufacturing company ($r_s = 0.516$, $p<0.01$). The study result is consistent and with the Omar *et al.* (2018). The strong and positive value of coefficient show that the human resource focus was positively related to operational performance. Numerous empirical studies indicate that businesses that have implemented a quality-oriented approach have achieved improved productivity, increased customer satisfaction, increased employee morale, improved labor relations management and increased overall operating performance (Almahamid & Qasrawi, 2017; Aquilani *et al.*, 2017; Keinan & Karugu, 2018; Pradhan, 2017). The result of this study found that strategic planning and development was significantly and positively related to operational performance ($r_s = 0.443$, $p<0.01$). The result of the study is similar to the result of previous studies. Therefore, this study had fully proved by previous studies, thus supporting the hypothesis on strategic planning and development have a significant positive relationship with operational performance. Moreover, strategic planning consolidates the development and implementation of strategies that improve relations with consumers, suppliers and business partners and also helps to achieve long-term and short-term goals by participatory strategy (Anil & Satish, 2016).

Supplier quality management was found significantly and positively related to operational performance which $r_s = 0.423$ and $p<0.01$. This finding is supported by empirical study of Gupta and Singh (2017) which indicated that there is a significant positive relationship between supplier quality management and operational performance. The establishment of long-term relationships and active engagement among suppliers in improving organizational quality will foster the systematic exchange of information between suppliers and producers which has an effect on quality and efficiency in inventory management. Facilitating the information exchange between suppliers and manufacturers may enable manufacturers to track inventories by creating flexible suppliers which supply the products

that manufacturers need. The promotion of information exchange among suppliers and manufacturers can also improve the manufacturer's quality of production and encourage the improvement of product or service. Engaging vendors in the development of new products will give companies a clearer understanding of the supplier's ability to supply the necessary components and parts with the customer satisfaction requirements. In addition, close ties will lead to the share of risks and rewards and promote long-term productivity (Gupta & Singh, 2017). The promotion of information exchange between suppliers and manufacturers can also enhance consumer efficiency and encourage product or service development. The involvement of suppliers in new product development can enable organizations to understand the supplier's ability to supply the materials and components required under the customer fulfillment requirements. However, close relations will help share risks and benefits and improve long-term relationships in terms of profitability (Anagha & Magesh, 2016). Efficient quality control of suppliers can be done by collaboration and long-term relationships with suppliers. The company will boost its profitability and efficiency by forming supplier partnerships and long-term relationships (Anil & Satish, 2016).

In conclusion, this study showed the most preferable of TQM practices in manufacturing company with the operational performance. From the results, all the TQM practices have strong relationship with operational performance in manufacturing companies. The implementation of TQM practices is important in ensuring that the operational performance increases in manufacturing companies in Johor.

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References

Abdul, O. S. (2018). An Overview of the Relationship between Total Quality Management andEmployee Performance in a Selected Nigerian Company. *Texila International Journal of Management, 4*(1). doi:10.21522/TIJMG.2015.04.01.Art007

Al-Dhaafri, H. S., Al-Swidi, A. K., & Yusoff, R. Z. B. (2016). The mediating role of total quality management between the entrepreneurial orientation and the organizational performance. *The TQM Journal*.

Al-Rfou, A. N. (2012). Competition and organizational performance: Empirical evidence from Jordanian firms. *Journal of Economics, 3*(1), 13-17.

Alkelani, A. M., Hasnan, K., Mohammad, M., Ahmad, M. F., & Ataalah, A. (2006). Relationship Between Total Quality Management (TQM) Practice and Organisational Performance: A Conceptual Model Based on Libyan Manufacturing Industries. *Journal of Engineering and Applied Sciences, 11*, 8635-8641.

Almahamid, S. M., & Qasrawi, S. T. (2017). The impact of TQM practices and KM processes on organisational performance. *International Journal of Quality & Reliability Management, 34*(7), 1034-1055. doi:10.1108/IJQRM-11-2015-0160

Alsaidi, A. (2014). Benefits of Total Quality Management in mechanical working in oil companies in Libya. *International Journal of Engineering Research and Social Technology, 3*(4), 241-247.

Anagha, K., & Magesh, R. (2016). Employee motivation to innovate and resources management: the mediating role of organisational commitment. *International Journal of Management Concepts and Philosophy, 9*(3), 185-199.

Anil, A. P., & Satish, K. (2016). Investigating the relationship between TQM practices and Firm's performance: A conceptual framework for Indian organizations. *Procedia Technology, 24*, 554-561.

Aquilani, B., Silvestri, C., Ruggieri, A., & Gatti, C. (2017). A systematic literature review on total quality management critical success factors and the identification of new avenues of research. *The TQM Journal, 29*(1), 184-213.

Arjun, N. (2016). Supplier issues faced by manufacturing industry. Retrieved from https://www.linkedin.com/pulse/supplier-issues-faced-manufacturing-industry

Barros, S. A., Sampaio, P., & Saraiva, P. (2014). Quality management principles and practices impact on the companies' quality performance. *1st International Conference on Quality Engineering and Management, 1*(5), 237-247.

Bask, A., Spens, K., Forslund, H., Jonsson, P., & Mattsson, S. A. (2009). Order-to-delivery process performance in delivery scheduling environments. *International Journal of Productivity and Performance Management, 58*(1), 41-53. doi:10.1108/17410400910921074

Basu, R., & Bhola, P. (2016). Impact of quality management practices on performance stimulating growth. *International Journal of Quality & Reliability Management, 33*(8), 1179-1201. doi:10.1108/IJQRM-10-2015-0153

Business Dictionary. (2019). Time Delivery. Retrieved from http://www.businessdictionary.com/definition/time-delivery.html

Chavez, R., Yu, W., Jacobs, M. A., & Feng, M. (2017). Data-driven supply chains, manufacturing capability and customer satisfaction. *Production Planning & Control, 28*(11-12), 906-918.

Deming, W. E. (1995). Out of the Crisis. In: Massachusetts Institute of Technology, Center for Advanced Engineering Study.

Department of Statistics Malaysia. (2018). *Population of Manufacturing Firm in Johor*. Retrieved from https://www.dosm.gov.my/v1/

Ebrahimi, Z. F., & Rad, R. H. (2017). The relationship between TQM practices and role stressors. *International Journal of Management Practice, 10*(3), 295-325.

Farish, K., Anil, A. P., & Satish, K. (2017). Effect of TQM practices on financial performance through innovation performance-in Indian manufacturing context. *International Research Journal of Engineering and Technology, 4*(7), 2649-2655.

Gupta, T. K., & Singh, V. (2017). Measurement of service quality of automobile organisation by artificial neural network. *International Journal of Management Concepts and Philosophy, 10*(1), 32-53.

Herzallah, A. M., Gutiérrez-Gutiérrez, L., & Munoz Rosas, J. F. (2014). Total quality management practices, competitive strategies and financial performance: the case of the Palestinian industrial SMEs. *Total Quality Management & Business Excellence, 25*(5-6), 635-649.

Industry Week. (2017). Top 3 Operational Challenges Manufacturers Face Today—and How to Overcome Them. Retrieved from https://www.industryweek.com/cloud-computing/top-3-operational-challenges-manufacturers-face-today-and-how-overcome-them

Jagtap, M., Teli, S., Raikar, V., & Deshmukh, P. (2017). Effect of Supplier Quality Management (SQM) on performance measures of manufacturing organization. *ISDSI International Conference, 30*(2), 2-9.

Karim, M. A., Samaranayake, P., Smith, A., & Halgamuge, S. K. (2010). An on-time delivery improvement model for manufacturing organisations. *International Journal of Production Research, 48*(8), 2373-2394.

Ke, H. Y., & Hwang, C. P. (1997). Reliability programme management based on ISO 9000. *International Journal of Quality & Reliability Management, 14*(3), 309-318.

Keinan, A. S., & Karugu, J. (2018). Total quality management practices and performance of manufacturing firms in Kenya: Case of Bamburi Cement Limited. *International Academic Journal of Human Resource and Business Administration, 3*(1), 81-99.

Khadka, K., & Maharjan, S. (2017). Customer satisfaction and customer loyalty: Case trivsel städtjänster (trivsel siivouspalvelut).

Kim, M., Vogt, C. A., & Knutson, B. J. (2015). Relationships among customer satisfaction, delight, and loyalty in the hospitality industry. *Journal of Hospitality & Tourism Research, 39*(2), 170-197.

Krejcie, R. V., & Morgan, D. W. (1970). Determining sample size for research activities. *Educational and Psychological Measurement, 30*(3), 607-610.

Mehralian, G., Nazari, J. A., Nooriparto, G., & Rasekh, H. R. (2017). TQM and organizational performance using the balanced scorecard approach. *International Journal of Productivity and Performance Management, 66*(1), 111-125. doi:10.1108/IJPPM-08-2015-0114

Omar, S. S., Ariffin, Z. Z., Abdullah, A. N., Mahadi, N., Mokhtar, F. S., & Azman, N. A. (2018). Conceptualising the influence of total quality management and organizational performance in Klang Valley service industry. *Advanced Science Letters, 24*(5), 3240-3243.

Parvadavardini, S., Vivek, N., & Devadasan, S. (2016). Impact of quality management practices on quality performance and financial performance: evidence from Indian manufacturing companies. *Total Quality Management & Business Excellence, 27*(5-6), 507-530.

Patyal, V. S., & Koilakuntla, M. (2017). The impact of quality management practices on performance: an empirical study. *Benchmarking: An International Journal, 24*(2), 511-535. doi:10.1108/BIJ-11-2015-0109

Pradhan, B. L. (2017). Confirmatory factor analysis of TQM implementation constructs: Evidence from nepalese manufacturing industries. *Management Review: An International Journal, 12*(1), 26.

Psomas, E. L., & Kafetzopoulos, D. P. (2015). HACCP effectiveness between ISO 22000 certified and non-certified dairy companies. *Food Control, 53*, 134-139.

Sabella, A., Kashou, R., & Omran, O. (2014). Quality management practices and their relationship to organizational performance. *International Journal of Operations & Production Management, 34*(12), 1487-1505. doi:10.1108/IJOPM-04-2013-0210

Sadikoglu, E., & Olcay, H. (2014). The effects of total quality management practices on performance and the reasons of and the barriers to TQM practices in Turkey. *Advances in Decision Sciences*.

Singh, V., Kumar, A., & Singh, T. (2018). Impact of TQM on organisational performance: The case of Indian manufacturing and service industry. *Operations Research Perspectives, 5*, 199-217.

Sinha, N., Garg, A. K., Dhall, N., & Douglas, A. (2016). Effect of TQM principles on performance of Indian SMEs: the case of automotive supply chain. *The TQM Journal, 28*(3), 338-359.

Sweis, R. J., Saleh, R. A., Al-Etayyem, R. H., Qasrawi, B. T., & Mahmoud, A. M. A. (2016). Total quality management practices and organisational performance in Jordanian courier services. *International Journal of Productivity and Quality Management, 19*(2), 258-276.

Trattner, A., Hvam, L., Forza, C., & Herbert-Hansen, Z. N. L. (2019). Product complexity and operational performance: A systematic literature review. *CIRP Journal of Manufacturing Science and Technology, 25*, 69-83.

Valmohammadi, C., & Roshanzamir, S. (2015). The guidelines of improvement: Relations among organizational culture, TQM and performance. *International Journal of Production Economics, 164*, 167-178.

Wu, S., Neale, K., Williamson, M., & Hornby, M. (2010). Research opportunities in maintenance of office building services systems. *Journal of Quality in Maintenance Engineering, 16*(1). doi:10.1108/13552511011030309

Xiong, J., He, Z., Deng, Y., Zhang, M., & Zhang, Z. (2017). Quality management practices and their effects on the performance of public hospitals. *International Journal of Quality and Service Sciences, 9*(3/4), 383-401. doi:10.1108/IJQSS-02-2017-0019