Journal of Technology and Operations Management 9(1), 9 – 15 (2014)

THE EFFECT OF KNOWLEDGE TRANSFER AND MANUFACTURING CAPABILITIES AMONG LOCAL MANUFACTURERS IN NORTHERN REGION OF MALAYSIA

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ABSTRACT

Due to uncertain of current economic situation, manufacturers must revise their ways to survive in their business. Manufacturing capability assumes that firms are more effective than their rivals at deploying resources. It is suggested that better performing firms are more likely to address multiple manufacturing capabilities simultaneously. In developing countries, manufacturing capabilities is a new concept. There is lack of awareness on the importance of upstream manufacturing capabilities such as product development and design. Through the email survey, a total of 89 companies representing various industries had responded. The hypotheses involved were tested using correlation and regression techniques. The results of the study support all the hypotheses.This paper provides an analysis on the relationship between knowledge transfer and manufacturing capabilities among local manufacturers in Malaysian Northern Region. .

. **Keywords:** Knowledge Transfer; Manufacturing Capabilities; Local Manufacturers, Northern Region of Malaysia

INTRODUCTION

The manufacturing sector is an important contributor to the economic growth and development of Malaysia which accounts for 31.6% of Malaysia's gross domestic product and exports of manufactured goods make up 78.4% of the country's total exports (MIDA,2005). One of the critical missions of the Ninth Malaysia Plan is to further move all sectors of the economy up the value chain. One of the key sectors being targeted by the Ninth Plan is the manufacturing sector. The Plan will continue to focus on enhancing the capability of the manufacturing sector to meet the competitive global environment. During the Ninth Plan, the sector is expected to grow by 6.7 per cent per year (up from 4.1 per cent per year during the Eighth Plan) with resource-based industries to grow by 6.0 per cent per year and non-resource based industries by 7.1 per cent (ECPDPB, 2007).

Manufacturing sector includes electric and electronics, food and beverage, automotive, just to name a few. Manufacturing sector developes the world's economy and provides job opportunities. Manufacturing capability in developing country and manufacturing in developed country are very different. They are different in terms of the time and management set up in the beginning (Grobler, 2007). The new manufacturing firm and the established manufacturing firm are different. For the firm that has established for a long period, the mile stone to be achieved must be different from the firm that is new in this area. Manufacturing capabilities refer to the manufacturer's contribution to get success in their areas (Sohal,1995). Some past literature elaborated manufacturing capability as something that the manufacturers do to generate profit through their products and services (Swink,1998)).

Despite the economy downturn, Malaysia is still one of the destinations that is capable of attracting multinational and foreign companies to invest in the country. The economic contribution is immense, through investment from multinational manufacturing and services sectors that creates significant linkages (PMD, 2005). Market demands have changed dramatically over the past decades and today's competition is on variety and time to market, with price and quality continuing to play their ever important role(Banker & Khosla, 1995).

Manufacturing Capabilities

Manufacturing capability is the concept of strategic capabilities that determine a manufacturing's contribution to the success of a firm is closely related to the notions of strategic resources, competences and priorities (Teece et al,1997). In contrast to capabilities, resources are something a firm possesses or has access to, is very important to consider for competitive advantage. Manufacturing capability is developed to make sure the productivity is at higher level(Li, 2000). High productivity can be ensured by high quality product (Yang,2004). Other than that, the company which develops high manufacturing capability can survive in the long term. Through manufacturing capability, the company can developed their competitiveness, use their resources at optimum level and keep on adding value not only in stable economic condition, but also during recession (Okejiri, 2000).

Manufacturing capability is determined as a manufacturing's contribution to the success of a firm and is closely related to the notions of strategic resources, competences and priorities(Teece, Pisano & Shuen, 1997). In order to enhance and utilise these capabilities, manufacturing practices need to be developed. Knowledge includes know how and know what in terms of converting inputs to outputs and their combining process. Training has been considered as a part of the assistance" or "general support" provided by the manufacturer, but not as a factor in its own right. The combination of all these can help company to attain high performance manufacturing companies (Sohal, Gordon, Fuller & Simon, 1999).

Innovative

There are three factors that had been highlighted in innovation's scope. There are scanning, creativity, and ingenuity (Narasimhan,2005). The manufacturers must create and implement uniques manufacturing process that radically improve manufacturing performance. The manufacturers also must capable to identify problem, the process that needed in the line, or useful technological developments inside and outside the manufacturing organization (Haifeng, 2006).

Innovative technological capability is further disaggregated into different levels or 'depths' – from fairly 'basic' levels (e.g. from minor adaptation and incremental quality improvement) through 'intermediate' levels (e.g. for various types of product and process design and engineering) to more 'advanced' and 'research-based' levels (e.g. for developing the knowledge base for new product and process designs), with only the latter likely to involve the kind of activities usually described as 'R&D"(Narasimhan,2005). Even though research-based levels, which involve activities at the tip of the iceberg, may be less applicable to firms in a production based electronics industry in a late industrialising country, it provides a perspective and link to total technological activity in the global electronics industry (Ariffin & Figueiredo, 2003).

Knowledge Transfer

Teece (1997), emphasize that capability is a mechanism from which enterprise learn and accumulate new skills and is devoted to use and allocate all kinds of resources. These resources can be transferred into exclusive capabilities after learning or knowledge input. Capability includes knowledge which enterprise accumulates from internal learning. Learning and knowledge are very important for development and usage of resources and capabilities.

Knowledge includes how and what in terms of inputs and outputs and their combining process (Haifeng et.al., 2006). Pillania (2008), define knowledge as a whole set of intuition, reasoning, insights, experiences related to technology, products, processes, customers, markets, competition and so on that enable effective action. And knowledge management as a systematic, organized, explicit and deliberate on going process of creating, disseminating, applying, renewing and updating the knowledge for achieving organizational objectives (Pillania, 2004).

Knowledge Sharing

In the language of Cook and Brown (1999) the typical operations management view of international manufacturing knowledge transfer would fit the epistemology of possession, where knowledge is a disembodied object that may or may not be owned by human beings. To quote Grant and Gregory, "Transferors need to identify where in the process tacit knowledge resides and explore ways of managing its 'human containers'," (1997a: 158). Elsewhere they refer it to "knowledge owners" (1997). Cook and Brown's alternative 'epistemology of practice' instead considers knowing, rather than knowledge, which emphasises more the use and application of accumulated skills and competences. This emphasis on 'knowledge as practiced' shifts the problem of knowledge transfer away slightly from the codification/tacitness debate. Where a high degree of practice knowledge – knowing- is shared between a transferor and a receiver this will obviate the need for much of the prompting, demonstration, explanation and codification that would be necessary if the receiver was not familiar with the transferor's domain of practice (Grobler,2007).

Based on the discussion it can be concluded that knowledge transfer is an important role in developing manufacturing capabilities. Therefore, it is essential to consider these factors in studying manufacturing capabilities. This study focuses on the keys of knowledge transfer namely *knowledge sharing*. The investigation on the relationship of knowledge transfer on manufacturing capabilities adressed by the following hypotheses:-

H_1 Knowledge transfer in term of knowledge sharing has significant influence on Manufacturing Capabilities in term of Innovative

METHODOLOGY

The Sample and Data

A survey was conducted to collect cross sectional data in Northern Region of Malaysia which is one of the state introduce as the Silicon Valley of Malaysia. The population of this study was the Top Management and Managers . These grades consist of management and professional employees which identified a group with high potential to engage manufacturing capabilities. The selection of the survey location and the sample was due to the Federation of Manufacturers of Malaysia (FMM). A set of questionnaire was formulated and designed based on the previous literature in the subject area. The questionnaires were emailed to 160 respondents. 119 sets questionnaires received within two weeks giving the response rate of 74.4%. The

sample profile of the survey is shown in Table 1.

Table 1: Sample profile of the respondent

Variables	Item	Frequency	Percentage (%)
Companies's Type	Malaysian owned	75	63.0
	Foreign owned	28	23.5
	Joint Venture	16	13.5
Size of Company(In term of Full Time Employees	Less than 5	-	-
	5 to 50	-	-
	51 to 150	36	30.0
	More than 150	83	69.7
Respondents' Job Designation	General Manager	3	2.5
	Manager	89	74.8
	Executive	27	22.7
Year of designation	Less than 1 years	8	6.7
	1-5 years	31	26.1
	6-10 years	17	14.3
	More than 10 years	63	52.9
Education level	Degree	98	82.3
	Master Degree	20	16.8
	PhD	1	0.9

From Table 1 it is found that more than 75% respondents are Malaysian owned companies and 83 companies had more than 150 workers in their operation. The respondents are 3 General manager, 89 Manager and 27 Executive and 63 from the respondent work more than 10 years. 98 of the respondent have Degree level.

Reliability Analysis

An internal consistency analysis was performed separately for the items of each personality traits and cyberloafing behaviour by using the SPSS version 20, reliability procedure. Hair, Money and Samuel (2007) suggested an acceptable alpha value is greater than 0.6. As show in Table 2, the alpha values of reliability analysis for this study ranges from 0.70 to 0.85. From the results obtained, all the alpha values are greater than 0.7. Thus it can be concluded that this instrument has good internal consistency and is therefore reliable.

Table 2: Reliability analysis result

Variables	**Number of items**	**Alpha**
Knowledge Sharing	4	0.927
Learning Ability	11	0.895
Innovative	6	0.752

The levels of knowledge transfer and manufacturing capabilities are based on the levels of mean score range provided in Table 3 which adopted from Kosnin and Lee (2008). Descriptive analyses for the knowledge transfer and manufacturing capabilities are shown in Table 4 and Table 5.

Table 3: Level of Mean Score Range

Range of mean score	Level
1.00 – 2.33	Low
2.34 – 3.67	Medium
3.68 – 5.00	High

FINDINGS

The Level of Manufacturing Capabilities

Manufacturing capabilities among the manufacturing companies are measured based on the values of means and standard deviations. Table 4 shows the ranking of knowledge transfer and the value of mean and standard deviation for each activity.

Table 4: Mean Values of Manufacturing Capabilities

Activities	Mean	Standard Deviation
Able to identify problems inside the organization	3.48	0.988
Able to identify problems outside the organization	3.40	1.120
Able to identify process needs inside the organization	3.27	1.223
Able to identify process needs outside the organization	3.24	0.812
Able to generate and evaluate new ideas which meet organizational objectives	3.67	0.932
Able to apply new technologies or methods to solve problems Surfing banking website	3.68	1.161
Manufacturing Capabilities	3.45	0.563

Mean values explained the propensity of the respondent to involve with manufacturing capabilities (Li, 2000). According to Kosnin and Lee (2008) the mean values in range of 1.00 to 2.33 is categorized as low. The mean score for the overall manufacturing capabilities is 3.45. This indicated that the level of manufacturing capabilities among manufacturing companies is at the medium stage.

The Level of Knowledge Transfer

Table 5 gives the mean values for the four knowledge transfer. It is shown that one of the knowledge transfer has more than 3.67 mean values which is 3.92. Base on Table 3, the levels of these knowledge transfer are considered as medium stage among the manufacturing companies.

Table 5: Mean Values of Knowledge Trasnfer

Personality Traits	Mean	Standard deviation
Employees shared knowledge inside the company through interaction	3.92	0.51
Skilled employees share their experience with customers in exhibitions or conference without any reward	3.58	0.57
Monetary rewards motivated the employees to share their knowledge.	3.48	0.51
Learning from the past experiences	3.44	0.75
Knowledge Transfer	3.60	0.57

The lowest mean of knowledge transfer is learning for the past experiences and the average mean value of knowledge transfer is at medium levels.

Correlation Analysis

From the results of correlation analysis it is found that knowledge transfer is significantly correlated to manufacturing capabilities. As shown in Table 6, the correlation coefficients are found to be positive and statistically significant at 0.01 level ($p<0.01$).

Table 6: Pearson Correlation Coefficients between Knowledge Transfer and Manufacturing Capabilities

	Correlations	
Variable	F1	Manufacturing Capabilities
F1	1.00	
Manufacturing Capabilities	0.837**	1.00

** Correlation is significant at the 0.01 level (1-Tailed)
* Correlation is significant at the 0.05 level (1-Tailed)

Therefore, Hypothesis 1 are supported. There are a significant relationships between knowledge transfer with manufacturing capabilities. Hence, Hypothesis 1 is supported.

DISCUSSION

The purpose of study is to identify empirically the core manufacturing capabilities in manufacturing companies, across industry in the northern region of Malaysia. The rationale of the study stems from the major consideration, that is, the emerging concern of shareholders of the manufacturing companies and the directors of the companies in this industry in particular to develop core manufacturing capabilities.

The analysis based on the respondents' perception of core manufacturing capabilities in manufacturing companies showed that manufacturers took a lot of effort in knowledge transfer in achieved high degree of core manufacturing capabilities.

The findings show that knowledge transfer is the important variables that must be consider by the manufacturers in their operation. These findings are supported by previous researchers who have studied in developing manufacturing capabilities (Swink & Hegarty, 1998; Haifeng, 2006; Li, 2000)

The correlation analysis show that knowledge transfer is the priority variables that must be highlight which show the correlations coefficients 0.837 at the 0.01 level (1-Tailed).

Limitation of study

This study has been conducted with the manufacturers in Northern Region of Malaysia. Nevertheless, the result may not be able to generalise the influence of knowledge transfer on manufacturing capabilities for the country as there are different focus on the company operation. This study focuses solely on the knowledge transfer. Future research should consider other factors that influence the manufacturing capabilities such as knowledge sharing, knowledge capabilities and knowledge management.

CONCLUSION

This paper has applied empirical analysis on the influence of knowledge transfer on manufacturing capabilities of local manufacturers. Survey on manufacturing capabilities on the local manufacturers reveals that the level of manufacturing capabilities is medium level. The results show that the knowledge transfer contributes to the manufacturing capabilities. The results suggest that, all manufacturers must consider knowledge transfer as their focusing aspect to survive in the business. Companies or manufacturers that increase knowledge transfer gain significantly in the core manufacturing capabilities. The knowledge transfer absalutely is very important in develops manufacturing capabilities.

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