

## Examining the Relationships of E-Commerce Capabilities in Implementing the Strategy and Competency in Small-and Medium-Sized Enterprises

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*Abstract*— The purpose of the research is to study the relationship between electronic commerce capabilities with SME competency and electronic commerce strategy. The survey is conducted by using the SMEs sample group has located in the Southern region from 14 provinces which collected data by using simple random sampling. The results of the research found that the relationship between the difference electronic commerce capabilities has a positive relationship with electronic commerce strategy and SMEs competency. Especially, the capability of using e-commerce to promote products and services, and to provide news and services will result in SME competency and using e-commerce strategy. The result could be used as a guideline of SME for applying electronic commerce capabilities to improve the SMEs competency.

*Keywords-* E-commerce; Small and Medium Enterprises; SMEs; Competency; E-commerce Capabilities;

### I. INTRODUCTION

Electronic Commerce (e-Commerce) is defined various definitions. E-Commerce is exchanging news, products, services, and payment via electronic systems [1]. E-commerce is defined as a business operation which use electronic devices to process business activities [2]. E-Commerce is a process of buying and selling goods or services by using data transmission over the internet [3][4]. E-commerce system provides many services such as e-mail, electronic data exchange, electronic money transfers and online buying and selling transaction [5][6].

Electronic commerce (e-commerce) is regarded as one of the most important technological developments that drive change and revolutionize business operations around the world. Traditional business operations rely on place, time, and employee. E-commerce is an innovation method change them to online channel that not rely on place, time, and employee. Electronic commerce enhances business capabilities such as convenient communication, speed, and efficiency in marketing, commerce, and customer access

[7]. Especially, E-commerce provides many benefits to Small and Medium Enterprises (SMEs) operation. Most SMEs in Thailand are operated in the form of an individual, and family members which not a juristic person. They operate business in many type no matter wholesale, retail, manufacture of goods and service [8].

The SMEs characteristics show that their capabilities and competency on business operation no matter investment, employment, and market competition cannot equivalent to big business. Therefore, electronic commerce helps SMEs to increase their ability to compete with large businesses. An environment of E-commerce support immediately sharing information between customer and business and provide a channel to present sale information and promotion to customers real-time and 24 hours with no rely on place and time. Moreover, E-commerce competency increases international competitiveness corresponding with the market demand and increase opportunities for trade expansion [9].

Analyzing factors effect on the efficiency of the adaptation of E-commerce in SMEs should be investigated to enhance SMEs competency. Especially, SMEs should understand the e-commerce capability that affects SMEs competency. The e-commerce capability might be improving the efficiency of international trade community competition, providing a guideline for business processes and improving business operations.

The researcher therefore proposed the research guidelines on the study of general characteristic of SMEs that use e-commerce, explored the relationship between e-commerce capabilities and SMEs competency as well as e-commerce strategy. To present the result in support of decision making in determining the appropriate improve e-commerce capabilities that enhance SMEs competency. At the same time, it draws the benefits of the positive impact to propose the strategy for efficiency enhancement in SMEs e-commerce toward international trade community.

## II. CONCEPTUAL FRAMEWORK

The research hypothesis stated as follows:

1. E-commerce capabilities (all three aspects) have a positive relationship with an e-commerce strategy.
2. E-commerce capabilities (all three aspects) have a positive relationship with SMEs competency.

The conceptual framework for the research is shown as the following:

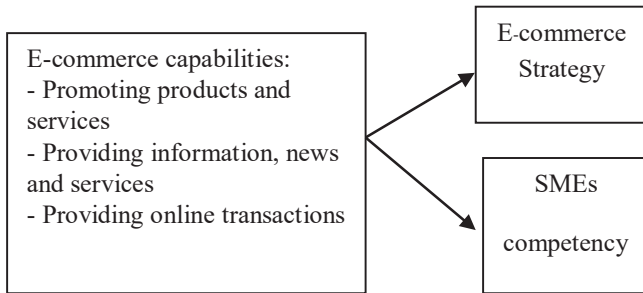


Figure 1. Conceptual Framework.

## III. LITERATURE REVIEW AND RELATED STUDIES

Small and medium enterprises (SMEs) is medium to small size business model that is usually operated by individuals, groups of people or partnerships which has a small of employment, a limitation of fixed assets and employment that stipulated by Small and Medium Enterprises Promotion Act, B.E. 2543.

SMEs Competency is the ability to conduct business, whether or not there is an ability to create competitive advantage with competitors included analysis of competitive pressures. The SMEs competency can be measured by using a set of standard questions namely "SMEs Competency Index" which defined by the Center for Economic and Business Forecasting of the University of the Thai Chamber of Commerce [10]. The set of standard questions to measure the SMEs competency as follows;

- Cost of goods and services.
- Quality of products and services.
- Differentiation of products and services.
- Ability to set sales price.
- Gross profit the business receives
- The ability to access funding sources.
- Competency levels of staff and employees.
- Relationship level and customer engagement.

E-commerce is use of information and communication technology (ICT) for supporting all of the business operation. E-commerce may use applications to support business operations, decisions in work management agencies, and administrative s for achieving operational organizational objectives [11][12]. Therefore, the e-

commerce capabilities are the ability to adaptation e-commerce systems for applying in an internal process of all department. It might be start from the use of websites to promote business product and services, to provide news and information or services, and to process online transaction [11].

Electronic commerce can be used as a strategy to create a competitive advantage, allowing customers to value the organization's products or services more than their competitors. Therefore, e-commerce can be used as a strategy which classified into 4 strategy include; 1) low-cost leadership strategy, 2) product differentiation strategy, 3) niche market strategy, and 4) customer and supplier intimacy [13][14]

Therefore, many researches in the e-commerce areas are exploring factors effect on SMEs competency and adaptation of e-commerce strategy. The success implementation of applying e-commerce in the business operation were strategy formulation and management of electronic commerce, knowledge of employee technology, and infrastructure of the use of electronic commerce systems [15]. Including, E-commerce capability of marketing has a positive impact on e-commerce capability on communication and export marketing of SMEs [16]

## IV. ANALYSIS OF DATA

This research was surveyed on SMEs that applied e-commerce in their business operation in south region, Thailand which 400 sampling populations. The finding revealed characteristic of SMEs classified by business type that majority of businesses were services businesses (35.3%), followed by retail businesses (30.3%), and the remainder are wholesale and manufacturing businesses respectively. This result showed that SMEs in southern region were service businesses which in line with regions and locations that focus on focus on tourism services.

In additional, if classified in detail about the business sub-type, it is found that the business sub-type was a cabbage business that operates food and beverage businesses. The results of the analysis of e-commerce capability of SMEs can be divided into 3 aspects as follows: 1) the implementation of e-commerce for promoting products and services of the business, 2) the implementation of e-commerce to provide news and services, and 3) the implementation of e-commerce to provide online transaction. Analysis of data according to each e-commerce capabilities using descriptive statistics display in table I-III.

TABLE I. DISPLAY MEAN AND S.D. FOR THE E-COMMERCE CAPABILITIES IN PROMOTING PRODUCTS AND SERVICES

E-commerce capabilities	$\bar{x}$	S.D.	Meaning	Order
1. There is a website that can sell products or services online.	2.33	1.643	Little	3
2. There is an integrated with a web-portal such as lazada, ebay, or shopee that can online sell.	0.90	1.491	Very little	4
3. There is a social media such as Facebook, Instagram, or Line that can advertise and promote your products or services	3.35	1.170	A lot	1
4. There is an online channels that can communicate with customers.	3.01	1.333	Middle	2

The survey gives us the conclusion the highest e-commerce capabilities of SMEs in promoting products and services were used social media for advertising and promoting products and services.

TABLE II. DISPLAY MEAN AND S.D. FOR THE E-COMMERCE CAPABILITIES IN PROVIDING NEWS AND SERVICES

E-commerce capabilities	$\bar{x}$	S.D.	Meaning	Order
1. There is information, news, service and product presentation via email to customers.	1.84	1.718	Little	3
2. There is information, news, services, and product presentations via social media channels such as Line or Facebook to customers.	3.16	1.138	Middle	1
3. There is a channel on Youtube to present news and offer products or services	0.91	1.464	Very little	5
4. There is an online catalog (E-Catalog) to present products and services to customers.	1.15	1.548	Very little	4

TABLE II. DISPLAY MEAN AND S.D. FOR THE E-COMMERCE CAPABILITIES IN PROVIDING NEWS AND SERVICES (CONT)

E-commerce capabilities	$\bar{x}$	S.D.	Meaning	Order
5. There is join online communities such as Facebook groups or follow specific fan page to receive news and exchange ideas related to running your business.	2.44	1.602	Little	2

The survey gives us the conclusion the highest e-commerce capabilities of SMEs in providing news and services were presented news, services, and product via social media channels such as Line or Facebook to customers.

TABLE III. DISPLAY MEAN AND S.D. FOR THE E-COMMERCE CAPABILITIES IN PROVIDING ONLINE TRANSACTION

E-commerce capabilities	$\bar{x}$	S.D.	Meaning	Order
1. There is an e-commerce system that provides a channel to allow customer for applying to be a membership	1.29	1.534	Very little	5
2. There is an e-commerce that provides a search channel to browse products or services.	1.86	1.634	Little	1
3. There is an e-commerce system that can allow customers to order products or services immediately	1.86	1.609	Little	1
4. There is an e-commerce system that allows customers to pay and received online receipts	1.57	1.713	Very little	4
5. There is an e-commerce system that allows customers to track orders and deliver service.	1.59	1.632	Very little	3
6. There is an e-commerce system that allows employees to access product or service information to support online sales.	1.80	1.600	Very little	2

The survey gives us the conclusion the highest e-commerce capabilities of SMEs in providing online transaction was provided a search channel to browse products or services. As shown in Table I-III, the results of the data analysis showed that e-commerce capabilities of SMEs focus mainly on social media as a means of communication with customers. Which is the same channel used to promote the sale of products to customers.

Among the three aspect of e-commerce capabilities of SMEs, the research found that having a capability in promoting products and services is the highest e-commerce capabilities of SMEs. The least is e-commerce capabilities in providing online transaction as in Figure 2.

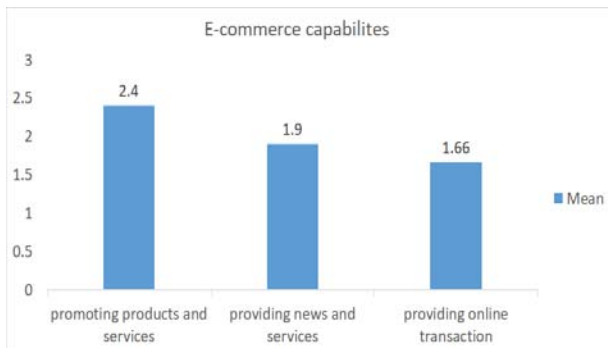


Figure 2. Overview e-commerce capabilities of SMEs

The data analysis results on the e-commerce strategy classified into 4 aspects including; 1) cost saving strategy 2) product differentiation strategy 3) niche markets strategy, and 4) customer relationship strategy.

In summary, the e-commerce strategy of SMEs was an average score of 2.18 percentages, which ranks at a low level. The survey gives us the meaning that the implementation of e-commerce strategy in SMEs are limitation. The most e-commerce strategy that SMEs implementation is the customer relationship strategy. Effort to keep in touch with customer vid social network. In contrast, the niche market e-commerce strategy to is the strategy that is used at the least level as in Table IV.

TABLE IV. DISPLAY MEAN FOR THE E-COMMERCE STRATEGY

E-commerce strategy	$\bar{x}$	Meaning	Order
1. Cost-saving leaders	2.00	Little	3
2. Product differentiation	2.46	Little	2
3. Niche markets	1.72	Very Little	4
4. Customer relationship	2.55	Little	1

Overall, the data analysis results on the SMEs competency was average score of 3.58 percentage, which ranks at a high level. The highest SMEs competency was the competency of the maintaining customer relationships was at 3.92 percentage, while the ability to set sales price was 3.39 percentage, which rank at a middle level, as in Table V.

TABLE V. DISPLAY MEAN AND S.D. FOR THE SME COMPETENCY

SMEs competency	$\bar{x}$	S.D.	Meaning	Order
1. Cost of goods and services	3.42	0.857	A lot	7
2. Quality of products and services	3.67	0.738	A lot	3
3. Create differentiation of products and services	3.66	0.757	A lot	4
5. The ability to set sales prices	3.39	0.734	Middle	8
6. Gross profit received by the business	3.49	0.934	A lot	5
7. The ability to access funding sources	3.44	0.709	A lot	6
8. Competency levels of staff and employees	3.68	0.656	A lot	2
9. Relationship and customer relationship levels	3.92	0.720	A lot	1

This research has set two hypothesis testing to explore relationship with e-commerce capabilities, e-commerce strategy, and SMEs competency with described in this section. The relationship analysis between two variables can be used the Spearman rank correlation coefficient (Sperman's rho) represented by the symbol  $r_s$ . This statistical uses to analyze the relationship of the data that the two sets are in ordinal scale, interval scale, or rating scale which each data set is independent of each other.

The relationship level of two variables is identified by the numbers for the correlation coefficient. If the relationship correlated getting close to -1 or 1 indicates a high level of relationship. However, if there is a value close to 0, it means there is little or no relationship for considering the correlation coefficient [17].

The results of the relationship analysis using spearman rank correlation coefficient found that the e-commerce capability to promote products and services of the SMEs among the e-commerce strategy for cost-saving leaders ( $r = 0.576$ , Sig <0.01), the e-commerce strategy for creating product differentiation ( $r = 0.598$ , Sig <0.01), the e-commerce strategy to focus on niche market ( $r = 0.533$ , Sig <0.01) and e-commerce strategy for maintaining customer relationship ( $r = 0.597$ , Sig <0.01) have a

positive relationship, which ranks in the middle level relationship in four strategies, as in Table VI.

TABLE VI. DISPLAY SPEARMAN RANK CORRELATION COEFFICIENT BETWEEN E-COMMERCE CAPABILITIES TO PROMOTE PRODUCTS AND SERVICES AND E-COMMERCE STRATEGY

E-commerce strategy	$r_s$	E-commerce capability to promote products and services
Cost-saving leaders	Correlation coefficient	0.576*
	Sig.)2-tailed(	0.000
Product differentiation	Correlation coefficient	0.598*
	Sig.)2-tailed(	0.000
Niche markets	Correlation coefficient	0.533*
	Sig.)2-tailed(	0.000
Customer relationship	Correlation coefficient	0.597*
	Sig.)2-tailed(	0.000

\* statistically significant  $p < 0.001$

As shown in Table VI, the data analysis results identified that when the sampling group has the e-commerce capability to promote the products and services will be used more e-commerce strategy in four aspects at significance level at 0.01.

The e-commerce capability to provide news and services of the SMEs among the e-commerce strategy for cost-saving leaders  $r=0.576$ , Sig  $<0.01$ (, the e-commerce strategy for creating product differentiation  $r=0.598$ , Sig  $<0.01$ ), the e-commerce strategy to focus on niche market ( $r= 0.533$ , Sig  $<0.01$ ) and e-commerce strategy for maintaining customer relationship ( $r= 0.597$ , Sig  $<0.01$ ) have a positive relationship, which ranks in the middle level relationship in four strategies, as in Table VII.

TABLE VII. DISPLAY SPEARMAN RANK CORRELATION COEFFICIENT BETWEEN E-COMMERCE CAPABILITIES TO PROVIDE NEWS AND SERVICES AND E-COMMERCE STRATEGY

E-commerce strategy	$r_s$	E-commerce capability to provide news and services
Cost-saving leaders	Correlation coefficient	0.663*
	Sig.)2-tailed(	0.000
Product differentiation	Correlation coefficient	0.665*
	Sig.)2-tailed(	0.000

TABLE VII. DISPLAY SPEARMAN RANK CORRELATION COEFFICIENT BETWEEN E-COMMERCE CAPABILITIES TO PROVIDE NEWS AND SERVICES AND E-COMMERCE STRATEGY (CONT)

E-commerce strategy	$r_s$	E-commerce capability to provide news and services
Niche markets	Correlation coefficient	0.628*
	Sig.)2-tailed(	0.000
Customer relationship	Correlation coefficient	0.684*
	Sig.)2-tailed(	0.000

\* statistically significant  $p < 0.001$

As shown in Table VII, the data analysis results identified that when the sampling group has the e-commerce capability to provide news and services could be used more e-commerce strategy in four aspects at significance level at 0.01.

The e-commerce capability to provide online transaction of the SMEs among the e-commerce strategy for cost-saving leaders  $r= 0.769$ , Sig  $<0.01$ (, the e-commerce strategy for creating product differentiation  $r= 0.726$ , Sig  $<0.01$ (, and e-commerce strategy for maintaining customer relationship  $r=0.739$ , Sig  $<0.01$ ) have a positive relationship, which ranks in the high level relationship in this three strategies. Including, the e-commerce capability to provide online transaction of the SMEs with the e-commerce strategy to focus on niche market  $r=0.690$ , Sig  $<0.01$ ) has a positive relationship but ranks in the middle level relationship as in Table VIII.

TABLE VIII. DISPLAY SPEARMAN RANK CORRELATION COEFFICIENT BETWEEN E-COMMERCE CAPABILITIES TO PROVIDE ONLINE TRANSACTION AND E-COMMERCE STRATEGY

E-commerce strategy	$r_s$	E-commerce capability to provide online transaction
Cost-saving leaders	Correlation coefficient	0.769*
	Sig.)2-tailed(	0.000
Product differentiation	Correlation coefficient	0.726*
	Sig.)2-tailed(	0.000
Niche markets	Correlation coefficient	0.690*
	Sig.)2-tailed(	0.000
Customer relationship	Correlation coefficient	0.739*
	Sig.)2-tailed(	0.000

\* statistically significant  $p < 0.001$

As shown in Table VIII, the data analysis results identified that when the sampling group has the e-commerce capability to provide online transaction could be used more e-commerce strategy in four aspects at significance level at 0.01.

The e-commerce capability to promote products and services of the SMEs with the SMEs competency ) $r=0.239$ , Sig <0.01( has a positive relationship, but ranks in the very low level relationship. Including, the SMEs competency among the e-commerce capabilities to provide news and services ) $r=0.321$  **SME Competency**, Sig <0.01(, and to provide online transaction of the SMEs ) $r=0.321$ , Sig <0.01( have a positive relationship, which ranks in low level relationship, as in Table IX.

TABLE IX. DISPLAY SPEARMAN RANK CORRELATION COEFFICIENT BETWEEN E-COMMERCE CAPABILITIES AND SME COMPETENCY

E-commerce capabilities	$r_s$	SME Competency
To promote products and services	Correlation coefficient	0.239*
	Sig.)2-tailed(	0.000
To provide news and services	Correlation coefficient	0.321*
	Sig.)2-tailed(	0.000
To provide online transaction	Correlation coefficient	0.447*
	Sig.)2-tailed(	0.000

\* Significance level at level 0.01 (p <0.01)

As shown in Table IX, the data analysis results identified that when the sampling group has the e-commerce capability could be used more e-commerce strategy in four aspects at significance level at 0.01.

Hypothesis testing can be summarized as follows:

Hypothesis 1: E-commerce capability (all three aspects) have a positive relationship with an e-commerce strategy. The P-value of all three capabilities is lower than 0.01, therefore the hypothesis is accepted. This means that e-commerce capabilities have a positive relationship with the e-commerce strategy of SMEs.

Hypothesis 2: E-commerce capabilities (all three aspects) have a positive relationship with SMEs competency. The P-value of all three capabilities is lower than 0.01, therefore the hypothesis is accepted. This means that e-commerce capabilities have a positive relationship with the SMEs competency.

## V. CONCLUSION

This research focuses on examining the relationships between e-commerce capabilities among e-commerce

strategy and SMEs competency. The studied of SMEs characteristics shows that the highest e-commerce capability is provides news and services. Most of SMEs use social network as a tool to communicate with customers. Moreover, most of them offering products and services via Line or Facebook and also join a specific Facebook group that related to their business to receive news and information. While communicating or providing news and information via email, YouTube or website has a very little operation.

The relationship of e-commerce capabilities with both e-commerce strategy and SMEs competency have a positive relationship. In conclusion, it could be implying that if SMEs have good e-commerce capabilities will result in increase of implementing e-commerce strategy and SMEs competency. This result is consistent with the research of [16] who conducted research on the e-commerce capabilities for exporting products and founded that e-commerce capability in marketing has a positive relationship the product export of SME.

SME should improve its e-commerce capabilities, especially, in providing online transactions. Most SMEs have this capability at a low level. For example, the e-commerce system should provide online membership applications, online payment, receiving an online receipt, online order tracking, and delivery services. These e-commerce capabilities are essential and could impact on e-commerce strategy and SMEs competency.

## VI. LIMITATION AND FURTHER STUDY

The survey area of the sampling is important in comparison of e-commerce capabilities and SMEs competency. There should be extend SMEs sampling group to cover of four regions in Thailand.

In future work, the study of e-commerce strategy as the mediator of the relationship between e-commerce capabilities to SMEs competency should be examined to receive new knowledge to enhance SME operation in an e-commerce system.

Moreover, it should investigate the factor effect on SME competency in aspects of an e-commerce operation.

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