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Inter-Firm Knowledge Transfer to the Capability of Local Parts Firms in the Malaysian Automobile Industry

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ABSTRACT
The current issue of technology transfer has risen dramatically in the past few years, primary associated with the knowledge transfer. Multinational Corporations (MNCs) in the developed countries are the main actors driving of technology and knowledge to developing countries. Thus the organizations in the developing countries are striving hard to create their internal environment that needed to build strong cooperation with MNCs through strategic alliance. A local parts firm in the Malaysian automobile is considered as one of the most important and strategic industries in the manufacturing sector. However this vital sector is facing remarkable challenges, and in the heart of these challenges is the global competition, rapid changes in consumer behavior, shorter product life cycle, and increasingly saturated market. Thus this industry is eager to gain new technology and knowledge to advance its capability, sustain competitiveness while consolidating their position in the global market place. A survey questionnaire was developed to investigate the impact of knowledge transfer on the capability of local parts firms in this industry. A result from 59 responds asserted that there is a significant relationship between knowledge transfer based on explicit and tacit knowledge on the capability of this industry.
Keywords; Inter-firm Knowledge Transfer, Malaysian automobile Industry

INTRODUCTION

The phenomenon of Technology has become the most important source of countries developing in economic growth, competitiveness, wealth, power, prestige, and even independence (Khalil, 2006). For a long time, capital and labour were considered the principal factors of production. With the increasing globalisation of business activities, knowledge and information have been gaining importance as vital elements of any firm's success in today's global economy (Ramlee M, 2008; Wong, 2005)

The word of technology has different definitions, in different times at different places. In line with Khalil (2006) technology is an expression of human creativity and depends on harnessing information into knowledge and applying this knowledge to the betterment of human conditions. The term of technology is a combination of human understanding of natural laws and phenomena accumulated since ancient times to make things that fulfil our needs and desires or that perform certain functions (Li-Hua, 2006).Technology as "a set of knowledge contained in technical ideas, information or data; personal technical skills and expertise, and equipment, prototypes, designs or computer codes", and technology transfer can be taken place in any of the above mentioned forms or their combinations, either embodied in the equipment supplied or in the forms of know-how, instruction and software (J. R. Lee, 2010).

Technical and scientific knowledge is a key main of creating activity of research and development which can be used to create new product, improve quality-control and problem-solving capabilities and teaching a new production processes and management practices (T.Terdudomtham, 2004). In fact, with moving from an industrial age to an information age, knowledge has become the most decisive factor of competitiveness and a factor of major importance and an important indicator of the success for the Organization (Khin, 2010; patil, 2010). Due to lack of resource capacities such as a weak research and development (R & D) base, limited investment in R&D, production and manufacturing capability, weak infrastructure and technological disadvantage, companies are struggling hard to gain external source of knowledge which underlying on knowledge transfer. there is a positive role of both internal R& D capabilities captured by the intensity of R&D efforts and the highly-qualified personnel (traditional notion of absorptive capacity) and the ability to interact and access external sources of knowledge (enhanced absorptive capacity) in raising innovative performance (Yannis Caloghirou, 2004). Transfer of technology is not just a movement of idle machinery and equipment from one place to another. It also includes the transfer and adoption of technique, know-how and information (J. R. Lee, 2010).

LITERATURE REVIEW

Knowledge transfer has become the main key of supporting not only to individuals or corporations but also the nations and societies. In contemporary economy, knowledge includes knowing about people, money, leverage, learning, flexibility, power and competitive advantage (Al-Gharibeh, 2011)). The importance of knowledge transfer underlying in extended benefits of R & D to the society also supported innovative performance especially in developing countries (Yannis Caloghirou, 2004). The sources of gaining knowledge take two aspects; internal or external sources, where internal source or knowledge creating view of firms focuses on knowledge as one of the most valuable resources that provides sustainable competitive advantage and on interaction as a key element for the access, acquisition and development of new knowledge, while external source can take place through transferring the knowledge from the foreigner partners under strategy alliances or foreign direct investment (FDI) or etc. Joint venture can be occurred when two or more firms form a legally independent firm to share their collaborative capabilities and resources to achieve competitive advantages in the market is termed as joint venture in the form of strategic alliance. Multinational Corporations (MNCs) have been regarded as the most efficient vehicle for transferring technology and knowledge across borders through strategic alliances and IJVs, and foreign direct investment (FDI). Therefore Malaysia relied on the multinational corporations (MNCs) as its primary source of technology to enhance the technological capabilities and competitiveness of local industries, creation (Mun-Cow Lai, 2004; Sazali Abdul Wahab, 2010; Sazali, 2009). China depends on Multinational Corporation as a preferred vehicle for technology transfer, it is reasonable to suggest that it would be wise and practical to promote the establishment of joint ventures between Xinjiang and Jiangsu, or between Xinjiang and Henan rather than to advocate setting up joint ventures between, for example, Xinjiang and the western countries (Li-Hua, 2006). Successful technology transfer in IJVs; which includes the transfer of substantial tacit and explicit knowledge could have significantly increased 1) the corporate performance in terms the local firms' business volume, market share, planned goals and profits, and 2) the human resource performance in terms of local firms' product/service quality, employees' productivity, managerial techniques/skills and operational efficiency, to local firms mostly originated from the sophisticated and competitive foreign MNCs (Sazali Abdul Wahab, 2010; Thomas muller, 2006)**.** There are different types of knowledge transfer, but the most commonly are inter-firm and intra-firm knowledge transfer. Inter-firm knowledge transfer as the most importance type of knowledge transfer which can take a place through transferring knowledge from main corporations to their affiliates, this knowledge can be obtained by different way such as: sharing and exchanging their knowledge and ideas through training, employee's mobility or studying, ((Benjamin, 2004; Nor Ziati A. H, 2010). Inter-firm knowledge transfer considerations are particularly applicable to the viability of cooperative alliances (Ding., 2009). Inter- firm knowledge transfer exists, analysing the context of knowledge acquisition from alliances ,(Jorge Walter, 2007). IJVs can be a useful vehicle not only for knowledge accessing and acquisition but also for knowledge co-creation on the local and global level (Kazuo Ichijio, 2008)

Tacit knowledge transfer is recognized organizationally as "the really hard stuff, individual bench-scientist experiences and things like that, however that explicit knowledge is knowledge which can be easily articulated, explained and understood, because explicit knowledge comes in a number of forms, for example books, manuals and documents (Yeh, 2009). Tacit knowledge is obtained by internal individual processes like experience, reflection, internalization or individual talents. Therefore it cannot be managed and taught in the same manner as explicit knowledge (Herrgard Tua Halin, 2000) . Managerial and marketing expertise is more tacit than product development, production, and technolog (Charles Dhanaraj, 2000). Organizations that recognize and use their employees' steadily growing wealth of tacit and explicit knowledge to solve problems and achieve goals have a major competitive advantage (Smith, 2001).

Explicit knowledge is possible to store in a mechanical or technological way, like in handbooks or information systems, tacit knowledge is mostly stored only in human beings (Herrgard Tua Halin, 2000). Knowledge transfer underlying on explicit knowledge is needed by any corporation to ehnance the capability those corporations through managing supply chain and risk management. It is necessary to absorb ordinary external knowledge and learn best practices from others, providing managers with explicit knowledge in the form of information materials and assisting tools, and providing them with tacit knowledge in the form of cases (Guo, 2011). Knowledge management (KM) enhances products, improves operational efficiency, speeds deployment,

increases sales and profits, and creates customer satisfaction (M.-C. Lee, 2009). In addition In adding, analyzing explicit knowledge to produce new knowledge can further it. Explicit knowledge stored in the form of instances of a mathematical model (what-if-cases) can be leveraged via deductive and/or inductive model analysis systems.

Malaysian Automobile Industry

Automotive Industry comprises of automobile and an auto component sector is one of the key drivers of the national economy as it provides large-scale employment, having a strong multiplier effect. Being one of the largest industries in Malaysia, this industry has been witnessing impressive growth during the last two decades. It has been able to restructure itself, absorb newer technology, align itself to the global developments and realize its potential. This has significantly increased automotive industry's contribution to overall industrial growth in the country.

The Heavy Industrial Policy in the early 1980s marks a significant change of industrialisation strategy in Malaysia towards building a nationally owned and controlled automotive industry (Wad, 2011).The development of SMEs in the Malaysian auto-parts industry has become noticeable for the last two decades. Between 1993 and 2005 alone, the number of auto-parts enterprises increased about six-fold to 590 in 2005 (Rosl, 2010). Automotive industry in Malaysia expanded tremendously from 1980 to 2009. Total new vehicle sales went up from around 97,000 in 1980 to 537,000 in 2009, and assembling of vehicles increased from around 104,000 in 1980 to 489,000 in 2009 (Wad, 2011). In addition Malaysian-Japanese automobile alliance did transfer standard product and process technology and created production capabilities among workers and administrative employees, but it did not support the creating of international sales capabilities. Despite the extending of the Malaysian automobile industry, it still lacks the competitive advantage to penetrate international markets due to its lack of technological and product upgrading especially among parts and component suppliers, low levels of skills among employees and weak global marketing capabilities (Wad, 2011). Developing stronger relationships with the technology supplier are more likely to experience higher achievement in terms of implementation performance which requires the key decision-maker, namely the technology champion, to be highly knowledgeable (Rahmana1 2008). Despite the efforts of Proton in developing local suppliers, a high dependence on domestic market and technology agreements has limited the performance of these suppliers at a regional and global scale (Peter Wad, 2011; Rashid Abdullah, 2003). An integrated TQM and LM practice has been proposed which will allow a systematic quality implementation for all vendors. This will facilitate control and monitoring of quality initiatives among vendors in the effort to meet higher customer satisfaction in the Malaysian automobile industry (Noor Zalina Mohamd, 2011).

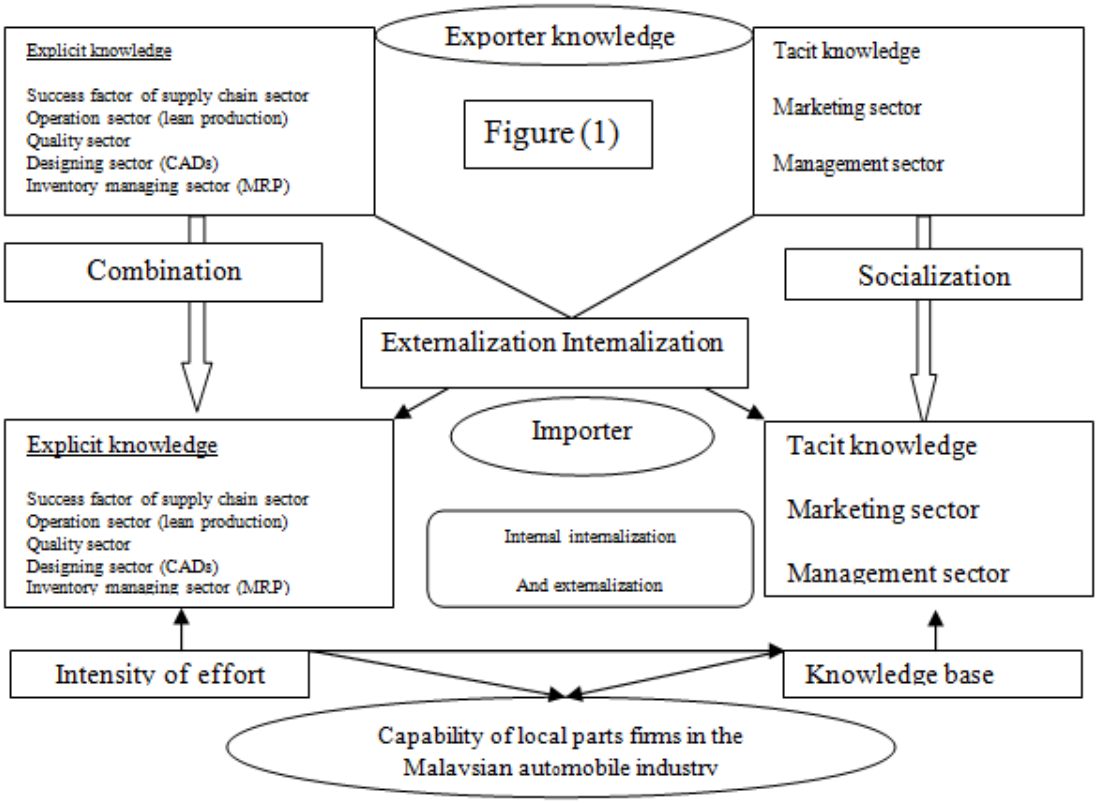
METHODOLOGY

This study highlighted on inter-firm knowledge transfer in terms of explicit and tacit knowledge and investigates the impact of these vital variables on the capability of local parts firms in the Malaysian automobile industry. Further Inter-firm technology transfer as a main factor of knowledge transfer can be defined as knowledge transfer between large, foreign and smaller, local-based firms in the manufacturing sector.

Tacit knowledge can be defined as a knowledge that is difficult to transfer to another person by means of writing it down or verbalising it which takes two aspects in this study, the first one tacit knowledge in terms of marketing and sellers skills, the another one in the management skills, while explicit knowledge can be defined as a knowledge that has been or can be articulated, codified, and stored in certain media which takes five types in this study namely: - "knowledge of supply chain and inventory management, knowledge of operation management, quality management, knowledge of designing". Theoretical framework developed to clarify the impacts between dependent variable which is capability of local parts firms in the Malaysian automobile industry, while independent variables are TK and EK as shown in diagram (1).

This research paper relies on the quantitative method, where a survey questionnaire has been used for gathering data from the manegers of the local parts firms in the malaysian automobile industry. This questionnaire is based on likert scale of general five-points measurements ranging from (1) very low to (5) very high. The theoretical model and hypotheses were tested by using empirical data gathered from local parts firms in the Malaysian automobile industry through survey questionnaires. In addition the results of hypotheses were analyzed by using the correlation coefficients and multiple linear regression analyses. In order to gain a deeper understanding of

this issue, a series of correlation, hypotheses testing have been conducted to describe the correlation between the impacts of explicit, tacit knowledge on the capability of the local parts firms in the Malaysian automobile industry as shown in figure (1)



This study aimed to answer the questions that shown below:-

I) What are the impacts of the inter-firm technology transfer degree of (tacit knowledge) on the capability of local parts firms in the Malaysian automobile industry?

II) What are the impacts of the inter-firm technology transfer degree of (explicit knowledge) on the capability of local parts firms of the Malaysian automobile industry?

FINDING

Table (1) below illustrates the relationship between inter-firm knowledge transfer based on TK, and EK and the capability of local parts firms in the Malaysian automobile industry, where TK refers to a marketing and seller's skills, and management skills. While EK refers to supply chain, operation management, quality management, computer aided design system, and material requirement planning.

All results indicate to the positive correlation between the inter-firm knowledge transfer based on TK and EK and capability of local parts in the Malaysian automobile industries. The Pearson correlation for marketing, seller's skills and capability of local parts firms in the Malaysian automobile industry is equal 1. The significant 2-trailed indicates that TK and EK are very significant in value 0.000 which presents 59 of respondents. Thus the positive linear relationship will cause an increase in one variable of independent variable; will contribute to increase in the dependent variable.

The correlation between marketing, seller's skills, and capability of the Malaysian automobile is very significant in the value of 0.000 P and coefficient of 0.932. In other words the contribution of marketing, sell's skills is 93.2% to the capability of Malaysian automobile industry, which asserts the positive correlation. Similarly the correlation between management skills and the capability of local parts firms in the Malaysian automobile industry is very significant in value of 0.900 of coefficient, which proves the positive correlation. In another word the relationship between the variables is in the value of 90% which is very high. In addition the correlation between supply chain management and capability of local parts firms in the Malaysian automobile industry is very significant in the value of 0.814 of coefficient, which indicates to the positive relationship between those variables. Furthermore the correlation between the operation management and the capability of local parts firms in the Malaysian automobile industry is very significant in the coefficient of 0.910, in other word 91% which considers as a high relationship between these variables. The correlation between quality management and the capability of local parts firms in the Malaysian automobile industry is very significant in the coefficient of 0.936, in other words 93.6% which consider high relationship between the variables.

However the correlation between the variable of Computer Aided Design system and the capability of the local parts firms in the Malaysian automobile industry is shows significant, in the coefficient of 0.943, which considers as very high positive in 94.3%. Finally the correlation between material requirement planning and the capability of the local parts firms in the Malaysian automobile industry is very significant too, in the coefficient of 0.930 which proves high positive relationship in 93%. To sum up the correlation between the independent variables of inter-firm knowledge transfer of explicit and tacit knowledge and dependent variables of local parts firms in the Malaysian automobile industry is very positive and significant relationship in value between 90% and 95% as high relation.

Table (1) Correlation between dimensions of inter-firm knowledge transfer and the capability local parts firms in the Malaysian automobile industry.

No	item		1	2	3	4	5	6	7	8	9	10
1	capability	Person Correlation	1									
2	tacit	Person Correlation	.942**	1								
3	marketing and marketing skills	Person Correlation	0.932**	.968**	1							
4	Skills of management	Person Correlation	0.900**	.975**	.888**	1						
5	explicit	Person Correlation	0.971**	.935**	.927**	.893**	1					
6	supply chain	Person Correlation	0.814**	.776**	.772**	738**	.878**	1				
7	operation management	Person Correlation	0910**	.889**	.896**	.836**	.942**	.793**	1			
8	quality	Person Correlation	0.936**	.915**	.904**	.877**	.954**	0.726	.897**	1		
9	Computer Aided Design	Person Correlation	0.943**	.906**	.880**	.880**	.970**	.834**	.883**	.917**	1	
10	MRP	Person Correlation	0.930**	.869**	.860**	.830**	.914**	.729**	.804**	.873**	.908**	1

**. Correlation is significant at the 0.01 level (2-tailed).

The regression linear analysis is used to determine whether there is a significant linear relationship between an independent variable x which presents inter-firm knowledge transfer (tacit and explicit knowledge) and a dependent variable y which presents the capability of local parts firms in the Malaysian automobile industry, the test focuses on the slope of the regression line

$$Y = B_0 + B_1X$$

Where B_0 is a constant, B_1 is the slope (also called the regression coefficient), X is the value of the independent variable which is inter-firm knowledge transfer (tacit and explicit knowledge), and Y is the value of the dependent variable which is capability of local parts firms in the Malaysian automobile industry.

Table (2): Model summary for Inter-Firm Knowledge Transfer to the Local Parts Firms in the Malaysian Automobile Industry

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.975[a]	.951	.950	.27350

a. Predictors: (Constant), Tacit and Explicit Knowledge.

Table (3): ANOVA for Inter-Firm Knowledge Transfer to the Local Parts Firms in the Malaysian Automobile Industry

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	81.976	2	40.988	547.968	.000[a]
	Residual	4.189	56	.075		
	Total	86.165	58			

a. Predictors: (Constant), Tacit and Explicit Knowledge

Table (4) coefficient for Inter-Firm Knowledge Transfer to the Local Parts Firms in the Malaysian Automobile Industry

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-.465	.116		-4.013	.000
	Tacit knowledge	.279	.085	.274	3.291	.002
	Explicit knowledge	.806	.094	.714	8.577	.000

Illustration (2) above refers to linear regression and R- Square is the coefficient of determination which explains 95.1% of the variance in the capability of local parts firms in the Malaysian automobile industry, while Inter-firm knowledge transfer shows a positive correlation (r = 0.975, p < .001) with the capability of local parts firms in the Malaysian automobile industry. Table (3) above indicates that the linear regression demonstrated a significant positive relationship in value of (F=547.968, P=0.000).

Based on the coefficient in table (4) both of the variables (tacit and explicit knowledge) are significant which consider that these variables are important for improving model. As Beta coefficients indicates that both of explicit and tacit variables are important however explicit knowledge is more important than tacit which has the largest value of 0.806, while tacit value 0.279.

Capability of local parts firms in the Malaysian automobile industry =

(0.806 explicit knowledge + 0.279 tacit knowledge – 0.465)

The coefficient of tacit knowledge is 27.9% which means increasing in every unit of tacit knowledge will lead to increase the capability of local parts firms in the Malaysian automobile industry by 27.9%. However

coefficient of explicit knowledge is 80.6% which indicates that for every unit increasing in explicit knowledge will lead to increase the capability of local parts firms in the Malaysian automobile industry by 80.6%. Accordance to the sig, result, both of explicit and tacit knowledge have positive and significant relationship with local parts firms in the Malaysian automobile industry at the value of 0.000 for explicit, and 0.002 for tacit knowledge. Therefore null hypothesizes are accepted for explicit and tacit knowledge.

CONCLUSION

The aim of this research was to develop an understanding of the investigation of technology transfer underlying on tacit, and explicit knowledge to the capability of the Malaysian automobile industry, and how can the local parts firms in the Malaysian automobile industry address these capability. This study has bridged the literature gaps in such that it provides empirical evidence of a positive significant correlation between a knowledge transfer based on tacit and explicit knowledge and the capability of the Malaysian automobile industry. The theoretical contribution of this research lies in the following three areas: First, we systematically identified the measures of two types of knowledge transfer to the capability of local parts firms in the Malaysian automobile industry, namely tacit and explicit knowledge. Second, this project paper specified various two types of tacit knowledge that relate to the effectiveness of capability in the Malaysian automobile which are marketing, sellers skills and management skills, and various five types of explicit knowledge which are supply chain management, operation management, quality management, Computer Aided Design system, and material requirement planning. Lastly this project paper predicted the impacts of knowledge transfer on the capability of the Malaysian automobile industry based on the results of the questionnaire survey, which take four aspects of improving the quality control and continue improvement, sustain competitive in the local and global market, improve customer's satisfaction and employee's loyalty, and growth in sales and profit effectively.

Like any research, our study has limitations. Also our data make cross-sectional comparisons possible, its setting (Malaysian Automobile). Like any sample focusing on only one country or one type of industry, all our observations are biased by their environment in terms of management and business cultures. A cross-national setting could increase the study is jeopardized by a lack of longitudinal insights. Our study is also limited by generalization of our findings and would offer deeper insights into cross-cultural differences in the role assigned to formal contracts and the way firms achieve cooperation in their strategic relationships. All of these limitations form an important agenda for future research. Due to lack of awareness on academic research the response rate in terms of the number of usable questionnaires, though sufficient, was not encouraging. This has become a major challenge to many researchers who conduct organization studies in Malaysia. In addition weak cooperative and responding from some companies was one of the limitations which faced by this research. Beside that the reluctance of some respondents to answer the research questions as if they believe that the information should remain confidential. Finally, due to time constraints, the types of knowledge transfer under investigation in this study were limited to tacit and explicit knowledge, and the tools of collecting and analysing data was pure quantitative. However for getting clear and deep understanding about this issue both of qualitative and quantitative data were necessary for conducting this research.

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