Segmenting small and medium manufacturing enterprises for electronic customer relationship management industry: the case of Thailand

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Abstract: The study examines the current adoption rate of electronic customer relationship management (e-CRM) applications among manufacturing SMEs in Thailand and segments the e-CRM adopters based on their similarities and differences. The purpose is to provide information on market segmentation for the e-CRM industry. Three types of e-CRM adopters were identified; basic, moderate and advanced adopters. The findings assert that even though e-CRM adopters share something in common, their perceptions about e-CRM applications are evidently different. Each group has different needs and expectations requiring different approaches from technology vendors. The basic e-CRM adopters are sceptical about the potential of e-CRM applications while moderate and advanced e-CRM adopters are more concerned with how to maximise the advantages of e-CRM applications.

Keywords: electronic customer relationship management; e-CRM; market segmentation; cluster analysis; e-business; manufacturing SMEs; Thailand.

Reference to this paper should be made as follows: Sophonthummapharn, K. (2011) 'Segmenting small and medium manufacturing enterprises for electronic customer relationship management industry: the case of Thailand', *Int. J. Electronic Customer Relationship Management*, Vol. 5, No. 1, pp.75–96.

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1 Introduction

The advantage of internet technologies for business is unquestionable these days. Many firms have successfully implemented e-business/e-commerce models and enjoyed earning revenue through this worldwide network, as verified by a number of researches over the past ten years (Pires and Aisbett, 2003; Poon, 2000; Stockdale and Standing, 2004). The focus of contemporary research is how to maximise the internet technologies and optimise software applications for each business sector. One of latest software applications is electronic customer relationship management (e-CRM). This is an internet business application used for managing relationships with the customers on the e-marketplace. Many have claimed that using e-CRM applications appropriately provides vast benefits to firms which can lead to sustainable competitive advantage (Chen and Chen, 2004; Fjermestad and Romano Jr., 2003; Wu and Wu, 2005).

Nevertheless, it can be argued that the perception of applying e-CRM applications is in the early phase of expansion. In effectively promoting and sustaining such applications, perceptive understanding about the characteristics of e-CRM adopters is needed. While there is a rich body of literature on the adoption and implementation of internet technologies, research on the adoption of specific technology like e-CRM is inadequate especially in the context of Asian small and medium sized enterprises (SMEs). Moreover, most studies emphasise on factors affecting a firm's decision to adopt and implement the technology. Little attention is given to analysing the profile and characteristics of technology adopters. The lack of this research in this domain forms the basis of the present study.

Thailand is seen as one of the world fastest growing countries. The Thai economy increases at an average rate of 8 to 9% a year (World Bank, 2008). It plays a significant role in the South East Asia (SEA) region in terms of economic growth, social development, political stability and international agreements. According to the UNCTAD's report (2005), Thailand was ranked #1 in SEA in term of attractive business location for foreign direct investment (FDI). The country is rich in natural resources and has the potential to be one of the major resource suppliers in the world market. The government has actively initiated and implemented a series of national plans and activities to promote e-business technology adoption in both the public and private sectors. A clear understanding of SMEs in a particular sector would help design appropriate policies and initiatives to accelerate e-business diffusion not only in Thailand, but also in other regional countries that show similar development in promoting internet technology.

The purpose of this research is to examine the current adoption rate of e-CRM applications in manufacturing SMEs in Thailand. Furthermore, the study intends to segment the e-CRM adopters based on their similarities and differences. This is to provide concrete information and judicious guidance to policy makers and marketing managers who want to encourage the implementation and maintenance of e-CRM applications among manufacturing SMEs.

The article is organised as follows. The next section reviews literature relating to the development of e-CRM. Definition, classifications and benefits of e-CRM are clearly provided. Then, the research method is presented by covering questionnaire development, data collection and data analysis done through descriptive statistics and cluster analysis. Next, the research findings are discussed together with the conclusion. The article

concludes with the limitations of the study and suggestions for future research are offered.

2 Literature review

2.1 The emergence of e-CRM

The field of customer relationship management (CRM) is a bi-discipline between business and information technology (IT). CRM is claimed as a subfield in both disciplines – business discipline (Christopher et al., 2002; Parvatiyar and Sheth, 2001) and IT discipline (Romano and Fjermestad, 2001). In the business discipline, CRM pertains more to management and marketing functions. In particular, CRM is involved mostly at strategic level while the IT discipline deals with technical architecture design relating to how to make CRM application work. In business literature, CRM is sometime referred to customer relationship marketing (Foss and Stone, 2001; Woodcock et al., 2000). Whether it is called CR-management or CR-marketing, it refers to the same concept under the umbrella of business discipline. CRM has increased the interaction between customers and companies. Customers' happiness is the ultimate objective of a company because they are the ones who sustain the business of a company (Nguyen et al., 2007).

Since the internet was commercialised in the mid 1990s, the infrastructure of the CRM market has been changed substantially. The internet has facilitated CRM vendors and clients to interact and communicate with each other more efficiently. The client server is no longer necessary since the client can use the vendor server which can be accessed through the internet. Furthermore, the breakthroughs of computer technology steadily increase the capability of computer while the price is significantly reduced. The capacity of the computer is greater than human capability in terms of faster retrieving, extracting, processing and analysing of data. The data calculated by computer are more accurate and reliable than those calculated by humans. In comparison, the cost of adopting and maintaining CRM applications today is not as expensive as it was before the advent of the internet. CRM application is now available to firms of all sizes.

By using internet technologies, the functions of CRM have been extensively changed and have become more interactive. Also, the term e-CRM, which stands for electronic customer relationship management has been introduced representing a subfield of conventional CRM. It is suggested that e-CRM is a part of a comprehensive CRM strategy and implementation. The e-CRM covers much more than customer service for visitors to websites (Fleischer, 2001). Moreover, e-CRM is not just about software and IT. It is about aligning business processes with customer strategies to build customer loyalty and increase profits over time. These processes are supported by technology and software (Rigby et al., 2002). In this study, e-CRM refers to "the marketing activities, tools, and techniques, delivered over the Internet (using technologies such as Web sites and e-mail, data-capture, warehousing and mining) with a specific aim to locate, build and improve long-term customer relationships to enhance their individual potential" [Lee-Kelley et al. (2003), p.241].

From a marketing standpoint, the firm can utilise an e-CRM application as a strategy to learn more about customers' needs and behaviours in order to strengthen relationships with them. It has been found that companies with higher levels of perceived e-CRM

success claim considerable increases in improvement of customer satisfaction, transaction amounts and frequency, brand image, sales volumes and profitability (Kimiloglu and Zarali, 2009). There are many technological components to e-CRM applications but initially viewing e-CRM in technological terms is inaccurate. The better way to look at it is viewing e-CRM as a strategic process that will help a firm better understand what customers need and how a firm can meet those needs which eventually enhance and retain good relationships with the customers. This strategy depends on bringing together many varied pieces of information about customers and market trends so a firm can sell and market products/services more effectively. The e-CRM application is expected to perform this job for the firm.

2.2 Classification of e-CRM applications

Dyche (2001) proposes two main types of e-CRM applications; operational and analytical e-CRM applications. Operational e-CRM is generally concerned with the customer contact points both from customers to company and from company to customers. It is known as the 'front-office' system. Analytical e-CRM is generally concerned with the use of technology or software to process large amounts of customer data. This data provides solid information that the company can use to analyse its customer behaviour. It is known as the 'back-office' system. Similar view is found in Karimi et al. (2001). Moreover, the design of the e-CRM software is used to classify the type of e-CRM application. Handen (2000) identifies four types of e-CRM applications including 'win back or save', 'prospecting', 'loyalty' and 'cross-sell/up-sell'. Tan et al. (2002) state three types of e-CRM applications namely 'marketing automation', 'sales force automation' and 'customer service and support'. Based on Tan et al. (2002), the present study classifies e-CRM applications into three major categories:

- Customer service and support – applications that maximise customer satisfaction and retention by automating functions such as order tracking and account status check. The examples of this category include automatic email reply systems, e-mail alert systems, order tracking systems, customisation systems, communication channels systems, call centre systems and other related automatic services systems.
- Automatic sales management – applications that manage and optimise a company's sales cycle and help to increase a company's productivity. The applications in this category consist of product/service introducing systems, cross/up-sell systems, sales opportunity management systems, customers name list and address management systems, sales activities management systems and inventory management systems.
- Automatic marketing management – applications that help companies effectively plan and execute marketing programs. The applications include immediate presentation of analytical report systems, marketing campaign organising systems, sales recording systems, sales trends and forecast report systems, customer profile and segmentation systems.

2.3 Benefits of e-CRM applications

By utilising e-CRM applications appropriately, a number of benefits can be anticipated (Chen and Chen, 2004; Fjermestad and Romano Jr., 2003; Wu and Wu, 2005). The

present study reviews the potential benefits of adopting e-CRM referred to in various sources including academic journals and commercial e-CRM vendors' websites. Three main aspects of e-CRM benefits can be derived (Sophonthummapharn, 2009):

- strategic benefits
  - gain and maintain competitive advantage
  - provide tools to efficiently analyse and understand customer requirements
  - identify new/added selling opportunities
- customer service benefits
  - increased customer satisfaction
  - increased customer loyalty
  - increased customer retention rate
- productivity benefits
  - increased revenue and profitability
  - increased employee productivity
  - overall cost reduction.

2.4 Small and medium manufacturing enterprises (SMEs)

SMEs are major driving forces contributing to economic development. They are considered as the backbone of economic activity since the diversity of SMEs generates enormous employment opportunities to the communities in which they operate. SMEs constitute the dominant form of business organisation in all countries worldwide, accounting for over 95% and up to 99% of the business population depending on the country (OECD, 2005).

In a broader perspective, SMEs can be categorised into three sectors; manufacturing, service and trading (wholesale and retail). In particular, manufacturing SMEs are concerned with production processes, collecting raw materials and making finished products, whereas trading SMEs are intermediaries transferring products to other firms or end customers. In contrast, service SMEs provide various types of services to individuals and organisations. It can be argued that SMEs in the different sectors differ in several aspects and therefore require differences in strategic planning. Treating SMEs as a homogenous set of businesses might mislead the policy makers and marketing managers who attempt to encourage the implementation and use of particular technology in SMEs. Thus, better understanding of SMEs in each sector could facilitate policy makers and marketing managers to correctly allocate resources and efforts when executing SMEs projects.

The present study focuses on the manufacturing sector since this sector, in comparison, tends to capture internet technologies slower than service and trading sectors. The nature of the manufacturing sector relates more to technicality and productivity which sometimes causes neglecting attention to managing customer relationships. When dealing with internet technology, little is understood about recent adoption rates of e-CRM applications in manufacturing SMEs, what similarities/differences there are among the adopter group, and whether the adopter group can be segmented. This study intends to probe and deduce answers for those issues.

3 Research method

3.1 Instrument development

The self-administered questionnaire was developed and pre-tested with 30 manufacturing SMEs. Six interviews were conducted to refine the wording, meaning, understanding and formatting of the questionnaire. The final questionnaire consisted of the following major sections:

- basic information (presence of company website, the time period of company website, presence of e-CRM application, source of getting e-CRM application, number of adopted e-CRM applications)
- demographic information (gender, age, education level, management position, firm size, industry type, internet knowledge and skill)
- psychographic information (attitude, subjective norm, self-efficacy, innovativeness, perceived advantage, perceived easiness, compatibility, observability, trialability, perceived relationship marketing functionality, competitive pressure, customer pressure, industry pressure, governmental encouragement, external support).

3.2 Data collection

The research survey was conducted to collect the data. The database from the Office of Small and Medium Enterprises Promotion (OSMEP), an official Thai government agency was selected as a sampling frame. This is an official government database containing up-to-date lists of enterprises throughout the Kingdom of Thailand. According to OSMEP (2006), there were approximately 96,518 manufacturing SMEs. Using a systematic sampling technique, a sample of 800 manufacturing SMEs was drawn. Then, a package containing a cover letter, a questionnaire and a postage-paid reply envelope were sent to the sample asking the owner or executive of the firm to fill out the questionnaire. A total of 296 questionnaires were received within two weeks, with a response rate of 37.0%. To increase the response rate, a follow-up letter was sent to the remaining sample that had not returned the questionnaire after the initial mail. Another 227 questionnaires were returned within two weeks, providing an overall response rate of 65.38%. However, 15 responses were excluded due to incomplete questionnaires or the firms not qualifying in terms of the SME definition used in this study. A total of 508 responses were used for data analysis.

The response bias was evaluated by comparing the early responses and late responses regarding demographic data (gender, age, education level, management position). Early responses were defined as those who had completed and returned the questionnaires within two weeks after the initial mail, while late responses referred to those who returned questionnaires within two weeks after the reminder mail. A Pearson Chi-square test was calculated and no significant difference was found in terms of gender ($\chi^2 = 0.156$, $p = 0.693$), age ($\chi^2 = 8.007$, $p = 0.091$), education level ($\chi^2 = 1.144$, $p = 0.766$) and management position ($\chi^2 = 1.227$, $p = 0.542$). The assessment indicated no response biases in this study.

4 Data analysis

4.1 Presence of company website

More than half of respondents (57.3%) indicated that the company website was already in place. Among this group, the majority have had a website for a period of 3–6 years (51.5%) followed by less than three years (25.4%), 6–9 years (18.9%) and over nine years (4.1%) respectively. Table 1 presents the frequency of respondents having a company website and the time period they have had this website

Table 1 Presence of company website

Availability of company website	*n = 508*	*%*
Yes	291	57.3%
No	217	42.7%
Time period of having website	*n = 291*	*%*
Less than three years	74	25.4%
3–6 years	150	51.5%
6–9 years	55	18.9%
Over nine years	12	4.1%

4.2 The e-CRM adoption

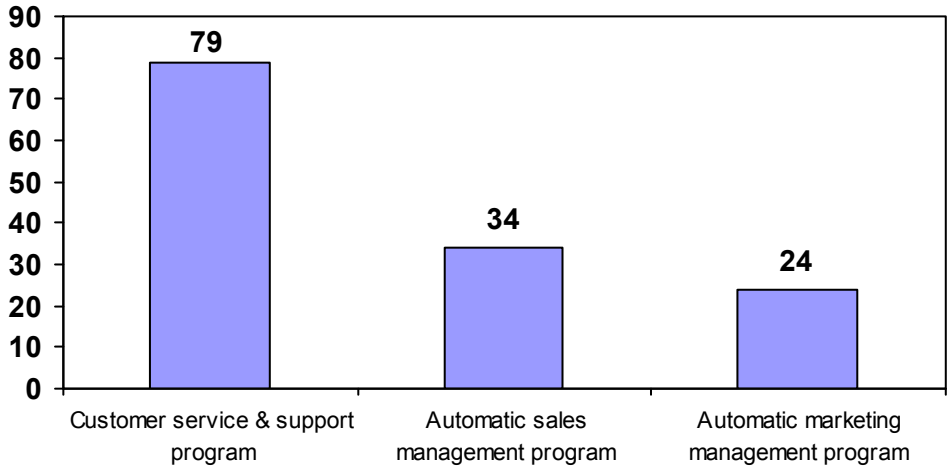
Results showed that 79.7% of the respondents did not have e-CRM application and this group was classified as e-CRM non-adopters in this study. There were 103 e-CRM adopters which accounted for 20.3%. Regarding the source of getting e-CRM application, those respondents who bought instant e-CRM packages constituted 39.8% while those who developed their own internal e-CRM applications constituted 38.8%. However, 21.4% of respondents hired outsider firms or individuals to develop specific e-CRM applications to match the firm's needs. Results also indicated that the majority of respondents had adopted only one type of e-CRM application (72.8%). Table 2 shows the e-CRM adoption rates.

Table 2 The e-CRM adoption

Availability of e-CRM applications	*n = 508*	*%*
Yes	103	20.3%
No	405	79.7%
Source of e-CRM applications	*n = 103*	*%*
Do-it-yourself e-CRM	40	38.8%
Instant e-CRM package	41	39.8%
Made-to-order e-CRM	22	21.4%
Number of adopted e-CRM applications		
One application	75	72.8%
Two applications	22	21.4%
Three applications	6	5.8%

Regarding the number of adopted e-CRM applications, respondents were allowed to choose more than one type. As can be seen from Figure 1, the most popular programs among e-CRM adopters were customer service and support programs. There were 79 firms that used some kind of customer service and support program. This accounted for 76.7% from the total e-CRM adopters (103 firms).The numbers of firms using automatic sales management programs and automatic marketing management programs were 34 and 24 which accounted for 33.0% and 23.3% respectively.

Figure 1 Popularity of e-CRM application (see online version for colours)



4.3 Clustering e-CRM adopters

The number of e-CRM adopters was found to be 20.3% (103 out of 508 firms), which was considered to be low. In order to effectively sustain the use of e-CRM technology, insightful understanding of the characteristics of e-CRM adopters was needed. Further analysis clustered e-CRM adopters based on their perceptual similarity. Using multivariate statistics, the cluster analysis technique was utilised to cluster the e-CRM adopters. This was done in three stages. Firstly, the specific cluster analysis techniques were tested and the number of cluster was identified. Secondly, the number of clusters was validated by using ANOVA. Finally, each cluster was labelled by focusing on the major source for getting e-CRM applications and the number of e-CRM applications being used in the firm.

4.3.1 Clustering procedure

Hierarchical clustering approach was chosen as it allows the researcher to see the structure of the clustering solution. Also, possible numbers of clusters are provided. The e-CRM adopters were clustered based on 15 psychographic variables including attitude, subjective norm, self-efficacy, innovativeness, perceived advantage, perceived easiness, compatibility, observability, trialability, perceived relationship marketing functionality, competitive pressure, customer pressure, industry pressure, governmental encouragement and external support. The scales used to measure these variables are shown in

Appendix B. The clustering was computed by using statistical computer software i.e., SPSS version 15.00. Ward's hierarchical clustering method was selected and the distance between the items was measured by squared Euclidean distance.

By looking at the difference in the values of the coefficients between cluster solutions, the outcome of computation suggested that a three-cluster solution tended to be the optimal solution since there was a sudden change of distance coefficients between two-cluster and three-cluster solutions. Table 3 presents the distance coefficients of the clustering solutions.

Table 3 Distance coefficient of clustering solutions

Number of cluster	*Coefficients*	*Change in distance coefficient*
1	2500.446	
2	1521.774	978.672
3	1141.859	*379.915*
4	950.030	191.829
5	781.416	168.614
6	650.800	130.616
7	548.275	102.525
8	448.189	100.086
9	363.624	85.565
10	279.866	83.758
11	228.963	50.903
12	178.772	50.191
13	137.408	41.364
14	97.451	39.957
15	63.814	33.637
16	35.462	28.352
17	13.948	21.514

Apart from comparing the proportion of cases in each cluster solution, frequency distribution was conducted for two-cluster, three-cluster, four-cluster and five-cluster solutions. As shown in Table 4, the proportion in the two-cluster solution was substantial and therefore was deemed inappropriate for interpretation. The three-cluster and four-cluster solutions looked similar. The groups in the three-cluster were divided into smaller groups in the four-cluster solution. In the five-cluster solution, the proportion was similar to the four-cluster solution whereby the additional group was broken from the biggest group in the four-cluster solution. As can be seen in Table 4, the four-cluster and five-cluster solutions appeared unsuitable because two groups in each solution contained a very low number of cases. Moreover, it could be argued that the more clusters that are chosen, the more difficult the understanding and interpretation become. Considering the data in Tables 3 and 4, a three-cluster solution seemed to be the optimal solution and it was, therefore, finally selected. The three-cluster solution consisted of six firms in cluster one, 34 firms in cluster two and 63 firms in cluster three.

Table 4 Frequency distribution for cluster solutions

Two-cluster			*Three-cluster*			*Four-cluster*			*Five-cluster*		
	n	*%*		*n*	*%*		*n*	*%*		*n*	*%*
1	6	5.8	1	6	5.8	1	6	5.8	1	6	5.8
2	97	94.2	2	34	33.0	2	34	33.0	2	34	33.0
	103	100.0	3	63	61.2	3	57	55.3	3	45	43.7
				103	100.0	4	6	5.8	4	12	11.7
							103	100.0	5	6	5.8
										103	100.0

4.3.2 Cluster validation

This stage was to verify that the three clusters were statistically different and theoretically meaningful. The three clusters were assessed by using ANOVA analysis against 15 psychographic variables initially used for compiling the clustering. Table 5 shows the results from ANOVA. It appeared that the difference in the means of the clusters for all psychographic variables were highly significant ($p < 0.005$). Therefore, all psychographic variables used for clustering e-CRM adopters were applicable indicating that cluster validation was demonstrated. It could be said that the means of the three groups were statistically different from each other.

Table 5 ANOVA analysis for cluster validation

Variables	*Comparison*	*F*	*Sig.*
Attitude	Between groups	230.837	0.000
Subjective norm	Between groups	43.796	0.000
Self-efficacy	Between groups	80.817	0.000
Innovativeness	Between groups	58.727	0.000
Perceived advantage	Between groups	109.406	0.000
Perceived easiness	Between groups	103.236	0.000
Compatibility	Between groups	45.294	0.000
Observability	Between groups	51.092	0.000
Trialability	Between groups	28.906	0.000
Perceived relationship marketing functionality	Between groups	91.281	0.000
Competitive pressure	Between groups	60.922	0.000
Customer pressure	Between groups	25.549	0.000
Industry pressure	Between groups	106.355	0.000
Governmental encouragement	Between groups	21.671	0.000
External support	Between groups	77.009	0.000

4.3.3 Labelling the clusters

The three clusters were labelled by looking at the means of the psychographic variables together with other two variables; the source of getting the e-CRM applications and the

number of adopted e-CRM applications. Table 6 shows the means of all psychographic variables across three clusters. It was evident that the means for cluster one were considerably lower than those in cluster two and cluster three. The means for cluster two and three were considerably higher than the midpoint of the seven-point scale. In comparison, the means for cluster three were appreciably higher than cluster two and were the highest across the three clusters.

Table 6 The means of the three clusters

Variables	*Cluster one n = 6*	*Cluster two n = 34*	*Cluster three n = 63*
Attitude	2.333	5.794	6.524
Subjective norm	2.000	5.309	5.897
Self-efficacy	2.667	2.451	5.455
Innovativeness	1.750	4.971	5.718
Perceived advantage	2.444	5.425	5.760
Perceived easiness	2.000	4.265	5.556
Compatibility	3.167	4.647	6.011
Observability	2.167	4.539	5.635
Trialability	1.500	5.206	5.508
Perceived relationship marketing functionality	2.333	5.427	6.175
Competitive pressure	2.500	5.530	5.790
Customer pressure	3.000	5.000	5.365
Industry pressure	2.583	5.088	6.040
Governmental encouragement	2.667	5.515	5.207
External support	1.833	5.618	5.841

When looking at the source of getting e-CRM applications, all firms (100.0%) in cluster one bought instant e-CRM packages. For cluster two, the majority (67.6%) bought instant e-CRM packages and the rest (32.4%) developed their own internal e-CRM. The firms in cluster three covered all sources of getting e-CRM applications. 'Do-it-yourself' e-CRM was the most popular source (46.0%) in this group followed by 'made-to-order' e-CRM (35.0%) and 'instant' e-CRM packages (19.0%) respectively. Furthermore, a similar pattern was found when looking at the number of adopted e-CRM applications. Most firms in all three clusters have adopted only one application. However, some firms in cluster two have adopted two applications while the firms in cluster three have adopted up to three e-CRM applications. Table 7 presents the distinctiveness of the three clusters by displaying these variables.

Considering the data from Tables 6 and 7, cluster one had the lowest means for the psychographic variables. The firms in this cluster simply bought instant e-CRM packages and adopted only one e-CRM application. It could be said that this group seemed to be a new or beginner e-CRM user. So, this cluster was labelled as '*Basic e-CRM adopter*'. For cluster two, the way the firms adopted e-CRM applications was more varied than cluster one but less than for cluster three. Also, their perceptions regarding the psychographic variables were midway between cluster one and cluster three. So, this cluster was labelled as '*Moderate e-CRM adopter*'. The last cluster was viewed as sophisticated users since the firms in this cluster seriously applied e-CRM applications to their firms. They were

likely to develop their own internal e-CRM applications or hired external vendors to develop specific e-CRM applications rather than just simply buying instant software packages. Furthermore, their perceptions about e-CRM technology were appreciably positive. Thus, this group was labelled as '*Advanced e-CRM adopter*'.

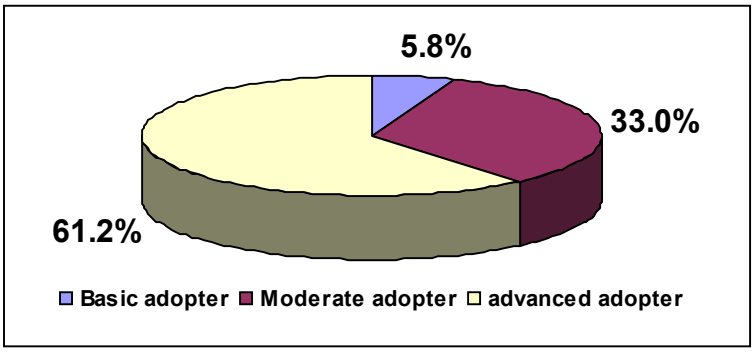
Table 7 Distinctiveness of the three clusters

	Cluster one n = 6		*Cluster two n = 34*		*Cluster three n = 63*	
Source of e-CRM applications		*%*		*%*		*%*
Do-it-yourself e-CRM	0	0	11	32.4	29	46.0
Instant e-CRM package	6	100.0	23	67.6	12	19.0
Made-to-order e-CRM	0	0	0	0	22	35.0
Number of adopted e-CRM applications						
One application	6	100.0	29	85.3	40	63.5
Two applications	0	0	5	14.7	17	27.0
Three applications	0	0	0	0	6	9.5

5 Findings and discussion

The cluster analysis suggests three classifications of e-CRM adopters in this study. Even though the three groups are seen to be e-CRM adopters, they are statistically different regarding their perceptions about e-CRM adoption. The first group accounts for 5.8% and tends to have the lowest level of perceptions on psychographic factors. The means value across psychographic factors for the first group are lower than the mid-point on the seven-point scale. The second group accounts for 33.0%. The means value (except for the self-efficacy factor) for this group are slightly higher than the mid-point on the seven-point scale. In general, the second group had a more positive perception than the first group but lower than the third group. The third group is the majority accounting for 61.2%. This group has the highest means value across all psychographic factors. Figure 2 shows the proportion of e-CRM adopters identified in this study

Figure 2 The proportion of e-CRM adopters (see online version for colours)



Given that the three types of e-CRM adopters among manufacturing SMEs were established, each group was profiled based on its demographic information. This provides better understanding about the characteristics of each group. Table 8 presents the descriptive statistics of demographic variables for all types of e-CRM adopters.

Table 8 Descriptive statistics across three e-CRM adopter groups

	Basic adopter		*Moderate adopter*		*Advanced adopter*	
	n = 6	*%*	*n = 34*	*%*	*n = 63*	*%*
Gender						
Male	0	0	11	32.4	47	74.6
Female	6	100.0	23	67.6	16	25.4
Age						
<31	2	33.3	6	17.6	17	27.0
31–40	4	66.7	11	32.4	23	36.5
41–50	0	0	12	35.3	12	19.0
51–60	0	0	5	14.7	11	17.5
Education level						
Vocational/diploma	0	0	6	17.6	0	0
Bachelor	6	100.0	17	50.0	52	82.5
Master	0	0	11	32.4	11	17.5
Management position						
Top management	0	0	23	67.6	34	54.0
Middle management	6	100.0	0	0	12	19.0
Lower management	0	0	11	32.4	17	27.0
Industry type*						
Type 1	0	0	11	32.4	6	9.5
Type 2	0	0	6	17.6	22	34.9
Type 3	0	0	0	0	6	9.5
Type 4	0	0	0	0	6	9.5
Type 5	6	100.0	12	35.3	23	36.5
Type 6	0	0	5	14.7	0	0
Company size (number of employees)						
25 persons or less	6	100.0	12	35.2	23	36.5
26–50 persons	0	0	11	32.4	12	19.0
51–100 persons	0	0	0	0	11	17.5
101–150 persons	0	0	0	0	6	9.5
151–200 persons	0	0	11	32.4	11	17.5

Note: *For detail of each industry type, please see Appendix A.

Table 8 Descriptive statistics across three e-CRM adopter groups (continued)

	Basic adopter		*Moderate adopter*		*Advanced adopter*	
	n = 6	*%*	*n = 34*	*%*	*n = 63*	*%*
Company size (capital investment)						
25 million Baht or less	6	100.0	12	35.3	41	65.1
26–50 million Baht	0	0	12	35.3	0	0
51–100 million Baht	0	0	5	14.7	5	7.9
101–150 million Baht	0	0	0	0	5	7.9
151–200 million Baht	0	0	5	14.7	12	19.0
Time period of using internet						
Less than four years	6	100.0	6	17.6	0	0
4–7 years	0	0	22	64.7	29	46.0
7–10 years	0	0	0	0	23	36.5
Over ten years	0	0	6	17.6	11	17.5
Frequency of using internet						
Once per month	0	0	5	14.7	0	0
Once per 2–3 days	0	0	6	17.6	0	0
Everyday	6	100.0	23	67.6	63	100.0
Internet's knowledge and skill						
Beginner	2	33.3	5	14.7	0	0
Moderate	4	66.7	29	85.3	51	81.0
Advanced	0	0	0	0	12	19.0

Notes: *For detail of each industry type, please see Appendix A.

5.1 Basic e-CRM adopters

The characteristic of the managers/owners in this group is that they are young females, aged younger than 40 years. They hold bachelor degrees and are at middle management positions in the firm. They have been using internet less than four years. They tend to use the internet everyday. However, since they have little internet experience, they typically consider themselves as beginners or moderate internet users. The characteristic of the firms in this group is that they are very small firms having employees of less than 25 persons and capital investment of less than 25 million Baht. The firms are in industry type 5.

5.2 Moderate e-CRM adopters

The characteristic of the managers/owners in this group is varied providing some interesting insight. The majority of this group is female (67.6%). The age range is diverse

but the majority is aged between 41–50 years (35.3%). They are well educated with 50% having bachelor degrees and 32.4% having master's degrees. The majority hold top management positions in the firm. Regarding their internet experience, they have been using internet for 4–7 years and they are likely to use the internet everyday. They consider themselves as moderate internet users. Furthermore, according to the firm characteristics, the firms in this group are either small or big in terms of number of employees. Nearly 70% have employees of less than 50 persons while around 30% have employees of between 151 to 200 persons. When considering the capital investment, their sizes do not vary too much. They tend to have capital investment of less than 25 million Baht (35.3%) or 50 million Baht (35.3%). Most of the firms are in industry type 5 (35.3%) and type 1 (32.4%).

5.3 Advanced e-CRM adopters

This group holds the biggest proportion of e-CRM adopters. The characteristic of the managers/owners is that this group contains more males (74.6%) than females (25.4%). Their ages cover all age groups from younger than 31 up to 60 years of age, but the majority is young and they tend to be younger than the 'moderate adopter' group. The majority is younger than 40 years (63.5%). Most of them hold at least a bachelor degree (82.5%) and they are in top management positions (54.0%) in the firm. This group could be viewed as sophisticated internet users since they use the internet everyday and more than half of them have been using the internet for more than seven years. The majority considers themselves as moderate internet users (81.0%), while some of them view themselves as advanced internet users (19.0%). Regarding the firm characteristics, the size of the firms in this group is varied covering all possible sizes of SMEs. However, the majority is still in the smallest category having employees of less than 25 persons (36.5%) and capital investment of less than 25 million Baht (65.1%). The type of firms is also varied with the majority being in industry type 5 (36.5%) and industry type 2 (34.9%) respectively.

As presented above, it is evident that there are observable differences among e-CRM adopters. This infers that each group might have different needs and expectations. Their perceptions toward e-CRM technology are obviously different. So, to sustain the use of e-CRM applications among e-CRM adopters, campaigns promoting the use of e-CRM applications should be diverse and appropriate for each specific adopter group. The findings from the descriptive statistics in this study provide pertinent information for market segmentation for the e-CRM industry as a whole. In addition, the research results will allow marketing managers in technology vendors to properly allocate resources to promote the implementation of e-CRM technology.

Based on the findings, it can be deduced that those manufacturing SMEs which recently adopted e-CRM application need more attention from technology vendors. In particular, the basic e-CRM adopters are still suspicious about adopting e-CRM applications. There is a need to make this group more confident about the potential of having e-CRM applications in their firms. On the other hand, the moderate and advanced e-CRM adopters might require different inputs to sustain the use of e-CRM applications. Although these two groups are well aware of the potential of e-CRM applications, their concerns might be on how to maximise the advantages of e-CRM applications.

6 Conclusions and implications

Given that applying e-CRM applications is expected to sustain long-term customer relationships on the internet, SMEs are encouraged to adopt this technology to contribute to and support their sustainable competitive advantage. Adoption rates are still low. There is ample room for promoting the technology. When focusing on the adopter group, the findings suggest that although e-CRM adopters share something in common, their perceptions toward e-CRM applications are somewhat different. Using the cluster analysis technique, the present study identifies three types of e-CRM adopters being basic adopter, moderate adopter and advanced adopter. The profile and characteristics of each group are clearly provided.

The implication is that the study provides pertinent information and insightful guidance to those policy makers and marketing managers who want to encourage the implementing and sustaining of e-CRM applications in SMEs. Each adopter group has a different perception about e-CRM benefits. So, different strategic plans are required to capture the attention of each adopter group. In addition, through using demographic profiles, the findings can be used for market segmentation in industry concerning e-CRM and its relevant components.

Since the analysis is based on manufacturing SMEs in the Kingdom of Thailand, it could be said that the findings are of direct benefit to local officials and private agencies. However, with cautious consideration, the findings are also applicable to other countries that have circumstances and infrastructure development similar to Thailand.

7 Limitation and future research

Although the findings provide useful information for understanding e-CRM adopters, some limitations must be addressed. First, the manufacturing sector is the main focus in this study. Other sectors of SMEs may exhibit different forms of behaviour. It would be interesting to examine the e-CRM adoption in other sectors such as service SMEs and trading SMEs to see if differences exist. Second, the number of e-CRM adopters seems appreciably low and the survey focuses on the phenomenon at a single point in time by using cross-sectional data collection. The proportion of adoption rates is expected to increase in the future. Thus, a longitudinal study is recommended to facilitate the understanding of the transition in manufacturing SMEs. Finally, the sample was drawn from Thai manufacturing SMEs. This selectivity restricts the ability to generalise the results since industry infrastructure differs from country to country. The results could only represent manufacturing SMEs in Thailand and other countries that have similar industry infrastructure. Hence, further comparative research is needed to validate the results found in this study. The outcomes of the study should, therefore, be interpreted in light of these limitations.

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Appendix A Industry type

Type 1 Manufacturing of food products, prepared food, beverages, alcoholic beverages, dairy products, oil, animal fat products, tobacco and other food products.

Type 2 Manufacturing of machines, vehicles, office accessories, medical instruments, electronic and computing equipments.

Type 3 Manufacturing of knitting, spinning, weaving and finishing of textiles, carpet, rope and nets.

Type 4 Manufacturing of wearing apparel, hats, wearing accessories, dressing and dyeing of fur.

Type 5 Manufacturing of wood, paper, wooden products, gasoline, metallic products, rubber, plastic, glass, cement, ceramic, chemical products, printing and publishing.

Type 6 Manufacturing of leather products, tanning and dyeing leather, luggage, bags, and footwear.

Appendix B List of perceptual measurement variables

Attitude

1 I believe that adopting e-CRM to my firm is a wise decision.

2 I believe that adopting e-CRM is helpful to my firm business.

3 I believe that e-CRM application is an effective marketing tool in the e-marketplace.

Based on Harrison et al. (1997), Cronbach's alpha = 0.89.

Subjective norm

1 People who are important to me think that I should use e-CRM applications.

2 People who influence my behaviour think that I should use e-CRM applications.

Based on Venkatesh and Davis (2000), Cronbach's alpha = 0.88.

Self efficacy

I could complete the job using the computer application….

1 …..if there was no one around to tell me what to do as I go

2 …..if I had only the software manuals for reference

3. …..if I had seen someone else using it before trying it myself.

Based on Compeau et al. (1999), Cronbach's alpha = 0.82.

Innovativeness

1 I often risk doing things differently.

2 I usually have fresh perspectives on old problems.

3 I have original ideas.

4 I would sooner create something new than improve something existing.

Based on Al-Qirim (2005), Thong and Yap (1995), Cronbach's alpha = 0.81.

Perceived advantage

Using an e-CRM application enables my firm to….

1 …..gain and maintain competitive advantage

2 …..analyse customer requirements more efficiently

3 …..identify new selling opportunities

4 …..increase customer satisfaction

5 …..increase customer loyalty

6 …..increase customer retention rate

7 …..increase revenue and profitability

8 …..increase employee productivity

9 …..reduce overall cost.

Newly developed scale, Cronbach's alpha = 0.95.

Perceived easiness

1 I believe that e-CRM applications are easy to use.

2 Learning to operate e-CRM applications is easy for me.

3 I believe that it is easy to get an e-CRM application to do what I want it to do.

Based on Moore and Benbasat (1991), Cronbach's alpha = 0.88.

Compatibility

1 Using an e-CRM application is compatible with most aspects of the firm's work.

2 Using e-CRM application fits with the firm's work style.

3 I think that using an e-CRM application fits well with the way I like to work.

Based on Karahanna et al. (1999), Moore and Benbasat (1991), Cronbach's alpha = 0.90.

Observability

1 I have noticed that e-CRM applications are being used by other firms.

2 I am aware of the existence of e-CRM applications in the market.

3 I know where to get e-CRM applications.

Newly developed scale and based on Moore and Benbasat (1991), Cronbach's alpha = 0.87.

Trialability

1 Before deciding whether to adopt e-CRM application, I am able to properly try it out.

2 I am permitted to use e-CRM application on a trial basis long enough to see what it can do.

Based on Moore and Benbasat (1991), Cronbach's alpha = 0.90.

Perceived relationship marketing functionality

I believe that e-CRM application is a marketing tool used to….

1 …..acquire new customers

2 …..enhance customer relationships

3 …..retain customers.

Newly developed scale, Cronbach's alpha = 0.93.

Competitive pressure

1 Competition is a factor in my decision to adopt an e-CRM application.

Based on Grandon and Pearson (2004), Cronbach's alpha = single item.

Customer pressure

1 Customers' requirements indicate that a company needs to have an e-CRM application.

2 Customers' behaviours indicate that a company needs to have an e-CRM application.

Newly developed scale, Cronbach's alpha = 0.91.

Industry pressure

1 The overall operational practices in my industry pressure me to adopt e-CRM applications.

2 It is a strategic necessity to use an e-CRM application to compete in my industry.

Based on Premkumar and Roberts (1999), Cronbach's alpha = 0.93.

Governmental encouragement

1 I know that the government has policies and initiatives encouraging companies to adopt internet technologies.

2 I am aware of the existence of governmental agencies providing services toward internet/e-business/e-commerce adoption.

Newly developed scale, Cronbach's alpha = 0.82.

External support

1 The availability of support from technology vendors is a factor in my decision to adopt e-CRM applications.

2 I know there are technology vendors, who provide technical advice and support for e-CRM adoption.

Newly developed scale and based on Al-Qirim (2005), Cronbach's alpha = 0.73.