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## **Thailand's Provincial Electricity Authority (PEA) Electronic Customer Relationship**

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### **ABSTRACT**

This study is an analysis of Thailand's Provincial Electricity Authority's (PEA) use of Electronic Customer Resource Management (CRM) systems and how they affect PEA's customers. The PEA operates as a government enterprise in the utility sector, having primary responsibilities which include power generation, procurement, distribution and sale of electricity to the public, businesses and the industrial sector. This currently includes 99.4% of Thailand, with a total of 74 of 77 provinces covering an area of 510,000 km<sup>2</sup>. Research methodologies used within this study include both quantitative and qualitative research. Quantitative is further qualified by the use of a survey given to 500 PEA executives. The Partial Least Square (PLS) technique, a form of structural equation modeling, is additionally used due to it being component-based rather than covariance-based. Additionally, qualitative research is supported by input from questionnaires from 10 key Thai PEA officials utilizing the purposive sampling approach. The results showed that two factors had an immediate and positive impact on customer satisfaction: There were Service Quality and E-CRM. Furthermore, there was also an immediate and positive impact on PEA Customer Satisfaction. A fact recognized by a hypothesis significance  $p \leq 0.01$ , respectively, with the results of qualitative research being consistent with the results of quantitative research. So, if the PEA has a good ECRM and Service Quality, organizational performance increases.

**Key words:** Service quality, electronic customer relationship management, customer satisfaction

### **INTRODUCTION**

The emergence of technology and information systems have come to play a key role within the organization and technology, specifically the Internet, becoming an important tool in assisting the organization in its ability to work faster and more efficient each day. As data and information has become more accurate and accessible, Information Technology (IT) systems have crept more and more into everyday life.

As IT became a tool for management allowing faster and faster decision making and analysis, E-CRM became a strategic component of an organization's survival at every level and today it dominates, offering a competitive advantage. Bringing IT into the development of Customer Relationship Management (CRM), is an effort at identifying and retaining customers (Rainer *et al.*, 2007). Process management is a long-term relationship with the customer which needs products or services to satisfy customer's needs.

The use of technology and human resource principles have been used more and more in customer relationship management which builds customer relationships and helps with the continuing education about customer needs and behavior in all aspects of interaction with customers. It also helps educate the customers, whose data is used to develop products and services as well as marketing programs to suit individual customers or groups to meet the needs of their customers at heart (Pleasant, 2005).

A customer relationship management system is a system designed to support all activities relating to the management of the relationship between the customer and the organization (Delafrooz *et al.*, 2009). It is also a system which creates a tool that allows organizations to collect customer data from various departments giving them the ability to analyze the objectives of the organization's needs.

It also allows the transfer of this information to other systems which can include customer contact points, helping to create long-term customer satisfaction. Data analysis helps provide enterprise customers greater details about all the old customers and new customers adding long-term value and loyalty to the organization creating greater profitability.

A customer relationship management system also allows organizations to learn their customer's behavior as well giving the organizations a better ability to analyze this data. It also allows organizations to find new customers and development new and better services, customizing and tailoring their services for each individual group. The E-CRM planning can increase customer perceptions and satisfaction leading to longer customer retention (Santos, 2003).

Electronic Customer Relation Management (E-CRM) is a technology tool that has been used to manage the information system applications and communication technology to increase the size and scope of customer service (Blery and Michalakopoulos, 2006). They also mentioned that E-CRM is a internet technology marketing tool with the aim of finding, building and improving long-term relationships with customers to improve their potential performance (Blery and Michalakopoulos, 2006).

**Provincial Electricity Authority (PEA):** It is a government enterprise in the utility sector attached to the interior ministry, was established on 28 September 1960 with primary responsibilities including power generation, procurement, distribution and sale of electricity to the public, businesses and industrial sectors in 74 provinces, over a nationwide area of 510,000 km<sup>2</sup> or 99.4% of Thailand,(with the exception of Bangkok, Nonthaburi and Samut Prakarn provinces). The stated missions of the organization are, (1) Optimal performance and utilization of its products and services, (2) A powerful enterprise management system, (3) To maintain successful financial performance and (4) Creation and maintenance of a Customer-Centric Organization with a focus on the customer and the environment (MEA, 2010).

PEA has also become a leading international energy services business functioning with social responsibility and a concern for the environment. With a mission to supply and provide electricity and related services in neighboring countries using international standards, with a focus on customer satisfaction both in the quality of products and services by continuing development within PEA's organizations.

PEA's modern business needs to be managed effectively, in line with market conditions as well as ready for business competitiveness and social and environmental responsibility. Long term strategy should also focus on customer relationship management building relationships to continue learning about customer needs and their behavior in all aspects of interaction with customers.

If you are able to learn from customers the data can be used to develop products and services as well as marketing programs to suit individual customers or groups to meet each customer's needs at a cost that is inexpensive. This will result in a sustainable long-term relationship with loyalty among the customer base contributing to sustained long-term profitability.

Education needs to focus on Customer-Centric Business to collect data and do analysis which contributes to the information helping CRM decision strategy. This helps create a competitive advantage in a highly competitive environment. The CRM has thus become the strategic 'weapon' to win in the modern market place and meet constantly changing business environments as well as the introduction of new information technology, equipment and instruments.

This study's researchers were interested in understanding the model of service quality and electronic customer relationship management (E-CRM) affecting PEA customer satisfaction. Variables have been determined to be: (1) Service Quality which consisted of Trust, Customer Service, Confidence, Customer Care and Physical Appearance, (2) Electronic Customer Relationship Management (E-CRM) variables included Basic Services, Customer-Centric Services and Value-Added Services and (3) Customer Satisfaction with Service, Service System and Overall Satisfaction.

## CONCEPTUAL DEVELOPMENT

**Service quality:** Organizations deploy various methods at being successful but one group's method might not necessarily be successful elsewhere. Indeed, as Buzzell and Gale (1987) cited in Gronroos (1990) state: "Quality (of service) is whatever the customers say it is and the quality of a particular service, is what the customers perceive it to be".

The meaning of Service Quality is provided by two types, (1) Technical Quality refers to the relationship of the results to what the client receives from the service and being able to measure it with the assessment of Product Quality, (2) Functional Quality is related to the process of evaluating which is in line with Crosby (1979), stated that Service Quality is a concept that holds to the idea of DRIFT or "doing it right the first time" and further stated that "quality is free" with zero defects. According to the study by Angelova and Zekiri (2011) "Measuring Customer Satisfaction with Service Quality Using American Customer Satisfaction Model (ACSI Model)", they found that Service Quality and Customer Satisfaction are very important concepts.

In a competitive environment, delivering high quality services is the most important key for a sustainable competitive advantage. Customer satisfaction has a positive effect on the profitability of the organization and is the foundation of a successful business. Customer satisfaction also leads to brand loyalty and repeat purchases from mouth to mouth customer satisfaction but when Service Quality isn't perceived by the client as satisfactory, expectations were higher than the recognition of customers satisfied with the service. The findings will provide additional information about customer needs and satisfaction.

Lewis and Soureli (2006) found that the perception of Service Quality has a direct effect on customer trust. This is consistent with the findings of Chao *et al.* (2009), who also found that Service Quality perception has a direct effect on the satisfaction and trust of customers. While research by Tsai *et al.* (2010) found that perceived Service Quality has a direct influence on customer loyalty. However, there are indirect costs to the service and customer satisfaction is a variable.

**Electronic Customer Relationship Management (E-CRM):** The concept of Electronic Customer Relationship Management (E-CRM) is a form of customer relationship management using the Internet as a medium. This form of online customer relationship management also includes electronic mail and electronic commerce activities along with several other channels that can reach customers on the internet (Panichchakul and Pongsasakulchai, 2009; Cherdchukijkul, 2005).

E-CRM provides Customer Service and corporate partners more efficient and more productive means to work, so E-CRM is not just something to make the organization's survival but also as a tool to help organizations take advantage of the business as well (Panichchakul and Pongsasakulchai, 2009) and organizations that put E-CRM operations continued to flow and information in relation to enterprise customers (Blery and Michalakopoulos, 2006).

Blery and Michalakopoulos (2006) noted that the use of Internet technology is to achieve specific search objectives and to build and improve relationships with customers to optimize their long term potential (Aydin and Ceylan, 2009) which resulted in employee satisfaction. Customer Satisfaction requires (Olowokudejo *et al.*, 2011), giving organizations the ability to interact with customers which leads to better quality service and responding quickly to customers (Nguyen *et al.*, 2007).

From a study by Wangkananon and Sawmong (2012) concerning the strategy to build loyalty in the Thai cosmetics industry found that the factors that influence loyalty factors are the basic building loyalty. (direct, = 0.243, indirect = 0.0048 and total = 0.2478) and the factor of customer relationship management. (Direct = 0.032), the factors that influence customer loyalty. Factors include building relationships closely and reducing factors that cause change. Strategy to build loyalty in the industry, the manufacture of cosmetics. Factors include the basic building loyalty. Factors and customer relationship management. Which should focus on the underlying factors creating loyalty. Cherdchukijkul (2005) found that the satisfaction of the public to the services at the center a single point, the Bangkok people total. The results showed that people were satisfied with the behavior of services and service system. Corry *et al.* (1997) and Tangkhaprasert (2007) found that users can search for the information you need from the site could be improved more efficiently than the existing site.

**Customer satisfaction:** Customer satisfaction is an emotion or feeling that the individual expresses at the pleasure of using the product or consuming the product (Pleasant, 2005), which is consistent with the research of Hornby (2000) and Wolman (1973) who stated success breeds happiness and satisfaction.

When we have been successful we get intentional goals to need or motivation. The ACSI model includes three factors that affect customer satisfaction which are the quality of the product or service that customers receive (Perceived Quality). Value of the product or service that customers receive (Perceived Value). The expectations of the customer (Customer Expectation). Other factors contributing to customer satisfaction include customer complaints (Customer Complaints) and loyalty to the product or services (Customer Loyalty) (Eskildsen and Kristensen, 2008).

A study by Aydin and Ceylan (2009) on the satisfaction of both customers and employees for the effectiveness of the organization creates and enhances long-term customer relationships. This affects the optimization potential of the organization and results in employee satisfaction as well as customer satisfaction (Olowokudejo *et al.*, 2011).

Chen and Tseng (2012) found that a website's ease of use affected the attitudes of the consumer and contributed directly to the knowledge, benefits and recognition of the organization. It also enables organizations to increase their ability to interact with customers, leading to a better quality of service and faster customer response times (Anderson, 2006). If the organization can manage the satisfaction of their client, this will lead to the successful operation and loyalty of the customers (Caruana *et al.*, 2000; Paul *et al.*, 2009; Pong and Yee, 2001).

The following hypotheses were developed from the previous discussion:

- **H1:** Service Quality affects Electronic Customer Relationship Management(E-CRM)
- **H2:** Electronic Customer Relationship Management (E-CRM) affects Customer Satisfaction

## **METHODOLOGY**

The format of the survey was drawn from 1,143,935 industrial PEA electrical customers (PEA, 2010).

**Data collection:** This study collected samples from 500 industrial PEA electric customers using Probability Sampling and Simple Random Sampling.

**Questionnaires design:** Questionnaire was constructed to be a tool to measure concept definition and practice. The instrument or questionnaire used the 7-Point Likert scale as the measurement scale and the conceptual framework for determining the internal consistency measured by coefficient alpha. ( $\alpha$ -coefficient) of Akron BAC (Cronbach) to calculate the average value of the correlation coefficient was found that alpha coefficients ranged from 0.725-0.856, which is considered a highly reliable. All values lower than 0.50 were eliminated from the measurement.

### **Scale**

**Dependent variables:** Firm performance analysis used a measurement instrument or questionnaires utilizing a 7-Point Likert scale (Likert, 1970) and have been constructed with the scales developed enabling measurement of Service Satisfaction, CRM satisfaction and Overall Satisfaction (Eskildsen and Kristensen, 2008; Joo and Sohn, 2008; Sohn *et al.*, 2008).

**Independent variables:** Electronic Customer Relationship Management (E-CRM) analysis used a measurement instrument or questionnaires utilizing a 7-Point Likert scale (Likert, 1970) and have been constructed with three aspects (Table 1) including Basic Services, Customer-Centric Services and Value-Added Services (Loiacono *et al.*, 2002; Thiwalai and Liampreecha, 2012).

Service Quality analysis analysis used a measurement instrument or questionnaires utilizing a 7-Point Likert scale (Likert, 1970) and have been constructed with five aspects (Table 1) including Trust, Customer Service, Confidence, Customer Care and Physical Appearance (Parasuraman *et al.*, 1985).

## **RESULTS AND ANALYSIS**

Partial Least Squares has been applied for analysis of quantitative data by the researcher. It is data analysis for Confirmatory Factor Analysis (CFA) relating to the determination of Manifest Variable and Latent Variable and testing of research hypothesis exhibiting in structural model analyzed by using the applications of PLS-Graph (Chin, 2001).

Table 1: Statistic values presenting convergent validity of reflective scales of latent variables

Variables	Construct/Item	Loading	t-stat
<b>Service quality</b>			
Q_TRUS	Trust	0.920	63.491
Q_RES	Customer service	0.978	79.979
Q_CON	Confidence	0.955	69.320
Q_EMT	Customer care	0.936	66.490
Q_AMP	Physical appearance	0.930	87.115
<b>Electronic customer relationship management</b>			
CRM_F	Basic services	0.976	88.666
CRM_C	Customer centric services	0.968	102.106
CRM_V	Value added services	0.971	84.915
<b>Customer satisfaction</b>			
CRM_SAS	Service	0.460	6.340
CRM_SYSTEM	Service system	0.969	134.881
CRM_Total	Overall satisfaction	0.964	151.632

According to the analysis result of scale validity and reliability, scale investigation has been conducted using internal consistency measurement coefficient alpha. ( $\alpha$ -coefficient) of Akron BAC (Cronbach) to calculate the average value of the correlation coefficient was found that alpha coefficients ranged from 0.725 to 0.856, which is considered to have high reliability.

In case of measure variables with reflective analysis, convergent validity has been conducted. Loading is used as consideration criteria and must be positive quantity and indicator loading has been more than 0.707 and all values have been statistically significant ( $|t| \geq 1.96$ ) representing convergent validity of scales (Lauro and Vinzi, 2004; Henseler *et al.*, 2009) quoted in (Piriyakul, 2010) and analysis results as shown in Table 1.

Service Quality factors (QUALITY) are the factors underlying the external variable Trust (Q\_TRUS) Customer Service (Q\_RES), Confidence (Q\_CON), Customer Care (Q\_EMT) and Physical Appearance (Q\_AMP) with values loading from 0.707 and a significant level of confidence percentage 95 ( $t\text{-stat} > 1.96$ ), which considers such factors. These factors affect Customer Satisfaction.

Electronic Customer Relationship Management (E-CRM) factors underlying the external variable are Basic Services (CRM\_F) Customer Centric Services (CRM\_C) Value Added Services (CRM\_V) and Customer Care (Q\_EMT), with values loading from 0.707 and a significant level of confidence percentage 95 ( $t\text{-stat} > 1.96$ ), which considers such factors. These factors affect Customer Satisfaction.

Customer Satisfaction factors underlying the external variables are Service system (CRM\_SAS), Service System (CRM\_SYSTEM) and Overall Satisfaction (CRM\_TOTAL) with values loading from 0.707 and a significant level of confidence percentage 95 ( $t\text{-stat} > 1.96$ ), which considers such factors. These factors affect Customer Satisfaction.

So, the researchers took the variables, Trust (Q\_TRUS), Customer Service (Q\_RES), Confidence (Q\_CON), Customer Care (Q\_EMT), Physical Appearance (Q\_AMP), management basic (CRM\_F) Customer-Centric Services (CRM\_C), Value added Services (CRM\_V), Service (CRM\_SAS), Service System (CRM\_SYSTEM) and Overall Satisfaction (CRM\_TOTAL) were used to analyze the structural equation.

Table 1 shows the discriminant validity of the internal latent variables and the correlation of variables. It also depicts the scale reliability which has been

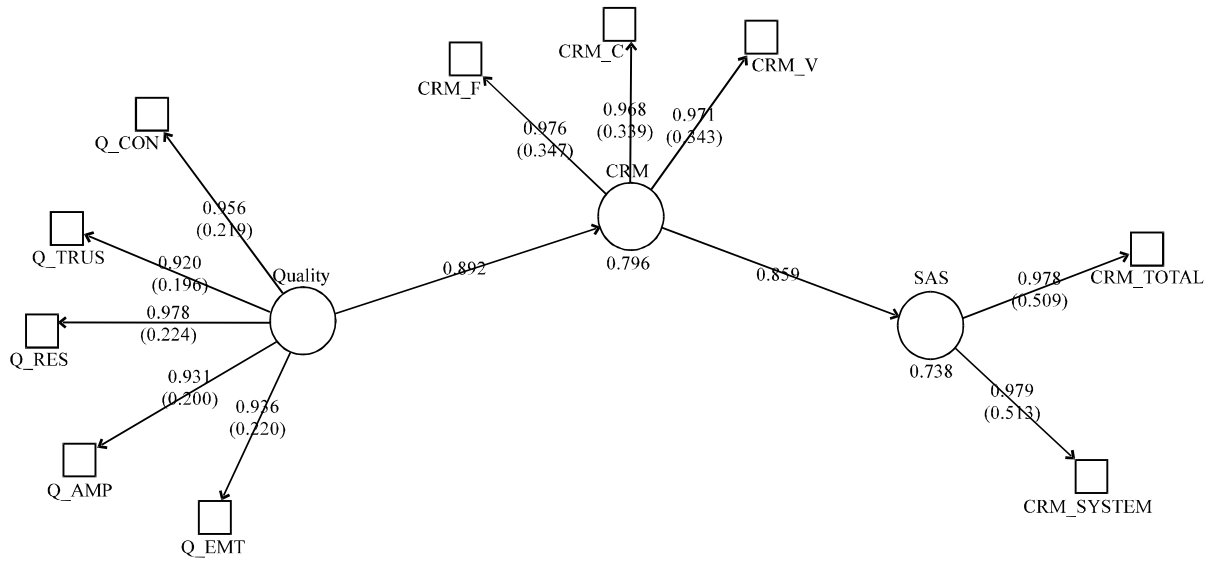


Fig. 1: Final model

Table 2: Results of Confirmatory Factor Analysis (CFA) for measurement model

Construct	CR	R <sup>2</sup>	AVE	Cross construct correlation		
				Service quality	E-CRM	Customer satisfaction
Service quality	0.979		0.892	0.9444		
E-CRM	0.981	0.796	0.944	0.8790	0.972	
Customer satisfaction	0.978	0.738	0.958	0.7680	0.852	0.979

Statistical significance level is at 0.01 and diagonal figures mean  $\sqrt{AVE}$

analyzed from Composite Reliability (CR) as well as the Average Variance Extracted (AVE) and R<sup>2</sup>. The CR value should not go below 0.60 and the AVE values should also drop below 0.50 and R<sup>2</sup> values should not be under 0.20 (Lauro and Vinzi, 2004; Henseler *et al.*, 2009) quoted in Wingwon and Piriyaikul (2010).

Table 2 shows the results of factor analysis affecting the PEA organizational performance. The data also shows the CR values are higher than 0.60, with all AVE values higher than 0.50 for all values and R<sup>2</sup> values higher than 0.20, representing the reliability of the measurement. It found that data sets in the  $\sqrt{AVE}$  have higher values than all of the corresponding values in the 'Cross Construct Correlation' in the same column, representing discriminant validity of the measure in each construct and with a greater value than 0.50 of AVE as shown in Table 2.

Analysis results of Service Quality, Electronic-Customer Relationship Management affecting Customer Satisfaction on the Thai PEA appears in Fig. 1.

Results for the structural model are depicted as the independent variables 'Quality' which is Service Quality, 'CRM' which is Electronic Customer Relationship Management and the dependent variable 'SAS', which is Customer Satisfaction.

## RESULTS AND DISCUSSION

Based on the research subject 'Thailand's Provincial Electricity Authority (PEA) Electronic Customer Relationship Management (E-CRM) System and how it affects customer satisfaction',



Service Quality, Electronic Customer Relationship Management (E-CRM) and Customer Satisfaction were studied to discover how the variables affect PEA customer satisfaction. Variables to be discussed are as follows:

- Service Quality factors affect E-CRM which is consistent with the study by Angelova and Zekiri (2011) 'Measuring Customer Satisfaction with Service Quality using American Customer Satisfaction Model (ACSI Model)', it was found that Service Quality and Customer Satisfaction are very important concepts. In a competitive environment it is crucial to deliver high quality service to maintain a sustainable competitive advantage
- Customer Satisfaction has a positive effect on the profitability of the organization and satisfied customers are the foundation of a successful business. Customer Satisfaction leads to brand loyalty and repeat purchases from word-of-mouth referrals
- The Service Quality perceived by the client is not satisfied. Expectations were higher than the recognition of customers satisfied with the service. The findings will provide additional information about the needs of the customer needs and satisfaction. It also leads to the researcher's measure the quality of service in the hospitality industry in Macedonia addition

Lewis and Soureli (2006) found that the perception of Service Quality has a direct effect on customer trust. This is consistent with the findings of Chao *et al.* (2009) who also found that Service Quality perception has a direct effect on the satisfaction and trust of customers. While research by Tsai *et al.* (2010), found that perceived Service Quality has a direct influence on customer loyalty. However, there are indirect costs to the service and customer satisfaction is a variable.

Electronic Customer Relationship Management affects Customer Satisfaction, which corresponds to Wangkananon and Sawmong (2012) 'A study of the strategy is to build loyalty in the industry of manufacturing in Thailand' found that the factors of customer relationship management affect customer satisfaction and loyalty to the service.

Chao *et al.* (2009) found that perceived service quality has a direct effect on the satisfaction and trust of customers. Additionally, research from, Lewis and Soureli (2006) found that perceived service quality has a direct effect on the trust of customers. While research from Tsai *et al.* (2010) found that perceived service quality has a direct effect on customer loyalty but there are indirect costs to the service.

## **CONCLUSION**

This study examined the quality of electronic customer relationship management (E-CRM) affecting PEA customer satisfaction. What is important to Service Quality is the ability to respond in providing services to the customers with the use of Electronic Customer Relationship Management (E-CRM) systems. The E-CRM systems must be available and up to date and up to the needs of the user. PEA's E-CRM system must also have an easy-to-use navigation system which gives the customer the confidence to use the online service which is a key factor in improving the Service Quality of E-CRM services.

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