

## **ELECTRONIC COMMERCE CUSTOMER RELATIONSHIP MANAGEMENT: A CASE STUDY OF THE PETROCHEMICAL INDUSTRY<sup>1</sup>**

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**Abstract** - Information Technology (IT) in recent years has become the major part of profitability in industry, economy and culture, where IT has accounted for 60% of the industry in 2002. In the new millennium, Information Technology (IT) comes out very effectively and is becoming evident in both developed and developing countries. These areas, especially within the fields of information gathering, strengthen networks in the broadest sense. Moreover, E-transformation has become a silent revolution. The frenzy of the dot.com years has gone, but the quiet work of harnessing the Internet to derive efficiencies in both business and government, if anything, has intensified. The Internet offers solutions to the twin priorities in these harsher economic times: saving costs and reaching customers. In this article the author will explain Electronic Customer Relationship Management and its impact on the petrochemical industry, and we will suggest necessary recommendations for the use of this important aspect of IT.

**Keywords** – E-Commerce, CRM, IT, Petrochemical Industry.

### **INTRODUCTION**

Competition among customers and manufacturers has increased significantly since the beginning of the 21<sup>st</sup> century. Electronic Business therefore plays an important role in the profit growth of industries. The term Electronic Business includes the exchange of information not directly related to actual buying and selling of goods. [1]

As can be seen in Table 1, there are at least five reasons for developed and developing countries to use IT.

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Table 1: Reasons for Developed and Developing Countries to Use IT

Reasons for the use of IT by developed countries	Reasons for the use of IT by developing countries
Reduce costs, up to 35%	Access to information
Better service to customers, up to 32%	E-mail and fast communications, up to 35%
Increase sale, up to 18%	Internet prices compared to other media, up to 17%
Improve marketing, up to 13%	More marketing facilities 6%
	Better promotion data base 4%
Others 2%	Others 4%

On the other hand, the Electronic Business formula is composed of five important factors:

$$EB = EC + BI + CRM + SCM + ERP$$

EC (Electronic Commerce) is “the use of transmission mediums (telecommunication) to engage in exchange, including buying and selling of products and services requiring transportation, either physically or digitally, from location to location.” [6]

BI (Business Intelligence) is referred to the gathering of secondary and primary information about competitors, markets, customers, etc.

CRM (Customer Relationship Management) is a fundamental critical component for planning and development of strategic applications. It is a new application of computer-based science in order to increase the sale and revenue of the organization. [4]

Moreover, CRM is about creating a meaningful relationship with customers and satisfying their needs and it is important for understanding customers.

SCM (Supply Chain Management) is a process that makes an opportunity for companies to buy, make, store, ship, and sell products and services. The supply chain management is profitable when communicating everywhere in a most efficient manner. [5]

Last, but not least, ERP (Enterprise Resource Planning) refers to back office operations such as order entry, purchasing, invoicing, and inventory control. ERP systems allow organizations to optimize business processes while lowering cost. Furthermore, technology has an impact on the growth of business. Thus, the term Electronic Commerce is used frequently.

The importance of CRM is the mutual benefit that refers to both customers and sellers. The key concept in customer relationship management is defined as three critical factors:

First, customers which are the major focus, and companies that have direct relationship with CRM. Second, it is not a one-to-one relationship, and third, a co-creative approach which helps the integration of Customer Relationship Management (CRM) and Customer Managed Relationship (CMR). These three aspects are helpful in order to understand

CRM. [9]

## DISCUSSION

In this decade Knowledge-Economy has caused the services to be performed inexpensively. Since K-Economy includes the use of IT, computers and Internet in all parts of production, economic sections, E-Government and Electronic Commerce, its use is inevitable.

In general, K-Economy is a multiplier function effect of Information-Communication Technology on business and strategy capabilities.

Capability = j

K-Economy = f ICT (Business + Strategy)

Capability = i

On the other hand, due to the growth of Electronic Commerce, a revolution has been taking place in the worldwide consumer market. The growth rate of Electronic Commerce is predicted to increase from US \$ 354 billion in 2001 to US \$ 10 trillion by 2005, with an annual increase of 70 percent per year. [5]

Therefore, customers' loyalty plays a more critical role in the world's E-market than ever before. Attracting and retaining customers is the most important responsibility of organizations. Those organizations, which focus on customer service and Customer Relationship Management (CRM) will be the long-term winners of markets.

Electronic Commerce is composed of three relationship types: "those between enterprises and customers; those between and among enterprises; and those internal to enterprises." The relationship between enterprise and customers are the most critical one, and this relationship is related to CRM. The term customer relationship management gained widespread recognition in the late 1990s. [9]

In other word, CRM "is a fundamental, critical component for planning and deployment of strategic application such as supplying chain management and electronic commerce." [5]

Ferris and Whipple define CRM as a relationship development process with the customer as the starting point for interaction with a company and other related parties, and the goal is to find a co-creative environment for all the parties to work together. In addition, CRM consists of the "practices, methods, and control systems that enable improvement in both effort and cost associated with acquiring, maintaining and creating loyal, happy, paying customers."

In general, there are five major E-CRM research areas: E-CRM and markets; E-CRM and technology; E-CRM business models; E-CRM and knowledge management; and E-CRM and human factors. These research areas focus on E-CRM from information system's perspective.

The most popular research area is E-CRM technology. There are three types of relationship management and customer relationship management technologies: passive, active, and interactive. New knowledge and technologies are helpful for both customers and sellers.

The second most popular topic is human factors. [10] This research area deals with virtual interactions among customers and between customers and enterprises. Customer emotional experience is effective on the main issues related to the human components of E-CRM such as: satisfaction, commitment, willingness to purchase, etc.

The third most important issue of research in E-CRM is business models. Keen offers six necessities for developing a business model dealing with E-CRM: “1) perfect one's logistic 2) perfect one's long-term customer relationship 3) harmonize one's channels 4) build a powerful portal brand 5) transform capital and cost structure 6) build value-adding intermediation.” [3]

The next popular research area is E-markets. Internet is not just media, it is a huge mall. “Traditional transactions may be thought of in three phases: information phase, agreement phase, and settlement phase.” These interactions are helpful in developing the relationship among customers and between customers and business enterprises.

The least popular topic of E-CRM research area is Knowledge Management. Commitment, trust, culture, and social-embeddedness of knowledge are four important factors in KM related to E-CRM. Successful KM required a proper blend of business process, people and IT.

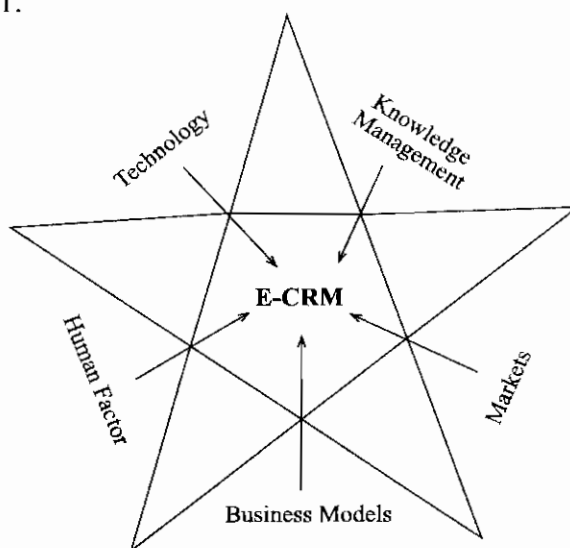


Figure 1: E-CRM Research Framework

Figure 1 illustrates E-CRM research framework. It shows that not only the five research areas have impact on E-CRM individually, but they also affect each other. However, the influence of different research areas on others is different. For instance, technology and markets are more effective on the human factor than KM. [10]

CRM has advantages and disadvantages. CRM integrates sales, marketing, services, enterprise resource planning and supply chain management functions through business processes and automation resources to maximize each customer contact. Therefore, paradoxes are the complexity of business environment in this century together with the fast growth of technology. Another paradox is that the structure of CRM has become old. The customer relationship is as old as the merchant trade. However, the concept of “customer” in CRM should be changed. [9]

On the other hand, there are many advantages on CRM. It provides manufacturers to do business in an easy environment, improves customers' loyalty and focuses on real customers. [11]

On the whole, in CRM term such as “customers” provide direction, the “relationship gives the focus,” and “management represents the approach,” are common. CRM treats different customers differently, thus focusing on customer behavior. For instance, it provides customers who are willing to pay more with better customer service.

CRM tries to develop business strategies via the usage of IS/IT. The rapid growth of technology for sales and marketing goals is helpful in using IS/IT in CRM. [4] It deals with aspects that increase customer contact.

CRM is divided into the following areas:

- Web marketing: the technologies include HTML/ HTTP, Java and web servers.
- CRM with data access: this section emphasizes on the interaction web-sites' users and key decisions like client, network, server, application server, and security.
- CRM with transactions: this section is about characteristics of user-to-business CRM and it focuses on secure transaction. [11]

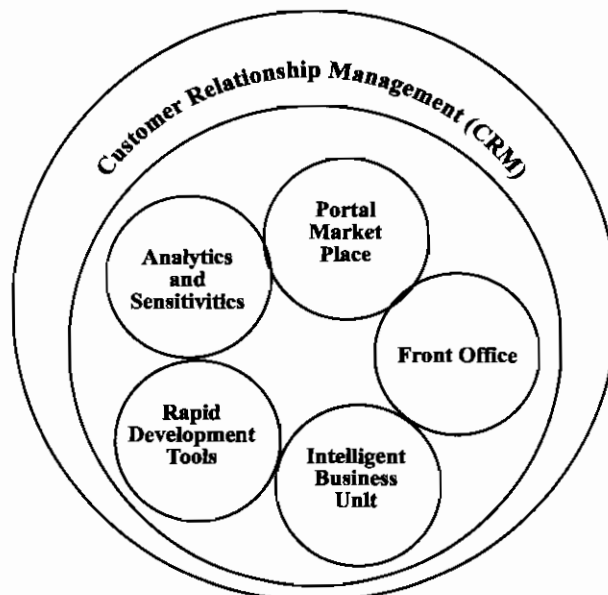


Figure 2: Component Parts of Customer Relationship Management Software

CRM software should focus on “incoming and outgoing” customers. It should investigate the customers and business opportunities in order to communicate in an effective manner. [1]

In short, CRM procedures are completely different from ERP procedures. CRM provides an efficient communication between the front desk and the customers; also it manages this relationship with the back office and its functional processes.

The difference between the old and the new perspective of CRM are investigated in three different areas:

- The orientation of customers in the old perspective was in two different patterns dealing with customer relationship, and is composed of customer-to-customer, and customer-to-business relationship. However, in the new perspective the orientation of customer is dealing with customer-managed relationship and the instance of this view is customer (e.g., priceline.com) and customer-to customer (e.g., eBay.com). The main point that customers should consider in a relationship is implementing the companies' communications.
- The pattern of relationship in the old view point is many-to-many and one-to one, but in the new perspective this pattern is one-network-one which is equal to customer-network-company. The term network shows the existence of numerous relationships among companies, internal and external customers.
- The third key dimensions are the strategies of management approach. The old perspective in this case is enterprise approach, customer behavior, and how to treat different customers differently. The new view towards this issue is the co-creative approach. In this case companies have direct relationship with customers, and they try to maintain profitable clients. [9]

Today, competitive advertising is one of the critical issues in CRM. *Salesforce.com*, *upshot.NetLedger* and *sale.net* are three such examples. [3]

The figures below show services purchased among hosted solutions customer and areas for improvement in CRM from the February 2003 Aberdeen Group report. They show that organizations, which address their CRM concerns, are interested in Customer Relationship Management hosted solutions. [7]

Table 2: Services Purchased among Hosted Solutions Customer and Areas of CRM

	Sales (%)	Marketing (%)	Customer Service (%)	Call Center (%)	Field Services (%)	Other (%)
<b>Yes</b>	87.2	84.4	89.6	91.7	88.9	1
<b>No</b>	12.8	15.6	10.4	8.3	11.1	0

Source: Aberdeen Group, January, 2003.

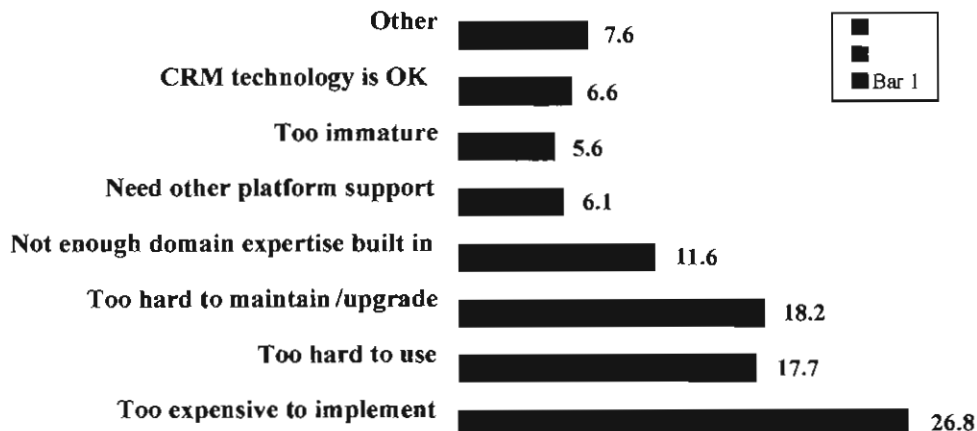


Figure 4: Areas for Improvement in CRM

Source: Aberdeen Group, February, 2003.

### THE IMPACT OF CRM AND E-COMMERCE ON PETROCHEMICAL INDUSTRY

Petrochemical industry is known as one of the largest worldwide industries, by US estimates \$1.7 trillion.

Globalization, development of transportation, customer service, the level of profit and the ways of production are critical factors in the growth of EC. Therefore, transfer of technology in the petrochemical industry was first through EDI and then it was completed by EC (e.g., virtual SCM, CRM, business intelligence, etc). In the last 5 years, there has been vast investments in IT improvement of the petrochemical industry, in order to optimize the ERP processes.

Introducing E-business in petrochemical industry has been effective both inside and outside the organizations. The trading cycle, which is influenced by systems for E-business, is started from pricing deals, contractual validation, shipping instructions and insurance and cargo tracking to reciprocal instructions on the receiving end.

The growth of E-commerce sites on the petrochemical industry allows customers to shop online and track the shipment, until they receive their orders.

According to the Forrester research Inc. in Cambridge, Mass. electronic sales from petrochemical industry were forecasted to rise from an estimated US \$4.3 billion in 1998 to US \$178.3 billion in 2003, US \$267 billion in 2004 and US \$400 billion in 2005. (Figure 5)

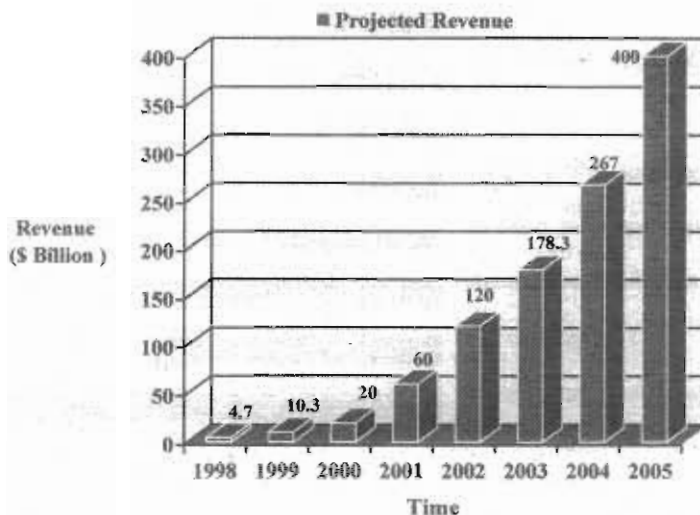


Figure 5: Projected Revenue of EC in Petrochemical Industry

Source: [www.forrester.com](http://www.forrester.com)

Polymerland, a unit of GE plastics, is one example of a firm with an E-sale growth of US \$100 million in 1999, US \$450 million in 2000, and US \$950 million in 2001. [8]

E-sale plays a critical role in reducing costs. For instance, Chematch, a petrochemical E-commerce site, with a its product focus on aromatic, methanol, plastics, and fuels, has been successful in reducing costs. It saves 10 to 25 percent of the processing cost, and 3 to 12.5 percent of the total transaction cost.

*PlasticNet.com* is one of the largest websites. It is plastic related online sales and E-services. It does more complex deals and saves a huge amount of costs.

Chemconnect, a petrochemical global trading site, with its product focus on chemicals and plastics, implements an innovative online trading service.

Many organizations have worked on the effects of CRM in E-markets, and how to improve and modify the ways of communicating with customers in order to increase E-sales. One of the sale policies in this case is to allow customers to order free chemical samples. Slide product, Inc. has adopted a policy to observe and maintain more customers. Another company which works on CRM is Chematch which allows customers to see "new headlines, and analytical market summaries."

## CONCLUSION

To sum up, IT investments directly support the generation of revenue and/or profitability in today's business, and industries, such as the Petrochemical industry. Of course, there are certain types of IT services and products that generally find their way into these areas, such as CRM, and ECRM.

Moreover; it is a known fact that Information Technology is considered as the major



part of the profitability in both industry and the economy, and knowledge economy allows services to be conducted inexpensively. Thus, providing IT projects is essential for business and industry.

Although, from the provider's point of view, the expectations of clients can be highly unrealistic. Therefore, one has to provide an industry, such as the Petrochemical Industry the following process for E-commerce (e.g. Electronic Commerce Customer Relationship Management) more effectively as follows:

- Present in the Global network via sending Information online.
- Increase contacts between the supply chain and demand, through personal strategies.
- Enhance transaction by introducing the marketing channel, and gathering the potential and available relevant business intelligence.
- Cause transformation by determining the problem, better scheduling, improving on the supply chain and better customer relations.

## RECOMMENDATIONS FOR FUTURE STUDY

It is suggested that in the future this case study be applied to other major industries such as steel, machinery, transportation and electronics.

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