

An Exploratory Study of Operations Management Best Practices

Mastora Mustafar^{a,b*}, Amran Rasli^a, Azlin Shafinaz Mohamad Arshad^{a,c}, Nadhirah Norhalim^a

^aFaculty of Management, Universiti Teknologi Malaysia

^bSchool of Technology Management and Logistic, College of Business, Universiti Utara Malaysia

^cMalaysia Academy of SME & Entrepreneurship Development (MASMED, Universiti Teknologi Mara, Malaysia)

*Corresponding author: mastora@uum.edu.my

Article history

Received :4 April 2013
Received in revised form :
25 July 2013
Accepted :15 October 2013

Abstract

The purpose of this paper is to conduct an exploratory investigation on the level of operations management best practices. A sample random t-test analysis was used upon a high technology company that was selected based on simple random sampling from government agency directory. After various attempts, 72 out of 138 are providing feedback. However, only 34 can be used, the rest did not answer completely. Descriptive analysis and t-test analysis were performed on 34 completed feedbacks. Six factors in the form of quality commitment, customer focus, formalization of performance measurement, people management, process management and technology management were examined as predictors for operations management best practices. Findings indicated that the mean value is more than 3 for all dimensions. Furthermore, most cases are significant as the selected samples are high technology based companies and their workers are knowledgeable in terms of operations management best practices.

Keywords: High technology based companies; innovation; operations management best practices

© 2013 Penerbit UTM Press. All rights reserved.

1.0 INTRODUCTION

In today's business environment, in order to sustain management of innovation and change, companies must create new products, services, and processes and implement operations management best practices to lead a higher performance (Sousa & Voss, 2008). Innovation is commercialization of inventions (Walsh *et al.* (2002). A commercialization is a process of bringing a product or service to the user application. While definition innovation by Trott (2005) also defines management as all activities involved in the process of generating ideas, technology development, manufacturing and marketing of products, manufacturing processes or new equipment or improvements. It is found that the change of an innovation is not able to be established well due to the lack of technology to create innovative products that can be sold (Walsh, Kirchhoff, & Newbert, 2002). While Komo (2006) argues that the creations of commercialized inventions are difficult for local researchers as they are not getting the trust of the company and the local people due to their lack of confidence on the quality of the products. Therefore, the level of consumer acceptance and quality management should also be considered before the launching any inventive idea.

Best Practice is the cooperative way in which firms and their employees undertake business in all key processes: Leadership, Strategic Planning, Customer Focus, Information and Analysis, People Management and Process Management (Prajogo & Hong, 2008). These practices, when effectively linked together, can be expected to lead to sustainable world-class outcomes in quality and customer service, flexibility, timeliness, innovation, cost and

competitiveness. Best practices have been applied in many areas, such as business planning, healthcare and manufacturing. Moreover, a best practice also can then be applied across divisions and SBUs as well as inter-organization to increase the overall performance (Reijers & Mansar, 2005).

An operation management best practice is a new management practices captured under themes such as total quality management (TQM) and lean production. These new practices have acquired a strong prescriptive stance and have often been advocated as universally applicable to organizations and organizations activities. The emergence of a new paradigm in Operations Management based on the assumption that the adoption of best practice in a wide range of areas leads to superior performance (Sousa & Voss, 2008) and focuses on the continuous development of best practice on all areas within a company.

Companies which used TQM generate many benefits such as higher quality products, more satisfied customers, reduced costs, improved financial, quality and innovation performance and in addition to these improved employee satisfaction (Zehir, Ertosun, Zehir, & Müceldilli, 2012) and also become a competitive advantage to firms (Chin, Rao Tummala, & Chan, 2002). Several studies on quality management are shown in Table 1.

Table 1 Several studies on quality management

Study		Quality variables
Zehir <i>et al.</i> , (2012)	8 elements	Leadership management Factual approach to decision making Employee management System approach to management Supplier management Process management Customer focus Continual improvement
Tran, Cahoon, & Chen, (2011)	12 practices	Leadership Customer focus Human resources Continuous improvement Process management Quality measurement Quality education and training Social benefit Integration quality Communication and information technology Quality culture Network optimization
Jusoh, Yusoff & Mohtar, (2008)	7 dimensions	Leadership Strategic planning Customer focus Data and information management People management Process and system management Partnership and resources
Tarí, Molina, & Castejón, (2007)	9 factors	Leadership Quality planning Human resource management Customer focus Supplier management Learning Process management Continuous improvement Quality tools and techniques
Chin <i>et al.</i> , (2002)	7 core concepts	Customer focus Leadership Strategic quality planning Design quality, speed and prevention People participation and partnership Fact-based management Continuous improvement
Malcolm Baldrige National Quality Award (1987) as cited in Russell & Taylor (2009)	7 criteria	Leadership Information and analysis Strategic planning Human resource focus Process management Business results Customer and market focus

This study has adapted the Malcolm Bridge National Quality Award (MBNQA) criteria as the dimensions of OMBP based on the following reasons. First, the MBNQA is more general and managerial (Foster, 2007). The MBNQA not only codifies the ideology of quality management in an understandable language but also provides organisations with a comprehensive framework for evaluating their organisational progress with a new management paradigm such as increased customer satisfaction and employee involvement (Garvin, 1987).

This is also supported by (Tari *et al.*, 2007) that many firms have used the MBNQA criteria to evaluate their quality performance. Second, the MBNQA criteria appear to be the most appropriate criteria for both manufacturing and service firms (Jusoh, Yusoff & Mohtar, 2008; Russell & Taylor, 2009) which were the focus of this study. For these reasons, the OMBP constructs in this study are conceptualized in terms of the six dimensions described by the MBNQA criteria namely; (1) quality commitment, (2) customer focus, (3) formalization of performance measurement, (4) people management, (5) process management and (6) technology management. Tables 2 describe operations management best practices that are oriented in this study.

Table 2 Operation management best practices

Dimensions	Remarks
Quality commitment	Highest management levels must spearhead quality efforts and commit goals to customer focus. All leaders must be genuinely committed and become actively involved. Perseverance and constancy are essential. Demand cross-functional cooperation in tackling quality issues. Encourage individuals to speak out constructively about quality problems.
Customer focus	Well satisfied customers are the ultimate aim. Develop and manage strong customer relationships for the longer term. Know customers' current requirements and future expectations. Get informed consensus with customers when setting design and improvement priorities.
Formalization of performance measurement	Which describes practices related to the company performance measurement
People management	which focus on human aspect (training, safety work environment, multiskilling employee, employee satisfaction, etc)
Process management	Which describes best practices related to the all process involved in transferring input into output have to manage, plan, monitor and assess.
Technology management	which describes best practices related to the technology that the business process uses or may use

■2.0 METHODS

The primary objective of this study was to explore and answer the following primary research questions in the setting of the high technology company in Malaysia: What are the levels of dimensions of operation management best practices?

The target population in this study is high technology company in Malaysia. High-technology company was selected by the companies who underline innovation in their business strategies (Kirner, Kinkel, & Jaeger, 2009) and employ scientists and engineers in their workforce (Soriano, 2010). The sampling frame gathered from government agency directory has listed the companies which are involved in scientific and technological activities in Malaysia. Unit of analysis in this study was high technology company in Malaysia. While operations director or operations executive or R&D personnel are deemed to be the respondents in this study. A questionnaire was designed based on the MBNQA model and on a literature review (see Table 1).

This questionnaire comprising 36 items was used as the survey instrument to collect data through online survey. The items were found and modified with those used in studies by Zehir *et al.*, (2012); Tran, Cahoon, & Chen (2011); Tari, Molina, & Castejón (2007); and Chin *et al.* (2002). Each of the items in the section is fixed on a five-point scale to measure the respondent's agreement to the item posed. Response rate in this study is 52% which are considered as moderate. According to Antony, Leung & Knowles (2002) and Yusof & Aspinwall (2000), low response rate between 16.5% and 25% are considered to be normal. However, from 52% only 34 companies have answered the questionnaires completely. Consequently, for the next subsection, the descriptive analysis and t-tests analysis was based on 34 companies.

■3.0 FINDINGS

The background of the company and respondents were described in Table 3, including years of company establishment, type of cluster, and respondents post. The result shows that 14 out of 34 companies have been established in Malaysia for more than 9 years. Only two companies are established for less than 3 years. Five companies are from biotechnology cluster, followed by electric and electronic and waste to wealth cluster. Among the respondents, the majority of them hold the post as managers (38.2%) and directors (26.5%). As the titles of the survey respondents include chief executive officer (CEO), chief operation officer (COO), business development manager, general managers/directors, operation managers, R&D managers and others, they are qualified (Chin *et al.*, 2002) to represent a wide spectrum of quality management and have sufficient understanding and experience of developing and implementing operation management best practices based on the business strategies of their companies.

Table 3 Background of respondents

Years of establishment	N	Percent
less than 3 years	2	5.9
4 - 8 years	13	38.2
more than 9 years	14	41.2
missing	5	14.7
Company cluster		
Industrial product	2	5.9
Advanced material	1	2.9
Electrical & electronic	4	11.8
Biotechnology	5	14.7
Waste to wealth	4	11.8
Food	2	5.9
Others	16	47.0
Respondent post		
CEO	2	5.9
Director	9	26.5
COO	1	2.9
General manager	4	11.8
manager	13	38.2
others	5	14.7

According to Sekaran (2003), cronbach alpha value 0.6 or higher is acceptable and satisfactory and the best Cronbach's alpha is the value closer to 1. The Cronbach's alpha value for operation management best practices representing 36 items is 0.953.

A t-test is used to determine whether a set or sets of scores are from the same population Bordens & Abbott (2005) and Carver & Nash (2012). This study was used one-sample t-test due to the data from a single sample of participants and wishes to know whether the mean of the population from which the sample is drawn is the same as the hypothesized mean. The t-tests analysis was implemented to analyze item by item, dimension by dimension and overall mean of operation management best practices.

Therefore, the hypotheses in this study is,

$$H_0 : \mu < 3$$

$$H_A : \mu \geq 3$$

The result in Table 4 shows that the range of mean is between 3.29 and 4.44. The highest mean is item no 1 for quality commitment as the top management of this firm is directly involved in quality management. While, item no 3 for people management scored the lowest mean. The question is employee satisfaction is formally measured and the significant level is 0.096. The table also depicted that all the mean values are more than 3 and significant.

Table 4 Item by item

Items	Mean	Significant	Decision
Quality commitment			
Top management of this firm is directly involved in quality management programs.	4.44	.000	Reject H ₀
The managers actively communicate quality commitment to the employees.	4.29	.000	Reject H ₀
Top management encourages the employees to improve the operation processes in the firm.	4.41	.000	Reject H ₀
Senior Managers actively encourage change and implement culture of improvement, learning, and innovation towards excellence.	4.09	.000	Reject H ₀
The managers and supervisors motivate their employees in quality management programs and help them perform at the highest level in their tasks.	4.15	.000	Reject H ₀
Customer focus			
We actively seek customer inputs to identify their needs.	4.15	.000	Reject H ₀
Customer needs are understood throughout the workforce.	3.94	.000	Reject H ₀
We involve customers in our product design processes.	3.94	.000	Reject H ₀
We always maintain a close relationship with our customers.	4.26	.000	Reject H ₀
We provide our customers an easy channel for communicating with us.	4.35	.000	Reject H ₀
We have an effective process for resolving customers' complaints.	4.09	.000	Reject H ₀
We systematically measure customer satisfaction.	3.65	.001	Reject H ₀
Formalization of performance measurement			
Our company has an effective system to track overall organizational performance.	3.56	.001	Reject H ₀
Up-to-date data and information of company's performance is always readily available for those who need it.	3.50	.009	Reject H ₀
Senior management meets regularly to review company's performance.	4.06	.000	Reject H ₀
Senior management uses company's performance review as a basis for decision making.	4.18	.000	Reject H ₀

	We actively benchmark our performance against the ‘best practice’ in the industry.	3.68	.000	Reject H ₀
	We have a written policy on performance measurement.	3.59	.001	Reject H ₀
People management	We have an organization-wide training and development process for all our employees.	3.47	.004	Reject H ₀
	Our company has maintained either/both ‘top-down’ and ‘bottom-up’ communication processes.	4.00	.000	Reject H ₀
	Employee satisfaction is formally measured.	3.29	.096*	Reject H ₀
	Employee satisfaction is regularly measured.	3.38	.026	Reject H ₀
	Employee training is actively used to support performance improvement.	3.82	.000	Reject H ₀
	Employees are given flexibility to support performance improvement.	3.94	.000	Reject H ₀
	Employees who are multi skilled are needed to support performance improvement.	4.29	.000	Reject H ₀
	We always maintain a work environment that contributes to the health, safety and well-being of all employees.	4.15	.000	Reject H ₀
Process management	The concept of the ‘internal customer’ (i.e. the next process down the line) is well understood in our company.	3.56	.002	Reject H ₀
	We design processes in our plant to be “fool-proof” (preventive-oriented).	3.76	.000	Reject H ₀
	We have clear, standardized and documented process instructions which are well understood by our employees.	4.03	.000	Reject H ₀
	We make use of techniques for process improvement.	4.00	.000	Reject H ₀
	We strive to establish long-term relationships with suppliers.	4.12	.000	Reject H ₀
	We use a system to select our suppliers and monitor their performance.	3.35	.050*	Reject H ₀
Technology management	Our company always attempts to stay on the leading edge of new technology in our industry.	4.15	.000	Reject H ₀
	We make efforts to anticipate the full potential of new practices and technologies.	3.97	.000	Reject H ₀
	We pursue long-range programmes in order to acquire technological capabilities in advance of our needs.	4.09	.000	Reject H ₀
	We are constantly thinking of the next generation of technologies	4.21	.000	Reject H ₀

p<0.05
*p<0.10

Table 5 shows that all the mean of dimensions are more than 3.5 above and significant. Quality commitment is the highest mean of dimensions. On the other hand, formalization of performance measurement is the lowest mean. The range mean of the dimensions is between 3.7598 and 4.2765.

Table 5 Dimension by dimension

Dimension	Mean	Significant	Decision
Quality commitment	4.2765	.000	Reject H ₀
Customer focus	4.0546	.000	Reject H ₀
Formalization of performance measurement	3.7598	.000	Reject H ₀
People management	3.7941	.000	Reject H ₀
Process management	3.8039	.000	Reject H ₀
Technology management	4.1029	.000	Reject H ₀

Table 6 depicted the overall mean of this study. Mean for operation management best practices variable is more than 3 and nearly 4 and significant.

Table 6 Overall mean

Variable	Mean	Significant t	Decision
Operation management best practices	3.9653	.000	Reject H ₀

4.0 DISCUSSION AND CONCLUSION

This exploratory study may provide the evidence that suggests that operation management best practices have been implemented among the high technology companies in Malaysia. Most the respondents are knowledgeable in quality management (85% respondents are from top management). Quality commitment is the highest mean in operation management best practices. This result is consistent with the study done by Jusoh, Yusoff & Mohtar (2008); Chin *et al.*, (2002), the study state that any quality program or initiative, the top management is the prime mover for significant improvement. The survey respondents have agreed that six dimensions namely, quality commitment, customer focus Chin *et al.*, (2002), formalization of performance measurement, people management, process management and technology management are implemented and practiced in their companies.

This finding supported and are consistent with scholars in quality management such as Zehir *et al.*, (2012); Tran *et al.*, (2011); Prajogo & Hong, (2008); Tarí *et al.*, (2007); Reijers & Mansar, (2005); and Chin *et al.*, (2002). Moreover, the results of the analysis from Han, Chen, & Ebrahimpour, (2007) support the belief that quality management practices contribute to company's competitiveness, which in turn helps to gain greater market share and profitability. Finally, this study has some limitations. Although response rates are considered high but only 34 companies responses are completed and viable to be analyze. For future studies, mixed methods approach may be considered to gain in-depth knowledge into the implementation of quality management in the companies.

References

- [1] Antony, J., Leung, K., & Knowles, G. 2002. Critical Success Factors of TQM Implementation in Hong Kong Industries. *International Journal of Quality & Reliability Management*. 19(5): 551–566.
- [2] Bordens, K. S., & Abbott, B. B. 2005. *Research Design and Methods*. 6th ed. New York: Mc Graw Hill, Inc.
- [3] Carver, R. H., & Nash, J. G. 2012. *Doing Data Analysis with SPSS Version 18.0*. United State: Brooks/Cole Cengage Learning.
- [4] Coakes, S. J. 2005. *SPSS version 12.0 for Windows: Analysis without Anguish*. Australia: John Wiley & Sons, Inc.
- [5] Chin, K., Rao Tummala, V., & Chan, K. 2002. Quality Management Practices Based on Seven Core Elements In Hong Kong Manufacturing Industries. *Technovation*. 22(4): 213–230. doi:10.1016/S0166-4972(01)00020-7.
- [6] Garvin, D. A. 1987. Competing on the Eight Dimensions of Quality. *Harvard Business Review*. 101–109.
- [7] Han, B. S., Chen, S. K., & Ebrahimpour, M. 2007. The Impact of ISO 9000 on TQM and Business Performance. *Journal of Business and Economic Studies*. 13(2): 1–24.
- [8] Jusoh, A., Yusoff, R. Z., & Mohtar, S. 2008. Determining TQM Practices in University R&D Activities Using Factor Analysis: Research Experience of Malaysian Universities. *Jurnal Kemanusiaan*. 11: 36–54.
- [9] Kirner, E., Kinkel, S., & Jaeger, A. 2009. Innovation Paths and the Innovation Performance of Low-Technology Firms — An Empirical Analysis of German Industry. 38: 447–458. doi:10.1016/j.respol.2008.10.011.
- [10] Komo, I. 2006. Ciptaan Penyelidik Sukar Dikomersialkan. *Utusan Melayu*. Januari 7.
- [11] Prajogo, D. I., & Hong, S. W. 2008. The Effect of TQM on Performance in R&D Environments: A Perspective from South Korean Firms. *Technovation*. 28(12): 855–863. doi:10.1016/j.technovation.2008.06.001.
- [12] Reijers, H., & Mansar, S. 2005. Best Practices in Business Process Redesign: An Overview and Qualitative Evaluation of Successful Redesign Heuristics. *Omega*. 33(4): 283–306. doi:10.1016/j.omega.2004.04.012.
- [13] Russel, R. S., & Taylor, B. W. 2009. *Operations Management: Along The Supply Chain*. 6th Edition. Asia: John Wiley & Sons Pte Ltd.
- [14] Sausa, R., & Voss, C. A. 2008. Contingency Research in Operation Management Practices. *Journal of Operation Management*. Elsevier.
- [15] Sekaran, U. 2003. *Research Methods for Business*. 4th ed. Singapore: John Wiley & Sons Inc.
- [16] Soriano, D. 2010. Management Factors Affecting the Performance of Technology Firms. *Journal of Business Research*. 63(2010): 463–470.
- [17] Tarí, J. J., Molina, J. F., & Castejón, J. L. 2007. The Relationship Between Quality Management Practices and Their Effects on Quality Outcomes. *European Journal of Operational Research*. 183(2): 483–501. doi:10.1016/j.ejor.2006.10.016.
- [18] Tran, H., Cahoon, S., & Chen, S.-L. 2011. A Quality Management Framework for Seaports in their Supply Chains in the 21st Century. *The Asian Journal of Shipping and Logistics*. 27(3): 363–386. doi:10.1016/S2092-5212(11)80017-9.
- [19] Walsh, S. T., Kirchhoff, B. A., & Newbert, S. 2002. *Disruptive Technologies*. 49(4): 341–351.
- [20] Zehir, C., Ertosun, Ö. G., Zehir, S., & Müceldilli, B. 2012. Total Quality Management Practices' Effects on Quality Performance and Innovative Performance. *Procedia - Social and Behavioral Sciences*. 41: 273–280. doi:10.1016/j.sbspro.2012.04.031.