Impact of Strategic Knowledge Management and Technological Development Capabilities on Organizational Competency and Performance: A Case Study of Auto and Automotive Parts Manufacturing Industries in Thailand

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Abstract

This article aims to share a three-folded perspective as the key results of the case study in the auto and automotive parts manufacturing industries in Thailand. Firstly, it points to the roles and interrelations of the four capability factors of the enterprises concerning strategic technological capabilities, knowledge management capabilities, operation and production competency and organizational performance. Secondly, it draws up and shows an integrated model used for assessment of such capability factors and impacts on organizational competency and performance. Lastly, it refers to an investigation and illustration of some critical parameters and effects of these factors. A mixed approach has been

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deployed, encircling literature review and desk-study & field observations for construction of images of industrial organizations and clusters. A questionnaire of 78 items was designed for surveying. A quantitative analysis applying multiple software packages was carried out upon the sample of 105 cases of the industrial enterprises that responded. Some statistical tools comprising MS Excel, SPSS, AMOS and SmartPLS were implemented based on structural equation modelling. The results have statistically discovered some interrelationships between the conceptualized factors and components. Substantially, it finds tangible correlations between these organizational capabilities, particularly influencing organizational competency and performance.

Keywords: Strategic Knowledge and Technological Management Capabilities, Organizational Competency, Organizational Performance, Auto and Auto motive Parts Industries in Thailand

ผลกระทบของพหุปัจจัยด้านการจัดการความรู้และการพัฒนาเทคโนโลยีเชิงกลยุทธ์ ต่อการดำเนินงานและผลประกอบการ: กรณีศึกษาอุตสาหกรรมยานยนต์และชิ้นส่วนยานยนต์ ในประเทศไทย

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บทคัดย่อ

บทความนี้มุ่งเสนอองค์ความรู้ใน 3 ประเด็นหลัก ได้แก่ 1) ความสามารถการบริหารความรู้ ความสามารถการพัฒนาเทคโนโลยีเชิงกลยุทธ์ สมรรถนะการปฏิบัติการ และผลประกอบการของธุรกิจอุตสาหกรรมยานยนต์และชิ้นส่วนยานยนต์ในประเทศไทย 2) เสนอตัวแบบการประเมินปัจจัยและองค์ประกอบความสามารถขององค์การ และ 3) ผลการทดสอบความสัมพันธ์เชิงสาเหตุ และผลกระทบระหว่างองค์ประกอบ และปัจจัยเหล่านี้ อันเป็นวัตถุประสงค์หนึ่งของการวิจัยนี้ การใช้วิธีวิทยาแบบผสมผสาน ด้วยการทบทวนวรรณกรรม ติดตามสังเกตกลุ่มเป้าหมาย สืบค้นข้อมูลและวิเคราะห์เบื้องต้น สังเคราะห์จินตภาพการบริหารองค์การและการพัฒนาอุตสาหกรรม สร้างตัวแบบและเครื่องวัดประกอบด้วย 78 ข้อคำถาม ใช้เป็นแบบสำรวจกับผู้บริหารของวิสาหกิจ มีผู้ตอบรวมทั้งสิ้น 105 กิจการ ทำการวิเคราะห์โดยเทคนิควิธีและโปรแกรมทางสถิติต่าง ๆ ในการพิจารณารอบด้าน ทำให้ได้ข้อสรุปที่แสดงถึงความสัมพันธ์เชิงโครงสร้างของปัจจัยที่ศึกษาอย่างมีนัยสำคัญ

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เชิงประจักษ์ที่สามารถใช้เป็นแนวทางในการส่งเสริมและพัฒนาขีดความสามารถขององค์การ และอุตสาหกรรมโดยรวม รวมถึงประยุกต์ใช้เพื่อการศึกษาเพิ่มเติม และขยายใช้กับอุตสาหกรรมอื่น ๆ ต่อไป

คำสำคัญ: การบริหารความรู้และเทคโนโลยีเชิงกลยุทธ์ สมรรถนะการปฏิบัติการ ผลประกอบการ อุตสาหกรรมยานยนต์ และชิ้นส่วนยานยนต์ในประเทศไทย

Introduction

The roles and importance of the auto and automotive parts industries (A3PI) as well as their supporting and consequent industries have been the cores of Thailand industrialization and economic growth as strategic industrial clusters over decades. The A3PI has contained 12% of the country gross domestic products (GDP). In 2013 the industries productivity of 2.5 million vehicles and Thailand was ranked 1st of ASEAN's automotive production (Asawachintachit, 2014). Also, they were 9th of the world's production out of a total of 2.85 million capacity (BOI, 2015). They have been highlighted as areas of the region and global trade to which many makers have eyed Thailand as a hub for automotive component and part supply, and maintenance networks as well as centers of competence (TAI, 2012; Williams et al., 2016). Despite the incessant promotion policy and implementation, the fierce market dynamics due to enormous movements of technology, regional and worldwide economics agreements and the complex fluctuating crunches in Thailand, have pushed the small-and medium-sized enterprises (SMEs) into struggling situations.

This literature has partly investigated the past economic profiles of these industries. Especially, it has overviewed the years 2011-2014 by using data and information retrieved from the data warehouse of the Department of Business Development (DBD), Ministry of Commerce (MOC). The consequence uncovered converse distributions of the various-sized enterprises. As an overview, Figure 1 presents some interesting ratios and trends. In fact, the AAPI have involved many sectors, beyond this estimate, those that provide and support factors of inputs for their supply chains and those both up-stream and down-stream. However, according to Thailand Standard Industrial Classification (TSIC), they are grouped by types of businesses that were declared at registration. There were 355 large enterprises (18%) compared with 220 medium-sized (11%) and the 1,421 small-sized (71%). Over the period, these AAPIs had contributed approximately more than 2,864 billion Baht per annum. The double digit growth was recorded (17%). In contrast to the numbers of firms, the most business volume (96%) of the whole was backed by LEs where MEs had 3% only, and a very small of 1% was added by the SEs. In other words, the SMEs (82%) provided the least amounts (up to 4% only) compared with the LEs who possessed the most (96%) of the markets.

Moreover, the probe looked over such accomplishments from the perspectives of firms' profitability of outcomes with values such as cost-effectiveness, productivity and viabilities, as well as quality improvement. The market environment dynamics as such, were partial outcomes of and impacted by the locus organizations' capabilities. These are typically designated and observed upon the 'organizational performance'. Under such trends, it also found that the SEs had 7.14% profits yielded while the MEs and LEs gained 4.66% and 5.32% consecutively. Still, upon optionally assessing, the LEs had the highest remaining net profit, 9.07% as return on assets (ROA) when the MEs and SEs earned 5.85% and 3.62%, smaller consequently.

Objectives

Such an occurrence has attracted two key objectives to this case study. The first was to find and substantialize impacts of knowledge management capabilities and strategic technological capabilities on organizational competency of the enterprises in the auto and automotive parts industries in exploiting their proprietary knowledge, technology and managerial skills for operation and production. Secondly, it was to examine the influence of such capabilities and competency on organizational performance. Whereas, it was necessary to develop a framework and an instrument for performing an assessment and verification of certain relationships of interest, thus, many related works of literature in theory and industrial practices concerning these four stream concepts were collectively and thoroughly reviewed as well as observations in the field. Such research activities permitted conceptualizing and developing of tools for a quantitative investigation and analysis for overcoming these objectives.

Indeed, the research was assuming a substantial existence of influences, therefore explicitly, this paper did assess the connections between these organizational capabilities surrounding knowledge management capabilities (KMC), strategic technological capabilities (STC), organizational competency (OC) and organizational performance (OP).

Literature Review

At the beginning a lengthy review of literature was going on, meanwhile, it was slowly dripped on to a number of perspectives of the interest and led this proposition

to be studied. It incorporated four concepts gradually conceived from readings and observation. Such concepts concerned Knowledge Management Capabilities; Strategic Technological Capabilities; Organizational Competency; and Organizational Performance. They are briefly expressed in theory and practice, including a plausible impact of knowledge management capabilities and strategic technological capabilities on organizational competency and on organizational performance as well as a connection between the two conceived concepts, KMC and STC, that was assumed as a bi-directional relationship and as a back and forth *interplay interaction*.

The terms were aimed perceptively and sequentially. Also, this paper has certain views on an organization, including the organization's knowledge, activities, resources, capabilities, and management and knowledge management capabilities. An organization is a multidimensional matrix where its members have multiple cross relationships with one another, both functional or within business groups and either within or across borders. An organization's knowledge is a collective knowledge-base of strategic resources and intellectual assets (Sveiby, 1997; 2001a; 2001b; Knight, 1995; Wiig, 1997). It is conceived as an association and relating with organizational capabilities such as: knowledge-based activities as efforts to have efficient flows; deployment and capitalization of knowledge assets; effectiveness of team-based efforts in achieving the organizational goals; and outcomes of an integration and utilization of organizational knowledge (Grant, 1996; Kogut and Zander, 1992).

Knowledge Management Capabilities (KMC)

The term *"Knowledge Management Capabilities" (KMC)* is ostensibly recognized as an organization's outstanding capacities in incorporating and leveraging knowledge-based flow process activities and knowledge-embodied and embedded resources. Such activities include learning, acquiring, applying, transferring, developing or newly creating, and both intra- and inter- organizational relationships. The concept has become even more interesting for researchers and practitioners for examination and discussion over recent decades (Aujirapongpan et al., 2010a; 2010b; Chuang, 2004; Tseng & Lee, 2014; Gold, 2001). However, the proposition has been conceptualized and appreciated in various ways. Some have proposed investigation of knowledge management perspectives and comprehended linkages between them and organizational

performance (Collinson, 1999; Grant, 1996; Wong & Wong, 2011; Zaied, 2012). Others have entitled and proposed an integrated framework of this aspect. However, despite covering particular areas, none has yet overlaid a near to complete manifestation.

Similarly, many people have realized this is critical and needed for firms to build and raise their various core corporate's competencies i.e. in marketing and sales management, product life cycle management (PLM), operation and production including logistics and supply or value chains management (SCM), financial management (FIM), human resource management (HRM) & development (HRD) and corporate or enterprise relationship management (CRM) or (ERM). Nonetheless, this paper perceives corporate capability perspectives of the generic managerial skills as the firm's core strategy for successful operation i.e. profitability and growth. Management knowledge and skills are conceived underpinning corporate competencies and core capabilities (Leonard-Barton, 1995) in a multifaceted manor. It also believes that they are intentionally deployed in the multi disciplines of organization, at various levels and corners of individuals, groups or functions, and organizations as well as inter organizational applications.

Apparently, it recognized a missing demonstration in a holistic view of a firm's inherent strategies, knowledge and technological capabilities, operational competencies and organizational performance. Therefore, in this work, it was considering and taking implicitly into account corporate strategy and management of knowledge & technological knowhow for improving the enterprises' core business competency. By design, it is specifically limited in the practical areas around knowledge flow creation (KCR) and knowledge transfer capabilities (KTC). Also, it was altered to measure knowledge application efficiency on the enterprises' operation and production competency exploitation.

Strategic Technological Capabilities (STC)

The phrase strategic technological capabilities (STC) refers to effectiveness of the strategically integrated (Bracker, 1980; Grant, 1991; Ohmae, 1982; Nonaka, 1995; 2007) thoughtful implementation of knowledge transfer across an organizations' boarders in their networking activities and technological knowledge sharing or beneficial development from any manner of alliance. (Schilling, 2007; 2008). Knowledgeable leaders, executives and entrepreneurs should have been able to realize the complex

dynamics of their firms' environments (Porter, 1995; 1998a; 1998b; 2011; Certo & Peter, 1991; Daft, 2010) if they are fitting the current capabilities as assets (Ireland, Hitt, Camp & Sexton, 2001; Chakravarthy, 1982; Cole, 2004; Jones, 1995; Teece, Pisano & Shuen, 1997; Wiig, 1997). These are in order to adapt their technical task strategies (Zack, 1999). They ought to emphasize where and how to advance the designated knowhow or innovate their technology to be successful in the target marketplaces (Nonaka, 1994; Spender, 1996; Spender & Grant, 1996; Schilling, 2008).

Alternatively, this analysis indicates some of the supposed relevant activities which stimulate knowledge and technological transfer among participating industrial networks. These comprised of identifying, planning, participating, promoting, facilitating and recognizing knowledge networking and technological alliance.

Organizational Competency (OC)

In this research into organization and management, organizational competency (OC) is emphasized and represented in the bounded extent of practices in manufacturing production and operation. Indeed, it is to get the core technical tasks done effectively and in an efficient manner. It is typical to integrate and apply the multiple functions' and firm's knowledge-based and technology-embedded resources (Grant, 1996; Zander & Kogut, 1992; 1993; 1995; Stocchetti & Volpato, 2007). Those resources are, for instance, technical workforce, machinery, standardized workflow and process, software tools and systems as well as a cultured workplace and atmosphere (Schein, 1983; Cook & Yanow, 1993; Al-Alawi, Al-Marzooqi & Mohammed, 2007) to supply the customers internally and inter organizationally and partners the required quality, timely and competitive delivery of products and services. Also, it is anticipating as the outcomes of KMC and STC as strategic capabilities (Leonard-Barton, 1995), are exploited and leveraged to achieve the firm's specific and strategic goal.

Organizational Performance (OP)

The parameter of organizational performance (OP) was derived to determine the enterprises' growth and profitability for explicitly demonstrating their competitiveness (Chiamchittrong, 2010; Hatrawang, 2012). This report follows and adapts some indicators which are used typically in business and depending on the availability of data collected

from the desk-study and the survey. In this scope, the variables of growth dimension embraced changes in sales and revenue, market access and market share, and expansion of production facilities and operational assets. Intentionally evaluating firm's profitability, it took the typical financial indicators i.e. gross margin, earning before interested and tax (EBIT), operating profit, earning saving, and some returns.

Methodology

The research design and actual steps were semi-flexible and of a mixed-manner (Teddlie & Tashakkori, 2009). Literature reviews and observations were ongoing over the years 2013-2016 when qualitative enquiries were leading the processes. Several preliminary sketches were drawn due to a number of concepts were interested and contained until this conceptual framework shown as in Figure 2 was proposed together with the instrument.

This instrument comprised a total of 78 items arranged into 4 sections. The first section with 4 items was to know the respondent individual profiles-gender and age; experience; education; and managerial roles. The following section, comprising of 18 questions, asked for the firm's profiles and some spaces for specific data filling – numbers of employees; venture shareholding; register capital; years of operation; type of businesses; scopes of supply in the chains; categories of products; plant facilities; capacity; production technology; design and development capacity; production engineering capacity; quality perspectives; market and sales trends over past years (2012-2016); productivity and resource efficiency perspectives; stand of memberships; forms of organizational structures; business functions; and roles of corporate communication.

In the 3rd section, a 7-points ordinal scale was typically used for the 52 items investigating a PDCA (Plan-Do-Check-Action) systematically oriented managerial practice. There were 7 groups of questions, each was specifically involving: 1) *organizational performance growth, GTH* (6 items); 2) *strategic knowledge network, SKN* (7 items); 3) *strategic technological alliance, STA* (8 items); 4) *knowledge creation capabilities, KCR* (7 items); 5) *knowledge transfer capabilities, KTC* (8 items); 6) organizational competency (OP) in *technical quality (operation and production) improvement, TQI* (7 items); and 7) firm's intensiveness in planning, implementation and promotion for *resource*

efficiency improvement or REI (9 items). In total, 52 items were incorporated. Furthermore, detailed profiles were gathered after and against the lists compiled from various sources. Those were mostly taken from the DBD's data warehouse, however, they had been cross-checked with the key industrial and trade association membership information sources. In preparation for the quantitative survey, several sampling techniques were combined in a random semi-structural design for convenience.

A total of 1,264 distributions of the questionnaire were succeeded by post, most were emailed and some personally handed over at the workshops and the field events such as seminars and conferences as well as company visits. This data collection was undertaken during early May to late August 2017. Later, the data was prepared for a quantitative analysis by screening and cleaning of the 110 returned packages except all blank replies, either denying to participate or any uncompleted ones. Nonetheless, a total of 105 cases was screened and re-fulfilled and confirmed (where there was any missing answer). Therefore, all the 52 items were accomplished and ready to be combined for analysis. Thus, the applicable sample size was 105 cases or at an 8.31% response rate. Consequently, the related *profitability performance data or PRO*, of each responding firm was retrieved from the source database warehouse and administered seeking trends and ranking against the 7-point scale scenario.

The sample dataset was analyzed quantitatively by deploying a number of applications. In a series, it was scrutinized thoroughly through confirmatory factor analysis (CFA), measurement modelling and path structural equation modeling (SEM). In terms of tools, a spreadsheet product of Microsoft Excel, the IBM SPSS 21, AMOS Graphics 22 and the PLS (partial-least-squared) Smart PLS 3 were the major applications adopted in the analytical processes. The spreadsheet was used for data entry and simplifying the datasets, whereas, SPSS was variously conducted for descriptive and principle component analysis (PCA) of factors. These included calculation of average variance extracted (AVE), construct reliability, discriminant validity, correlations (r_{ij}) and associated power (r^2) as displayed in Table 1a and Table 1b. A graphical user interface package-AMOS which is a covariance based (CB) SEM was exploited to draw and test the preliminary default and alternative models in a CFA approach. Thus, a number of variables measured were extracted and reduced (Schreiber et al., 2006). As a result of using a CB-SEM, the analytical measurement model was formulated, in accordance with

Figure 2 given with .856 NFI (normed fit index).

From an analytical research framework, the study had taken SEM approach. It considered KMC and STC as the exogenous variables that may have somewhat of an effect on the endogenous variables i.e. OC and OP. Even though, this was set as the default frame, however, additional as well as alternative paths and models of numerous setups were tried and carried out. This is possible as of the advantage of the PLS software featured functions that is quite flexible to compute path coefficients, the strengths, for the searches and to validate the supposed linkages between the interested organizational and management capabilities concepts.

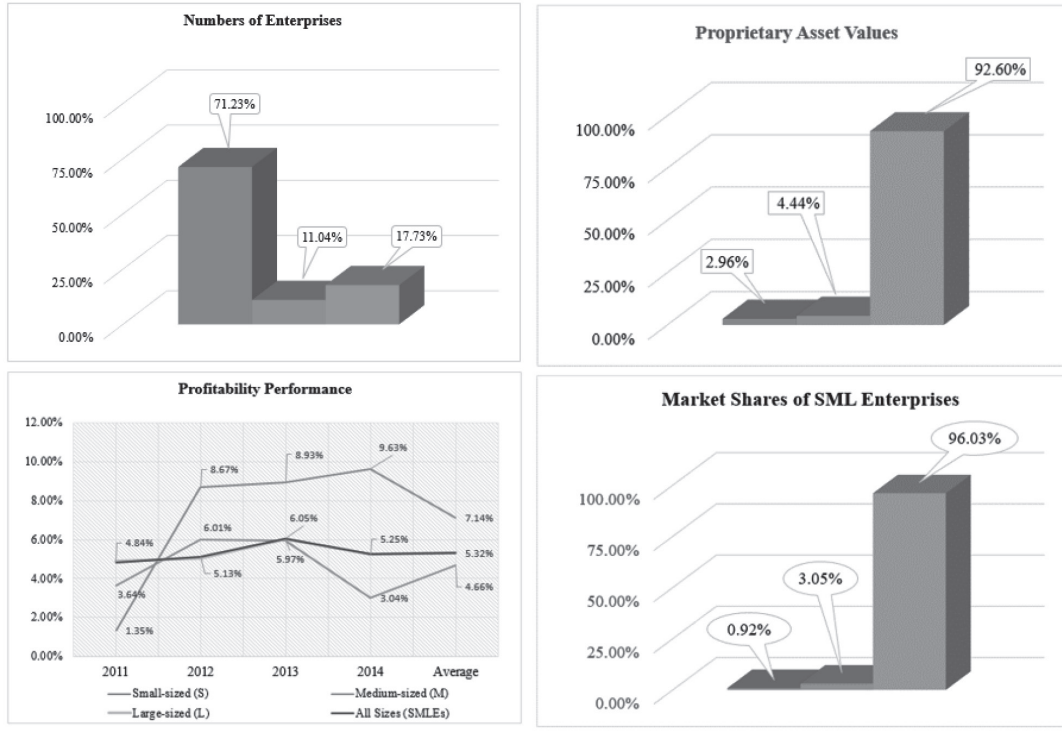

Figure 1: AAPI's Business Performance during 2011–2014

Source: Author's compliance (DBD, 2016-2017) adapted from Chomphuka, 2018, p. 9 and p. 349-350.

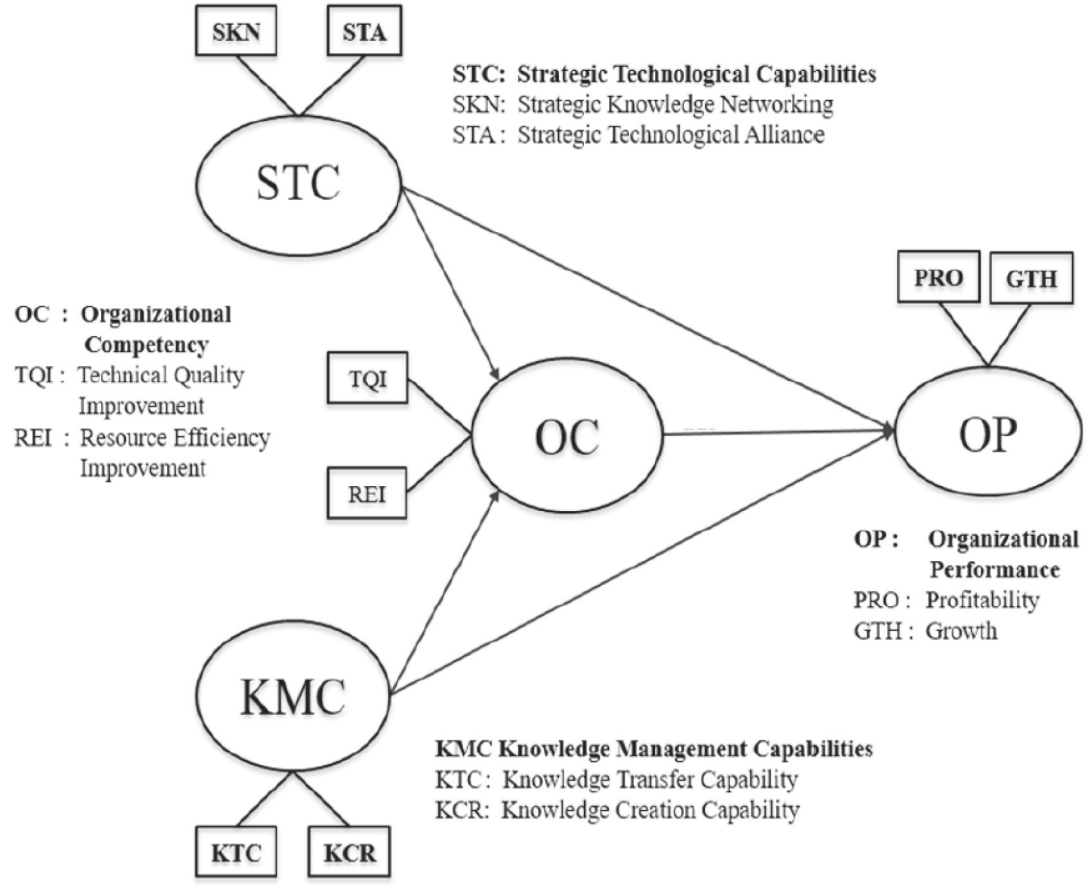

Figure 2: Research Framework

Source: Chomphuka, 2018, p. 115.

Table 1a: Factor Analysis – Distributions and Factor Loadings

Constructs	Factors	M	SD	Skewness	Kurtosis	(Li)	(Li^2)
STC	STA Applicability (FSTA1)	4.09	1.41	-0.36	-0.66	0.91	0.82
STC	STA Alliance (FSTA2)	3.51	2.00	-0.04	-1.40	0.61	0.37
STC	SKN Capital (FSKN1)	4.27	1.38	-0.27	-0.90	0.86	0.74
STC	SKN Enhancement (FSKN2)	4.15	1.50	-0.22	-0.67	0.84	0.71
KMC	KTC Development (FKTC1)	4.13	1.40	-0.31	-0.38	0.89	0.78
KMC	KTC Experiencing (FKTC2)	4.30	1.48	-0.39	-0.45	0.81	0.66
KMC	KCR Collaboration (FKCR1)	3.33	1.60	0.29	-0.80	0.89	0.78
KMC	KCR Infrastructure (FKCR2)	3.85	1.61	-0.08	-1.03	0.88	0.77
OC	REI Application (FREI1)	4.49	1.42	-0.37	-0.47	0.90	0.87
OC	REI Information System (FREI2)	4.91	1.46	-0.52	-0.51	0.87	0.75
OC	REI Sustainability (FREI3)	4.30	1.59	-0.40	-0.78	0.82	0.67
OC	TQI Management (FTQI1)	5.17	1.20	-0.74	0.19	0.87	0.76
OC	TQI Certification (FTQI2)	3.51	1.94	0.14	-1.14	0.53	0.28
OP	PRO Earning Profitability (FPRO)	4.36	1.26	-0.76	0.46	0.13	0.02
OP	GTH Return Growth (FGTH1)	4.33	1.53	-0.35	-0.90	0.75	0.56
OP	GTH Market Growth (FGTH2)	4.49	0.96	-0.44	1.38	0.87	0.72
OP	GTH Capacity Growth (FGTH3)	4.79	0.95	-0.45	1.39	0.78	0.60

Source: Author's analysis and compliance

Table 1b: Factor Analysis – Construct Reliability and Validity

Constructs	Number of Items	Reliability Cronbach's alpha	Validity AVE	Consistency CR	Corelation (r_{ij})			Squred Corelation (r_{ij}^2)		
					KMC	OC	OP	KMC	OC	OP
Strategic Technological Capabilities (STC)	4	0.84	0.66	0.88	0.98	0.75	0.36	0.97	0.56	0.13
Knowledge Management Capability (KMC)	4	0.92	0.75	0.92		0.74	0.35		0.55	0.12
Operational Competency (OC)	5	0.87	0.66	0.90			0.27			0.07
Organizational Performance (OP)	4	0.67	0.48	0.75						

Source: Author's analysis and compliance

In fact, application of partial-least-square (PLS) statistics techniques available in the software was brought in for the probes after surprising findings in the initial runs using a covariance-based (CB-SEM). In general, this technique is considered as very intensively developed and is extensively applied in research in several disciplines such as marketing, strategic management and information systems (Henseler, Hubona & Ray, 2016; Hair et al., 2012). This led to some extensive results (Amaro, Abrantes & Seabra, 2015) of the multi variate algorithms and the trials. Nonetheless, it was comprehended that PLS techniques, especially the robustness of this software, and founded more suitable with this sample at hand. Also, such PLS calculations were likely more flexible for the path

Table 2: Results of Factor Analysis – Standardized Regression Weights (r)

Factors (Latent Variables)		Constructs		r	r2
Strategic Technological Capabilities (STC)					
FSTA1	STA Application	<---	F1 STC	.873	763
FSTA2	STA Affiliate	<---	F1 STC	.532	.283
FSKN1	SKN Capital	<---	F1 STC	.913	.834
FSKN2	SKN Enhancement	<---	F1 STC	.857	.735
Knowledge Management Capabilities (KMC)					
FKCR2	KCR Collaboration	<---	F2 KMC	.906	.822
FKCR1	KCR Infrastructure	<---	F2 KMC	.913	.834
FKTC2	KTC Experiencing	<---	F2 KMC	.758	.574
FKTC1	KTC Development	<---	F2 KMC	.844	.712
Organizational Competency (OC)					
FTQI1	TQI Management	<---	F3 OC	.890	.792
FTQI2	TQI Project Initiative	<---	F3 OC	.487	.237
FREI1	REI Application	<---	F3 OC	.877	.770
FREI2	REI Information System	<---	F3 OC	.899	.808
FREI3	REI Sustainability	<---	F3 OC	.802	.644
Organizational Performance (OP)					
FGTH1	GTH Return Growth	<---	F4 OP	.754	.568
FGTH2	GTH Market Share Growth	<---	F4 OP	.826	.682
FGTH3	GTH Capacity Growth	<---	F4 OP	.796	.634
FPRO	PRO Profitability	<---	F4 OP	.140	.019

Note: AMOS 22 Estimates

analysis, detecting relationships between the latent variables, even though the distribution pattern may not be normal. This examination found a number of critical components that had influence on capability and competency constructs.

Actually, the probes were conducted numerously of SPSS for descriptive analysis and factor analysis to reduce the number of variables preparing for a path analysis based on CB-SEM AMOS and for a simple regression, and the SEM techniques of both AMOS and PLS. Seemingly, flexible functions of the algorithms in the PLS software were considered more suitable with the sample dataset at hands and simpler in drawings. Particularly, the robustness of the graphic tools allowed specific identification of coefficients of the SEM paths, together with the supporting probability (p) values as each parameter's significance (Vinzi, Chin, Henseler & Wang, 2010).

Results

Descriptively, the profiles of respondents were 72.7% male and 27.3% female, and, most of them were above 40 years old (73.5%). They also identified as having many years of experience. About 84.6% had have more than 10 years of experiences and 36.5% had above 20 years. Almost all (92.9%) have, at least, graduated with bachelor degrees and 40.4% hold masters degrees and above. Among 105 representatives, the most were top management positions i.e. entrepreneurs, executive directors/partners, managing directors and plant/factory manager (56%) and 23% were managers or department directors. These accounts gave a clear picture that the respondents were in high rank management positions and who have many years of insight and experience. Therefore, it should be assumed they were able to reflect the true views of the industries and be somewhat representative of their organizations doing the assessment and administration of the questionnaire.

Initially, the application of SPSS for principle component factor analysis and construction of a measurement model using CB-SEM AMOS signified quite strong measurement variable (MV) loadings, whereby the specific shots, both written as *OPC (operation and production competency)* and *OC (organizational competency)* were equivalent. Though there was remarkably weak loading of profitability (FPRO) i.e. the given 0.134, however, it was intentionally maintained in the model in order to point to its

firm performance. Therefore, in applying PLS algorithms for path analysis, almost all of the earlier composed factors (excepted FSKN1 and PRO) were consolidated. Only FPRO and FSKN1 were considerably represented by their critical indicators.

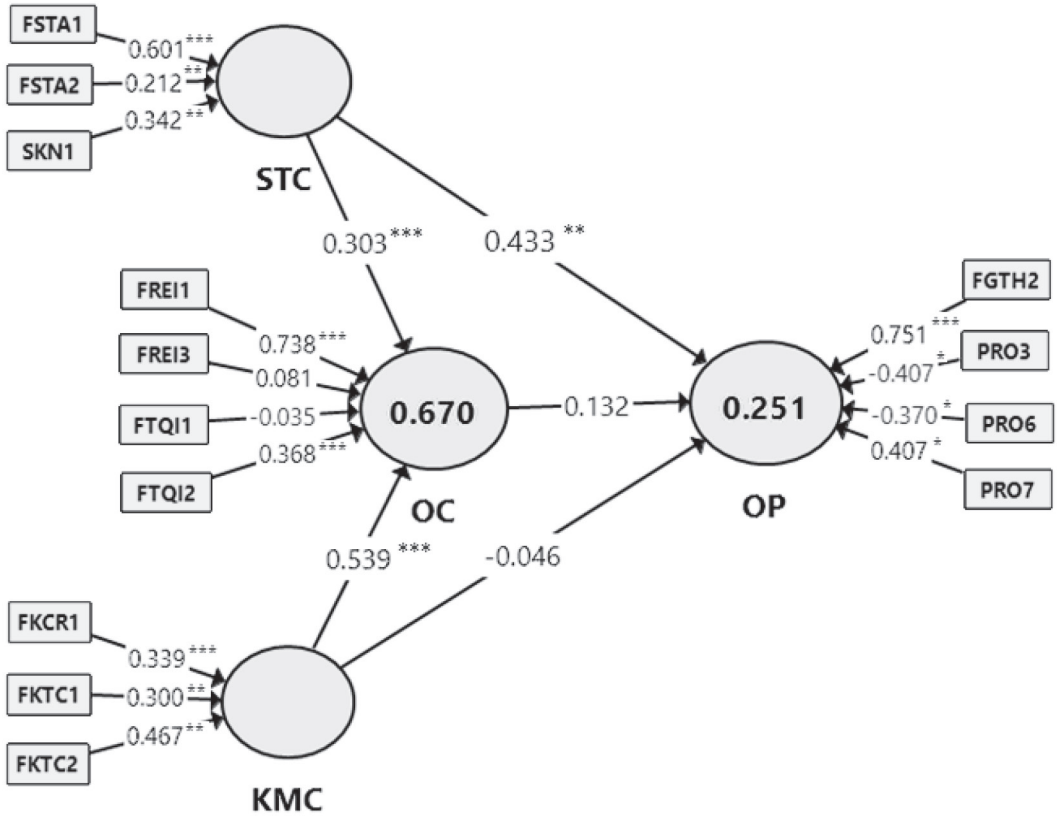

Figure 3: Analytical Results of Structured Equation Modelling and Tests of Hypotheses Model Fit Indices: SRMR 0.041***, chi square 78.476, NFI 0.912

Source: Adapted from Chomphuka, 2018, p. 405.

The consequences of the path relationships and certain attributes are exhibited in Figure 3 and Table 3 and demonstrate a statistical degrees of significance. These present most the effective parameter i.e. factor loadings and regression weights. In particular, this model (VB-SEM) outlines and consolidates all the four constructs of interest. It also identifies the *critical capability factors* at most and maintains the consistency with the proposed framework as well as the use of all the sample.

Table 3: Results of PLS-SEM Analysis of Measurement Model (Outer Model)

Outer Factor Loadings		Latent Variables or Constructs			
		STC	KMC	OC	OP
FSTA1	Strategic Technological Alliance	0.939***			
FSTA2	Decision Making (Alliance)	0.693***			
SKN1	Strategic Network Assessing	0.846***			
FKCR1	Knowledge Creation Infrastructure		0.888***		
FKTC1	Knowledge Network Development		0.905***		
FKTC2	Knowledge Experiencing		0.916***		
FREI1	Resource Efficiency Application			0.937***	
FREI3	Resource Efficiency Sustainability			0.777***	
FTQI1	Total Quality Management			0.745***	
FTQI2	Initiatives and Projects			0.739***	
FGTH2	Organizational Performance Growth				0.756***
PRO3	Gross Margin				-0.44**
PRO6	Current Asset Ratio				-0.374*
PRO7	Return on Capital				0.282*
Outer Factor Weights		**Latent Variables or Constructs**			
		STC	KMC	OC	OP
FSTA1	Strategic Technological Alliance	0.601***			
FSTA2	Decision Making (Alliance)	0.212*			
SKN1	Strategic Network Assessing	0.342**			
FKCR1	Knowledge Creation Infrastructure		0.339*		
FKTC1	Knowledge Network Development		0.300*		
FKTC2	Knowledge Experiencing		0.467**		
FREI1	Resource Efficiency Application			0.738***	
FREI3	Resource Efficiency Sustainability			0.081	
FTQI1	Total Quality Management			-0.035	
FTQI2	Initiatives and Projects			0.368***	
FGTH2	Organizational Performance Growth				0.751***
PRO3	Gross Margin				-0.407**
PRO6	Current Asset Ratio				-0.370*
PRO7	Return on Capital				0.407**

Remarks: '*', '**' and '***' refer to statistical significance (sig.) based on probability (p) value. '*' is given that $p < 0.05$, '**' and '***' are for $p < 0.01$ and $p < 0.001$ intensively significant.

Source: Author's compliance, adapted (parts equivalent) from Chomphuka, 2018, p. 210-213.

Apparently, Figure 3 was purposely structured in a formative measuring for all the conceptualized constructs. It gives three strongly supported paths and coefficients, on which the signs of: '*' or '**' or '***' were indicated of the impacts of the interested KMC and STC on OC and on OP, out of the five supposed to be significant. This was drawn to direct on how significantly each influence backed, however, such analytical proceeding was statistically based on the dataset of the overall sample (this set of 105 cases).

Considerably, this analytical SEM was based on the dataset, it apprehended the explicit model's goodness of fit of the model and this sample. Approximately, the most important fit indexes consist of the standardized root mean square residual (SRMR) of 0.041, chi-square (X^2) 78.476 and the normed fit index (NFI) at 0.912 point. Table 4 expresses the results of all direct and indirect effects of the postulated exogenous constructs upon the target organizational performance there in the organizational competency was perceptually mediating variables.

By visualization of such the results in association (Figure 3, Table 3 and Table 4), it can be inferred that the sample enterprises' organizational competency (OC) in terms of their technical quality improvement and resource efficiency improvement had got signified effects of their strategic technological capabilities (STC), shown as path coefficient (β) of 0.303 and p-value <0.001. Also, such OC was determined by their organizational knowledge management capabilities (KMC), even with higher influence, β = 0.539 ($p < 0.001$). Moreover, the organizational performance (OP) was influenced by their STC, significantly in 0.433 degree ($p < 0.01$).

Table 4: Organizational Capability Dimensions and Effects on Competency and Performance

Path Coefficients	Effect	OC	OP
KMC	DE	0.539***	-0.046
KMC -> OC -> OP	IE		0.071
	TE		0.025
STC	DE	0.303**	0.433
STC -> OC -> OP	IE		0.040
	TE		0.473***
OC	DE		0.132
	IE		0.000
	TE		0.132
	R^2	0.67***	0.251**

Remarks: '*', '**' and '***' refer to statistical significance (sig.) based on probability (p) value. '*' is given that $p < 0.05$, '**' and '***' are for $p < 0.01$ and $p < 0.001$ intensively significant.

Source: Adapted (parts equivalent) from Chomphuka, 2018, p. 219-220.

Additionally, extended alternatives as of several trials to evaluate the model in a more deep and broad manner, such as the configuration in Figure 4, aimed to validate each of the perceived relationships at the time or specifically refer to those path coefficients of the inner model in PLS words. It was assumed that 'strategic knowledge networking (SKN) capability' shall contribute certain degrees on 'strategic technological alliance (STA) capability' in and around a circumstance of STC. While for KMC, the endeavor and invention for development or creation of knowledge and knowhow (KCR), on the one hand, shall stimulate and raise the capacity and capability of the firm in sharing, circulating or transferring (KTC) such insights and skills enhancing accessibility and exploitability. Also, this should add up the intended values for the supply chains measured by improving quality (TQI), productivity and responsiveness as well as lowering the transactional costs, thereby improving resource-efficiency (REI).

The results as a whole, find concretely interrelating paths, as can be seen remarkably by the indicating symbol '*' significantly supported, p-value < 0.05. In more detail, Table 5 presents most key latent variables and the associated attributes/indicators/measurements. As can be seen (Figure 4 and Table 5) in detailed descriptions, the

enterprises' SKN capability had signified (β = 0.910*) STA capability that consequently had impact (β = 0.753*) on organizational TQI competency which was in a series affected their REI competency. At the same time, REI competency was signified by firms' KTC (β = 0.555*), whereas, their KCR had improved such attributes (β = 0.975*), outstandingly. In terms of ultimate outcome, the enterprises had their organizational performance, critically measured by profitability and growth in revenue and market share, affected or determined by their STC thru STA (β = 0.683*), REI (β = 0.077*) strengthened by TQI, and KCR (-0.084*). In sum, STC, KMC and OC associatively explained the enterprises favorable outcome in approximately 36.4% (0.364 point).

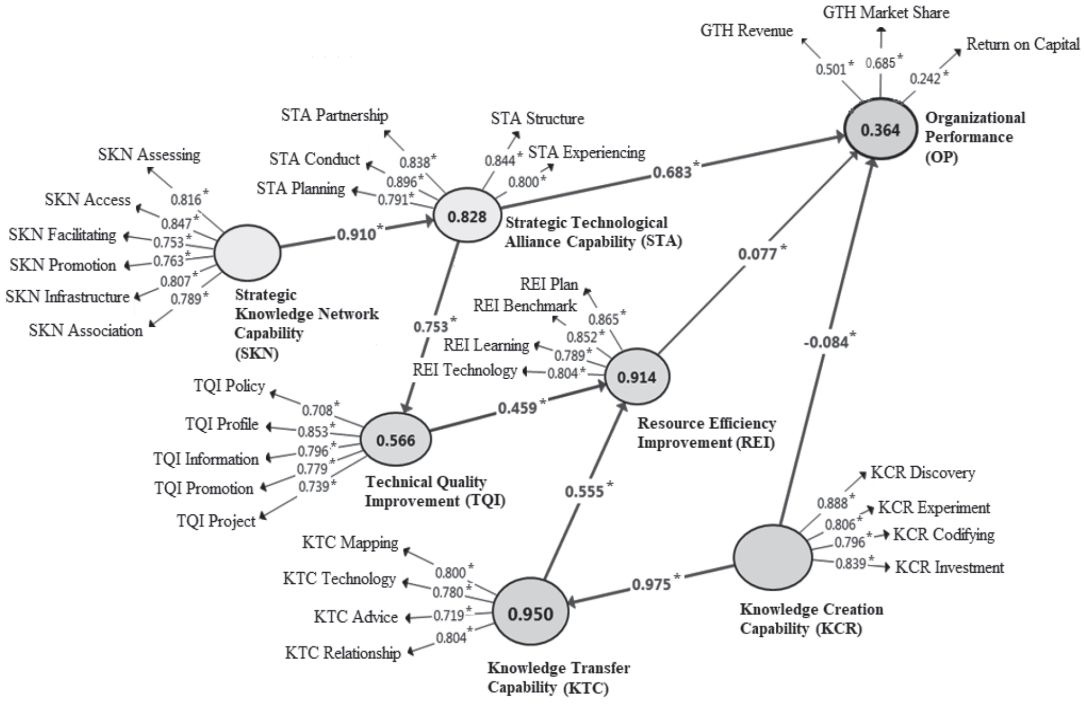

Figure 4: In-Depth Series of Latent Variables of Organizational Capabilities
Model Fit Indices: SRMR 0.073, chi square 890.332, NFI 0.724
Source: Adapted (parts equivalent) from Chomphuka, 2018, p. 439.

Also sometimes, it should be noted on a negative variance of OC and KMC on OP in some similar situations. Such the dynamic negative variances may relate to very low loadings and weights of factors indicating growth or GTH and PRO or profitability performance. In fact, there are conflicting indicators due to using marginal or +/- opposite tendency ratios. However, variances are also depending on several factors. While organizational growth (GTH) is measured using a questionnaire, all PRO profitable indicators are taken from a secondary database of the Department of Business Development (DBD). Obviously, most of the PRO scales have quite low weights on OP, however, some show criticality on OP. Assumingly, this is using several conflicting scale ratios which could not be proven explicitly under the limits of this study at the time.

Table 5: Analytical Results of Determining SEM Paths

IPMA Total Effecta (TE)	KTC	STA	TQI	REI	OP
SKN Strategic Knowledge Networking		0.910*	0.685	0.314	0.621
STA Strategic Technological Alliance			0.753*	0.345	0.683*
KCR Knowledge Creation Capabilities	0.975*			0.541	-0.084*
KTC Knowledge Transfer Capabilities				0.555*	0.043
TQI Technical Quality Improvement				0.459*	0.035
REI Resource Efficiency Improvement					0.077*

Remark: The symbol '*' represents significant level of probability, p-value < 0.05

Source: Author's compliance of results

Findings and Implication

Up to our knowledge, it has been rarely to locate any research that provides a comprehensive links of such the multiple-paradigms as in this organizational study. It has the intention to investigate and been able to verify the existence of impacts of the strategic knowledge and technological (development) capabilities, substantially, on an organizational competency and organization's performance, as depicted in Figure 4, noticeably. The KMC variables and constructs under this research were emphasized and considered in particulars as internal activities of creating, acquiring importing and tapping of knowledge in traditional ways. These are such as attending in some seminars, workshops and courses as well as learning and building skills and capacities outside of business hours. In the nearby so doing, the latent STC variables

have pointed on criticality of absorbing information, knowledge, and a far reaching technology through enterprises' relationships, networking, collaboration and some various platforms of understanding and contractual joint initiatives and ventures. Hence, realization of the close relationships between these KMC and STC on OC and OP, should lead the enterprises to have considerably effortful stimulation and reasonable investment in strategically aligned knowledge and technological networks and alliance initiatives and practices. These are to assure a higher quality work and to maximize resource efficiency in their operation and production, as the main sources and core of firms' competency and competitiveness in their target markets.

Empirically, this study provides a tangible view on the organizational management capabilities in connections between knowledge management capabilities, strategic technological capabilities, organizational competencies, and the impact on organizational performance of the auto and automotive parts industries. In particular, it adds a body of knowledge by identifying some critical indicators having directed to some comparable degrees of the enterprises' knowledge management capabilities (KMC) that was stressing on knowledge creation capabilities (KCR) and knowledge transfer capabilities (KTC), and the strategic & technological development capabilities (STC) which accentuated certain extents of knowledge networking (SKN) and alliance (STA). Furthermore, it append the viewpoints of STC in association with OC and OP, of the quantifiable gauges in these industries (and for any other), and highlighting on organizational and management capabilities in knowledge and technology development areas. It encircled the aspects of knowledge creation and knowledge transfer, technological development, and underlined how firm competency and performance may be impacted despite any influence of size.

In addition, it indicated the interrelationships between KM capabilities and STCs of the participating organizations as well as the influences on their organizational competency. A flexible sets of indicators and the proposed analytical framework of this study should encourage and allow the industrialists and scholars to take on and to adjust suitably with the contexts and conditions of the firms. Such selecting and reformulating of the relevant indicators and scales should be done with awareness of certain limits and precautions, in particular of using secondary source data for measuring some aspects in comparison with first-hand information. Thereby, a ratio scale is not inclined, instead,

it is to find any other direct measurement, or, to adopt the more clarity ones for the questions.

Similar, with reference to the target industries, fluctuations of business environments whether external or/and internal are matters and pressures the enterprises need to adapt for maintaining their strategies and competitiveness. As such the very minimal margins (Figure 1) and the tough delivery requirements (leading to an even imbalance of performance), and the various dynamic circumstances, there exists continuous injection of comprehensive industrial promotion schemes offered for the enterprises. These industries have flourishing over several decades. Even though, the large enterprises of the makers/assemblers and the tier-1, at most, have dominated and direct the technological trends, however, they do not do everything by themselves. Rather, they do need and must make much effort for development of their supply chains by collaboration and alliances. The makers of automobiles and motorcycles and their producers and suppliers along the chains may share the scope of work depending on the resources and expertise/competency of support they have, hands-in-hand with the lower and the higher tier-3, tier-2 and tier-1, and makers who supply materials, components and parts forward along the chains, the higher tiers and the auto makers and assemblers.

In order to have this research valuable as it can be so, an enterprise should have strategic intent for self-assessment to find and identify what and where its core (and required) knowledge is/are. These give opportunities the enterprise to gear improvement by either newly create and transfer or further develop based on the pre-existing knowledge within its supply/value chains and networks. In addition, it can take parts in any strategic networking and alliance to tap or exchange knowledge and technology with other organizations in the markets. The required improvement will be realized only when such enriched knowledge and/or technology are adapted and applied in its business process for improving quality and competitiveness. These will ultimately raise up a bar of its organizational performance, either growing revenue, market share or profitability, or overall.

Conclusion

This paper is established to present important roles of knowledge management capabilities, in particular of knowledge creation and transfer, strategic technological capabilities through knowledge networking and technological alliance. Both knowledge management capabilities such as the intra organizational orientation and strategic technological capabilities in the inter-organizational relation attentiveness, have been operatively determining improvement of organizational competency. The two main perspectives, in principles and in practice, in the field of this project were founded being extremely crucial in enabling the enterprises for improving their competency (managing manufacturing technical/total quality and resource efficiency), similarly to the other industries of production and operation manners. However, it is applicable and can be suitable for many others, not only the auto and automotive parts industries of Thailand. It also can be used for organization and policy implementation impact assessment, both for the enterprises and for the policy makers and implementers as a monitoring and evaluation of project/program outcomes and impacts at varying levels and scopes. However, these have to be adjusted appropriately to suit the desirable approach.

Theoretically and in practice, knowledge management capabilities and technological development capabilities are of the utmost importance for an enterprise's abilities, competencies and its overall performance, however, not only these particular knowledge and technological-based views, but, also many other perspectives that have somehow contributed partly to the firm's economic performance, in general.

Recommendations for Future Study

This paper expects, should any future research, researchers to pay attention on alternative methodology and selection of sectors. Certain measurements or indicators should be reviewed and adjusted purposively as well as sampling if it is to be in different sectors. Familiarity with research tools/programs seems quite substantial to prepare one-self and have good will for handling some specific limits of modeling, data and analysis process. However, it is encouraging for extension to cover some other perspectives such as leadership traits, cultural aspects or some more dimensions of organizational learning and connections. Exploration and distinguishing in comparison in different industries may be also valuable.

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