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# AN INTEGRATIVE AND COMPLEMENTARITY-BASED MODEL FOR THE DESIGN AND ADOPTION OF CUSTOMER RELATIONSHIP MANAGEMENT TECHNOLOGIES

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## Abstract

*Relationship marketing or customer relationship management (CRM) emphasizes the need to build a long term relationship with customers. Spending on CRM software has grown 6 times over the past years but customer satisfaction of American consumers did not grow. An examination of the literature reveals that current CRM model tends to focus more on customer "service" instead of customer "relationship". This study proposes to combine the American Customer Satisfaction Index (ACSI) model and complementarity framework to provide directions for the design and adoption of CRM software.*

## Introduction

Relationship marketing or customer relationship management emphasizes the need to build a long term relationship with customers. Different from "contact marketing" or conventional "sales", relationship marketing calls for a long term customer retention through the building of commitment and loyalty. As a result, customer relationship management (CRM) software has been gaining recognition. Spending on CRM software has grown from \$200 million in 1994 to \$1.1 billion in 1997 (Sweat and Hibbard, 1999). Big software giants such as Oracle, Lucent Technologies, SAP, IBM and many others, have rolled out their CRM systems (Sweat and Riggs, 1999).

However, several, including the *Wall Street Journal*, have noticed that as CRM spending grows nearly 6 times between 1994 to 1997, customer satisfaction has been going down steadily (Sweat and Hibbard, 1999; McDermott, 1999). American Customer Satisfaction Index (ACSI), the most comprehensive index to measure customer satisfaction in the United States, has been dropping from a score of 74 in 1994 to less than 71 in 1997. According to the latest number, ACSI index has rise slightly back to 72 in the fourth quarter of 2000 (ACSI web site, 2001), which still falls short of the growing spending of CRM software.

To establish a long term relationship with customers requires an integrated design and a new way to look at customer satisfaction. Customer satisfaction is not narrowly defined as the satisfaction of customer service; on the contrary, it requires a comprehensive support from the customization of product or service, quality of the product or service, to customer service during and after the consumption experience (Fornell, et. al., 1996). A potential customer who enjoys an on line shopping experience on the web but cannot find the desirable product will not become an actual customer. A customer unhappy about the quality of the merchandise will not become a repeat customer even if a replacement product is offered to her.

Current CRM models and technologies appear to emphasize more on the customer service aspect and less on the product and quality issues. Although customer services is undoubtedly a critical part of customer relationship, product and quality are equally important. This bias is also recognized in relationship marketing literature. It was noted that: "... Particularly lacking are studies on relationship marketing in the consumer markets, especially for consumer *products* as opposed to consumer *service* industries." (page 256, Sheth and Paratiyar, 1995).

In addition, it is important to note that three factors, product, quality, and service, are complementary in nature; that is, the value of one will determine the contribution of others. According to the complementary framework (Lee et al., 2000), when several factors are complementary, the overall payoff is limited by the least favorable factor. That is, if product, quality, and service are complementary toward customer satisfaction and that product and quality are at unfavorable conditions, then even a high quality of customer service will not improve customer satisfaction. This finding may bring significant insight into the declining customer satisfaction and growing CRM spending.

This study proposes to develop a framework to model CRM by combining ASCI model and the complementarity framework. By doing so, this model will identify major factors that contribute to a long term customer relationship, and shed light on the interaction among these factors. In addition, this model will point directions to the design and adoption of CRM software.

## Literature Review

### The ASCI Model

Marketing has an extensive literature on the studying of customer satisfaction. The most comprehensive index of customer satisfaction is the American Customer Satisfaction Index, or ACSI, developed by the University of Michigan. ACSI is calculated by data collected on interviews of leading companies in each SIC categories (250 customer interviews per company). The interview and data collection is based on the following model of customer satisfaction (Figure 1). Customer satisfaction has been defined as the combining effect of (1) perceived quality, which is determined by the customization of the products and services, and the reliability of it, (2) perceived value, which is the difference between perceived quality and price, and (3) expectation, which indicates the customer satisfaction of prior consumption experience. Customer complaint is a result of customer (dis)satisfaction. The handling of customer complaint and customer satisfaction result in customer loyalty, or a long term customer relationship. ACSI is a comprehensive measure of how satisfied the customer is, with respect to almost all aspects of the consumption. Major findings of Fornell et. al. (1996) are that first, customization is more important than reliability. Second, the impact of quality on customer satisfaction is greater than that of value in each of the seven sectors.

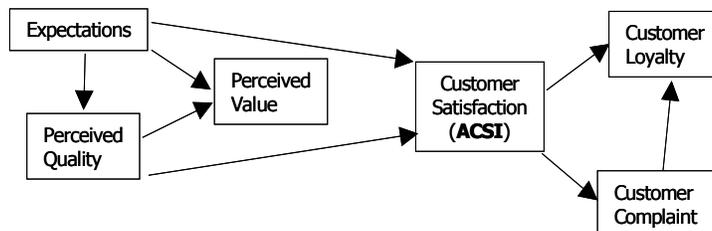


Figure 1. The ASCI Model

Although the ACSI model provides a high level foundation of customer satisfaction and customer relationship, there seems to exist a gap between the high level construct and actual design and adoption of CRM software.

### The Complementarity Framework

The importance of the interactions, or complementarity, among organizational factors are recognized by the Complementarity framework. One factor's marginal contribution to the output is seldom absolute; it depends on the value of the other factors. If one factor's contribution increases due to a favorable value of the other and it decreases due to an unfavorable value of the other, the two factors are said to be complementary. This observation often leads to important conclusions to explain organizational ineffectiveness. Many organizations have invested heavily in information technologies (IT) without realizing that such an investment may not payoff as highly if other complementary factors are in unfavorable conditions. Important work of the complementarity framework includes Topkis (197x) and Milgrom and Roberts (1995). Particularly relevant to our understanding of CRM model is the model by Lee et al. (2000). It analyzes impact of information technologies (IT) on customization and quality and the complementary natures of IT features. Assuming that customer has an ideal product,  $\mathbf{u}$ , which is unobservable by the manufacturer. The manufacturer uses  $\hat{\mathbf{u}}$  to estimate  $\mathbf{u}$ . As a result, the manufacturer was able to manufacture an actual product which is  $\mathbf{x}$ . Then the customization of a product to the customer's true preference can be represented by two variables:  $d_{\hat{\mathbf{u}}}$ , distance between estimated customer demand ( $\hat{\mathbf{u}}$ ) and actual customer demand ( $\mathbf{u}$ ), and  $d_{\mathbf{x}\hat{\mathbf{u}}}$ , distance between the firm's product ( $\mathbf{x}$ ) and estimated customer demand ( $\hat{\mathbf{u}}$ ).  $d_{\hat{\mathbf{u}}}$  can be reduced by data mining techniques and extensive marketing research effort and  $d_{\mathbf{x}\hat{\mathbf{u}}}$  can be reduced by advances in manufacturing technologies, especially modular design. On the other hand, reliability of the product or services can be improved through quality control technology, and an emphasis in high quality production and service in the organizational incentive systems.

There are two major implications from this model. First, IT impact high level performance variable, such as customer satisfaction, in a multi-level fashion. That is, IT does not impact customer satisfaction immediately; the influence is transformed through

multiple layers, such as customization and quality, before making a final impact on customer satisfaction. If the impact is not well transformed anywhere during the cycle, customer satisfaction will not increase as a result. Secondly, these factors are complementary in nature. A product with highly customized feature but low reliability will not increase customer satisfaction; and vice versa. Therefore, in order to have maximum customer satisfaction, all factors must have favorable values.

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