

A COMPARATIVE STUDY ON SCM PRACTICES: THAI SMALL, MEDIUM AND LARGE ENTERPRISES

Therakorn Yardpaga, Dongping Song, Phil Megicks

*School of Management, Plymouth Business School, Plymouth University, Plymouth, United Kingdom
E-Mail: therakorn.yardpaga@plymouth.ac.uk*

ABSTRACT

Purpose: The purpose of this paper is to present the result of a study that investigates current supply chain management (SCM) practices and performances benchmarking among Thai Small, Medium and Large Enterprises.

Design/methodology/approach: Survey data was collected from 166 companies with 50 or fewer employees, 145 companies with 51 – 200 employees, and 98 companies with more than 200 employees.

Findings: Research on SCM practices in Thai SMEs was rare indeed. The outcome of study shows that overall perception of SCM between Thai SMEs and LEs has little difference. Both of them concentrated on relationship management as the first priority. Whilst LEs focused on manufacturing flow as the next, SMEs preferred product development and commercialisation.

Research Impact: In order to investigate the effectiveness of SCM implementation between SMEs and LEs; literature reviews and semi-structure interviews have been conducted with antecedents and consequences to SCM. Then SCM practices model is conceptualised including five-dimensional constructs. Although the model is developed in the context of Thai SMEs, the overall framework is generic and can be generalized to other developing countries.

Originality/Value: The result from research offers a number of managerial implications to Thai SMEs, e.g. (1) better comprehension of perception in SCM practices and its antecedents and consequence between SMEs and LEs, (2) an appropriate framework to implement SCM practices in Thai SMEs, which may improve their competitive performance that would directly result in sustainable growth of Thai economy.

Keywords: Supply chain management, SMEs, Thailand

Paper Type: Research paper

Introduction

The supply chain management contains a concept of direct extended coordination of operations across the entire supply process (Skjott-Larsen et al., 2007, Christopher, 2011, Harrison and Hoek, 2011, Sweeney, 2009). It is acclaimed as source of competitive advantage (Mentzer, 2004). The definition of supply chain management used in this paper was developed by members of the Global Supply Chain Forum (GSCF) as: “*Supply chain management is the integration of key business processes from end user through original suppliers that provides products, services and information that add value for customers and other stakeholders (Lambert et al., 1998)*”. The supply chain encompasses all organisations and activities associated with the flow and transformation of products from the raw materials, through various stages to the consumer, along with this is effective information flows both up and down in the supply chain (Harrison and Hoek, 2011). SCM is the integration and management of supply chain organisations and activities, which have the ultimate goal to enhance customer value and satisfaction, and profitability for the supply chain member organisations (Mentzer et al., 2001).

Small and Medium Enterprises (SMEs) are core business format of the country (Stokes and Wilson, 2006, Tan et al., 2006). SMEs create jobs, contribute to Thailand economic growth, and enhance country's rural development (Thailand Business News, 2010, Office of Small and Medium Enterprises Promotion, 2009). SMEs have realised that good strategies are substantial to survive under current complex and competitive business environment with higher demanding customers to require better, cheaper and faster products and services (Thakkar et al., 2008).

Large Enterprises (LEs) have recognised that competition has been rapidly shifted from a firm versus firm perspective to a supply chain versus supply chain perspective (Christopher, 2011, (Koh et al., 2007). Supply Chain Management (SCM) has become a sweet spot for organisations (Handfield and Nichols, 2002), which look for sustainable growth and profit. The cross-functional integration of major business processes both among the members of supply chain and their internal processes are keys to achieve successful supply chain management. Then supply chain management is aimed at performance improvement and relationship management. (Lambert, 2008)

Therefore, the relationship of supply chain management practices and the firm's performance of SMEs is an issue in the practitioners' interest. Tan et.al.(2006) argued that supply chain management can help SMEs to gain the most benefits from collaboration with others in order to exchange their expertise and become strategic alliance.

The purpose of this paper is therefore to benchmarking level of supply chain management practices and performance of Thai SMEs with LEs by conducting survey research. Firstly, through literature reviews antecedents and consequences of SCM factors such as SCM drivers, facilitators, impediments and firm's performance are identified. Then the SCM practices, identified by the Global Supply Chain Forum, are selected to construct a SCM practices model by developing the relationships between the selected SCM practices and the SCM factors and the firms' performance. Secondly, semi-structured interviews are conducted with 20 Thai practitioners in Thailand to study the insight of success and hinder factors of supply chain management implementation in the large enterprises. The result from interview was used to modify survey questionnaire before send out. Conclusion from survey was analysed by using analysis of variance (ANOVA) to test for statistical difference in managerial perception among different firm size.

Literature Review

The literature on the reasons why SMEs implement supply chain management may be classified into three broad categories: SCM drivers, SCM impediments and SCM facilitators that are antecedents (Mentzer et al., 2001). As SCM may be implemented in different practices and have different impacts on firms' performance, which is consequences (Mentzer et al., 2001), this section will also review the literature related to SCM practices and firms' performance. .

Supply chain management drivers, which are the strategic factors that help to determine an appropriate level of supply chain management practices. Supply chain management drivers are omitted by daily supply chain operation while they are the critical factors to make change to a firm (Ayers, 2006) 'Supply chain management driver' is defined as the set of driving forces that will affect their ability to implement supply chain management in the firm (Fawcett et al., 2009). Ayer (2006) argues that innovation is the first force from external supply chain network to drive the whole supply chain network members to move forward to improve supply chain ability. The next three drivers – extended product design, globalisation and flexibility imperative – form the direction, scope and format of products and services, and supply chain configuration to deliver them. Process-centred management is designed for the whole network process in order to create collaboration among supply network members. Collaboration is the final driver that will loop back to create innovation to the supply chain. These drivers can be both internal and external of single company. Therefore we classify supply chain drivers into three groups based on the individual driver and its effect on the industry and the company.

Research Question 1: Does company's perception of SCM drivers is positively associated with firm size and to what extent these drivers have an impact to the company.

Supply chain management impediments that can potentially cause supply chain management practices to fail. Supply chain management impediments are defined as obstacles that prevent supply chain management practices to succeed. The following SCM impediments or inhibitors have been identified in the literature, e.g. employee resistance to change, ineffective information technology systems, lack of trust and sharing between supply chain network members and improper resources allocation, affect negatively supply chain management performance (Mentzer et al., 2000, Mentzer et al., 2001, Bayraktar et al., 2009, Goh and Pinaikul, 1998, Fawcett et al., 2008, Fawcett et al., 2009, Tan et al., 2006). According to their relationship with the firm, we classify supply chain inhibitors into two categories; internal firm supply chain impediments and external firm supply chain impediments.

Internal impediments are more related to operational efficiency or poor utilisation of organisation while external impediments are more related to collaboration among network members such as communication infrastructures (Goh, 2002). By grouping these supply chain obstacles into two categories it will give us a clearer understanding how to manage and eliminate them.

Research question 2: Does company's perception of SCM impediments is associated with firm size and how these obstacles hinder firm to success.

Facilitators can be ideas, tools, actors and organisations that usually enhance supply chain management implementation. For example, Mentzer et al. (2000) use term "enablers" as the same meaning of facilitators, which include people, organisation and technology that move supply chain management forward. However, as some factors such as organisation environment may hinder implementing supply chain management practices, we therefore extend its definition as follows: supply chain management facilitators are the structural and infrastructural factors that may affect the implementation of supply chain management practices. Structural facilitators relate to such tangibles as information system and technology, process technology and system. On the other hand, facilitators that enhance the utilisation of the structural facilitators and to control those facilitators are classified as infrastructural facilitators. These infrastructural facilitators are intangibles for instance, management, corporate culture, and organisation design.

Research Question 3: Does company's perception of SCM facilitators is positively associated with firm size and how these enablers help firm to implement SCM successfully.

Supply chain management practices, which is a set of effective activities across the supply chain network. Cooper et al., (1997) explains framework of SCM that consists of business processes, management components and the structure of supply chain. Process approach is the focus of every activity to meet customer's requirements. Supply chain management practice, which embraces process approach, is integrating process across functions to produce a specific output for a particular customer or market. The Global Supply Chain Forum (GSCF) developed a process-based supply chain management framework consisting of:

- Customer relationship management
- Supplier relationship management
- Customer services management
- Demand management
- Order fulfilment
- Manufacturing flow management
- Product development and Commercialisation
- Returns management (Cooper et al., 1997)

We proposed in this research to study the three main processes of a firm according to GSCF process framework. From semi-structured interview, the three selected processes are recognised as the significant processes to the firm's proliferation. The processes are:

1. Network relationship management, which include customer relationship management and supplier relationship management,
2. Manufacturing flow management and
3. Product development and commercialisation.

With the proposed methodology, the rest of processes can be done similarly as this research in the future. In each process, this study will examine the supply chain flows including material flow, information flow and resources flow (Mangan et al., 2008). The material flow encompasses the movement of physical products and services from a supplier to a customer and its return. The information flow embraces orders transmitting and the products delivery status. The resource flow consists of financial such as payments, credit terms, consignment and title ownership and non-financial such as people and equipment, which improve supply chain effectiveness.

Research question 4: Does level of SCM practices is positively associated with firm size and what are the major area of interest for SCM practices of the firm.

Firm's performance can be identified as the efficiency of performance measure according to the whole supply chain network members which is very difficult and, may be, not in existence (Bhanomyong and Supatn, 2011). Then internal supply chain performance, which takes into account of efficiency and effectiveness of internal firm's processes in producing its products and services such as cost, time and reliability, will be measured. Li et al., (2006) classifies organisational performance into short-term and long-term objectives. In short-term objectives of SCM are mostly to increase productivity and reduce inventory and cycle time, while long-term objectives are to increase market share and profit. In firm's financial aspect, increase market share and profit reflects asset utilisation of a firm.

For this study, firm's performances will be organised into four categories as:

- Cost dimension
- Time dimension
- Reliability dimension
- Asset utilisation dimension

Research Question 5: Are there any association between firm size and firm's performances and which is the main result of SCM practices.

Based on the above literature review and result from semi-structured interviews, we conceptualize a supply chain management practice model consisting of five dimensions: supply chain management drivers, supply chain management impediments, supply chain management facilitators, supply chain management practices and firm's performance with constructs, as shown in figure 1.

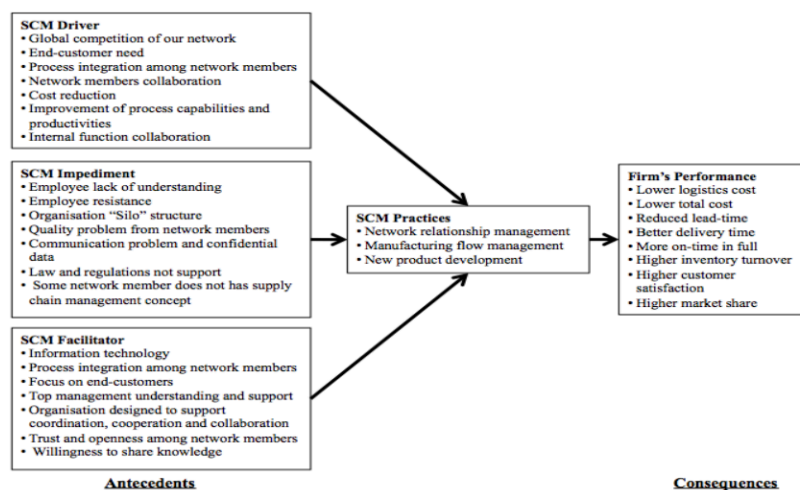


Figure 1 : A supply Chain Management practices model with constructs

Research Methodology

To achieve the research objectives, i.e. developing the supply chain management practices suitable for SMEs model, the following research methods have been used. Firstly, literature reviews both antecedents and consequences constructs that related to supply chain management practices is to be examined. Then, an empirical study of SCM implementation by using semi-structured interview has been conducted. The semi-structured interview has been widely adopted with deductive approach. It is considered as a favoured strategy in business and management research (Saunders et al., 2007). An interview guide is prepared in order to confirm that information obtained from the experts is identical. The interview examined to both SMEs and large firm to confirm that SMEs have a particular understanding of SCM similar to large firm. Resulting from interview, mapping the practices and literatures has been framed as SCM practices for Thai SMEs with construct as in figure 1.

A questionnaire of a study on Supply Chain Management Best Practices Model for Thai Small and Medium Enterprises was sent out via e-mail. The mailing list consisted of 3,700 firms who are members of The Federation of Thai Industries (FTI). We received 129 respondent answered within one month. The second and third reminding mails were sent out month later. After screening

incomplete data out of the respondents, total 409 completed surveys for a response rate of 11.1 per cent was valid. According to definition of SMEs from The Federation of Thai Industries (FTI), the size for small business (S) is typically 50 or fewer employees, the size for medium business (M) is 51 to 200 employees and more than 200 employees will be classified as large business (L). Therefore, the respondents were grouped as 166 small, 145 medium and 98 large firms. Analysis of variance (ANOVA) was used to test statistical differences in perception.

Findings and Discussion

Perceptions of SCM drivers

Questionnaire was sent out to respondents with five-point scale (1 = Unimportant, 5 = Very Important) for SCM Drivers, SCM Impediments and SCM facilitators. Table 1 shows perceptions of SCM drivers according to three firm sizes. Overall cost reduction is major driver to implement SCM then improvement of process capabilities and productivities. SCM driver composite index is calculated by averaging together individual drivers into new composited variable. We also conducted reliability analysis to determine whether from statistical point of view these individual drivers should be averaged together. SCM driver composite index alpha is 0.794 reveals high reliability value of the average SCM drivers. Mean of each firm sizes and grand mean are illustrated in column one to four respectively. Column five to eight show the exact significant value of t (p – value), and we are interested in whether these value is less than or greater than 0.05. Overall column is represent p value of difference between mean of these three groups while each pair of p value can be found in the following column. Then, the research question that company's perception of SCM drivers is positively associated with firm size is concluded by the statistically significant difference for SCM drivers composite index ($p > 0.05$) which mean that there are no significant difference between the means of three group. However, when we paired the difference of the means of two groups, managers from large firms perceived important of SCM drivers to implement supply chain to their organisation than medium firms manager. Interestingly, large firms perceived process improvement slightly more important than cost reduction while small and medium firms rank cost reduction more important than process improvement. Process improvement is statistically significant less sensitive driver to both small and medium firms when compare with large firm. For small firm, global competition is also statistically significant less sensitive when compare with large enterprises. This can be explained that small firm may only deal with local competition while LEs competed in wider geographical area.

	Mean Evaluation				Significant (p – value)			
	Small	Medium	Large	Total	Overall	S - M	S - L	M - L
SCM driver composite index ($\alpha = 0.794$)	4.15	4.13	4.29	4.18	0.051	0.731	0.055	0.031
•Global competition of our network	3.85	3.91	4.16	3.95	0.049	0.621	0.023	0.075
•End-customer need	4.31	4.24	4.43	4.31	0.242	0.489	0.255	0.088
•Process integration among network members	4.02	3.94	4.07	4.00	0.505	0.447	0.621	0.253
•Network members collaboration	3.89	3.89	4.00	3.92	0.561	0.984	0.323	0.327
•Cost reduction	4.47	4.38	4.55	4.46	0.237	0.310	0.417	0.095
•Improvement of process capabilities and productivities	4.34	4.33	4.57	4.39	0.010	0.887	0.019	0.016
•Internal function collaboration	4.17	4.20	4.26	4.20	0.728	0.790	0.451	0.615

Table 1 : Perceptions of SCM drivers

Perceptions of SCM impediments

Respondents were asked about important of SCM Impediments as similar five-points scale. Table 2 shows perceptions of seven SCM impediments construct. Embracing, employee lack of understanding, quality problem from network members and communication problem are the main barriers to implement supply chain management. From SCM impediments composite index calculation, the research question that company's perception of SCM impediments is positively associated with firm size is rejected by the statistically significant difference ($p < 0.05$). Firm size is not related to an important of SCM obstacles. Statistically significant differences are found that managers from medium firms ranked more important of communication problem and confidential data than respondents from small and large firms. This can be interpreted as small firm usually run by single owner or family member, which tends to be less communication problem. When firm grows to medium size the complexity leads to communication problem. While large firm knows this problem and solves it with established good communication channel then the problem becomes less.

	Mean Evaluation				Significant (p – value)			
	Small	Medium	Large	Total	Overall	S - M	S - L	M - L
SCM Impediment Composite Index ($\alpha = 0.818$)	3.84	3.89	3.82	3.86	0.649	0.507	0.772	0.391
•Employee lack of understanding	4.15	4.12	4.17	4.14	0.853	0.719	0.826	0.598
•Employee resistance	3.67	3.72	3.67	3.69	0.905	0.681	0.971	0.747
•Organisation "Silo" structure	3.67	3.78	3.63	3.70	0.458	0.354	0.740	0.259
•Quality problem from network members	4.05	4.06	4.07	4.06	0.980	0.892	0.839	0.936
•Communication problem and confidential data	3.85	4.10	3.82	3.93	0.020	0.017	0.776	0.019
•Law and regulations not support	3.70	3.68	3.58	3.67	0.651	0.889	0.363	0.444
•Some network member does not has supply chain management concept	3.81	3.79	3.79	3.80	0.970	0.848	0.815	0.951

Table 2 : Perceptions of SCM impediments

Perceptions of SCM facilitators

Respondents were also questioned about important of seven constructs of SCM Facilitators as similar five-points scale. Table 3 shows result of SCM facilitators' perception. Top management support, Information technology and organisation designed to support collaboration are rated important respectively. Only small business ranked focus on end-customer higher than organisation design. This can be explained as small firm has simple organisation design and flexibility. In their opinion about facilitator to support supply chain management implementation, they believe that organisation designed is not as important as focusing on end-customer need. The research question that company's perception of SCM facilitators is positively associated with firm size is again not supported by the statistically significant difference for SCM facilitators composite index ($p < 0.05$). Contradiction to SCM facilitators composite index, Information technology is perceived as important to large firm than small and medium firm with statistically significant differences. This shows that large firm supply chain management implementation is heavily relying on information technology. Another factor that shows statistically difference in the means of three groups is top management understanding and support. Large firm perceived important of top management support than small firm. This may be because of large firm has several projects to be implemented then supply chain management implementation will be chosen among other projects. Top management is a key decision maker to allocate budget and resources to support supply chain management.

	Mean Evaluation				Significant (p – value)			
	Small	Medium	Large	Total	Overall	S - M	S - L	M - L
SCM Facilitator Composite Index ($\alpha = 0.831$)	4.10	4.11	4.19	4.13	0.288	0.891	0.201	0.260
•Information technology	4.19	4.18	4.40	4.23	0.040	0.933	0.034	0.032
•Process integration among network members	4.03	3.97	4.20	4.05	0.041	0.515	0.081	0.024
•Focus on end-customers	4.16	4.06	4.04	4.10	0.444	0.293	0.256	0.847
•Top management understanding and support	4.24	4.34	4.52	4.34	0.012	0.273	0.005	0.073
•Organisation designed to support coordination, cooperation and collaboration	4.11	4.11	4.24	4.14	0.301	0.963	0.190	0.188
•Trust and openness among network members	3.98	4.08	3.97	4.01	0.427	0.275	0.903	0.286
•Willingness to share knowledge	3.99	4.03	3.98	4.00	0.884	0.725	0.893	0.663

Table 3 : Perceptions of SCM facilitators

Perceptions of SCM practices

Respondents were inquired level of current SCM practices in their company with five-points scale (1 = Not at all Implement, 5 = Fully Implement). Table 4 shows result of current SCM practices. The questionnaire grouping practices into three major processes as network relationship management, manufacturing flow management, and product development and commercialisation. Each process consists of four questions then total twelve questions were asked. The major finding is that there is no pattern of statistical difference among the three groups ($p < 0.05$) except level of implement of IT coordination among large and medium firm. Large firm has level of implement IT coordination among network partner higher than small and medium firm. This is not surprising large firm usually spend more IT budget in collaboration and coordination with network partner. Then the hypothesis for degree of SCM practices is positively associated with firm size is rejected. Despite of IT coordination in relationship management process, which is strongly implement for all the three groups, small and medium firms (SMEs) also leverage joint inventory management while large firm focuses on the clear vision of SCM. This shows that SMEs focus on day-to-day management rather than long-term vision planning. For manufacturing flow management process, both SMEs and LEs have similar implementation pattern. Customer's feedback as input to design is rated as highly executing in product development and commercialisation process.

	Mean Evaluation				Significant (p – value)			
	Small	Medium	Large	Total	Overall	S - M	S - L	M - L
SCM Practices Composite Index ($\alpha = 0.954$)	3.63	3.54	3.66	3.61	0.439	0.324	0.828	0.285
Network Relationship Management Composite Index ($\alpha = 0.891$)	3.67	3.59	3.72	3.65	0.367	0.379	0.612	0.209
• Joint inventory management	3.71	3.59	3.67	3.66	0.500	0.251	0.758	0.484
• IT Coordination	3.78	3.66	3.90	3.76	0.117	0.248	0.306	0.046
• Long-term relationship enable	3.65	3.58	3.63	3.62	0.792	0.514	0.883	0.671
• Clear vision of SCM	3.54	3.52	3.68	3.57	0.353	0.912	0.226	0.202
Manufacturing Flow Management Composite Index ($\alpha = 0.893$)	3.59	3.48	3.65	3.57	0.287	0.281	0.612	0.153
• JIT / Lean implementation	3.57	3.43	3.57	3.52	0.440	0.256	0.995	0.326
• S&OP implementation	3.58	3.50	3.71	3.58	0.275	0.524	0.302	0.119
• Benchmarking and performance measurement	3.49	3.39	3.57	3.47	0.387	0.384	0.576	0.193
• Quality policy established	3.73	3.61	3.76	3.70	0.386	0.263	0.868	0.256
Product Development and Commercialisation Composite Index ($\alpha = 0.912$)	3.64	3.55	3.59	3.60	0.731	0.426	0.705	0.746
• Material strategy alignment	3.66	3.50	3.58	3.58	0.393	0.170	0.566	0.525
• Customer requirement information sharing	3.61	3.51	3.57	3.56	0.705	0.413	0.783	0.657
• Design for supply chain concept	3.53	3.57	3.51	3.54	0.863	0.707	0.875	0.631
• Customer's feedback as input to design	3.75	3.63	3.70	3.70	0.619	0.325	0.737	0.596

Table 4 : Perceptions of SCM practices

Perceptions of Firm's performance

Finally respondents were self-evaluated level of their performance comparing with their competitors in the past year with five-points scale (1 = Definitely Worse than Competitors, 5 = Definitely Better than Competitors). The results of firm's performance in four areas including cost, time, reliability and assets utilisation are illustrated in table 5. Overall there is no association between firm size and firm's performances according to statistical difference among the three groups ($p < 0.05$). The highest achievement from SCM implementation from respondents was higher customer satisfaction and more on time in full. Better delivery time was rated as the second while both logistics cost and total cost saving were rarely fulfilled.

	Mean Evaluation				Significant (p – value)			
	Small	Medium	Large	Total	Overall	S - M	S - L	M - L
Firm's Performance Composite Index ($\alpha = 0.909$)	3.60	3.53	3.56	3.56	0.624	0.327	0.631	0.701
•Lower logistics cost	3.43	3.41	3.35	3.41	0.732	0.842	0.438	0.560
•Lower total cost	3.44	3.43	3.38	3.42	0.848	0.902	0.575	0.660
•Reduced lead-time	3.58	3.50	3.55	3.55	0.649	0.354	0.753	0.617
•Better delivery time	3.70	3.62	3.69	3.67	0.615	0.351	0.914	0.481
•More on time in full	3.75	3.60	3.72	3.69	0.234	0.112	0.828	0.242
•Higher inventory turnover	3.58	3.48	3.44	3.51	0.357	0.277	0.187	0.732
•Higher customer satisfaction	3.73	3.62	3.73	3.69	0.376	0.238	0.955	0.280
•Higher market share	3.57	3.55	3.60	3.57	0.902	0.833	0.786	0.655

Table 5 : Perceptions of firm's performance

Conclusions and Further Recommendation

This paper presented a comparative study on SCM practices in Thai small, medium and large enterprises. Through a questionnaire survey and ANOVA analysis, it is found that Thai small, medium and large enterprises have mostly similar characteristics in implementing SCM in their firms. The main driver of SCM implementation is cost reduction and the major supporting factor is top management support while the strongest obstacle is employee lack of understanding. The most common area of SCM practice is IT coordination and the main performance gain from SCM implementation is higher customer satisfaction and more on time in full delivery.

Next step of a research, the collected data will be analysed using structural equation modelling (SEM) approach including both exploratory factor analysis (EFA) and confirmatory factor analysis (CFA). Further research will focus on how Thai SMEs measure their firm's performance and how it relates to SMEs' supply chain management implementation.

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