

The Mediating Role of Quality Leadership in Lean Practices and GLCs Performance

Mohd Rizal Razalli¹, Hartini Ahmad², Darwina Arshad³

^{1, 2, 3} Universiti Utara Malaysia

¹rizal@uum.edu.my

²hartini@uum.edu.my

³darwina@uum.edu.my

Abstract— Lean practices are expected to eliminate wastes and consequently increase the bottom line profit of an organization. The benefits not only go to the organization, but also to the customers as well. The government-linked companies (GLCs) are always known for their big-sized establishment. Hence, managing the resources of the GLCs is very challenging. Therefore, investigating the leanness of Malaysian GLCs, and how lean practices affect the organizational performance are important. This paper would examine the relationship of lean and performance of the GLCs in Malaysia. A total of 281 managers in the GLCs were surveyed. The direct relationship and mediation effects were analysed using the Partial Least Square (PLS) structural equation modelling. The findings showed that the level of leanness was relatively high among the GLCs, while the lean management practice was significantly related to the organizational performance. The quality leadership partially mediates the relationship between lean practices and organizational performance. The findings suggest that lean practices are critical for the GLCs performance, while quality leadership is significant in order these companies to have better performance. The findings can also be applied to other organizations as well.

Keywords— GLCs, operational performance, lean practices, leadership, quality

1. Introduction

Many organizations aim to employ lean practices in their effort to reduce organizational waste, and ultimately hope lean implementation would improve their competitiveness in the market. Nevertheless, achieving lean organization is a journey [1]; hence need to be carefully planned and implemented. It requires an organization to continuously improve its internal processes throughout organization as well as the external

processes. A study in automotive industry in Malaysia found that lean implementation stresses the focus on customers which link internal organizational processes, suppliers, and customers [2].

For the Government-Linked Companies (GLCs), becoming lean is extremely important due to the enormous size of the companies. Their organizational performance depends on how well they manage their resources. Efficiently managed GLCs, and well formulated and implemented strategies are critical for the success of business organizations [3]. GLCs in Malaysia are mainly the major providers of utilities, postal services, airlines, airports, public transport, water and sewerage, banking and financial services, automotive, plantation, and construction industries. These companies hire an estimated 5 per cent (about 400,000 employees) of the national workforce, and accounts for approximately 36 per cent of the Malaysian Stock Exchange market capitalization and 54 per cent of the Kuala Lumpur Composite Index [4]. With regard to the performance, lean practices are deemed to be able to improve organizational performance in terms of efficiency as well as effectiveness [5].

The purpose of this paper is to investigate the adoption level of lean practices among the GLCs in Malaysia and also examine the effect of lean practices to the performance of these GLCs. In addition, quality leadership is expected to mediate the relationship between lean practices and performance. Although this relationship has been studied by previous researchers [6], the current study specifically focuses on the GLCs as no such setting has been investigated before. Additionally, this study seeks to examine the role of quality leadership in the relationship between adoption of lean practices and performance. In doing so, the following research questions will be addressed accordingly:

RQ1: What is the level of adoption of lean practices among the GLCs?

RQ2: Do lean practices have significant effects on the performance of GLCs?

RQ3: Do lean practices have significant effects on the quality leadership?

RQ4: Does quality leadership has a significant effect on the performance of GLCs?

RQ5: Does quality leadership mediate the relationship between lean management practice and performance?

1.1 GLCs Performance

GLCs include those profit-oriented companies in which the Malaysian Government has a direct control. Hence, the performance of GLCs is important for the government as well as for the national economy [7]. The top 17 GLCs recorded an all-time high net income of RM20.1 billion in 2011 from only RM 9 billion in 2004, reflecting a growth of 18.2% per annum [8]; whereas G20 net profit has reached a record of RM 25.8 billion in 2012 [9]. The 17 corporations are part of the so called G20, an earlier selection of 20 GLCs that make the Putrajaya Committee on GLC High Performance (PCG), which are now down to 17 due to mergers, demergers and other corporate restructurings. G20 market capitalization increased more than doubled to RM 319 billion from RM 140 billion over the same period and delivered a return on equity of 11.8% in 2011, up from 10.6% in 2010. The G20 market capitalization has increased continuously whereby it grew to RM 405 billion as at 31 May 2013 [9]. All of the statistics showed the important role of the GLCs in generating Malaysian economy. Thus, the GLCs' transformation into high-performing entities is crucial for the future prosperity of Malaysia.

An organization may achieve excellent performance by developing a competitively distinct set of resources and deploying them in a well-conceived strategy [10]. The theory of Resource-based View may be able to explain the performance of the GLCs. In this view, competitive advantage would be obtained by aligning skills, motives, and other resources with the organizational systems, structures and processes to achieve capabilities at the organizational level. The current study views performance as the consequences of lean management practices. We argue that the adoption of good practices of lean management would translate into better performances of the GLCs.

In this particular study, the GLC performance is operationalized by the financial (accounting-based measures such as return on investment, net profit, etc.) and the non-financial performance indicators such as market share, cycle time, customer service,

etc. An effective firm performance measurement system ought to cover more than just financial measures [11]. Financial measures mostly reflect the firm's emphasis on achieving quantifiable firm performance objectives, while non-financial indicators reflect the health of the firm.

1.2 Lean Practices and Performance

Following the RBV theory, organizational performance is determined by its unique internal resources or capabilities. Lean management practices, one of the quality management approach, are the capabilities that would enable companies to achieve superior performance through cost saving and productivity improvement [12]. The main purpose of lean approach is to eliminate wastes while at the same time attempt to reduce or minimize supplier, customer, and internal variability [13]. To name a few, those wastes include overproduction, inventory, waiting, motion, transportation, rework, and over processing. The concept is not new because Krafcik has started to introduce the lean concept into the academic world in 1988 and Womack through his book entitled "The Machine That Changed the World" has made the concept becomes well known today. In a simple term, lean can be viewed as a mix of JIT elements and techniques and tools of total quality management (TQM) [13].

JIT companies have a better alignment between organizational goals and objectives and their core competencies. Management factors such as transforming organizational culture, enhancing internal and external communication, improving employee morale, encouraging teamwork, and improving supplier relationships higher than the non-JIT companies. In addition, they also give more emphasis on the element of time-based competition and customization, eliminating wastes, improving quality, reducing inventory, and improving efficiency by reducing costs and increasing capacity utilization [14]. Hence, JIT implementation can effectively improve performance [5]. Among the benefits of JIT include inventory reduction, good relationship with suppliers and high quality or zero defects [15]. The above argument leads to the following hypothesis:

Hypotheses 1: Lean management practice has a positive direct effect on the GLCs performance.

1.3 Lean practices, quality leadership, and performance

Lean practices and quality leadership

The importance of leadership in quality management has been well documented by scholars [16]. In fact, leadership is one of the main criteria of quality award such as the Malcolm Badridge

National Quality Award. The reason for such high emphasis is that the commitment of management is a vital element to the success of any quality programs [17]. The main question is that what type of leader can be labeled as a quality leader? Forbes magazine lists down honesty, ability to delegate, good communication skill, sense of humor, confidence, commitment, positive attitude, creative, intuitive, ability to inspire others as the top ten qualities that make a great leader (Prive, 2012).

Leadership effectiveness enables employee involvement in continual improvement activity, improved communication and collaboration, and better dissemination of information (Habidin & Yusof, 2013). Further, they also found leadership to be the main critical success factor for lean. Although the research on leadership in the quality management has been well investigated, we think the area need to be further examined in terms of the type of quality leadership that is suitable in the lean environment.

Quality leadership is defined as the top management behavior in terms of his/her responsiveness, critical thinking, and adaption to change. Note that the current study only focuses on the strategic improvisation of a leadership style. Improvisation enables managers to continually learn while working and act spontaneously and creatively to consistently move products and services out of the door (Brown & Eisenhardt, 1997). It can potentially generate value to the company in terms of prudent change management, adjustability to adopt best practices as well as adding flexibility and innovation (Kamoche, Cunha, & Cunha, 2002). We believe this dimension of leadership style has not been thoroughly investigated before. Hence, we hypothesize:

Hypothesis 2: Lean practice has a positive direct effect on quality leadership.

Quality leadership and performance

Quality management has been found to have positive associations with organizational performance. These performances would include financial measures such as profits (Arawati, 2008; Lakhal, Pasin, & Limam, 2006), (Chapman, Murray, & Mellor, 1997) product quality and innovation (Prajogo & Sohal, 2003), quality related performance (Brah & Lim, 2006; Zu, 2009), and customer satisfaction (Mehra & Ranganathan, 2008; Terziowski, 2006; Yaacob, 2009). Additionally, past researches have also consistently found quality practices needed or success factors to achieve those business performances. Among these practices would include leadership, strategic planning, customer focus, information and analysis,

people management, and last but not least process management (Prajogo & Sohal, 2003). Note that one of the critical factors of the quality management success factors is related to leadership. A study found that the “soft” elements such as people is even more critical compared to the “hard” elements of quality management (Fotopoulos & Psomos, 2009). However, the study on the “soft” perspective of quality management is still limited. Hence, we hypothesized:

Hypothesis 3: Quality leadership has a positive direct effect on the GLCs performance.

Mediation effect of quality leadership

The above three hypotheses were aimed at investigating the direct relationships. In addition, we also expect the quality leadership to mediate the main relationship. This is due to the findings that not all lean implementations would lead to better performance. Lean practices have been found to affect performance only in terms of the productivity and inventory, not all performance measures (Bonavia & Marin-Garcia, 2011). A study found 74% of companies surveyed failed in realizing the benefits of lean implementation (Pay, 2008). Further, the author argued that one of the main reasons for lean failure is due to leadership or top management factor. Leadership plays important role in making the lean practices to be successful. Thus, we formulate the next hypothesis as:

Hypothesis 4: There is a significant mediation effect of quality leadership on the relationship between lean practices and the GLCs performance.

2. Model development

This section introduces the model of GLCs performance and its relationship with lean and a mediator variable, quality leadership. Figure 1 depicts the proposed model. We view performance (PF) as the outcome of lean practices (LP) and indirectly influenced by the quality leadership (QL).

Lean practices are defined as the organizational practices related to reducing wastes. These practices include continuous improvement, zero defects, Just-in-time, and integration between functions. Quality leadership refers to the leadership behaviour in terms of his/her responsiveness, critical thinking, and adaptation to change. Finally, GLCs performance is the perception-based indicators of financial and non-financial performance of an organization.

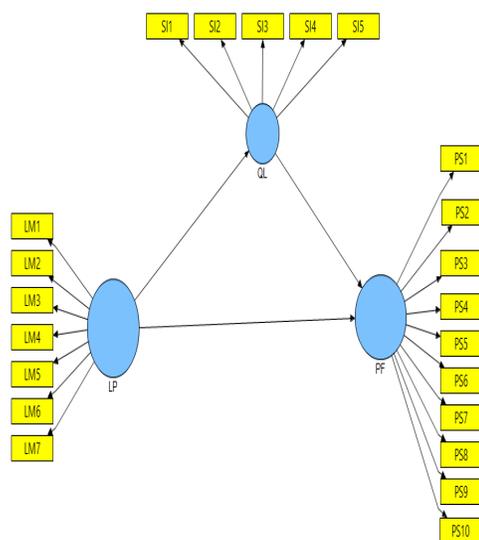


Figure 1. Theoretical proposed model

3. Methodology

3.1 Research Design

This is a quantitative study. Questionnaire method was used for data collection. These questionnaires were given to the GLCs companies in Malaysia. Government-linked Companies or GLCs are defined as the companies with primary commercial objective and in which the Malaysian Government has a direct controlling stake. In this context, controlling stake would refer to the Government's ability (not just percentage ownership) to appoint Board of Directors members, senior management, make major decisions (e.g. contract award, strategy, restructuring and financing, acquisitions and divestments etc.) for GLCs either directly or through Government linked Investment Companies or GLICs. The GLICs are companies that hold shares in the GLCs such as Khazanah Nasional Berhad, Pension Trust Funds, Employees Provident Fund, and Permodalan Nasional Berhad. The respondents in this study were the employees from various hierarchical levels, including the top level, middle level and operational level. It is based on the authority of making decisions of each level. Each respondent received a copy of the questionnaire personally (face to face), hence to ensure the highest possible response rate (Zickmund, 2003). The cover letter explained the purpose of the study and more importantly assured the respondent anonymity. The data were collected from those firms that met the criteria of the GLCs throughout the country.

The sampling frame utilized the GLCs under Khazanah Nasional Berhad which included 13 sectors; agriculture, automotive, financial institutions, healthcare, infrastructure and construction, leisure and tourism, media and communication, property, technology and biotech, transportation and logistics, utilities and sustainable development. A total of 26 listed companies was included in the sampling frame of this research. The respondents in the study were the executives of the companies. These executives were considered as the most likely key informants, as he or she was the person who would be involved in strategic decision at the respective levels.

3.2 Data analysis procedures

We use Partial Least Squares (PLS), SmartPLS 2.0.M3 (Ringle, Wende, & Will, 2014), technique to analyze the causal relationships among major constructs. The reason for choosing the PLS analysis was due to the fact that it can analyze all paths at once, particularly the mediation effect. In addition, the bootstrapping method was used to derive the statistical significance. The size of sub-samples to run bootstrapping technique was based on the suggestion in Hair, Hult, Ringle and Sarstedt (2014).

4. Findings

4.1 Descriptive statistics

There were 228 male respondents and the remaining 53 were female respondents. This statistic probably shows that men were still dominant at the senior executive level in the GLCs with more than 80 percent, while women made up less than one fifth (18.9%) of the GLC executives. In terms of the age group, we found the majority of the respondents were in the age group of above 40 years with more than 50 percent, followed by the age group of between 31 and 40 years (26%), and the age group from 21 to 30 years accounted the remaining of 17.4 percent. In terms of academic qualifications, nearly four fifth of the respondents possessed at least a university degree, with 31 percent of them obtained professional qualifications or master degree. There were also 44 respondents (15.6%) who had diploma qualification while 19 (6.8%) of them had attained only up to the SPM/STPM levels. Finally, the respondents were also asked the types of industry their GLCs were involved in. The biggest sector was in the communication and utility (21.4%), followed by agriculture (19.2%), property and construction (17.4%), manufacturing (14.9%), banking, finance and insurance (13.2%), and mining, oil and gas (4.3%) industry.

4.2 *Leanness of the GLCs in Malaysia*

This section answers our research question 1. Table 1 shows the means and standard deviations of all items of lean practices. All items were measured on a five-point scale. The mean scores for lean practices were found to be ranged from 3.62 to 4.17 points. The overall mean (3.90) showed that the degree of lean practices among the GLCs was relatively high. The top three practices would be (1) continuous improvement, (2) integrated functions, and (3) vertical information system, while the lowest practice would be the Just-in-time.

Table 1. Level of lean practices in GLCs

No	Lean practices	Mean	SD
1	Wastes are eliminated in production/services	3.82	0.83
2	Continuous improvement is implemented in our organization	4.17	0.63
3	Zero defects approach is implemented in our organization	3.86	0.87
4	Just-in-time (JIT) is used in production/services	3.62	0.85
5	Our organization utilizes integrated functions	4.06	0.74
6	Vertical information system is implemented in our organization	3.93	0.74
7	All major department heads within our plant work to encourage lean manufacturing	3.81	0.74
	Overall leanness	3.90	0.58

The following sections will answer the remaining of our research questions. In doing so, we divide our findings into two sections, namely (1) measurement model and (2) structural model.

4.3 *Measurement model*

Figure 2 shows the overall results for our hypothesized model. A good model fit in PLS depends on several factors such as (1) the availability of the significant path coefficients, (2) acceptable R² values, and (3) good construct reliability (Gefen & Straub, 2005). Our results showed that all path coefficients were statistically significant. The R² values were 46.2% for path lean and quality leadership, and 39% for lean and performance. The R² value above 26% is considered substantial (Cohen, 1988). Thus, we can conclude that our model was an acceptable model.

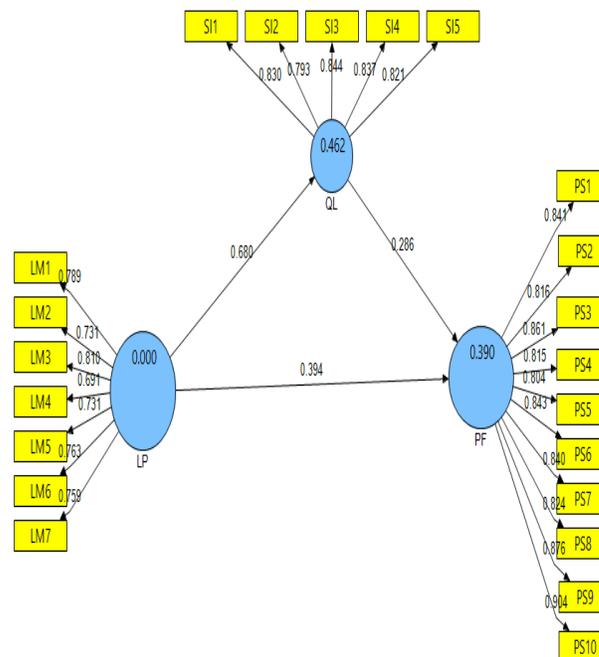


Figure 2. Hypothesized model structure and results

The composite reliability (CR) and average variance extracted (AVE) were used to assess the reliability of the constructs. Table 2 shows the results of the analysis. Composite reliability is recommended to be higher than 0.7 (Fornell & Larcker, 1981). Our CR values for the three constructs were all above the recommended 0.7 level. The values of the Cronbach’s alpha (α) for the constructs were also above 0.7. The AVE, on the other hand, denotes the amount of variance that a construct captures from its indicator relative to the amount due to measurement error (Chin, 1998). The recommended critical value for AVE is 0.5 (Fornell & Larcker, 1981). In our case, the AVE values were also above the recommended value of 0.5. In addition, the convergent validity was also assessed through the loadings of each indicator. The standardized loadings should be greater than 0.7 (Hair et al., 2014). As shown in Table 2, all loadings were above the cut-off point except LM4. We decided to maintain the indicator since it approached the 0.7 point.

Next, we assessed the discriminant validity through the cross loadings and the relationship between correlations among constructs and the square roots of AVE (Chin, 1998; Fornell & Larcker, 1981). Table 3 shows the results of the analysis. The cross loadings exhibited adequate levels of discriminant validity as the square roots of AVE (bold in

diagonal) were greater than the correlations among the constructs (off diagonal values).

Table 2. Convergent validity and reliability of the constructs

Latent variable	Indicator	Loading	Indicator or Reliability	AVE	CR	α
Lean Practices	LM1	0.789	0.622	0.569	0.909	0.873
	LM2	0.731	0.534			
	LM3	0.810	0.655			
	LM4	0.691	0.477			
	LM5	0.731	0.534			
	LM6	0.763	0.582			
	LM7	0.759	0.576			
Perf	PS1	0.841	0.707	0.711	0.914	0.884
	PS2	0.816	0.666			
	PS3	0.861	0.741			
	PS4	0.815	0.664			
	PS5	0.804	0.647			
	PS6	0.843	0.711			
	PS7	0.840	0.705			
	PS8	0.824	0.678			
	PS9	0.876	0.768			
	PS10	0.904	0.817			
Quality Leadership	QL1	0.830	0.689	0.681	0.961	0.955
	QL2	0.793	0.629			
	QL3	0.845	0.713			
	QL4	0.837	0.700			
	QL5	0.821	0.675			

Table 3. Discriminant validity of constructs

	Lean	Perf	Quality Leadership
Lean practices	0.754		
Performance	0.589	0.843	
Quality Leadership	0.677	0.553	0.825

4.4 Structural model

Table 4 summarizes the results of the structural model. First, the standardized path coefficient from lean practices to performance was significant (0.394; $p < 0.01$). Thus, lean practices would result in better performance of the GLCs. This result supports our *H1*. Likewise, the relationship between lean practices and quality leadership was also significant (0.680; $p < 0.01$), supporting *H2* that lean practices would also cause better quality

leadership. Finally, the standardized path coefficient for quality leadership to performance was also statistically significant with a path coefficient of 0.286 ($p < 0.01$). Hence, *H3* was supported which means quality leadership would yield better performance in the GLCs.

Table 4. Structural model results

Path	Beta	Std Error	t-value	Decision
Lean -> Performance	0.394	0.093	4.262	Supported
Lean -> Quality Leadership	0.680	0.057	11.850	Supported
Quality Leadership -> Performance	0.286	0.091	3.133	Supported

* $p < 0.01$

In order to test for the mediation effects of quality leadership (*H4*), the guidelines of Baron and Kenny (1986) were followed. Those guidelines include:

- (1) Variations in level of the independent variable (lean practice) significantly account for variations in the mediator (quality leadership);
- (2) Variations in mediator (quality leadership) significantly account for variations in the dependent variable (performance); and
- (3) When the path between the independent variable and mediator, and between the mediator and dependent are controlled, a previously significant relation between the independent and dependent changes its value significantly (Hair et al., 2014).

Table 5 shows the results of the mediation analysis: (1) a model without mediation, and (2) a model with the mediation (quality leadership). It can be seen from the table that the path coefficient for both models were positive and statistically significant. Hence, first and second conditions above were met. The third condition was also met, as the path coefficient of the relationship between lean practices and performance was found to reduce its value from 0.602 to 0.394. Hence, quality leadership mediated the lean practices and performance, thus supported *H4*. Note that this is only a partial mediation because the direct effect is reduced and the t-value is still significant with the existence of the mediator in the analysis.

Table 5. Standardized path coefficients for testing mediation effect

	Model 1	Model 2
Direct relationship (model 1)		
Lean Practices -> Performance	0.602*	
Direct with mediation (model 2)		
Lean Practices -> Performance		0.394*
IV -> MV		
Lean Practices -> Quality Leadership		0.680*
MV -> DV		
Quality Leadership -> Performance		0.286*

*p<0.01

5. Discussion and conclusion

Overall, the purpose of this study is to investigate the mediation effect of quality leadership on lean practices and the GLCs performance. In doing so, our research questions are based on this model development purpose. First, we examine the level of lean in these companies. In general, we found the degree of leanness is relatively high among the GLCs. This finding provides evidence with regard to the importance of lean practices in the GLCs in Malaysia. Lean practices are known for efficiency improvement because these practices focus on waste reduction. In particular, lean practices such as continuous improvement, integrated functions, and vertical information system are among the top three most common practices of lean in the GLCs. On the other hand, surprisingly a well-known practice such as JIT is the least common practice among the GLCs in Malaysia.

Next, we also argue that lean practices will affect the bottom line performance of these GLCs. For this objective, we use the PLS path analysis to verify our contention. Our findings support this hypothesis (*H1*). This particular result empirically validates previous findings related to lean and performance (Chen & Tan, 2011; Meybodi, 2009; Moreira & Alves, 2008). In other words, lean practices significantly contribute to the performance of the GLCs. Note that, our perceptual measures of performance are not only by the financial-based indicators, but also the non-financial indicators as well. This means lean practices not only affect operational performance, such as productivity, but also affect the sales and profit of the companies. However, we have to note that lean practices have many challenges. The major obstacles of lean include backsliding to the

old ways of working, employee's resistance, budget constraints, and company culture (Wong & Wong, 2009). Furthermore, firms should implement lean step by step based on their own organization and do not simply replicate by other systems without considering itself conditions to maximize the outcome of lean (Chen & Tan, 2011).

Our *H2-H4* hypotheses aim to test the causal effect of lean, leadership quality, and performance. We argue that the relationship of lean and performance will be mediated by leadership quality. This is due to the fact that despite the positive effect of lean and performance, not all lean implementers are successful in their lean initiatives (Worley & Doolen, 2006). Our findings show that quality leadership, in fact, is a mediator in the relationship between lean practices and performance. However, in terms of the strength, it is only a partial mediator. This mean quality leadership is necessary for the lean implementers to achieve better organizational performance. What kind of leaders is suitable for lean environment? We view quality leadership in terms of the leader's behavior of being responsive, critical thinking, and adaptable to change. Hence, the leader who has these traits would help their organizations achieve better performance.

In conclusion, our study reinforces the belief of lean practices in the Malaysian GLCs, and the role of quality leadership in lean practices and performance relationship. We hope the findings can be used for further investigation in future research to add knowledge in the area of lean practices and organizational performance.

ACKNOWLEDGEMENT

The authors wish to thank Universiti Utara Malaysia for funding this study under PBIT Scheme SO Code: 12152 to enable this research to be successfully accomplished.

References

- [1] Razalli, M. R., Ahmad, H., Mahmood, R., Arshad, D. A., & Bakar, L. J. A. "Assessing the leanness of government-linked companies and its influence on performance", The 3rd International Soft Science Conference, Cambodia. 2012
- [2] Nordin, N., Deros, B. M., & Wahab, D. A. "A survey on lean manufacturing implementation in Malaysian automotive industry", International Journal of Innovation, Management, and Technology, Vol 1, No. 4, pp. 374-380, 2010.
- [3] Singh, K., & Ang, S. H. "Government in Business: An Empirical Analysis of the

- Strategies and Success of Government Linked Corporations in Singapore*", The Academy of Management, 1999.
- [4] Abdullah, A. B. The GLC transformation program. www.pmo.gov.my/WebNotesApp/ABDULLAH.nsf/index_en, (22/12/2006)
- [5] Chen, Z.-X., & Tan, K. H. "The perceived impact of Just in Time (JIT) implementation on operations performance: Evidence from Chinese firms", Journal of Advances in Management, Vol 8, No. 2, pp. 213-235, 2011.
- [6] Agus, A., & Hajinoor, M. S. "Lean production supply chain management as driver towards enhancing product quality and business performance: Case study of manufacturing companies in Malaysia", International Journal of Quality & Reliability Management, Vol 29, No. 1, pp. 92 – 121, 2012.
- [7] Mokhtar, A. "The Malay Way of Business Change", Economist, Vol 376, pp. 50, 2005.
- [8] Putrajaya Committee. *GLCs Performance Report Card*: Putrajaya Committee, 2012.
- [9] Putrajaya Committee. GLC Transformation Program. <http://www.pcg.gov.my/FAQ.asp>, (14/5/2013)
- [10] Fahy, J. "The resource-based view of the firm: some stumbling-blocks on the road to understanding sustainable competitive advantage", Journal of European Industrial Training, Vol 24 No. 2/3/4, pp. 94-104, 2000.
- [11] O'Regan, N., & Ghobadian, A. "Short- and long-term performance in manufacturing SMEs: different targets, different drivers", International Journal of Productivity and Performance Management, Vol 53, No. 5, pp. 405-424, 2004.
- [12] Singh, B., Garg, S. K., Sharma, S. K., & Grewal, C. "Lean implementation and its benefits to production industry", International Journal of Lean Six Sigma, Vol 1, No. 2, pp. 157-168, 2010.
- [13] Shah, R., & Ward, P. T. "Defining and developing measures of lean production", Journal of Operations Management, Vol 25, No. 4, pp. 785-805, 2007.
- [14] Meybodi, M. Z. "Benchmarking performance measures in traditional and just-in-time companies", Benchmarking: An International Journal, Vol 16, No. 1, pp. 88-102, 2009.
- [15] Moreira, M. R. M. O. A., & Alves, R. A. F. d. S. "A study on Just-In-Time implementation in Portugal: Some empirical evidence", Brazilian Journal of Operations and Production Management, Vol 5, No. 1, pp. 05-22, 2008.
- [16] Saraph, J. V., Benson, G. P., & Schroeder, R. G. "An instrument for measuring the critical factors of quality management", Decision Sciences, Vol 20 No. 4, pp. 810-829, 1989.
- [17] Brown, A., Eatoc, J., Dixon, D., Meenan, B. J., & Anderson, J. "Quality and continuous improvement in medical device manufacturing", The TQM Journal, Vol 20, No. 6, pp. 541 – 555, 2008.
- [18] Prive, T. Top 10 qualities that make a great leader. <http://www.forbes.com/sites/tanyaprive/2012/12/19/top-10-qualities-that-make-a-great-leader/>, (14/2/2014)
- [19] Habidin, N. F., & Yusof, S. r. M. "Critical success factors of Lean Six Sigma for the Malaysian automotive industry". International Journal of Lean Six Sigma, Vol 4, No. 1, pp. 60 – 82, 2013.
- [20] Brown, S. L., & Eisenhardt, K. M. "The art of continuous change: linking complexity theory and time-paced evolution in relentlessly shifting organizations", Administrative Science Quarterly, 1997
- [21] Kamoche, K., Cunha, M. P., & Cunha, J. V. *Organizational Improvisation*. London: Routledge, 2002.
- [22] Arawati, A. "Quality management and profitability linkage: Does the length of QM adoption act as the moderating variable?", International Journal of Management Studies, Vol 15, pp. 1-23, 2008.
- [23] Chapman, R. L., Murray, P. C., & Mellor, R. "Strategic quality management and financial performance", International Journal of Quality & Reliability Management, Vol 14, No. 4, pp. 432-448, 1997.
- [24] Prajogo, D. I., & Sohal, A. S. "The relationship between TQM practices, quality performance, and innovation performance", International Journal of Quality & Reliability Management, Vol 20, No. 8, pp. 901-918, 2003.
- [25] Brah, S. A., & Lim, H. Y. "The effects of technology and TQM on the performance of logistics companies". International Journal of Physical Distribution & Logistic Management, Vol 36, No. 3, pp. 192-209, 2006.
- [26] Mehra, S., & Ranganathan, S. "Implementing total quality management with a focus on enhancing customer satisfaction", International Journal of Quality & Reliability Management, Vol 25, No. 9, pp. 913-927, 2008.
- [27] Terziovski, M. (2006). Quality management practices and their relationship with customer satisfaction and productivity improvement. *Management Research News*, 29(7), 414-424.
- [28] Yaacob, Z. "Komitmen kakitangan sebagai pemoderat hubungan antara amalan pengurusan kualiti dan keperluan

- pelanggan*”, Jurnal Kemanusiaan, Vol 14, pp. 1-19, 2009.
- [29] Fotopoulos, C. B., & Psomos, E. L. *The impact of "soft" and "hard" TQM elements on quality management results*”, International Journal of Quality & Reliability Management, Vol 26, No. 2, pp. 150-163, 2009.
- [30] Bonavia, T., & Marin-Garcia, J. A. *“Integrating human resource management into lean production and their impact on organizational performance”*”, International Journal of Manpower, Vol 32, No. 8, pp. 923 – 938, 2011.
- [31] Pay, R. Everybody's jumping on the lean bandwagon, but many are being taken for a ride.
<http://www.industryweek.com/articles/everybody-jumping-on-the-lean-bandwagon-but-many-are-being-taken-for-a-ride-15881.aspx>, (14/2/ 2014).
- [32] Zikmund, W. G. *Business Research Method (7th Ed.)*. Thompson South-Western: Ohio, 2003.
- [33] Ringle, C. M., Wende, S., & Will, A. *SmartPLS 2.0 M3*. Hamburg: University of Hamburg, 2014.
- [34] Hair, J. F., Hult, G. T. M., Ringle, C. M., & Sarstedt, M. *A primer on partial least squares structural equation modeling*. Singapore: Sage Publications Inc., 2014.
- [35] Gefen, D., & Straub, D. *“A practical guide to factorial validity using PLS-graph: Tutorial and annotated example”*”, Communication of the Association for Information Systems, Vol 16, No. July , pp. 91-109, 2005.
- [36] Cohen, J. *Statistical power analysis for the behavioural sciences*. Marwah, NJ: Lawrence Erlbaum, 1988
- [37] Fornell, C., & Larcker, D. *“Evaluating structural equation models with unobservable variables and measurement error”*”, Journal of Marketing Research, Vol 18, pp. 39-50, 1981.
- [38] Chin, W. W. *“Issues and opinion on structural equation modeling”*”, MIS Quarterly, Vol 22, No. 1, pp. vii-xvi, 1998.
- [39] Baron, R. M., & Kenny, D. A. *“The moderator-mediator distinction in social psychological research: Conceptual, strategic and statistical considerations”*”, Journal of Personality and Social Psychology, Vol 51, No. 6, pp. 1173-1182, 1986.
- [40] Wong, Y. C., & Wong, K. Y. *“A study of lean manufacturing implementation in the Malaysian electrical and electronics industry”*”, European Journal of Scientific Research, Vol 38, pp. 521-535, 2009.
- [41] Worley, J. M., & Doolen, T. L. *“The role of communication and management support in a lean manufacturing implementation”*”, Management Decision, Vol 44, No. 2, pp. 228-245, 2006.