

Supplier Development Practices: From Manufacturers' Perspectives

Rahayu Tukimin^{1,2*}, Wan Hasrulnizam Wan Mahmood¹, Mohd Razali Muhamad³, Norhafiza Mohamed⁴

¹Sustainable and Responsive Manufacturing Research Group, Faculty of Engineering Technology, Universiti Teknikal Malaysia Melaka, 76100 Melaka, Malaysia

²Kolej Kemahiran Tinggi MARA Kuantan, KM 8 Jalan Gambang, 25150 Kuantan, Pahang, Malaysia

³Faculty of Manufacturing Engineering, Universiti Teknikal Malaysia Melaka, 76100 Melaka, Malaysia

⁴Kolej Kemahiran Tinggi MARA Balik Pulau, Genting, 11000 Balik Pulau, Pulau Pinang, Malaysia

*Corresponding e-mail: rahayu@kktmkuantan.edu.my

Keywords: Green supplier development; Malaysian manufacturers; EMS ISO-14001

ABSTRACT – In Malaysia, the awareness in green supplier development (GSD) has been increased and plays an important role for manufacturing firms to survive in a competitive environment. For this reason, this study is aiming to explore the acceptance level of GSD implementation by Malaysian manufacturing firms. A total of 71 datasets collected from Malaysian manufacturing firms with EMS ISO-14001 certification is used in a psychometric test analysis. The results show that the current achievement of green supplier development practices (GSDP) by Malaysian manufacturing firms is still lower than the level of priority placed on their practices. Further analysis using factor analysis, suggested that 25 GSDP can be extracted into 5 factors, namely capability development, evaluation, collaborative communication, assessment and resource transfer. The finding is very useful, primarily for manufacturing firms as a guideline in setting the appropriate activities to achieve the highest level of GSD implementation.

1. INTRODUCTION

Supplier development was a collaboration activity between manufacturing firms and their suppliers focusing in improving buyer-supplier relationship and supply chain performance. In Malaysia, the manufacturing firms make a substantial contribution in Malaysian economy and accounted for 81.5% of Malaysia's total export in 2016 [1]. For these reasons, manufacturing firms must always increase their initiatives in raising their productivity. In this case, the role of suppliers is vital. In sustaining their operations, manufacturing firms have begun to focus on SDP, specifically in GSDP [2]. The practices available for GSDP are extensive and it is reasonable to assume that not all manufacturing firms can afford to incorporate all these practices. Previous literatures [3][4] have shown that the implementation of supplier development programme give a significant contribution to improve product quality, reduce cost, shorter lead times and higher supplier flexibility. The status of current achievement of GSDP by Malaysian manufacturing has not been analyzed extensively by large scale. Thus, the aim of this article is to investigate the current level of GSDP that have been implemented by Malaysian manufacturers' by comparing the current achievement and the level of priority set for each initiative.

2. METHODOLOGY

In achieving the objective of this study, a questionnaire-based survey was chosen. The measurement scales were adapted and established based on previous studies. A five-point Likert scales is chosen as it is widely used to measure the opinions, belief and attitudes as well as it is easy to complete. This questionnaire consists of two aspects of GSDP; priority and current performance. A total of 264 questionnaires were distributed by post to all 264 manufacturing firms including automotive, electrical and electronic, mechanical and chemical that certified with the EMS ISO-14001 as recorded in *Standards and Industrial Research Institute of Malaysia (SIRIM)* database, until April 2015. The respondents were from the top management with at least two years working experience and have a knowledge about the issues related to environment and business aspect since this study combines these two aspects. In analyzing the data, the statistical analysis was applied in comparing the mean scores and exploratory factor analysis was performed to identify the possible underlying factor of GSDP.

3. RESULTS AND DISCUSSIONS

Out of 264 questionnaires distributed, 71 complete responses were used for analysis, constituted of 29.55% response rate. Figure 1 presents the mean score for both priorities and current performance of GSDP. The details of each practice item for are defined in the Appendix. The highest mean score value for GSDP for current achievement is 3.42 (GSD21–ISO 14001 certification for supplier), whereas for the priority is lower than the current achievement at mean score value of 3.23. This mean value perceived to be influenced by the awareness of manufacturing firms to the importance of GSD21 in enhancing manufacturing performance, particularly environmental performance [5].

As for the priority, the highest mean score value is 3.32 (GSD17–Formal assessment and evaluation). GSD17 perceived is set to the highest priority because it's lead to create a closer collaboration between supplier and manufacturing firms. Meanwhile, the lowest mean score value for both priority and achievement were recorded for GSD3 (provide the financial support to supplier) and GSD8 (personnel transfer) at mean score value 2.25 for priority, while the mean score value for both practices on current achievement is 2.15 and 2.14 respectively. Factor analysis was carried out as an explorative analysis

cluster that grouped related variables for GSDP and suggested that 25 GSDP can be extracted into 5 factors, namely capability development, evaluation, collaborative communication, assessment and resource transfer as presented in Table 1.

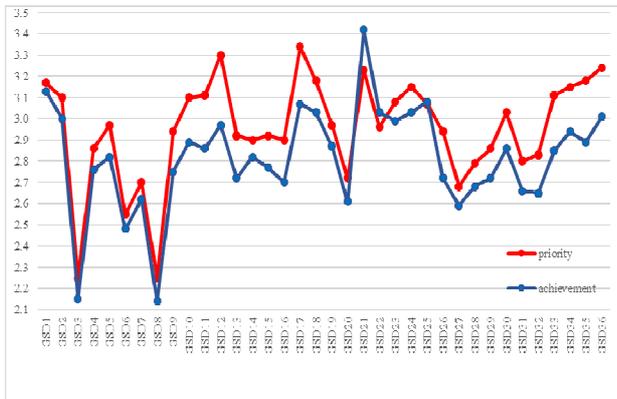


Figure 1 Comparison of mean score value between priorities and the current achievement of GSDP.

Table 1 Exploratory factor analysis on GSDP

Construct	Cronbach's alpha	Construct	Cronbach's alpha
1. Capability development	0.921	3. Collaborative communication	0.882
GSD32 (0.832)		GSD19 (0.804)	
GSD30 (0.771)		GSD36 (0.802)	
GSD29 (0.747)		GSD34 (0.694)	
GSD28 (0.697)		GSD7 (0.689)	
GSD33 (0.646)		4. Assessment	0.862
GSD27 (0.567)		GSD25 (0.824)	
2. Evaluation	0.915	GSD22 (0.790)	
GSD12 (0.783)		GSD4 (0.665)	
GSD11 (0.768)		GSD26 (0.591)	
GSD10 (0.747)		5. Resource transfer	0.885
GSD14 (0.710)		GSD8 (0.818)	
GSD18 (0.664)		GSD3 (0.803)	
GSD17 (0.634)		GSD6 (0.671)	
GSD20 (0.615)			
GSD13 (0.561)			

4. CONCLUSIONS

From the analysis result of 71 data sets, it can be concluded that the level of current achievement for most of GSDP is still lower than the priority been set except for three practices; namely certify the ISO 14001 certification for supplier, conduct a social audit and establish supplier rating scheme to track performance. These results suggested that the manufacturing firm should increase their commitment and effort in increasing the level of achievement of the GSDP. In the meantime, exploratory factor analysis extract five factor namely capability development, evaluation, collaborative communication, assessment and resource transfer. These findings are very useful, primarily for manufacturing firms as a guideline in setting the appropriate activities to achieve the highest level of GSD implementation.

ACKNOWLEDGEMENT

This research was co-funded by Universiti Teknikal Malaysia Melaka (UTeM) under the FRGS Grant (FRGS/1/2016/TK03/FTK-AMC/F00324) and MyPhD Grant of Ministry of Education.

REFERENCES

- [1] "MATRADE," 2016. [Online]. Available: <http://www.matrade.gov.my/en/malaysia-exporters-section/33-trade-statistics/3813-malysias-exports-by-main-sectors-2016>.
- [2] A. K. Asare, T. G. Brashear, J. Yang, and J. Kang, "The relationship between supplier development and firm performance: the mediating role of marketing process improvement," *J. Bus. Ind. Mark.*, vol. 28, no. 6, pp. 523–532, Jul. 2013.
- [3] S. B. Modi and V. A. Mabert, "Supplier development: Improving supplier performance through knowledge transfer," *J. Oper. Manag.*, vol. 25, pp. 42–64, 2007.
- [4] D. R. Krause, R. B. Handfield, and B. B. Tyler, "The relationships between supplier development, commitment, social capital accumulation and performance improvement," *J. Oper. Manag.*, vol. 25, no. 2, pp. 528–545, Mar. 2007.
- [5] Q. Zhu, J. Sarkis, J. Cordeiro, and K. Lai, "Firm-level correlates of emergent green supply chain management practices in the Chinese context," *Int. J. Manag. Sci.*, vol. 36, no. 4, pp. 577–591, Aug. 2008.

APPENDIX

Item	Green Supplier Development Practices
GSD1	Conduct environmental awareness seminar
GSD2	Train suppliers in dealing with environmental issues
GSD3	Provide financial support to supplier
GSD4	Visit suppliers' premises
GSD5	Establish a total reduction cost team
GSD6	Provide expertise advise on technical and quality issue
GSD7	Establish the environmental teams
GSD8	Develop environmental expert employees transfer programme to supplier
GSD9	Collaborate with supplier to solve environmental problems
GSD10	Joint efforts with supplier to reduce waste
GSD11	Cooperate with suppliers on environmental issue
GSD12	Joint effort on sustainability, cost and quality improvement
GSD13	Allow supplier involvement in green procurement and production
GSD14	Establish long-term contracts with suppliers
GSD15	Implement supplier environmental assessment program
GSD16	Possess formal process of supplier development
GSD17	Conduct formal environmental assessment and evaluation
GSD18	Formal feedback of environmental assessment and evaluation
GSD19	Informal/verbal feedback of environmental assessment and evaluation
GSD20	Perform environmental management of 2 nd tier supplier evaluation
GSD21	Certify the ISO14001 certification for supplier
GSD22	Conduct a social audit
GSD23	Conduct an environmental audit
GSD24	Establish supplier certification programs
GSD25	Establish supplier rating scheme to track performance
GSD26	Use questionnaire to collect information
GSD27	Supplier incentives and rewards for better environmental performance
GSD28	Establish environmental improvement target and performance goals
GSD29	Develop productivity improvement program
GSD30	Involvement of supplier in the early product design and development
GSD31	Work with supplier in eco-design
GSD32	Provide related advice on eco-design in product development
GSD33	Collaborate with supplier in green innovation and solutions
GSD34	Sharing an information on environmental topic
GSD35	Involvement of top management commitment in green supplier practices
GSD36	Formal long-term plan to improve supplier environmental performance