

Effect of Supply Chain Cultural Competence on Thai SMEs Performance with Mediating Role of Supply Chain Technology

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Abstract- Performance is a key indicator for the survival of any business. Organizational culture must have strong liaison with the goals of organizations because it has direct association with organizational performance. Therefore, the core objective of this study was to investigate the influence of supply chain cultural capabilities on the performance of Thai SMEs with the mediation role of supply chain technology adoption. To achieve the objective of this study, the data was collected from the managers of SMEs by using survey questioner approach. Smart-PLS was used to test the hypotheses and analysis of data. Findings of contemporary study highlighted that supply chain cultural capabilities have significant positive influence on the performance of SMEs in Thailand. Furthermore, results indicated that supply chain technology adoption could increase the performance of organizations. Results of this research illuminated that Adaptability and consistency in organizational cultural support in the adoption of supply chain technology and supply chain technology boost up the performance of organization. This research offer new empirical indication that supply chain cultural capabilities are significant for the performance of SMEs in developing countries like Thailand. Though, this research used only cultural capabilities, the other important capabilities of supply chain such as supply chain technological capabilities, would be used in future research.

Keywords; Supply Chain cultural capabilities, performance, SMEs, Supply chain technology.

1. Introduction

Nowadays, Supply chain management (SCM) is a critical factor for firms to sustain competitive edge and profitability [1, 108-109]. Consequently, the concept gained wide attention of managers as well as researchers by considering it a significant perspective. Interest of researchers significantly increased in the topic over the last decade. Resultantly, researchers conducted a wide range of studies particularly associated with the different perspectives of supply chain such as supplier decision [2], supplier participation [3], supplier associations [4], and supplier management [5]. Supply chain management

activities and practices are included the primary aim of enhancing sustainable competitive advantage of a firm. Furthermore, SCM not only have focus on the coordination of activities inside the firm but also emphasis on external integration with suppliers, producers, customers and other and remaining supply chain partners [6]. Moreover, SCM integrate all the activities associated with the planning, managing, financing, purchasing, transforming and all transportation activities along with the cooperation and collaboration with network participants [7].

Performance of firm is a collective impression that indicates the operational performance subject to a company. More specifically, it indicated the success of a firm regarding achievement of its monetary and market targets [1]. Objectives of SCM can be categorized as short-term and long-term objectives. Short-term objectives include reduction in stock, productivity enhancement, reduction in processing time and services. However, long-term aims of SCM are profitability increment, entry into new markets, bettering quality and prominent growth in market share regarding all aspects of supply chain [8]. According to the study of [9], to obtain highest possible performance, it is necessary for a business to integrate supply chain operations with the financial standings. Resultantly, a firm with better measurement of economic and operations outputs, it will be in better position to improve fiancé and operations. Hence, to study the association of Supply Chain Cultural Competence with performance of firms is the matter of greater significance. Firm performance generally includes actual and estimated sales, operative expenses, varying cost of production to product, logistics cost of raw resources and completed goods and actual and estimated profits.

Firms hold diverse competencies and capabilities that lead to competitive advantage which are costly and difficult for competitors to apply and imitate [10]. In the contemporary globalized market, firms are required to focus on four competitive elements necessary for gaining competitive edge that are price, quality, efficiency, and flexibility [11]. Additionally, firm's cultural competence in supply chain is the factor of greater importance for performance of the firm [12, 13]. From the aforementioned, definitely the supply chain organizational culture capability has the ability to influence and give impact to firm's performance. Organizational culture been proved to be factor of greater importance for organization's performance since numerous years.

In general, it is perceived that organizational culture must have strong liaison with the goals of organizations because it has direct association with organizational success and failure [14, 15]. S[5] proved positive association of organizational culture with its performance. Specifically, greater flexibility [16] and improved receptiveness of world-wide SCM has positive association with organizational culture [17]. The study of [18] and [19] in the context of Malaysian SMEs, found significant impact of organizational culture on supply chain performance. Additionally, Braunscheidel and Suresh [20] conducted study from 218 supply chain professionals registered with the New York's Institute of Supply Management (ISM) and concluded that organizational culture has significant impact on supply chain performance. Besides, the organizations must have the ability of providing high quality and innovative products to market at a rapid pace consistently [21].

Besides, organizational culture technological and administrative innovations are associated with supply chain operational management. Several studies found that innovativeness in the supply chain produce benefits for firm's performance [22, 23], such as improved flexibility reduced labour cost and inventory cost [24]. Furthermore, the involvement of employees to participate in related job functions significantly affected the supply chain performance [25, 26]. The study of [27] revealed that organizational involvement was important in improving supply chain responsiveness, since it can identify gaps in organizational capabilities. Therefore, it is difficult for organizations to achieved desired performance without complete involvement of employees [28].

Firms' performance depends on many factors such as involvement of employees and suppliers, consistency and adaptability. Moreover, Supply chain technology adoption is also compulsory for performance of the firms. However, according to the best knowledge of researcher, these factors received a little attention in literature. This study intended to examine the influence of supply chain organizational cultural capabilities on the performance of manufacturing firms of Thailand with mediating role of Supply chain technology adoption. Hence, the area still needs to be investigated as it has less empirical studies specifically that examine the cultural capabilities and supply chain technology adoption.

2. Literature Review

2.1. Organization Cultural Capability

Generally, culture is defined as the combination of the language, behaviours, beliefs, rituals, rules, institutions, and practices that characterize a society [29]. Organizational culture has been widely studied by anthropologists and other organizational researchers since the early 1980s [30]. [31] explained organizational culture as a collectiveness of integrated settlements and identifications about organizational operations. It can also be generally defined as a set of behaviour and actions of employees who work in an organization where it affects the way in which people and groups interact with each other [32]. While, the characteristics of culture can be described as staffing, training, compensation, evaluation

[33], common values, attitudes, assumptions and beliefs of employees in the organization [34].

In short, organizational culture capability can be understood as the way of employees think that how they should do. [35] found that organizational cultures can be valued as flexibility, adaptability, consistency, and direction. While, [36] found that organizational cultural characteristics can be categorized in 54 items that include the selected dimensions of organizational culture, namely, involvement, adaptability and consistency. Organizational innovativeness is vital to be sustained within the uncertainty market. However, existing studies tend to focus only on a few dimensions of organizational culture and innovativeness rare to be considered [37]. Employees are the key to success for an organization. Therefore, organizations have to employ the right people to the right position to performing the right job [38].

Organizational involvement can be defined as the act of employees takes part or participates in organizational activities. It is supported by [39] and [40], who argued that organizational involvement also represents the degree of strategic integration of internal resources and communication across different departments into a particular project to ensure achievement of time efficiency and cost effectiveness. The frequent connections with other departments enable effective communications and results in process simplification. Referring to the argument of [41], organizational involvement in their opinion means the resources such as capabilities, investment, information, knowledge, and ideas that employees provide to the tasks and the responsibilities they assume for the benefit of an organization.

The concept of consistency is also an important dimension of organization culture because it is the backbone of numerous influential theories such as social psychology and personality theories [42]. Westerners viewed themselves consistent among the different aspects of identity, while East Asian viewed themselves as multiple selves. However, there is believed that consistent persons received positive social evaluations from others [43]. Previous culture research has focused on examined the consistency of self-descriptions across contexts and multiple self-dimensions [32]. The result of [32] showed that East Asians' relatively lack of consistency in the self-concept at the global level. Moreover, adaptability refers to the ability of the organization to reshape supply chains to cope with changed environment. The adaptabilities of supply chains are mostly dependent on the ability of information systems to assess market changes and guidelines for users to take appropriate actions. For the executives' perception, adaptive expertise is focused on the aspects of resourceful and constructive when solving problems [44].

2.2. The Relationship between Organizational Culture Competence and Supply Chain Technology Adoption

Limited studies are available on the impacts of organization culture in the supply chain technology adoption literatures [18, 35]. However, previous studies demonstrated that the organizational culture is considered as a prominent factor for supply chain technology

adoption [35, 45, 46]. [47] found that culture affects usefulness of technology. Moreover, [48] argued that culture affects the use of supply chain technology. Specifically, numerous studies in organizational culture indicate that organizational culture has significant effect on supply chain technology adoption [49, 50], advanced manufacturing technology adoptions [19], common technology adoption [51], cellular manufacturing practices [52] and real time manufacturing practices [53].

Employees involvement has not been thoroughly studied as enabler of technology adoption [19]. Accordingly, organizations ought to be given special attention to enhance employee involvement in adopting supply chain technology as a strategic tool. In today's globalizing society, the use of technology is crucial for firm to obtained greater harmonisation among the various linkages in the supply chain. Several researchers highlighted the contribution of employee involvement in the success of supply chain technology adoption such as the adoption of RFID [54]. [55] noted that top management involvement also has significant relationship with the supply chain technology success level. These showed that the intra-organizational involvements are crucially important, nevertheless, the inter-organizational involvements are equally important for an organization in successful implementation of technology. However, lack of employee's involvement is one of the critical failure factors for supply chain technology adoption [56, 57].

In diffusion of innovation theory, formalization is referred to the working culture of employees in an organization, whether they follow the organization rules and working procedures [58]. In current study, one of the dimensions which is known as "consistency" has the similar meaning of formalization and they are measuring the similar constructs. This reveals that consistency significantly and positively influences the supply chain technology adoption. In addition, cultural adaptabilities between two parties or adaptability to the new work practices are required to achieve successful adoption of a supply chain technology [59, 60]. The study of [61] discovered that organizational culture towards organization acceptance of change is a critical antecedent of innovation. Innovation factor is one of the most common factors that have a relationship with supply chain technology adoption. [62] added that employees' resistance to change at the operational level able to affect the adoption process. The innovativeness of personnel in the domain of technology has significant positive relationship with the use of new technology. It means that innovativeness has the ability to give impact to supply chain technology adoption such as the adoption of e-commerce [63]. This is supported by the results of [64] who found that employee's innovativeness in the domain of IT positively influence the adoption process. The operational benefit is an important factor for organization to make consideration on the adoption of e-commerce in business operation. However, the study of [65] is inconsistent with the findings of Webb [63], who argued that innovation attributes have no impact on e-commerce adoption. Hence, this study proposes the following hypothesis.

H1. Adaptability has a significant positive influence on Supply Chain Technology Adoption.

H2. Consistency has a significant positive influence on Supply Chain Technology Adoption.

H3. Involvement has a significant positive influence on Supply Chain Technology Adoption.

2.4. Supply Chain Technology Adoption and Supply Performance of the firms

Nowadays, the concept of supply chain technology gaining wide attention of researchers globally and considered as an important driver of competitive advantage. In spite of the fact that several studies conducted in past twenty years, direction of relationship between supply chain technology adoption and supply chain performance remained varied. However, still an on-going discussion is prevailed regarding the direction of association between variables [66]. Performance of organizations regarding adoption of supply chain technology has become the topic of greater attention in last some years [67]. [68] argued that improvement in supply chain capability may results in higher performance. However, kind of technology adopted is important for the success of organization. Concluding, alone technology is not the factor of influence regarding performance. However, combined effect may be realized in the case where supply chain technology extensively improved and adopted [69].

In the era of advanced technology, the utilization of supply chain technology would allow long term survival for textile and apparel organizations [68]. The adoption of new technology is often linked with the destruction of existing or obsolete technology. The new technology not only directly showed results in optimal production costs, but also indirectly add value for human and organizational capital [70]. By having the power of supply chain technology, supply chain must be rapid, innovative, and flexible in response to gain profitability, competitive advantage, and core competencies [71]. The literature illustrates that technological innovation is the greatest strategy effort for firms to be competitive [59], especially logistics firms that wish to improve organizational and supply chain performance [72].

The supply chain technology acceptance provides numerous benefits for organizations. Many of the studies found that technology adoption in supply chain leads to functional benefits, reduce costs, improve reliability [73], reduce inventory cost, improve flexibility [49] and enhance agility [22, 23, 50]. Moreover, it increase responsiveness [74], provide support for management, improve services for customers, reduce functioning costs, generate competitive edge [75, 76], diminish bullwhip effect, decrease stocks, complete activities with efficiency [73, 76], lower cycle times, better transaction efficiency, Smith, & Smith, 2013), and provide greater market transparency [77, 78]. B2B technology adoption results in better performance by reducing operational and procurement costs [79]. Moreover, e-commerce and communication technology lead to increase promptness in the supply process [80], responsiveness and flexibility [5]. It is prominent that supply chain technology improvement enhances supply chain performance [81]. Though, these

benefits and incentives can be temporary [67]. Use of different applications may result in different results even using same technologies [23].

In SCM, the information plays a key role in the supply chains coordination and performance enhancement. Therefore, the true adoption of supply chain technology is the way to enhance a firm's supply chain performance [82, 83] and support some of their operations [84]. The study of [85] points out that advance technology leads to modern manufacturing facilities and efficiently improved production processes with maximize the inherent advantages. In Vietnam apparel industry, the growth of the performance is mostly depended on the supply chain technology [85]. For those firms that are unable to invest in technology would lose competitiveness in quick response to market changing and in the reduction of production costs [86].

Thus, a successful business operation is not only equipped with computers and the Internet, but also supply chain technology adoption. The organizations gain competitive advantage through technology adoption that is exclusive and competitors find it costly and hard to be imitated [87]. Manufacturing industries are far behind in comparison with the services industries in terms of the adaptation of new technology, the partially reason is the flexibility and cost of the adaptation. Supply chain technologies supported by chain leaders in their supply networks are now universal. Firms like Dell, Wal-Mart, Seven-Eleven, Toyota, Saturn, Cisco, Ford, Chrysler, and Charles Schwab have utilized their supply networks to become leaders in respective businesses industry [88]. The adoption of e-commerce has achieved visible improvements in value chain activities, which increased revenues and operational efficiency. The finding of [85] study identified that the technologies in supply chain have positive association with supply chain performance, especially improving the efficiency in textile manufacturing production processes. These are supported by the study of [89] which indicates that the supply chain technology adoption able to improve the standard of communication and information technology.

The advent of advance supply chain technology and strong worldwide competition has attracted numerous multinational producers and service providers for adoption of an integrated strategic model in SCM [90]. Nowadays, integration of supply activities and supply chain technology adoption becomes competitive necessities in most of the industries such as manufacturing, service, finance, retail or wholesaler, hotel, and health care [14, 77, 91]. [92] founds that implementation of supply chain practices enable the retailer to improve the performance of supplier, inventory, distribution, forecasting, plan, and sales. Particularly, this enables the organizations to extend its supply chain such as information sharing to upstream suppliers and downstream customers [93]. While, [94] studied the adoption of supply chain technologies in small retails. The analysis revealed that CRM technology offered a better opportunity to strategically understand customers. In addition, a case study of [95] found a significant improvement on operational performance immediately after the adoption of technology. Thus, there are many companies such as Cisco, Ford, Dell, General

Electric, and China's logistics service providers that have started to pay attention on adoption of more efficient supply chain technologies, because they believed that supply chain technologies able to bring them benefits such as accurate, timely, accessible, and adequate information sharing throughout the supply network [96].

The study of [97] indicated that the technology advancement is necessitated in every facet of the business. Therefore, the adoption of new technology for harmonisation in business process is needed to hold market share and to improve market penetration. Supply chain technology adoption enables firm to transfer more accurate and real time information visibly such as demand and inventory levels. This is aligned with the study of [98] who found supply chain technology applications have direct effects on supply chain responsiveness as well as speed and flexibility. Therefore, in order to achieve a smooth information, material, and financial flow along the supply chain, the suitable supply chain application of information system such as web-based information is critically important to reduce communication barriers and improve supplier or customer profiling.

The study proves that many organizations are adopting new supply chain technology to achieve improvement in performance to automate the internal and external processes of the organization [99]. Specifically, it is supported by the study of [100] that the utilization of technology in operations can influence the delivery, quality, flexibility and cost. In fact, the greater business value can be achieved through selecting the correct technology at the right time and the well managed adoption. [101], stated that fast moving pace of every elements of business is essential to avoid competitiveness lost in the industry. However, operational improvements are time consuming due to learning effects. Therefore, it is important for organization to make informed decisions while adopting the technology, otherwise, the result can be absolutely negative, especially in the case of the SMEs [95, 96]. However, supply chain technology does not impact on the performance of the firms in similar ways [87]. Some firms admitted that supply chain technology remained in effective for supply chain performance. While, the research of [12] indicated that adoption of supply chain technology has insignificant association with the supply chain performance. Consequently, technology adoptions in supply chain and supply chain performance are significantly required to be investigated. Hence, this study proposes the following hypothesis.

- H4.** Supply Chain Technology adoption has significant positive influence on the Performance of SMEs.
- H5.** Supply Chain Technology adoption has significant mediating effect between the relationship of Adaptability and Performance of SMEs.
- H6.** Supply Chain Technology adoption has significant mediating effect between the relationship of Consistency and Performance of SMEs.
- H7.** Supply Chain Technology adoption has significant mediating effect between the relationship of Involvement and Performance of SMEs.

3. Research Framework:

This section of the study presents the proposed framework of the study.

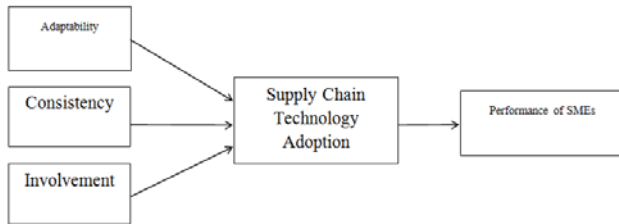


Figure 1. Proposed research framework

4. Methodology

Current study carried out quantitative approach of research to inquiry the proposed relationship among independent and dependent constructs. The intent of this study is to examine the relationship of Supply Chain Cultural Competence and adoption of supply chain technology towards the performance of Thai SMEs. Since the research applied a quantitative research approach in conducting the research, the instrument was survey questionnaires.

In social sciences, survey is the most commonly used method for empirical research [102]. The survey method is employed in this study because it encompasses the broader population study or larger sample size [103]. Nowadays, web-based or online survey becomes more popular in survey method due to it provide short response time. However, both traditional and web-based surveys are used by the researcher in this study.

5. Instrument Development:

This section discusses the design of the questionnaire, structure of the questionnaire, and measurement scale used in the questionnaire. Structure of the questionnaire describes the construct of the questionnaire and dimensions of each variable as well as the corresponding source for the items. In a survey questionnaire all questions were closed-ended. The items used to measure the variables were adapted from the previous studied. Scale for Supply Chain Cultural Competence was adapted from the study of [104], items for supply chain technology were adapted from the study of [22], and items for organizational performance were adapted from [105]. There are four sections available in the questionnaire. Respondent profile in the first section, and follow by organizational performance, supply chain technology adoption in third section, Supply Chain Cultural Competence was in the last section.

6. Analysis and Discussion:

SMART-PLS was used for data analysis purpose and data analysis was comprises on two parts. Frist part of data analysis was investigated "Reliability and validity" of data through measurement model while, second part consists on hypotheses testing through structural equation model.

7. Measurement Model Assessment:

The section examine the "reliability and validity" of all construct.

7.1. Reliability and Validity Assessments:

Constructs' "reliability and validity" was measure through the assessment of measurement model by using PLS statistical software. For the examination of reliability, the values cronbach's alpha, and Composite Reliability (CR) was used [106], and for the validity square root of AVE was used. The threshold values for cronbach's alpha and CR should be grater then 0.70 according the recommendations of [106].

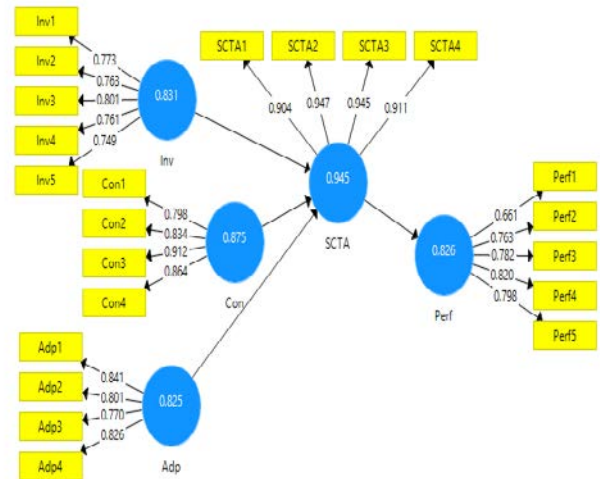


Figure 2. Measurement Model Assessment

Table 1. Cronbach's alpha and CR:

Sr#	Constructs	Cronbach's alpha	CR
1	Adap	0.825	0.884
2	Cons	0.875	0.914
3	Invol	0.831	0.879
4	Perf	0.826	0.876
5	SCT	0.945	0.961

Table 2. Discriminant Validity

Sr#	Const	1	2	3	4	5
1	Adap	0.810				
2	Cons	0.582	0.853			
3	Invol	0.778	0.537	0.769		
4	Perf	0.674	0.457	0.695	0.767	
5	SCT	0.503	0.471	0.405	0.363	0.927

8. Structural Model:

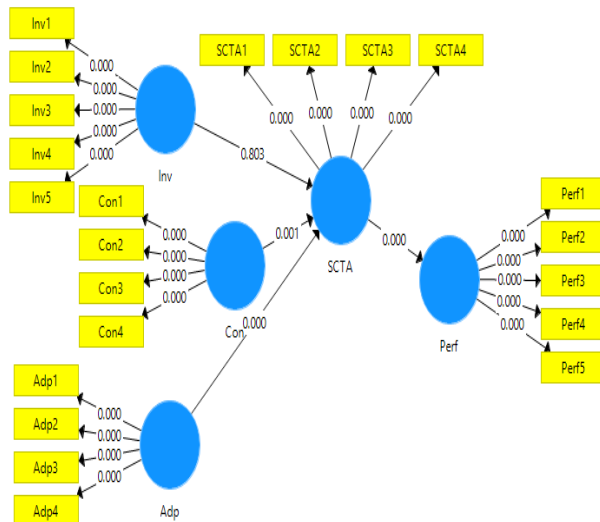


Figure 3. Structural Model Assessment

Table 3. Structural Model Assessment (Direct Results)

	(β)	STD	t-value	Pvalue
Adp -> SCTA	0.362	0.093	3.881	0.000
Con -> SCTA	0.273	0.080	3.427	0.001
Inv -> SCTA	-0.023	0.091	0.249	0.803
SCTA -> Perf	0.363	0.061	5.910	0.000

Structure model applied to estimate the hypotheses of current study. Findings of this study shows that Adaptability and consistency have positive significant relationship with supply chain technology adoption with t-value, 3.881 and 3.427 respectively. Meanwhile, involvement had no relationship with supply chain technology adoption. Moreover, Supply chain technology adoption also has positive influence on performance of SMEs. Hence, these results supported H1, H2, and H4.

Table 4. Structural Model Assessment (Indirect Results)

	(β)	STD	t-value	p-value
Adp -> SCTA -> Perf	0.131	0.045	2.894	0.004
Con -> SCTA -> Perf	0.099	0.035	2.845	0.005
Inv -> SCTA -> Perf	-0.008	0.035	0.236	0.814

Table 4 shows the results of mediation effect. Results found that supply chain technology adoption has mediation effect between adaptability and performance of SMEs. Moreover, supply chain technology adoption has also mediation effect between consistency and performance of SMEs. However, supply chain technology adoption has no mediation effect between involvement and performance of SMEs.

9. Conclusion

Performance of any organization is a key indicator for the survival of any business. The main purpose of this research was to investigate the effect of supply chain cultural capabilities on the performance of Thai SMEs. To attain the objective of this study, quantitative approach of research was carried out and survey questioner was used to gather the data from managers of SMEs. The results of this research highlighted that implementation of supply chain cultural capabilities and supply chain technology has a curial role on the performance of SMEs in Thailand. These findings are consistent with the results of [107]. These results show that Thai SMEs should implement supply chain cultural capabilities.

Moreover, Findings also indicate that supply chain cultural capabilities are important for the adoption of supply chain technology. Supply chain technology has positive significant effect on the performance of Thai SMEs. Even though the findings of this study indicated that supply chain cultural capabilities and supply chain technology adoption are imperative for the performance SMEs in Thailand. But this study only cultural capabilities, the other important capabilities of supply chain such as supply chain technological capabilities, would be used in future research.

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