AENSI Journals

Advances in Environmental Biology

ISSN-1995-0756 EISSN-1998-1066

Journal home page: http://www.aensiweb.com/aeb.html

Relationship Between Quality Management Practices, Sustainable Product Development and Organizational Performance

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ARTICLE INFO

Article history:
Received 25 March 2014
Received in revised form 20 April 2014
Accepted 15 May 2014
Available online 5 June 2014

Key words:
Quality Management Practices; Sustainable Product Development; Organizational Performance; Malaysian Automotive Industry.

ABSTRACT

This paper presents a study on the relationship between quality management practices and organizational performance, while exploring the influence of sustainable product development in the Malaysian automotive industry context. The demand for high quality is emerging as the single most critical factor for organizations to survive in the ever-expanding global marketplace, where quality is vital in determining the economic success of manufacturing firms. Furthermore, organizations that minimise the negative environmental impact of their products, process recycling of post-customer waste, and establish environmental management systems, are poised to expand their market or displace competitors that fail to promote strong environmental performance. A number of empirical studies had also concluded that adopting environmental management does bring certain advantages for the business. However in the Malaysian automotive industry context, there is still lack of researchers that seek to determine the relationship of quality management practices, sustainable product development, and organizational performance. Even though the relationship between quality management practices and organizational performance has been widely discussed, there still exists potential empirical study on sustainable product development. This paper describes the relationship of sustainable product development as a moderator that influences the relationship between quality management practices and organizational performance. The outcome of this research effort may offer more viable solutions for those firms in the automotive industry to enhance organizational performance in terms of overcoming global competition.

To Cite This Article: Mohd Akhir Ahmad., Relationship Between Quality Management Practices, Sustainable Product Development and Organizational Performance. ***Adv. Environ. Biol., 8(9),*** *529-535, 2014*

INTRODUCTION

In these recent decades, quality management practices and sustainable product development have played important roles in advancing firms in the competitive market. Thus, it is widely believed that the underlying practices in quality management are fundamental and essential for competitive survival of organizations [43], and nowadays, many organizations have embedded quality management practices into their operations. However, in order to survive, these organizations must meet the requirements and expectations from a number of actors that can cause the organization to fail [17].

Meanwhile, there is also increasing environmental concern, as was publicized during the Earth Summit Conference (United Nations Conference on Environmental and -Development) which was held in Rio de Janeiro in 1992. These growing environmental issues, coupled with public pressure and stricter regulations, are fundamentally impacting the way organizations design and launch new products across the globe [4]. Thus, environmental values in business play a great role in the marketplace today.

The concept of quality management was developed as the result of intense global competition [63]. Meanwhile the understanding of sustainable product development is concerning the three main pillars: environmental, economic, and social aspects [25]. The positive relationship between quality management practices and organizational performance has been studied by many authors [13,46,35], and the results of which encourages organizations to take the initiative to implement quality management practices.

For the Malaysian automotive industry, the implementation of quality management practices is necessary for optimising their normal operations. Meanwhile, studies by many authors had identified that, in order to become a surviving business in the ever competitive market, these organizations need to adopt quality management practices that focus on improving quality, which can substantially improve organizational performance [61]. Furthermore, quality is vital determining the economic success of manufacturing companies

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[7]. However, to focus on quality alone is still not sufficient enough for organizations to survive without considering customer focus [29].

In other words, a consideration of quality management practices and sustainable product development made by organizations toward their new product launch could lead to profitable advantages in the competitive market. This is because both these elements are important aspects that require the firms to be exerting conscious and sustained efforts to continuously improve all facets of their business for long term.

Studies of quality management practices in various industries have been performed by many authors. According to Garvin [21] and Curkovic *et al*. [7], for an organization in an increasingly competitive environment to survive the ever-expanding global market place, quality is vital in determining the economic success of companies and industries. However, in the face of growing environmental concern, coupled with public pressure and stricter regulations, organizations are finding fundamentally new approaches to the design and launch of their new products worldwide [4].

As noted by Smith and Sharicz [51], the organization should take into account not only the simple profit of their business operations, but also to adopt a triple bottom-line perspective that includes economic, social, and ecological implications of doing business. The organization would potentially be able to achieved superior business performance if they are willing to take extra measures for gaining competitive advantage. Among these measures, quality management practices and sustainable product development have been emphasised time and time again. However, the relationship between environmental and societal factors, on the one hand, and quality management, on the other hand, is much less researched [34].

Sustainability issues, also known as the triple bottom-line [25], have been used as a new paradigm to appraise the success of an organization. It also defines the balance of sustainability from three different aspects; the environmental, social, and economic aspects as the "three legs of sustainability" [44]. Quality and quality assurance of the natural environment have been perceived as urgent management issues and it is clear that new thinking is needed to tackle the environmental and societal concerns of the global community [47].

In most countries, small and medium enterprises (SMEs) dominate the industrial and commercial infrastructure. More than 90 percent of manufacturing in Malaysia are classified as SMEs. The automotive industry has made remarkable positive contributions to the world economy and people mobility. However, its products and processes are significant source of environmental impacts [45].

As highlighted by the Toyota report [55], it is estimated that there will be two billion cars on the road by 2050. Thus issues of carbon emission control will be highly debated, especially regarding by what percent countries should be responsible for reducing their emissions. As for the Malaysian case, there is finding that there are marginal considerations of environmental policy for the overall pursuit of social economic advancement [27].

Additionally, the automotive industry is affected by rapid changes in the business environment. The capabilities to sustain in business depend largely on how these organizations apply practices of quality management and sustainable product development. Significantly, as highlighted by Ishioka and Yasuda [29], the organization is forced to conform to both requirements of ecological regulation and customer satisfaction; if one of them is not fully satisfied, the organization would find difficulties in continuing the business.

As recommended by Sila and Ebrahimpour [50], quality management practices should be implemented as a holistic integrated system rather than as an implemented subset of quality management practices. Moreover, the relationship of integrated quality management and environmental management (sustainability product management) has been found to be significantly positive [64]. However, in practice it has been proven difficult to deal with separate management systems covering quality and environmental aspects, especially in ensuring that they are aligned with organizational strategy [58]. And yet, the presence of quality management does not ensure the functionality of a quality system in an organization [56,22,52]. However, significant research which links quality management practices and sustainable product development in the automotive industry is severely limited.

The goal of organizational performance is focused on maximising efficiency and effectiveness, through improving systems and processes, as well as aligning with business objectives and customer requirements [62]. However, this study is planned to measure beyond the current operation measurement practices, which may include the measurement of the third era of quality management, such as considering stakeholder theory [17].

2. Literature Review:

An extensive literature review has been carried out to select the various quality management practices framework for this study. Primarily literature related to this study are based from Merino de Cerio [42], Flynn *et al.,* [14].

2.1 Quality Management Practices:

When the expression "quality" is used, one usually thinks in terms of an excellent product or service that fulfils or exceeds one's expectations. These expectations are based on the intended use and the selling price.

According to ANSI/ASQC standard A3-1987, quality is the totality of features and characteristics of a product or service that bear on its ability to satisfy implied or stated needs [8].

From the organizational standpoint, those organizations that pursue ISO 9000 certification willingly and positively across a broad spread of objectives are more likely to report improved organizational performance. Customer pressure, however, is the most commonly cited motivating factor for pursuing ISO 9000 certification. These companies are less likely to report improved organizational performance [53].

A quality management practice or system is viewed in different ways. ISO [30] defines it as a "management system to direct and control an organisation with regard to quality". Magnusson and Berggren [39] gave a more comprehensive description of QMS and view it as a tool to control and improve the quality of a company's product, which includes everything from methods and routines to organization and responsibility distribution. This study interprets a QMS as a comprehensive practice that supports the assurance and improvement of quality [30].

According to this interpretation of QMS, commonly recognised principles and techniques, as described by Dean and Bowen [9], are used to customise practices to fit the needs of a particular organization. Every organization has a general management system where the development can be graded on a scale according to different levels of adoption. In terms of the higher levels, organizations have achieved efficiency and effectiveness through continuous improvement and learning.

The purpose of a QMS is to establish an organization's policies and to realise the contents of these policies through short- and long-term goals. The substance of a QMS often follows a PDCA cycle. The cycle is a continuous quality improvement model consisting of a logical sequence of four repetitive steps for continuous improvement and learning [10]. The main purpose of this cycle is to start by planning and formulating concrete goals for the organization. The next step is to put the action plans or programmes into action to reach these set goals, which is followed by checking that the goals have been obtained, and finally, further improve the organization's processes [30].

After a review of the available literature, this paper focuses on quality management practice construction by Flynn *et al*. [14], regarding critical success factors, like human resource management, design of product, process approach, customer focus, and supplier relationship.

2.2 Sustainable Product Development:

The modern concept of environmental sustainability goes back to the post-world war II period, when a utopian view of technology-driven economic growth gave way to a belief that the quality of the environment is linked closely to economic development. The relationship between economic development and environmental degradation was first placed on the international agenda in 1972, at the UN conference on the Human Environment. In Our Common Future, "sustainable development" is defined as meeting the needs of the present without compromising the ability of future generations to meet their own needs [60].

Within the larger issue, industrial environmental protection has been subject to similar interest in the last decades [32]. As Van Der Woerd and Van Den Brink [57] stated, companies today have good reasons to feel overwhelmed by the number of various approaches to corporate sustainability and to its sister concepts. Encouragingly, a growing number of companies have realised the advantage of proactive sustainable practice.

Companies, such as Daimler Chrysler and BMW, along with approximately 10 other companies from the automotive and energy industries, are involved in the Sustainability Mobility Project of World Business Council for Sustainable Development. Their focus is on issues such as new vehicle technologies, improved and alternative fuels, infrastructure, and future demand for passenger and freight transport.

Sustainable product development approach has varying roots, and therefore various meanings. This paper will only give a very limited discussion of sustainability in the literature considering the many roots and meanings that exist, and focus more on the evolution of the concept in an organizational context. Furthermore, the guidelines given by BS and development of ISO 20121 contents will be used.

Two perspectives on the sustainability notion have played important roles in sustainability literature. Firstly is the Brundlandt perspective, based on the "Brundlandt definition" of sustainable development [60], which is "*meeting the needs of the present generation without compromising the ability of future generations to meet their needs*". The second perspective is based on triple-P [12], which uses this perspective to consider an organization as sustainable if a certain minimum performance is attained in the areas of people, plane, and profit. The main point is that the bottom line of an organization is not only an economic one; an organisation is responsible for its social and environmental actions as well. From all these perspective, an organization needs to find a balance between economic goals of profit and goals with regard to the social and ecological environment.

2.3 Organizational Performance:

Organizational performance measurement and its application to identify growth may encompass both quantitative and qualitative measurements and approaches. The variety and level of performance measures depends on the goal of the organization or individual strategic business unit's characteristics [26]. For example,

Advances in Environmental Biology, 8(9) Special 2014, Pages: 529-535

when measuring performance, companies must consider existing financial measures such as return on investment, profitability, market share, and revenue growth at a more competitive and strategic level.

Also according to Hervani *et al*. [27], a performance measurement system may be unique to each individual organisation, or unit within an organization, reflecting its fundamental purpose and its environment. Several studies had investigated the universal principles of performance measures [3,23]. For this study, the authors will use the measures of organizational performance, process performance, customer satisfaction, and newly measures of sustainability performance.

Table 1: Organizational performance matrices, adapted from Merino and Cerio [42].

Authors	Organizational Performance Measures
Ebrahimpour & Johnson (1992)	Operational and Financial Performance
Flynn et al. (1994)	Operational Performance (quality performance)
Adam (1994)	Operational and Financial Performance
Mann & Kehoe (1994)	Operational and Financial Performance
Powell (1995)	Finance Performance
Flynn et al. (1995a)	Operation Performance
Flynn et al. (1995b)	Operation Performance
Flynn et al. (1995c)	Operation Performance
Forza (1995)	Operation Performance
Lawler III et al. (1995)	Operation and Finance Performance
Ittner & Larcker (1996)	Operation and Finance Performance
Martinez (1996)	Operation and Finance Performance
Madu et al. (1996)	Operational Performance
Leal (1997)	Finance Performance
Forker (1997)	Operational Performance
Adam et al. (1997)	Operation and Finance Performance
Terziovski (1997)	Operation and Finance Performance
Choi & Eboch (1998)	Operational Performance and Customer Satisfaction
Wilkinson et al. (1998)	Several
Samson & Terziovski (1999)	Operation Performance, Customer, & Employer Satisfaction

Table 2: Organizational performance, adopted from Hubbard [28].

Authors	Organizational Performance Measures
Hubbart (2004)	Finance Performance, Customer Performance, Internal Process Performance, Learning and Development Performance, Social Performance and Environmental Performance.

3.0 Conceptual Framework:

This paper proposes a framework, as shown in Figure 1, related to the integration of quality management practices affecting organizational performance with sustainable product development as moderators in influencing the relationship.

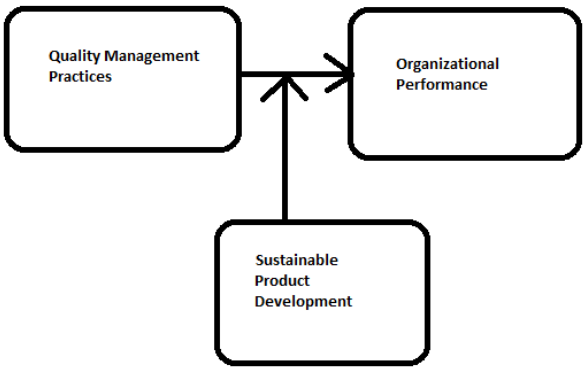

Fig. 1: Framework of the conceptual model.

4.0 Conclusion:

This study is proposing five fundamental principles of quality management practices that were adopted from Flynn *et al*. [15] and will try to investigate the effect of these principles on organizational performance. However, this study will also determine the strength of the influential relationship of sustainable product development, between the relationship of quality management practices and organizational performance.

Previous case studies by Nunes and Bennett [45] had found that three big giant automotive makers have adopted environmental initiatives in their business with various own organizational efforts, and there are no systematic approaches implemented. Hopefully this paper might trigger some idea on relations between quality management principles, sustainable product development, and organizational performance. Focusing on quality

management alone is not sufficient in today's business without considering sustainability issues. However, both issues need to be considered by the organization as a whole. In summary, the theoretical framework portrayed in this paper is hoped to provide new dimensions for empirical investigation in the Malaysian automotive industry.

REFERENCES

1. Adam, E.E. Jr., 1994. Alternative quality improvements practices and organisation performance, *Journal of Operation Management, 12*(1): 27-44.
2. Adam, E.E. Jr., L.M. Corbett, B.E. Flores, N.J. Harrison, T.S. Lee, B.H. Rho, J. Ribera, D. Samson, R. Westbrook, 1997. An international study of quality improvement approach and firm performance, *International Journal of Operation & Production Management*, *17*(9): 842-873.
3. Adams, S., J. Sarkis, D. Liles, 1995. The development of strategic performance metrics, *Engineering Management Journal, 7*(1): 24-32.
4. Choi, J.K., L.F. Nies, K. Ramani, 2008. A framework for the integration of environmental and business aspects toward sustainable product development, *Journal of Engineering Design, 19*(5): 431-446.
5. Choi, T.Y., K. Eboch, 1998. The TQM paradox: Relations among TQM practices, plant performance and customer satisfaction, *Journal of Operations Management*, *17*(2): 59-75.
6. Crosby, P.B., 1984. *Quality without tears: The art of hassle-free management*. New York: McGraw-Hill.
7. Curkovic, S., S. Vickery, C. Droge, 2000. An empirical analysis of competitive dimensions of quality performance in the automotive supply industry, *International Journal of Operations and Production Management*, *20*(3): 386-403.
8. Dale, B.G., 2003. *Managing quality*. Oxford: Blackwell Publishing.
9. Dean, J.W., D.E. Bowen, 1994. Management Theory and Total Quality: Improving research and Practice through Theory Development, *The Academy of Management Review*, *19*(3): 392-418.
10. Deming, W.E., 1986. *Out of the crisis*. Cambridge, MA: MIT Press.
11. Ebrahimpour, M., J.L. Johnson, 1992. Quality, vendor evaluation and organizational performance: A comparison of U.S. and Japanese firms, *Journal of Business Research*, *25*(1): 129-142.
12. Elkington, J., 1994. Enter the triple bottom line, *California Management Review*, *8*(1): 90-100.
13. Flynn, B.B., R.G. Schroeder, S. Sakakibara, 1994. A framework for quality management research and an associated measurement instrument, *Journal of Operation Management, 11:* 339-366.
14. Flynn, B.B., R.G. Schroeder, S. Sakakibara, 1995a. Relationship between JIT and TQM: Practices and performance, *Academy of Management Journal, 38*(5): 1325-1360.
15. Flynn, B.B., R.G. Schroeder, S. Sakakibara, 1995b. The impact of quality management practices on performance and competitive advantage, *Decision Sciences, 26*(5): 659-691.
16. Flynn, B.B., R.G. Schroeder, S. Sakakibara, 1995c. Determinants of quality performance in high and low quality plants, *Quality Management Journal*, winter, 8-25.
17. Foley, K.J., 2005. *Meta management: A stakeholder/quality management approach to whole of enterprise management*. Sydney: Standards Australia Ltd.
18. Forker, L.B., 1997. Factors affecting supplier quality performance, *Journal of Operations Management, 15:* 243-269.
19. Forza, C., 1995. The impact of information systems on quality performance: An empirical study, *International Journal of Operations & Production Management, 15*(6): 69-83.
20. Foster, D., J. Jonker, 2003. Third generation quality management: The role of stakeholders in integrating business into society, *Managerial Auditing Journal, 18*(4): 323-328.
21. Garvin, D.A., 1986. Quality problems, policies, and attitudes in the United States and Japan: An exploratory study, *Academy of Management Journal, 29*(4): 653-673.
22. Gotzamani, K.D., 2005. The implications of the new ISO 9000:2000 standards for certified organisations: A review of anticipated benefits and implementation pitfalls, *International Journal of Productivity and Performance Management, 54*(8): 645-657.
23. Gunasekaran, A., C. Patel, E. Tirtiroglu, 2001. Performance measures and metrics in a supply chain environment, *International Journal of Operation and Production Management, 21*(½): 71-87.
24. Hansson, J., B. Klefsjo, 2003. A core value model for implementing total quality management in small organisations, *The TQM Magazine, 15*(2): 71-81.
25. Hemming, C., S. Pugh, G. Williams, D. Clackburn, 2004. Strategies for sustainable development: Use of a benchmarking tool to understand relative strength and weakness and identify best practice, *Corporate Social Responsibility and Environmental Management, 11*(2): 103-113.
26. Hervani, A.A., M.M. Helms, J. Sarkis, 2005. Performance measurement for green supply chain management, *Benchmarking: An International Journal, 12*(4): 330-353.
27. Hezri, A.A., M.N. Hasan, 2006. Towards sustainable development? The evaluation of environmental policy in Malaysia, *Natural Resources Forum, 30:* 37-50.

28. Hubbard, G., 2004. Measuring organisational performance beyond the triple bottom line, *Business strategy and the environment, 19:* 177-191.
29. Ishioka, M., K. Yasuda, 2009. Product development concept with product sustainability, *Proceedings of PICMET 2009*, August 2-6, Portland, Oregon USA.
30. ISO, 2000. *MS ISO 9000:2000 Quality management systems – Fundamentals and vocabulary.* Shah Alam: SIRIM.
31. Ittner, C.D., D.F. Larcker, 1996. Total quality management and the choice of information and reward systems, *Journal of Accounting Research, 33*, Suplemento, 1-34.
32. Johansson, A., P. Kisch, M. Mirata, 2005. Distributed economic, a new engine for innovation, *Journal of Cleaner Production, 13:* 971-979.
33. Juran, J.M., 1999. *Juran's quality handbook (5th ed.).* New York: McGraw-Hill.
34. Lagrosen, S., 2004. Quality management in global firms, *The TQM Magazine, 16*(6): 396-402.
35. Lakhal, L., F. Pasin, M. Limam, 2006. Quality management practices and their impact on performance, *International Journal of Quality and Reliability Management, 23*(6): 625-646.
36. Lawler III, E.E., D.T. Hall, 1974. Organizational climate: Relationship to organizational structure, process and performance, *Organization Behaviour & Human Performance, 11*(1): 139-155.
37. Leal, A., 1997. Total quality management in Spanish companies: An cultural and performance analysis, *Revista Europea de Direccion y Economia de la Empresa, 6*(1): 37-56.
38. Madu, C.N., C.H. Kuei, R.A. Jacob, 1996. An empirical assessment of the influence of quality dimensions on organizational performance, *International Journal of Production Research, 34*(7): 1943-1962.
39. Magnusson, T., C. Berggren, 2001. Environmental innovation in auto development-managing technological uncertainty within strict time limits, *International Journal of Vehicle Design, 26*(2-3): 101-115.
40. Mann, R., D. Kehoe, 1994. An evaluation of the effects of quality improvements activities in business performance, *International Journal of Quality and Reliability Management, 11*(4): 29-44.
41. Martinez, A.M., 1996. *Quality Management in Operations, Theoric Review and the Analysis of his Implementation and Performance in Spain*. Doctoral thesis unpublished. University of Murcia.
42. Merino, J., Cerio, D. de., 2000. *Quality Management and Operational Performance: Empirical Evidence for Spanish Industry*. Doctoral thesis unpublished. Public University of Navarra, Pamplona, Spain.
43. Nair, A., 2006. Meta-analysis of the relationship between quality management practices and firm performance-implications for quality management theory development, *Journal of Operations Management, 24*(6): 948-975.
44. Newport, D., T. Chesnes, A. Linder, 2003. The environmental sustainability problem: Ensuring that sustainability stands on three legs, *International Journal of Sustainability in Higher Education, 4*(4): 357-363.
45. Nunes, B., D. Bennet, 2010. Green operations initiatives in the automotive industry, *Benchmarking: An International Journal, 17*(3): 396-420.
46. Powell, T.C., 1995. Total quality management as competitive advantage: A review and empirical study, *Strategic Management Journal, 16*(1): 15-27.
47. Quazi, H.A., Y.K. Khoo, C.M. Tan, P.S. Wong, 2001. Motivation for ISO 14000 certification development of a predictive model, *Omega: The International Journal of Management Science, 29:* 525-542.
48. Ritzen, S., C. Beskow, 2001. Actions for integrating environmental aspects into product development, *Journal of Sustainable Product Design, 1*(2): 91-102.
49. Samson, D., M. Terziovski, 1999. The relations between total quality management practices and operation performance, *Journal of Operations Management, 17:* 393-409.
50. Sila, I., M. Ebrahimpour, 2005. Critical linkages among TQM factors and business results, *International Journal of Operation and Producton Management, 25*(11): 1123-1155.
51. Smith, P.A.C., C. Sharicz, 2011. The shift needed for sustainability, *The Learning Organisation, 18*(1), 73-86.
52. Sroufe, R., S. Curkovic, 2008. An examination of ISO 9000:2000 and supply chain quality assurance, *Journal of Operations Management, 26*(4): 503-520.
53. Terziovski, M., D. Power, A.S. Sohal, 2003. The longitudinal effects of the ISO 9000 certification process on business performance, *European Journal of Operation Research, 146*(3): 580-595.
54. Terziovski, M., D. Samson, D. Dow, 1997. The business value of quality management systems certification. Evidence from Australia and New Zealand, *Journal of Operations Management, 15:* 1-18.
55. Toyota, 2007. *Challenge, commitment, progress: 2007 North America environmental report.* Washington, DC: Toyota Motor North America.
56. Van der Wiele, T., A. Brown, 2002. Quality management over a decade: A longitudinal study, *International Journal of Quality and Reliability Management, 19*(5): 508-523.

57. Van Der Woerd, F., T. Van Den Brink, 2004. Feasibility of a responsive business scorecard – A pilot study, *Journal of Business Ethics*, *55*(2): 173-186.
58. Wilkinson, A., T. Redman, E. Snape, M. Marchington, 1998. *Managing with Total Quality Management. Theory and Practice*, MacMillan Business, Londres.
59. Wilkinson, G., B.G. Dale, 2002. An examination of the ISO 9000:2000 standard and its influence on the integration of management systems, *Production Planning and Control, 13*(3): 284-297.
60. World Commission on Environment Development (WCED), 1987. *Our common future*. Oxford: Oxford University Press.
61. Yahya, S., W.K. Goh, 2001. The implementation of an ISO 9000 quality system, *International Journal of Quality and Reliability Management, 18*(9): 941-966.
62. Yusuf, Y., A. Gunasekaran, G. Dan, 2007. Implementation of TQM in China and organisational performance: An empirical investigation, *Total Quality Management, 18*(5): 509-530.
63. Zakuan, N., S.M. Yusof, M.Z.M. Saman, A.M. Shaharoun, 2007. Confirmatory factor analysis of TQM practices in Malaysia and Thailand automotive industries, *International Journal of Business and Management, 5*(1): 105-116.
64. Zeng, S.X., P. Tian, J. Shi, 2005. Implementing integration of ISO 9001 and ISO 14001 for construction, *Managerial Auditing Journal, 20*(4): 394-407.